Multi-State Alternate Assessment

2016–17 Technical Report

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CHAPTER 1 CURRENT YEAR UPDATES

For the 2016–17 assessment, the MSAA Partner States comprise Arizona, Arkansas, Maryland, Maine, Montana, the Pacific Assessment Consortium (PAC-6: Guam and the Commonwealth of Northern Mariana Islands [CNMI]), Rhode Island, South Dakota, Tennessee, the U.S. Virgin Islands (USVI), and Washington, D.C.

For the 2016-17 operational assessment, the Multi-State Alternate Assessment (the MSAA) became two-stage adaptive in nature, meaning that student performance in the first stage of the assessment determines the second stage administered to the student. Furthermore, operational reading foundational items and Tier 1 writing prompts were removed from the MSAA to allow for additional research and/or development of these item types. Based on analysis of item performance, the MSAA Partner States decided to remove the grade 3 and 4 ELA foundational reading items in order that they may be revised to better align to the standards. Additionally, the Tier 1 writing prompts were removed from the 2016–17 test design in order to reevaluate the scoring model used for these items. Although the Tier 1 writing prompts were removed, basic writing skills were still assessed at every grade via writing process multiple choice items. The balance of the MSAA operational items remained fundamentally the same as the 2015–16 operational assessment. The 2016–17 assessment included field-test items in both English language arts (ELA; reading items, writing skills items and writing prompts) and mathematics. The field test items for each grade and content area included items from differing levels of complexity. There were three forms per grade for each content area. Additional detailed information is available in Chapter 3.

Test documentation was updated to reflect changes in the *Test Administration Manual* (TAM), *MSAA Online Assessment System User Guide for Test Administrators*, *MSAA Online Assessment System User Guide for Test Coordinators*, *Directions for Test Administration* (DTA), and *MSAA 2017 Guide for Score Report Interpretation Guide*. The TAM, *MSAA Online Assessment System User Guide for Test Administrators*, *MSAA Online Assessment System User Guide for Test Coordinators*, DTA, and online training modules were heavily revised in order to streamline information and provide more clarity to test administrators (TAs) and test coordinators (TCs). Additional detailed information is available in Chapter 5.

1.1 MEASURED VALIDITY STATEMENT

The 2016–17 report describes several technical aspects of the MSAA in an effort to contribute to the accumulation of validity evidence to support MSAA score interpretations. Because the interpretations of test scores, not the test itself, are evaluated for validity, this report presents documentation to substantiate intended interpretations (AERA, APA, & NCME 2014). Each section in this report contributes important information to MSAA: test development, test alignment, test administration, scoring, reliability, performance levels, and reporting.

Standards for Educational and Psychological Testing (AERA et al., 2014) provides a framework for describing sources of evidence that should be considered when constructing a validity argument. These sources include evidence based on the following five general areas: test content, response processes, internal structure, relationship to other variables, and consequences of testing. Although each of these sources may speak to a different aspect of validity, they are not distinct types of validity. Instead, each contributes to a body of evidence about the comprehensive validity of score interpretations.

CHAPTER 2 OVERVIEW OF MSAA

MSAA assesses ELA and mathematics at grades 3–8 and 11 and is aligned through the States' Content Standards and the MSAA Core Content Connectors (CCCs). MSAA is a computer-based, on-demand, two-stage adaptive assessment consisting mostly of selected-response and some constructed-response items. Both item types are written at distinct levels of complexity, representing different levels of skill acquisition by students.

Students with significant cognitive disabilities often need materials and instructional strategies that are substantially adapted and scaffolded, and that have built-in supports to meet their individual needs.

The MSAA levels of complexity are designed to follow instructional practices. When students begin to learn a new skill or acquire new knowledge, they need more support and scaffolding. As students learn and develop mastery of that skill or knowledge, they need less support. The test items on MSAA are developed with many scaffolds and supports embedded within the items. Supports not embedded in the test items may be provided as accommodations, as may other allowable ways to present the item to students, based on their individual requirements.

The assessment is designed to be administered one-on-one, and may be delivered via an online, paper-pencil, or hybrid format. The needs of the student may also be addressed through other supports, such as assessment features built into the platform, and accommodations which include assistive technology, a paper version of the test, a scribe, and sign language. Appendix A contains the 2016-17 summary of accommodation usage frequencies for the MSAA.

Each content area consists of 32–35 operational items, which are mostly selected-response with some constructed-response items in mathematics. The operational writing items of the ELA test consist of a series of selected-response items at each grade level. Each content area assessment is divided into test sessions. There are also embedded field-test items in Session 1 for each grade and content area, as well as a field-test writing prompt for ELA. Test administrators have substantial leeway in developing a testing schedule with the ability to start and stop a test depending on the engagement of the student.

2.1 HISTORY OF MSAA

Work leading up to MSAA began in late 2010, when the National Center and State Collaborative (NCSC) began development of the NCSC Alternate Assessments based on Alternate Achievement Standards (AA-AAS) for students with the most significant cognitive disabilities. This work culminated in the operationalized NCSC assessment in spring 2015. For additional information about the NCSC assessment, please refer to the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* or contact the MSAA Partner States at MSAA@AZED.gov.

2.1.1 Core Beliefs

The core beliefs of MSAA began with NCSC and were laid out in the prior planning and development of that assessment. As recorded in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*, as states and organizational partners implemented the NCSC development plan, they found they had to come to a consensus on topics that were a mix of practice and theory in the comprehensive context of teaching and learning for the students. They required a blend of policy, educational, and technical solutions. Through policy discussions and in iterative research and design steps, the partners arrived at a shared philosophy and guiding principles that are reflected in the overall project resources. These project resources include the comprehensive system of curriculum, instruction, classroom assessment, and professional development, as well as in the operational assessment design.

The MSAA Partners, as their NCSC counterparts before, believe that accessibility is central to the validity argument of the assessment, and that accessibility to the academic content based on college- and career-ready academic standards begins with rigorous curriculum and instruction resources and training to teachers. The original design of NCSC curriculum and instruction resources was informed by extant research and iterative small studies to ensure inclusive accessibility and appropriately high expectations for learning. Then, the NCSC assessments were based on the same model of learning as reflected in classroom resources. Finally, the NCSC project provided resources for intervention on communicative competence to ensure all students have a way first to learn the concepts and then to show what they know on the assessment. The NCSC Theory of Action, available at www.ncscpartners.org/Media/Default/PDFs/Resources/NCSCBrief9.pdf, was developed to explain the bases for these resources and how they were intended to relate to one another, to college- and career-ready academic standards, and, ultimately, to the goals of having all students with significant cognitive disabilities leave high school ready to participate in college, careers, and their communities.

Practice-focused summaries of the foundational components reflected in the design of the NCSC assessment, known as the NCSC Brief series, are available to orient readers to the larger context of the comprehensive NCSC system of curriculum, instruction, assessment, and professional development. For additional information about the NCSC assessment, please refer to the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* or contact the MSAA Partner States at MSAA@AZED.gov.

2.1.2 Stakeholders

Many stakeholders are involved in the development of MSAA. MSAA State Leads are key representatives from each Partner State and together compose the decision-making body for MSAA. Members of this body participate in various subcommittees that focus on specific aspects of the assessment and have decision-making authority on behalf of the Partner States for each subcommittee's focal area.

The MSAA Manuals, User Guides, and Training Subcommittee that oversaw development of the *Test Administration Manual* (TAM), *MSAA Online Assessment System User Guide for Test Administrators*, *MSAA Online Assessment System User Guide for Coordinators*, and online training modules consisted of MSAA State Leads from Arizona, Maine, Maryland, Montana, Rhode Island, and South Dakota. The End-of-Test Survey Subcommittee that provided the content of the survey, determined relevant policies, and received the results after administration had representation from Arizona, Rhode Island, and South Dakota. Decisions and approvals related to the core item constructed sets and the front matter for the *Directions for Test Administration* (DTA) were addressed by the Test Construction and DTA Revisions Subcommittee, with representation from Arizona, Maine, Maryland, Montana, Rhode Island, and South Dakota. The Item Development Subcommittee, composed of MSAA State Leads from Arizona, Maine, Maryland, Montana, Rhode Island, and South Dakota, provided overall input and direction related to development of field-test items. Finally, report revisions and decisions were the responsibility of the MSAA Reports Subcommittee, with representation from Arizona, Maryland, South Dakota, and Tennessee.

2.2 PURPOSES AND USES OF MSAA

MSAA is a comprehensive assessment system designed to promote increasing higher academic outcomes for students with significant cognitive disabilities in preparation for a broader array of post-secondary outcomes. MSAA is designed to measure academic content that is aligned to and derived from Partner States' content standards. This test contains many built-in supports that allow students to use materials they are most familiar with and communicate what they know and can do as independently as possible. MSAA is administered in the areas of ELA and mathematics in grades 3–8 and 11.

MSAA was developed to ensure that all students with significant cognitive disabilities are able to participate in an assessment that is a measure of what they know and can do in relation to the grade-level State Content Standards. MSAA is a component of a system of curriculum, instruction, and professional development that allows students with the most significant cognitive disabilities to access grade-level content aligned to the grade-level State Content Standards.

The MSAA Partners' long-term goal is to ensure that students with the most significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school capable of pursuing post-secondary options. A well-designed summative assessment alone is insufficient to achieve this goal.

MSAA is designed to meet the requirements of the Every Student Succeeds Act (ESSA) and Individuals with Disabilities Education Act (IDEA). These laws mandate that all students participate in assessments that measure student achievement on grade-level content standards.

2.3 MSAA PARTICIPATION

The criteria for student participation in MSAA reflect the pervasive nature of a significant cognitive disability. All content areas should be considered when determining who should participate in this assessment. Table 2-1 below shows the participation criteria and the descriptors used to determine eligibility for participation for each student.

Students must meet the following eligibility criteria:

Table 2-1. 2016–17 MSAA: Participation Criteria

Participation Criteria	*Participation Criteria Descriptors*
1. The student has a significant cognitive disability.	Review of student records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior.* *Adaptive behavior is defined as essential for someone to live independently and to function safely in daily life.
2. The student is learning content linked to grade-level content standards.	Goals and instruction listed in the IEP for this student are linked to the enrolled grade-level content standards and address knowledge and skills that are appropriate and challenging for this student.
3. The student requires extensive, direct individualized instruction and substantial supports to achieve measurable gains in the grade- and age-appropriate curriculum.	The student (a) requires extensive, repeated, individualized instruction and support that is not of a temporary or transient nature, and (b) uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings.

Appendix B shows the 2016-17 summary of participation rates by demographic category for the MSAA.

Assessments for students with significant cognitive disabilities rely on a foundation of communicative competence. Students who do not have receptive and expressive communication are unlikely to be able to demonstrate what they know and can do on an assessment. Students who do not have a mode of communication are identified during the assessment process.

Post-assessment, teachers may use the Communication Toolkit developed by NCSC to help these students develop a mode of communication. The toolkit can be found here: https://wiki.ncscpartners.org/index.php/Communication_Tool_Kit.

CHAPTER 3 TEST CONTENT

3.1 HISTORY OF ALTERNATE ACHIEVEMENT STANDARDS AND CORE CONTENT CONNECTORS

Designed specifically for students with significant cognitive disabilities, NCSC Alternate Assessment is a performance-based test that is aligned with grade-level State Content Standards for ELA and mathematics. The NCSC AA-AAS tests student performance in ELA and mathematics based on alternate achievement standards. The student's performance on the NCSC AA-AAS is reported by a scale score for each content area, as well as by a performance level. NCSC looked at the Learning Progression Frameworks (LPFs) together with the grade-level content expectations from the Common Core State Standards (CCSS) to identify and clarify the most salient grade-level, core academic content to guide instruction and assessment of students with the most significant cognitive disabilities from kindergarten through high school. This academic content is referred to as the Core Content Connectors (CCCs).

The NCSC state and center partners, which comprised content and special education experts, focused on defining the constructs of reading, writing, and mathematics to reflect an appropriate expectation of instruction and learning throughout a student's educational experience. Furthermore, the experts sought to make those constructs adaptable to the way in which students with significant cognitive disabilities demonstrate acquired knowledge and skills. NCSC established overarching content definitions by examining (a) existing content definitions in general education; (b) the content, concepts, terminology, and tools of each domain; (c) a body of extant research; and (d) the CCSS. These content definitions became central to the development of assessment items.

NCSC developers revised and refined the NCSC AA-AAS design using cycles of continuous feedback from state and center partners. Developers evaluated proposed designs through iterative item and test development steps, special studies, and pilot testing, all of which were central to the final NCSC assessment model implemented through the first administration of the operational test in spring 2015.

Prior to the start of item development, the development of CCCs to connect the LPFs to the CCSS took place and was led by NCSC with Partner State involvement.

3.1.1 The Learning Progression Frameworks

The LPFs present a broad description of the essential content and general sequencing for student learning and skill development (Hess, 2010). It is the pathway that students typically take toward mastering skills for college and career readiness, as they move through the grades. The LPFs provide the educational logic to help move students with the most significant cognitive disabilities along with their peers in an

educationally sound way. Experts at NCSC looked at these learning targets together with the grade-level content expectations from the CCSS to identify and clarify the most salient grade-level, core academic content to guide instruction and assessment of students with the most significant cognitive disabilities from kindergarten through high school. This academic content is referred to as the CCCs. The CCCs identify the academic content designed to frame instruction and assessment while retaining the grade-level content focus of the CCSS and the learning targets of the LPFs. Each CCC represents a teachable and assessable part of the content. Related CCCs are addressed during instruction to create deeper understanding of grade-specific academic content. The CCCs are specifically intended to promote success as students advance with their peers without disabilities from grade level to grade level. They are the starting point for instruction, not necessarily everything an individual student can and should learn.

3.1.2 Core Content Connectors

The CCCs are, defined by NCSC as, the academic content designed to frame the instruction and assessment of students with the most significant cognitive disabilities. The CCCs create a connection between the LPFs and CCSS for students with the most significant cognitive disabilities. The CCCs illustrate the necessary knowledge and skills students with the most significant cognitive disabilities need to reach the learning targets within the LPFs and the CCSS. This identified core content serves as a connection or stage between the LPFs (designed for typically developing students) and the CCSS (which define grade-level content and achievement). The CCCs are intentionally dually aligned with both. The CCCs identify academic content in each subject area to guide the instruction for students in this population and for the alternate assessment. CCCs are designed to contribute to a fully aligned system of content, instruction, and assessment that focuses on the core content, knowledge, and skills needed at each grade to ensure success at the next.

The CCCs preserve the sequence of learning outlined in the LPFs to the extent possible while deconstructing the progress indicators (which describe concepts and skills along the learning continuum for each grade span in the learning progression) into teachable and assessable segments of content. The connectors and corresponding *Curriculum Resource Guides* were developed to help promote how students can engage in the CCSS while following the LPFs. Table 3-1 shows a series of CCCs within one big idea across multiple grades for the mathematics strand of geometry to demonstrate the academic content sequence that is maintained by the CCCs.

Table 3-1. 2016–17 MSAA: Example of the Core Content Connectors, Developed by NCSC, Across Grades—Mathematics Strand: Geometry Big Idea: Shapes and Figures—Their Attributes, Properties, and Corresponding Parts

	Grades K–2	*Grades 3–4*	*Grades 5–6*	*Grades 7–8*	*HS*
Properties and attributes of shapes and figures and their corresponding parts	K.G.M1a1 Recognize two-dimensional shapes (e.g., circle, square, triangle, rectangle) regardless of orientation or size	3.GM.1h1 Identify shared attributes of shapes	5.GM.1a1 Recognize properties of simple plane figures	7.GM.1e Construct or draw plane figures using properties	H.GM.1e Make formal geometric constructions with a variety of tools and methods
	K.GM.1a2 Recognize two-dimensional shapes in environment regardless of orientation or size	4.GM.1h2 Classify two-dimensional shapes based on attributes (# of angles)	5.GM.1b1 Distinguish plane figures by their properties	8.GM.1g1 Recognize congruent and similar figures	H.GM.1b Use definitions to determine congruency and similarity of figures
	K.GM.1a3 Use spatial language (e.g., above, below) to describe two-dimensional shapes				
	2.GM.1a4 Identify two-dimensional shapes such as rhombus, pentagons, hexagons, ovals, equilateral, isosceles, and scalene triangles				

The CCCs reference the *Learning Progressions Frameworks Designed for Use with the Common Core State Standards in Mathematics K–12* (Hess, 2010). The letter/number in each box provides a cross-reference to the letter/number in the original learning progressions. For example, H.GM.1b is based on an original progress indicator within the progression that stated, "Using congruence and similarity relationships to solve problems, including triangle congruence relationships." The letter/number shows the grade level (in this case, high school), the next letters show the content (e.g., geometry), and the rest of the code relates to where the connector falls in the progression. For example, for 3.GM.1h1, the 3 means third grade, the GM means geometry, the 1h relates to the specific progress indicator in the original learning progression, and the 1 means that it is the first in a series of connectors.

Table 3-1 shows how learner understanding builds across years. For example, in the second row, the student recognizes shapes, then compares shapes based on attributes, then distinguishes plane figures by properties, then recognizes congruent/similar figures, and finally by high school can use definitions to

determine congruency/similarity of figures. These skills all promote the big idea about shapes—their attributes, properties, and corresponding parts (Wakeman, Lee, & Browder, 2012).

3.2 ALIGNMENT AND LINKAGES

As part of the assessment development process, NCSC conducted an alignment study in 2015. The purpose of the alignment study was to examine the relationship between the spring 2015 operational assessment items and academic grade-level content targets prioritized for the NCSC AA-AAS. NCSC used results from this study to provide content validity evidence for the NCSC summative assessment. The National Alternate Assessment Center (NAAC) developed the Links for Academic Learning (LAL; Flowers, Wakeman, Browder, & Karvonen, 2007), which established the criteria used in this alignment study. The criteria are:

1. The content is academic;
2. The focus of achievement maintains fidelity with the content of the original grade-level standards (content centrality) and when possible, the specified performance (performance centrality);
3. The Depth of Knowledge (DOK) differs from academic grade-level content targets, as described in the academic grade-level content targets, but maintains high expectations for students with the most significant cognitive disabilities;
4. There is some differentiation in achievement across grade levels or grade bands; and
5. The potential barriers to demonstrating what students know and can do are minimized in the assessment.

The *Alignment of NCSC English Language Arts and Mathematics Operational Items to Academic Grade-Level Content Targets* report is available in the 2014–15 NCSC Technical Report.

3.3 ASSESSMENT DESIGN

3.3.1 Operational Design

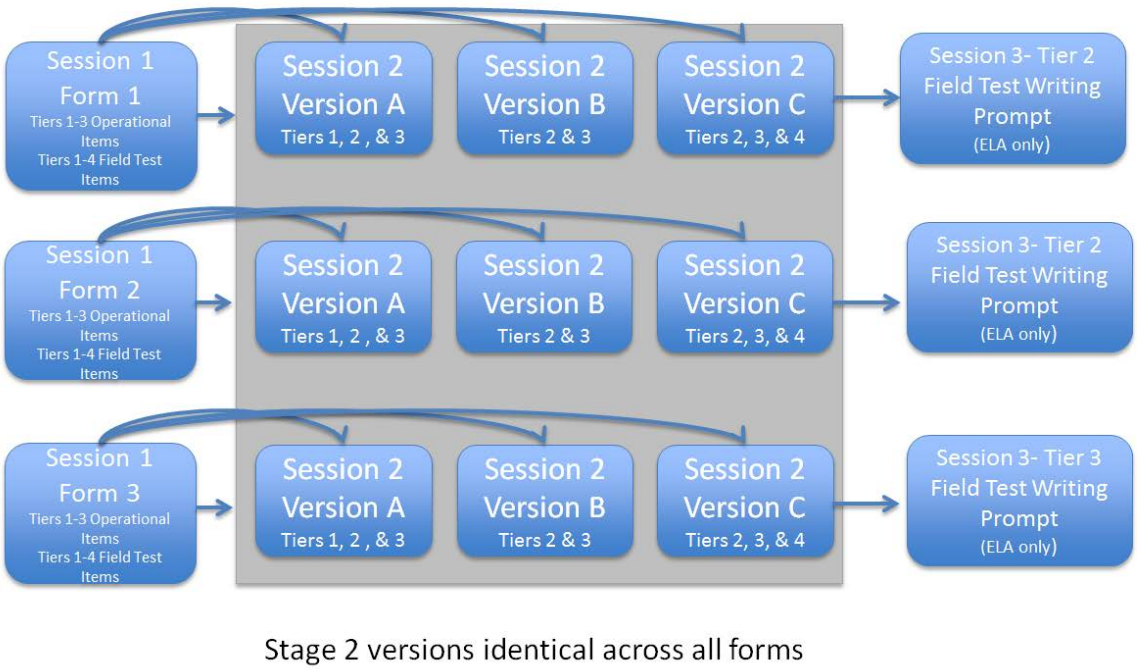
The operational MSAA assessment program was designed to produce valid and reliable mathematics and ELA (reading and writing) scores. The mathematics and reading portions of the test are comprised primarily of selected-response items. In mathematics, all grade levels, except for grades 6 and 7, also included constructed-response items. For the 2016–17 assessment, writing was comprised of only selected-response items, stand-alone items.

The items utilized in the assessment vary in complexity. There were a variety of tier levels used. Items were built as item families where each tier within the family addressed both the content complexity and

the degree of scaffolding and support provided with the items. Each item family provides four decreasingly complex versions (items) of the task referred to as Tier 4 (most complex), Tier 3 (less complex), Tier 2 (less complex than Tier 3), and Tier 1 (least complex). Additional detailed information about the item development is available in section 3.3.3 of Chapter 3.

For the 2016–17 assessment, three two-stage adaptive forms were developed for both ELA and mathematics to accommodate the inclusion of field-test items within Session 1 for each content area. The forms followed guidelines informed by the respective content-area test blueprints. Each form contained 9–10 field-test items embedded in Session 1. The operational items in Session 1 were the same across the forms. Session 2 consisted of Version A, Version B, and Version C. Each version was intended to be slightly more complex and difficult than the previous version. For 2016–17 there was a high level of overlap between the items in each version, but there were slight variations to ensure the distinction. ELA also included a Session 3 for the purposes of field-testing a writing prompt. A Tier 2 writing prompt was included for Forms 1 and 2 and a Tier 3 writing prompt was included for form 3. Figure 3-1 below is a visual demonstration of the two-stage adaptive forms that were developed, which shows the distribution of tiers that were used.

Figure 3-1. Stage Adaptive Forms



3.3.2 Operational Core Items and Embedded Field-Test Items

The items on each of the forms were reviewed by Psychometrics for any validity and reliability concerns.

The mathematics tests consisted of 35 operational items across the testing sessions per grade, with 10 additional field-test items as shown in Table 3-2:

Table 3-2. 2016–17 MSAA: Mathematics Items

Grade	*Total Operational Items*	*Field-Test Items (total across three forms)*
3	35	30
4	35	30
5	35	30
6	35	30
7	35	30
8	35	30
11	35	30

For Session 1, each form had 15 operational items. These items were the same across all forms. Each form had 10 different field-test items for a total of 30 field-test items. Three versions of Session 2 were developed. Each version had 20 items. There were a number of items that were the same across Sessions 2A, 2B, 2C in Tier 2 and Tier 3. There were 10 items that overlap between Sessions 2A, 2B, and 2C for mathematics.

The ELA tests consisted of 32 operational items across the testing sessions per grade, with 9 additional selected-response field-test items and 1 additional writing prompt field-test as shown in Table 3-3.

Table 3-3. 2016–17 MSAA: ELA Items

Grade	*Total Operational Items*	*Selected-Response Field-Test Items (total across three forms)*	*Writing Prompt Field-Test Items (total across three forms)*
3	32	27	2
4	32	27	2
5	32	27	2
6	32	27	2
7	32	27	2
8	32	27	2
11	32	27	2

For Session 1, each form had 15 operational items. These items were the same across all forms. Each form had 9 different field-test items for a total of 27 field-test items. Three versions of Session 2 were developed. Each version had 17 items. There were a number of items that were the same across Sessions 2A, 2B, 2C in Tier 2 and Tier 3. There were 2 passage sets and 2 writing items (stand-alone), for a total of 12-13 items, that overlap between Sessions 2A, 2B, and 2C for ELA.

The field-test items were selected from items developed in 2016. During the item development process, these items followed a typical development cycle, including reviews by MSAA State Leads and by

Item Content and Bias and Sensitivity panelists. The 2016–17 field-test items were selected based on the following criteria:

- Items represented a variety of tier levels.
- The writing stand-alone items were at various tier levels.
- Passage topic or writing topic was unique to the form.
- Passage topic and genre provided greater variety across the forms.
- Passage and item content was engaging, accurate, and free of regional bias.

All constructed tests, as well as the field-test items, were posted on a secure FTP site for the Test Construction and DTA Revisions Subcommittee review and approval. A webinar was held with the MSAA subcommittee to explain the constructed sets process and to review the Test Construction Design document, which provided information specific to each content area about the operational items selected and the field-test items selected to meet the MSAA two-stage adaptive design. The MSAA subcommittee then had an opportunity to review the constructed sets and provide input and final approval.

3.3.3 Item Design and Administration

The MSAA item design and administration is designed to capture student performance at different levels of skill acquisition. The assessment items incorporate important aspects of item design related to both varying levels of content complexity and the degree and type of scaffolds and supports. The MSAA Partners followed NCSC's intentional assessment development process to address the targeted grade-level academic content linked to evidence-based curricular and instructional materials, and resulted in useful information for educators and families.

The MSAA content development processes addressed levels of cognitive and language complexity, specifically addressing the States' Content Standards, and the heterogeneous characteristics of the target student population. The assessment items vary systematically in complexity yet remain aligned to the focal knowledge, skill, and ability (FKSA) behind the CCCs which were designed to capture student performance through two specific item design features: (1) levels of content complexity, and (2) degrees and types of scaffolds and supports. Items were built as item families where each tier within the family addressed both the content complexity and the degree of scaffolding and support provided with the items. The items were written intentionally to measure a range of academic abilities within the target population. The array of item characteristics to facilitate varying student needs include reminders, examples, and models. These are provided to focus the student on the task and elicit a response without guiding the student's response.

Overall Item Structure

Multiple item families were developed for each CCC. An item family is a cluster of items that are specific to one CCC and contain one item from each tier level, for a total of four items. Each tier provides variable features and supports that provide multiple entry points for a variety of students to demonstrate their FKSAs. All items in an item family assess grade-level academic concepts defined by either the FKSAs or Essential Understandings (EUs).

Each item family provides four decreasingly complex versions (items) of the task referred to as Tier 4 (most complex), Tier 3 (less complex), Tier 2 (less complex than Item 3), and Tier 1 (least complex).

The guidelines used in MSAA item development for graduated complexity of the items within a task were developed and implemented in the initial design phase of NCSC. These guidelines were used to create items of graduated complexity that address the same FKSA but provide increased levels of support and/or decreased levels of complexity so that students with different levels of cognitive ability are able to access the content. In addition to the tier-specific item content, all items include an introductory sentence and teacher directives.

Overall Item Types

Item types were developed with MSAA Partner-approved item specifications. MSAA item specifications are consistent with design patterns and task template guidelines that were originally developed by NCSC. The item types that have been developed include selected-response, multiple-part selected-response, constructed-response, and open-response.

Selected-response items are multiple-choice items where a student selects a response from three options (two options at Tier 1) and the answer is worth 0 or 1 point. Multiple-part selected-response items are multiple-choice items that are clustered together and connected to a single CCC. For each item the student selects a response from three options (two options at Tier 1) and the answer is worth 0 or 1 point. The overall cluster is worth more than 1 point. There are two- and three-part items. A typical example of a multiple-part selected-response item would be an initial item in the cluster that asks the student to identify the main idea and then a second item that asks for a supporting detail. Multiple-part selected-response items exist in ELA, but do not exist in mathematics. The MSAA item specifications and tier guidelines for mathematics direct test developers to address CCCs with multiple components with unique items. Therefore, a CCC that might ask a student to identify and solve an equation would have items written that require the student to identify the correct equation for a word problem and items written that require the student to solve an equation.

Constructed-response items require the student to interact in some way with response information to provide a response. In the case of the constructed-response mathematics items, all items are worth 0 or 1 point because the items ultimately ask the student to show whether he or she understands a single concept; therefore, a 0/1 point score assignment is appropriate. There are no operational ELA constructed-response items.

The writing open-response field test items have been developed such that the student is required to compose a permanent product. The student response is evaluated against a grade- and tier-specific rubric. Writing open-response items were developed for Tiers 3 and 2 only. In 2016-2017, both of these tiers were field-tested in each grade.

Administration

Test administrators (TAs) could begin with either the mathematics test or the ELA test. Once a content-area test was started, TAs were required to complete that test before beginning the test in the other content area. Each content-area test consisted of a set of testing sessions. Students were administered the test sessions in order for a given content area. ELA consisted of three test sessions and mathematics consisted of two test sessions at each grade level, as shown in Tables 3-4 and 3-5.

Table 3-4. 2016–17 MSAA: ELA Test Sessions

Session 1: ELA	*Session 2: ELA*	*Session 3: ELA - Writing Prompt*
Literary and informational reading passages and associated selected-response reading items	Literary and informational reading passages and associated selected-response reading items Selected-response writing stand-alone items	One constructed-response writing item (Field-tested)

Table 3-5. 2016–17 MSAA: Mathematics Test Sessions

MSAA Mathematics Test	
Session 1: Mathematics	*Session 2: Mathematics*
Selected-response mathematics items	Selected-response mathematics items
Constructed-response mathematics items in selected grades	Constructed-response mathematics items in selected grades

3.3.4 Item Components

3.3.4.1 *SELECTED-RESPONSE: READING, WRITING, MATHEMATICS*

Selected-response items are presented to students in a standardized and consistent format. All directions and materials needed for administering selected-response items are in the secure *Directions for Test Administration* (DTA) that accompanies each test form. Every item is presented in the following order:

- Item stimulus (which may include a passage, passage part, picture, graphic, or other illustration)
- Item question
- Response options presented in stacked, or vertical, formation

Students select a response from the options and may do so in a variety of ways (e.g., using the computer mouse, verbalizing, gesturing, using eye gaze or communication devices, using assistive technology). Students enter responses into the MSAA system. If the student has the scribe accommodation, the scribe enters the student-selected response on behalf of the student.

3.3.4.2 *CONSTRUCTED-RESPONSE: MATHEMATICS*

The constructed-response items, in selected grades for mathematics, require students to develop an answer instead of selecting an answer from response options. Constructed-response items are presented as novel tasks using materials and content presented in a test format that allows the TA to print out materials and manipulatives for the student to interact with. Each item is presented to the student in a standardized, scripted sequence of steps culminating in the TA scoring the student performance using the Mathematics Scoring Rubrics. The Mathematics Scoring Rubrics provide scoring standards that must be used to evaluate student responses. Directions and materials needed for administering mathematics constructed-response items are included in the secure DTA accompanying each mathematics test form. The TA enters the student constructed-response score into the MSAA system.

3.3.4.3 *CONSTRUCTED-RESPONSE: WRITING*

The field-tested constructed-response writing item requires students to produce a permanent product in response to a writing prompt. The student, or a scribe, records the response to the writing prompt either on the response template that is in the online MSAA system or on the paper response template that is included in the writing DTA.

The constructed-response writing item is presented to the student by the TA in a standardized, scripted sequence of steps and includes directions to present grade- and prompt-specific writing stimulus materials that need to be printed and prepared. All writing stimulus materials, including the response template, are identified

by a card number and are included in the writing DTA. If the student uses a paper version of this template to write a response, the TA will:

- annotate or interpret the student's writing directly on the student's written product if the TA determines that a novel reader (i.e., a scorer) may not be able to interpret a component (e.g., inventive spelling, penmanship, or use of symbolic expressions) of the student's written product.
- transcribe or type exactly the student's written response, including any annotations, into the MSAA system.

Note: If the TA determines that a student can enter an online response using a keyboard, a printed response template does not need to be used during the administration.

Information related to preparation and the standard administration of the constructed-response writing item is included in the DTA.

3.4 CONTENT AND BLUEPRINTS

The test blueprint followed by MSAA was consistent with the original NCSC Theory of Action, the evidence-centered design undertaken to develop the summative assessment, and best practices in educational measurement. Tables 3-6 and 3-7 show the broad targets developed to guide the item development process and to inform test construction. They provide general guidance for identifying areas of emphasis in the development of the mathematics and ELA test forms. The blueprint tables in Appendix C incorporate the overall content distributions used for the development of the operational tests. Each grade level/content area is represented by a table that first describes the domain (e.g., operations and algebraic thinking) or text type (e.g., reading informational text), weights by domain and ELA strands and text types, CCC, item types, and number of items. The items for each form of the test in each grade and content were revisited following the operational assessment window to balance both the content requirements of the blueprints and the psychometric characteristics of the items. The core set of operational items on each form was established from this balance.

Table 3-6. 2016–17 MSAA: Guidelines for Distribution of Mathematics Content by Grade Level

Math Content Category	*Gr 3*	*Gr 4*	*Gr 5*	*Gr 6*	*Gr 7*	*Gr 8*	*Gr 11*
Operations and Algebraic Thinking	30%	30%	10%				
Number and Operations Base Ten	20%	10%	40%				
Number and Operations Fractions	20%	30%	20%				
Measurement and Data	20%	20%	20%				
Geometry	10%	10%	10%	10%	20%	30%	10%
Ratio and Proportions				30%	40%		
Expressions and Equations				20%	10%	20%	
The Number System				30%	20%	10%	

continued

Math Content Category	*Gr 3*	*Gr 4*	*Gr 5*	*Gr 6*	*Gr 7*	*Gr 8*	*Gr 11*
Statistics and Probability				10%	10%	20%	20%
Functions						20%	
Algebra and Functions							50%
Number and Quantity							20%

Table 3-7. 2016–17 MSAA: Guidelines for Distribution of ELA Content by Grade Level

ELA Content Category	*Gr 3*	*Gr 4*	*Gr 5*	*Gr 6*	*Gr 7*	*Gr 8*	*Gr 11*
Reading Literary	38%	41%	41%	41%	38%	34%	38%
Reading Informational	44%	41%	37%	41%	44%	44%	41-44%
Reading Vocabulary	9%	9%	13%	9%	9%	13%	9-13%
Reading Foundation	0	0	0	0	0	0	0
Writing	9%	9%	9%	9%	9%	9%	9%

3.4.1 Mathematics

Mathematics items are aligned to prioritized CCCs, which are in turn connected to the CCSS and States' Content Standards, as well as the LPFs. Mathematical knowledge is assessed across the CCCs through selected-response items and constructed-response items. Constructed-response items were present at grades 3, 4, 5, 8, and 11 only. The need for constructed-response items was determined by the FKSA associated with a given CCC. Students might construct a graph, solve a problem, or complete a table in a constructed-response item. Constructed-response items were scored dichotomously, or "correct/incorrect," only.

In some cases, the selected FKSAs were best addressed by separating the skill into two parts. Therefore, two unique items are necessary to fully address a single content standard. For example, the CCC 8.DPS.1h1 asks students to both graph bivariate data using scatter plots and identify possible associations between the variables. Items were developed to address both parts of the standard. Tables in Appendix I identify which CCCs require two item versions.

In addition, in mathematics, there were items identified as not allowing the use of calculators in responding to the item. These items tended to be related to computation, where the construct being assessed would be masked by the use of a calculator.

3.4.2 English Language Arts

ELA items in reading and writing are aligned to prioritized CCCs, which are in turn connected to the CCSS and States' Content Standards, as well as the LPFs. The distribution of ELA items related to various text types (e.g., literary, informational, and argument) aligns to the text type emphasis in reading and writing outlined in the CCSS and States' Content Standards.

For MSAA all reading comprehension assessment items are presented in a selected-response format. Thus, to measure more complex reading skills, some selected-response items are presented as a set of two or

three sequenced items ("multipart"), which, when combined, serve to measure the breadth of one prioritized content standard. In other words, in some instances the FKSAs aligned to a specific CCC are designed to have two or three selected-response items associated with them.

In grades 5–8 and 11, some prioritized content standards require evaluation of content across more than one passage. These skills are measured using "paired passage sets." All paired passages are written in the informational text type.

The three CCCs prioritized for writing at each grade level consist of one CCC assessed by a constructed-response item and two assessed by selected-response items. The selected-response writing items are designed to assess discrete basic writing skills. These are considered stand-alone writing items. The constructed-response writing items are designed to measure a student's ability to generate a permanent product to represent organized ideas specific to a writing mode, supported with details or facts to develop those ideas or clarify meaning and the use of standard English conventions. For the 2016–17 assessment, writing was assessed through the use of selected-response writing stand-alone items and the constructed-response writing items were considered field-test items and did not count toward the student's score.

CHAPTER 4 TEST DEVELOPMENT

4.1 GENERAL PHILOSOPHY AND ROLE OF ITEM DEVELOPMENT SUBCOMMITTEE IN TEST DEVELOPMENT

As noted previously, MSAA is a comprehensive assessment system designed to promote increasing higher academic outcomes for students with significant cognitive disabilities in preparation for a broader array of post-secondary outcomes. MSAA assesses ELA and mathematics at grades 3–8 and 11 and is aligned through the State Content Standards and the MSAA Core Content Connectors (CCCs). MSAA is a computer-based, on-demand, two-stage adaptive assessment consisting mostly of selected-response and some constructed-response items written at four levels of complexity. These complexity levels represent different levels of skill acquisition by students. Students with significant cognitive disabilities often need materials and instructional strategies that are substantially adapted and scaffolded, and that have built-in supports to meet their individual needs.

The MSAA items on the 2016–17 administration were from the previous NCSC 2014–15 administration and/or the 2015–16 MSAA administration. As described in Chapter 3, the items selected as field-test items were developed by MSAA. The item development process was an iterative one, which allowed for multiple opportunities for review of the items by various stakeholders including MSAA State Leads, content experts and Partner State representative reviewers that were selected by MSAA State Leads, and external passage and item content and bias review participants. The list of participants from the item content and bias review are included in Appendix D The Item Development Subcommittee, which was made up of the MSAA State Leads, provided overall direction and guidance regarding field-test item development. This multistage development and review process provided ample opportunity to evaluate items for their accessibility, appropriateness, and adherence to the principles of Universal Design. In this way, accessibility emerges as a primary area of consideration throughout the item development process. This is critical in developing an assessment that allows for the widest range of student participation, as educators seek to provide access to the general education curriculum and foster higher expectations for students with significant cognitive disabilities.

CHAPTER 5 TRAINING AND ADMINISTRATION

5.1 TEST ADMINISTRATOR TRAINING

The MSAA Partners adhered to the premise from the testing standards (AERA et al., 2014) that a key consideration in developing test administration procedures and manuals is that the test administration should be fair to all examinees. When all test administrators are utilizing the same, well-defined administration procedures, the provided training, manuals, and supporting documents, administration is standardized and fair to all examinees. As MSAA was a computer-administered test, the administration procedures were consistent with the hardware and software requirements of the test specifications. MSAA required completion of training by all test administrators (TAs) to support standardized test processes and procedures. MSAA provided ancillary testing materials outlining specific practices and policies including (a) the *Test Administration Manual* (TAM); (b) *MSAA Online Test Administration Training*; (c) *MSAA Online Assessment System User Guide for Test Administrators*; (d) *MSAA Online Assessment System User Guide for Test Coordinators*, and (d) grade- and content-specific *Directions for Test Administration* (DTA). TAs received both the online training and the supporting documents to ensure fidelity of implementation and the validity of the assessment results as well as to help MSAA prevent, detect, and respond to irregularities in academic testing and maintain testing integrity practices for technology-based assessments.

5.2 TEST ADMINISTRATOR TRAINING MODULES

The online training modules for TAs were made available prior to the beginning of the testing window and throughout the testing window. They were customized to address the specific responsibilities of the TA and to provide important information from the three documents TAs were required to use: the (1) TAM, (2) DTA, and (3) *MSAA Online Assessment System User Guide for Test Administrators*. MSAA subcommittees heavily revised the abovementioned materials to provide more comprehensive resource documents and trainings. During the revision process, the MSAA Manuals, User Guides, and Training Subcommittee worked to reduce redundancy and provide clear, consistent instruction for the administration of the MSAA. This work resulted in a reduction of modules from 13 modules in 2016 to 6 shorter modules (see Table 5-1) in 2017 (i.e., the run time reduction of modules was not a result of combining the 13 modules to form 6 longer modules. Each module was limited to approximately 25 minutes.).

Table 5-1. 2016-17 MSAA: Modules for Test Administrators

Module 1: MSAA Overview
Module 2: Test Design and Experience
continued

Module 3: Navigating the MSAA Online Assessment System
Module 4: Completing the Student Information
Module 5: Accessibility Features and Accommodations
Module 6: Student Response Check and Early Stopping Rule

All online training recordings were accessed by TAs through the MSAA system. It was a requirement that the online training modules be viewed in sequence, and one module had to be viewed before the link to the subsequent module would become accessible. Once a module was accessed, that module would be marked as complete in the MSAA system and the link to the next module in the sequence would become available. Once all six modules were marked as complete, a final quiz became available to TAs within the MSAA system.

There were quiz questions pertaining to information from the module at the end of each online training module for TAs and Test Coordinators (TCs). The quiz questions were included as a review of the content to prepare TAs for the final quiz, which was accessed via the MSAA system following completion of all online training modules.

TAs were required to take the final quiz, which covered content across all modules, and had to obtain a score of 80% or higher to be provided access to secure test administration materials. If TAs did not fulfill this certification requirement, they were not allowed access to the secure test materials. The TAs were notified within the MSAA system whether or not they passed the final quiz. TAs were allowed multiple attempts to obtain a score of 80% or higher on the final quiz. In addition to the module trainings, TAs were instructed to become familiar with the online system by accessing the sample items supplied within the system. MSAA utilized the same set of sample assessment items developed by content and measurement experts for teachers, administrators, and policymakers for the NCSC assessment that were also used for the 2016 administration. No new samples were introduced. The sample items did not address all assessed content at each grade level and were not representative of every item type. Rather, the sample items provided a preview of the array of items and illustrated multiple item features supporting ways in which students with a wide range of learner characteristics interact with the assessment process.

5.3 TEST COORDINATOR TRAINING

MSAA requires completion of training by all TCs to support standardized test processes and procedures. MSAA provides ancillary testing materials outlining specific practices and policies including the (a) TAM; (b) *MSAA Online Test Administration Training*; (c) *MSAA Online Assessment System User Guide for Test Administrators*; (d) *MSAA Online Assessment System User Guide for Test Coordinators*; and (e) grade- and content-specific DTA. TCs receive both the online training and the supporting documents to ensure fidelity of implementation and the validity of the assessment results as well as to help MSAA prevent,

detect, and respond to irregularities in academic testing and maintain testing integrity practices for technology-based assessments.

5.4 TEST COORDINATOR TRAINING MODULES

In addition to the training modules for TAs described above, online modules specific to the role of TCs were made available prior to the beginning of the test window and throughout the testing window. These training modules are customized to address the specific responsibilities of the TC and to provide important information from the documents TCs are required to use the (1) TAM and (2) *MSAA Online Assessment System User Guide for Test Coordinators*. Like the TA training modules, the TC training modules were also heavily revised based on the revisions made to the TAM, DTAs, *MSAA Online Assessment System User Guide for Test Administrators*, and *MSAA Online Assessment System User Guide for Test Coordinators.* The MSAA Manuals, User Guides, and Training Subcommittee worked to reduce redundancy and provide clear, consistent directions for the administration of the MSAA. This work resulted in the TC modules increasing from four modules in 2016 to six modules in 2017. The increase was due to the revisions of information in the module layout and in an effort to keep each module around 20–25 minutes (see Table 5-2).

Table 5-2. 2016–17 MSAA: Modules for Test Coordinators

Module 1: MSAA Overview
Module 2: Test Design and Experience
Module 3: Navigating the MSAA Online Assessment System
Module 4: Completing the Student Information
Module 5: Create Users and Orgs
Module 6: Student Response Check and Early Stopping Rule

All online training recordings were accessed by TCs through the MSAA system. It is a requirement that the online training modules be viewed in sequence, and one module has to be viewed before the link to the subsequent module will become accessible. Once a module is accessed, that module is marked as complete in the MSAA system and the link to the next module in the sequence becomes available. TCs are required to complete the online training for TCs but are not required to take a final quiz. At the end of each online training module for TCs are quiz questions pertaining to information from the module. The quiz questions are included as a review of the content.

5.5 TEST ADMINISTRATION MANUAL

The MSAA TAM was heavily revised and reorganized in 2017 by the MSAA Manuals, User Guides, and Training Subcommittee for clarity, comprehensiveness, conciseness, and ease of use. The TAM was made available prior to the beginning of the testing window and throughout the testing window. The TAM provided an overview of and the guidelines for planning and managing MSAA administration for district and

school personnel. Additionally, the TAM defined the roles and responsibilities of the TA, TC, and State MSAA Coordinator who are involved in and oversee the administration of MSAA. Some important additions to the TAM in 2017 were

- the MSAA State Leads' Contact Information and Links;
- Important Dates;
- Service Center Support and hierarchy information for obtaining support;
- MSAA Test Experience—Stage Adaptive;
- TA and TC Checklists for ELA and Mathematics;
- *Directions for Test Administration* (DTA) samples; and
- the Student Response Check (SRC) and Early Stopping Rule guidelines and flowchart,

Each of these additions are explained in more detail on the following pages. For the purposes of this report, some content in the following sections was copied directly from the TAM for consistency.

5.5.1 MSAA State Leads

Intentionally positioned as the first page in the TAM, this section is new for 2017 and provided TAs and TCs with the State MSAA Coordinator and contact information, along with the appropriate state link for detailed information on state-specific policies created by each State MSAA Coordinator.

5.5.2 MSAA Technical Support

The MSAA Technical Support chart was also placed as the second page of the TAM to provide examples of when and who to contact to obtain answers pertaining to the MSAA Online Assessment System and test administration procedures. This section was revised to provide TAs and TCs with a clearer, preferred hierarchy for accessing MSAA support. Clear guidance was provided in both the TAM and training modules directing both the TA and the TC to consult the TAM and user guides first for any questions or issues that arise. If a question or issue remained, a TA's first level of support was to contact his or her TC. If the TC could not resolve the question/issue or from where the question/issue generated, the TA and/or TC was directed to contact the MSAA Service Center. Lastly, TCs were instructed to contact their State MSAA Coordinator for further direction or instruction beyond the MSAA Service Center (e.g., state policies, MSAA Online Assessment System change requests related to the school/district, appropriate organizations, new students, wrong name/email address).

5.5.3 Important Dates

The Important Dates page was another vital addition to the front portion of the TAM in 2017. This page was developed to provide a quick, hands-on reference for important dates pertaining to the test administration window, the ordering, shipping, and returning materials window (Maryland only), and the

availability and location of training and test administration documents within the MSAA Online Assessment System, for quicker access for both TAs and TCs.

5.5.4 How to Use the TAM

This section reviews the purpose of the TAM, how to access the hyperlinks and resources, and provides a list of terms and acronyms frequently used in the TAM and administration documents.

5.5.5 Introduction

The introduction provides information about the purpose of the MSAA. It outlines that the MSAA was developed for students with significant cognitive disabilities to demonstrate what they know and can do in relation to the State Content Standards; MSAA Partner States' long-term goal of ensuring that students with the most significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school capable of pursuing a variety of post-secondary options; and that the MSAA has been designed to meet the requirements of the ESSA and IDEA.

5.5.6 Administration Procedures Overview

This section includes information and references on how and where to access the documents required for test administration. Table 5-3 outlines each document with the document's purpose and its primary user(s).

Table 5-3. 2016-17 MSAA: Who Can Perform Actions in the MSAA Online Assessment System?

Document	Purpose	User
Test Administration Manual (TAM)	Provides policies and procedures for TAs and TCs to prepare for the administration of the Test.	TAs and TCs
Directions for Test Administration (DTA)	• Provides directions and scripts for each item of the Test (All test items are included in the DTA, but not all items will be administered to each student.) • Includes details about manipulatives required in order to administer a test item, such as calculators and counters • Includes reference sheets that contain important graphics • Includes scoring rubrics for mathematics CRs in grades 3, 4, 5, 8, and 11 • Provides writing prompt script, mentor text (when applicable), graphic organizer, student response templates, and stimulus materials for all writing **NOTE:** *The DTA is a secure document and available only when TAs complete the MSAA Online Training Modules and pass the Final Quiz.*	TAs

continued

Document	Purpose	User
MSAA Online Assessment System User Guide for Test Administrators	Provides technical information and troubleshooting tips, plus step-by-step instructions to navigate the MSAA Online Assessment System, such as how to complete the LCI; how to pause, resume, and submit a test for scoring; when to contact the MSAA Service Center; and how to administer the Student Response Check	TAs
MSAA Online Assessment System User Guide for Test Coordinators	• Provides technical information and troubleshooting tips, • step-by-step instruction to navigate the MSAA Online Assessment System (e.g., how to check that all TAs have completed their training), • how to ensure that all students are properly registered and have the correct grade levels, • how to ensure that all tests have been submitted for scoring, and • how and when to close a student test	TCs

Also found in this section are the participation criteria, which reflect the pervasive nature of a significant cognitive disability and the descriptors, used by each student's individualized education plan (IEP) team to determine eligibility for participation in MSAA. Three criteria are named in particular: (1) The student has a significant cognitive disability; (2) the student is learning content linked to grade-level content standards; and (3) the student requires extensive direct individualized instruction and substantial supports to achieve measurable gains in the grade- and age-appropriate curriculum.

5.5.7 Who Can Administer the MSAA?

This section defines the roles of the TA, TC, and State MSAA Coordinator within the MSAA Online Assessment System. Table 5-4 was added to the TAM to clearly identify who can perform actions in the MSAA Online Assessment System.

Table 5-4. 2016-17 MSAA: Who Can Perform Actions in the MSAA Online Assessment System?

Action	Test Administrator	School Test Coordinator	District Test Coordinator	State Test Coordinator for MSAA	MSAA Service Center
Start, Pause, Resume, and Submit Tests	X	X	X	X	
Print DTA and Paper Test	X	X	X	X	
Complete Student LCI, SRC, and Accommodations Tabs	X	X	X	X	
Add or Edit TA		X	X	X	
Close a Test		X	X	X	
Add Classroom		X	X	X	
Add or Edit TC			X	X	

continued

Action	Test Administrator	School Test Coordinator	District Test Coordinator	State Test Coordinator for MSAA	MSAA Service Center
Add Student or Edit Student Demographic Information				X	
Unlock Test				X	X
Change Test Form Grade				X	X

In addition to the roles in the online assessment system, this section explains who can be a TA and who supports the administration process. Whoever serves as a TA must be a certified and licensed educator familiar with the student, typically the student's teacher, who has completed the required MSAA Test Administration Training, the end-of-module quizzes, and attained at least an 80% accuracy score on the final quiz. Alternatively, if a student's teacher has a long-term substitute who is a certified and licensed educator, has completed the required MSAA Test Administration Training and end-of-module quizzes, and attained at least an 80% accuracy score on the final quiz, then the long-term substitute may administer the test. Relevant state-specific criteria are also provided where applicable. Some MSAA Partner States have additional policies regarding who can administer the test and who can assist the TA; TAs are referred to their state-specific policy information document to learn about any additional policies regarding who can be involved with administering the test.

TCs provide administration support by overseeing the administration of the test at the district or school level. Some MSAA Partner States have additional policies regarding who can fulfill the role of TC in their district or school as well.

To assist TAs and TCs with completing the requirements before, during, and after test administration, the *Test Administrator Checklist* and *Test Coordinator Checklist* were developed and added as an appendix of the TAM.

5.5.8 The MSAA Test Design

New in 2017, the MSAA became stage adaptive. The stage adaptive design for the Test provides the student with a test experience that assigns Session 2 of the assessment based on how the student responds to the operational items in Session 1. The versions in Session 2 vary by difficulty and complexity level. The student will take only the Session 2 version that is assigned to him or her.

Session 1 contains items with varying levels of complexity. It is important that students take items at all complexity levels in order for Session 2 to be an accurate reflection of the student's abilities. Once the student completes Session 1, the student will be directed to Session 2 for one of three versions of the test—Version A, B, or C.

NOTE: It is possible that students in the same grade in the same classroom will take different versions of Session 2. It is also possible that the same student will, for example, take Version A for ELA and Version C for mathematics.

For ELA, after Session 2 Version A, B, or C is completed, all students are administered the field test writing prompt in Session 3. Mathematics has no Session 3.

Figures 5-1 and 5-2 outline the MSAA stage adaptive design for ELA and mathematics.

Figure 5-1. The MSAA ELA Stage Adaptive Design (All Grades)

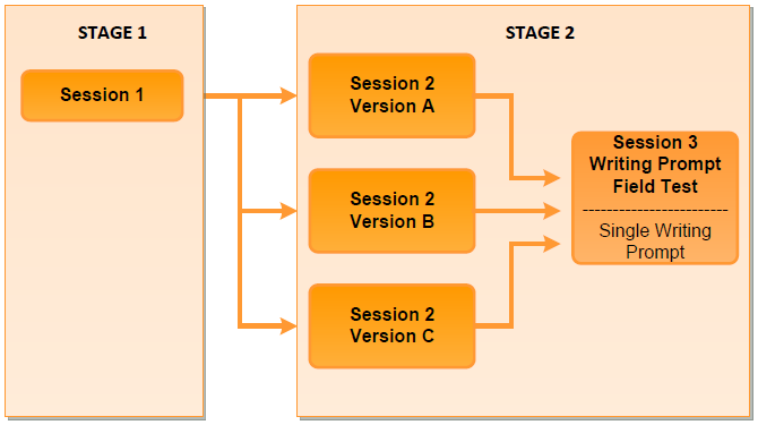
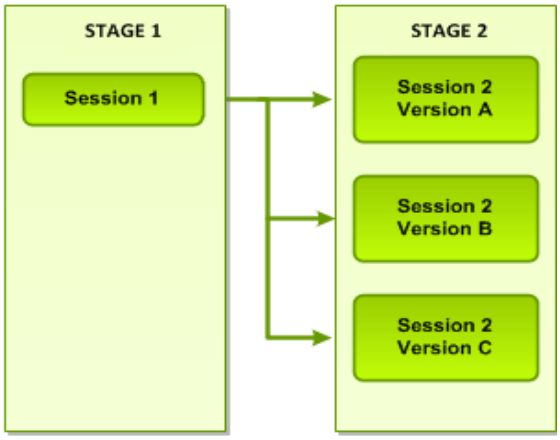


Figure 5-2. The MSAA Mathematics Stage Adaptive Design (All Grades)



The item types used in the test include selected-response for ELA and mathematics; constructed-response for mathematics; and the field-test writing prompt for ELA.

TAs and students can access multiple sample items for both ELA and mathematics prior to the beginning of the test window. The sample items are located in the MSAA Online Assessment System at http://www.msaaassessment.org/ under Resources. The sample items allow the TA and student to become familiar with the online item presentation and to test any assistive technology required. In addition to the online item samples, a reading and mathematics sample item was added to the TAM and broken down for the TA.

5.5.9 Directions for Test Administration (DTA) and How They Are Used

This section provides TAs with the purpose of the DTAs, additional materials for test administration, and directions and guidelines for use. The DTAs were also heavily revised in 2017 to provide clear and consistent shared information across all DTAs and the TAM:

1. The directions for test administration provided in the TAM should be used along with the instructions and directions provided in the DTA for the Test assigned to the student. The DTA should be accessed and downloaded from the Action button in the MSAA Online Assessment System at http://www.msaaassessment.org/. Each DTA is specific to the form, or version, of the Test that is assigned to the student.
    - Grey text in the directions provides instructions for the TA on what to point to in the items and should *not* be read aloud to the student.
2. Read the directions, passages, items, and answer option text exactly as written, using a consistent rate of reading and tone of voice, as appropriate.
3. Be familiar with and utilize the Alternative Text, as appropriate. Alternative Text is written in italics and appears in brackets. Two types of Alternative Text are provided in the DTA:
    a. Alternative Text for all students includes standardized descriptive statements for tables, charts, graphs, timelines, and math flow to be read aloud to *all* students.
    b. Alternative Text for students who are blind or have visual impairments includes descriptive statements for tables, charts, graphs, and any other graphics necessary for appropriate interaction with the items (e.g., an answer option that is a graphic with no accompanying text, or a graphic that provides contextual clues for a sighted student).

NOTE: *If the Alternative Text for students who are blind or have a visual impairment is not read by the computer, the TA must read this text aloud to the student as indicated in the DTA.*

Each DTA also provides specific clarity to a particular test.

5.5.10 Accessibility Features and ACCOMMODATIONS

This section identifies various ways the TA must provide each student an appropriate testing environment during every testing session. This includes:

- the two types of accessibility features that are (1) available to any student who benefits from the supports and (2) are accommodations that must be included in the student's IEP prior to test administration,
- timing and scheduling considerations because every student is different and has varying degrees of stamina and ability to stay on task. TAs may pause testing to take a break at any time. A test session for a student may consist of one or two items at a time, or 10 or more items. The Test is not timed and can be paused for a variety of reasons, including frustration, lack of engagement, refusal to participate, or sickness. The TA may pause and resume the administration of the Test as often as necessary during the whole administration window. A break may consist of a few minutes to a few days, depending on the student's needs. For some students, a break in their daily routine is very disruptive. For students who respond best to consistent routines, TAs may consider building MSAA time into their daily schedule beginning several weeks prior to testing. For example, 5 to 10 minutes during ELA instruction and 5 to 10 minutes during Math may improve the testing experience for the student. Using the MSAA practice items and/or introducing any vocabulary words the TA identified prior to testing can help establish this routine.

- how to support students prior to testing to ensure that students have equitable opportunity to access the items. The TA is directed to read the test items and DTA prior to the Test. The following are acceptable ways to prepare students prior to testing:
    - Review the vocabulary lists for ELA and Mathematics to identify any words that may need to be introduced or reviewed with the student.
    - Add and/or review any vocabulary words, phrases, and alternative text with students using sign language, creating new tactile graphics or objects, or adding pictures or symbols to a word bank, word book, or other communication device.
- how to create a comfortable and secure testing environment includes, but is not limited to, the following:
    - Restricting student access to resources that are explicitly identified in the DTA
    - Viewing of test items only by the student taking the Test and the certified, licensed, and trained TA administering the Test
    - Removing any devices or materials that could jeopardize test content in the test-taking environment or distract the student
    - Ensuring a quiet test-taking environment, void of distractions, and one that does not permit other students to hear the responses to the items of the student being tested. This does not need to be a separate room or location in the school building if the student is unfamiliar with that space. Students are often comfortable in a routine, and disrupting this routine could have consequences on their ability to focus on the Test. A secure and comfortable space could be a corner of the classroom where the TA and the student can work uninterrupted and in privacy. Other students may remain in the classroom but cannot interfere when testing is taking place. Additional staff may be required in order for the TA to focus on the student being tested.
    - Reviewing the assessment features and accommodations the student may need
    - Making sure the same computer (if using a computer administration), laptop, tablet, or other device is available for testing. This ensures that security of materials is maintained.
    - Providing scratch paper for students to make notes or solve mathematics items. All scratch paper must be submitted to the TC for secure shredding.
    - Providing appropriate student positioning, appropriate assessment features, and the accommodations in the student's IEP that are consistent with MSAA accommodations policies
    - Providing encouragement to support student engagement and focus. TAs may use phrases that do not indicate either the correct or incorrect response. Examples of acceptable encouraging phrases include:
        - "I like the way you are listening and following directions."
        - "Only one more to go!"
        - "Just five minutes until a break!"
        - "Keep working!"
- that physical prompting including hand-over-hand is not permitted and is considered to be an inappropriate test practice and a test irregularity

TAs are instructed to review the MSAA Online Assessment System and assessment features before testing to ensure that the computer, laptop, or tablet, login information, and any necessary assessment features are working as intended. TAs must ensure that the computer or any AAC/assistive technology device a student may use meets the minimum requirements, is in working order, is available for testing, and is compatible with the MSAA Online Assessment System before the student is assessed.

Another change in the 2017 administration was the removal of open-response foundational reading items administered to students in grades 3 and 4. Because of this change to the test, the Procedures for

Assessing Students Who Are Blind, Deaf, or Deaf- Blind: Additional Directions for Test Administration was no longer necessary as a separate and secure document, and as such was consolidated and included in the Accessibility Features and Accommodations section of TAM for all students.

The accessibility features for the computer, laptop, or tablet administration, as well as for the paper administration, were refined for clarity as shown in Figures 5-3–5-4 below.

Figure 5-3. Accessibility Features: Computer, Laptop, or Tablet Administration

Answer Masking Tool	The embedded Answer Masking tool allows students and TAs to electronically cover and reveal individual answer options as needed.
Line Reader Tool	The embedded Line Reader tool allows the entire item to be shaded, and an adjustable box allows attention to be focused on one line or a few lines at a time. The box can be adjusted by the student or the TA.
Alternate Color Theme Tool	The student or TA can change the onscreen background color and/or text color based on need or preference. The options are: • White background with black text • Light blue background with black text • Black background with white text • Cream background with black text • Light magenta background with black text • Dark blue background with light blue text
Audio Player Tool	The embedded Audio Player reads each line automatically and can be paused, resumed, and made to repeat segments as needed. The pace of reading can be controlled by the student or TA so that text may be slowed or sped up depending on student needs.
Read Aloud by TA	The TA may read the directions, answer options, or passage as often as is reasonable to obtain a student's response to an item. All text must be read to students exactly as written, with no paraphrasing or word substitution.
Alternative Text Read Aloud by TA	Alternative Text includes descriptive statements for graphics (e.g., tables, charts, graphs, timelines, etc.) that may need to be described verbally in order for the student to understand. *Alternative text can be read by the embedded Audio Player or the TA. If the TA will read the alternative text, it is included in the DTA and should be read as indicated.*
Increase Volume	To increase the volume on the computer, laptop, or tablet, use the built-in volume control options. Students may need headphones depending on testing location.
Magnification Tool	The embedded magnification tool increases the size of the text and graphics only in the selected area. The magnification tool is attached to the cursor so it will highlight any section the mouse hovers over.
Increase/ Decrease Size of Text and Graphics	Computers, laptops, and tablets provide zoom-in and zoom-out functions. Projection systems, video magnifiers, and smart boards may also be used to increase the size of the text and graphics. Zoom may also be used to reduce the size of the text or graphics in order to view more item information on one page.
Manipulatives for Mathematics	Directions for the use of manipulatives are described in the DTA; to the extent possible, these should be the tools the student uses during instruction. Manipulatives are not provided by MSAA because not all students use the same tools. Possible manipulatives and tools required for testing include: 1. Ruler, thermometer, clock, abacus, talking calculator, raised line graph/grid paper, tiles, blocks, etc. 2. Calculator. Each item includes information for the TA on whether a calculator is allowable. Most items do allow the use of a calculator, but it is important to note which ones do not.

continued

Tactile Graphics	Tactile graphics are raised versions of print graphics that are adapted for the sense of touch (*Guidelines and Standards for Tactile Graphics*, 2010, Braille Authority of North America). An example is the raised lines on a simplified image of the parts of a flower or on a mathematical graph. Tactile graphics may be used during the Test if they are already used by the student on a regular basis. Review the vocabulary lists for ELA and Mathematics prior to testing to ensure that students have time to learn and become familiar with any new tactile graphics. TAs are responsible for creating any tactile graphics the student may require. Refer to page 23 for guidance.

Figure 5-4. Accessibility Features: Paper Administration

Answer Masking	For students who require answer masking on the paper version of the Test, TAs should use paper or cards to cover and reveal individual answer options as needed.
Line Reader	The TA or student can use two pieces of paper to limit attention to one or a few illuminated lines at a time, while blocking out the rest of the test item.
Alternate Color Themes	Acetate overlays in the color preferred by the student should be used. Another option is to print the Test on paper that is the color preferred by the student.
Increase/Decrease Size of Text and Graphics	Paper versions of the Test can be projected by document projection devices or interactive white boards as needed by the student.
Increase Volume	TAs can adjust the volume of their voice as necessary.
Magnification	Any handheld magnification device normally used by the student is acceptable.
Read Aloud by TA	The TA may read the directions, answer options, or passage as often as is reasonable to obtain a student's response to an item. All text must be read to students exactly as written, with no paraphrasing or word substitution.
Read Aloud by TA Alternative Text	Alternative text includes descriptive statements for graphics (e.g., tables, charts, graphs, timelines, etc.) that may need to be described verbally in order for the student to understand. *Alternative text is included in the DTA and should be read aloud by the TA as needed.*
Manipulatives for Mathematics	Directions for the use of manipulatives are described in the DTA; to the extent possible, these should be the tools the student uses during instruction. Manipulatives are not provided by MSAA because not all students use the same tools. Possible manipulatives and tools required for testing include: 1. Ruler, thermometer, clock, abacus, talking calculator, raised line graph/grid paper, tiles, blocks, etc. 2. Calculator. Each item includes information for the TA on whether a calculator is allowable. Most items do allow the use of a calculator, but it is important to note which ones do not.
Tactile Graphics	Tactile graphics are raised versions of print graphics that are adapted for the sense of touch (*Guidelines and Standards for Tactile Graphics*, 2010, Braille Authority of North America). An example is the raised lines on a simplified image of the parts of a flower or on a mathematical graph. Tactile graphics may be used during the Test if they are already used by the student on a regular basis. Review the vocabulary lists for ELA and Mathematics prior to testing to ensure that students have time to learn and become familiar with any new tactile graphics. TAs are responsible for creating any tactile graphics the student may require. Refer to page 23 for guidance.

continued

Tactile Symbols	Tactile symbols are concrete representations of objects or concepts developed for individuals who are blind or have a practical need for a graphic language system. For example, a seed within a textured triangle can represent a plant or a textured slanted line with a series of dots can represent a graph. Tactile symbols may be used during the Test if they are already used by the student on a regular basis. Review the vocabulary lists for ELA and Mathematics prior to testing to ensure that students have time to learn and become familiar with any new symbols. TAs are responsible for creating any tactile symbols the student may require. Refer to page 23 for guidance.
Object Replacement	An object or part of an object may be used to represent a person, place, object, or activity. For example, a silk flower petal, leaf, and stem may represent parts of a flower or interlocking centimeter blocks may represent graphed numbers. Object replacement may be used during the Test if it is already used by the student on a regular basis. Please review the vocabulary lists for ELA and Mathematics prior to testing to ensure that students have time to learn and become familiar with any new objects. TAs are responsible for creating any objects the student may require. Refer to the following section for guidance.

TAs must review the DTA and the test items for both ELA and Mathematics to determine which items and stimulus materials require tactile graphics, tactile symbols, or object replacements. Tactile graphics and symbols may be used when the student is not able to see graphics that are essential to understanding the item. Object replacements may be used when the visual and/or tactile graphics do not provide optimal accessibility to the student. Further guidelines for creating tactile representations and using object replacements are located in the TAM.

The allowable accommodations for the MSAA are defined as changes in the standard administration of the assessment that do not alter the construct being measured. Any accommodation required by a student must be included in the student's IEP prior to testing, and should be used regularly during instruction. The allowable accommodations are listed and explained in Figure 5-5 below:

Figure 5-5. Allowable Accommodations

Assistive Technology (AT)	Students may use assistive technology devices for viewing, responding to, or interacting with the Test. The student and TA should use the AT device with the sample items to ensure that it functions properly with the MSAA Online Assessment System. Refer to the *MSAA Online Assessment System User Guide for Test Administrators* for information about compatibility of the MSAA Online Assessment System with assessment features.
Paper Version	A Paper Version of the Test may be downloaded and printed from the MSAA Online Assessment System in PDF format. After testing, all printed assessment materials must be given to the TC for secure shredding, and all downloaded files must be deleted from any computer or laptop used for testing.
Scribe	A TA may record student responses for all or part of the Test, including the writing prompt. Anyone performing as a scribe for the student must read and follow the *MSAA Scribe Accommodation Protocol* in Appendix A of the TAM. Here are three ways a scribe can support the student's independence during testing: 1. **A student is able to use a mouse to select a response to the selected response items but cannot use the keyboard to type a response to the writing prompt.** In this case, the scribe can type the student's writing response but may not need to help with any other part of the Test. 2. **A student is able to use the mouse but becomes physically fatigued easily.** The scribe can select the response the student indicates as needed. The scribe can assist with recording and typing the student's writing response. 3. **A student is able to complete the Paper Version of the Test that the TA printed.** The TA enters the student's responses into the MSAA Online Assessment System when the student has completed the Test, after each testing session, or after several items are completed. **NOTE:** *All student responses **must** be entered for Session 1 before an assignment in Session 2 may be determined.*
Sign Language	For students who use American Sign Language (ASL), Pidgin Sign English (PSE), or Sign Exact English (SEE), the TA may translate passages, items, answer options, and directions. Review the vocabulary lists for ELA and Mathematics to determine which words the student may need practice with prior to testing. **Required Documents:** It is important to adhere to the *Sign Language Protoco*l in Appendix C of the TAM as it will help signers avoid cueing the student.

5.5.11 Test Security and Test Irregularities

This section describes MSAA policies related to testing integrity and appropriate and inappropriate test practices. The importance of test security and the practices required for appropriate handling of secure test materials is explained, including the following:

- Maintain all printed test materials in a secure, locked location.
- Protect secure materials from view by other students, teachers, parents, school staff, or other individuals. This includes logging out of the MSAA Online Assessment System and closing the browser after each testing session.
- Do not duplicate, reproduce, or share items or other secure test materials.
- Give *all* printed test items or other printed material to the TC for secure shredding.
- Delete any test materials, items, and information from the computer and any assistive technology used by the student after testing is complete.

TAs are required to ensure that all aspects of the test are maintained in a secure manner. TAs are informed that items are for the exclusive use of testing and are not to be used for instruction and are not to be shared, e-mailed, copied, or distributed in any manner. To do so is considered a test irregularity and a violation of test security.

To underscore the importance of appropriate test practices, this section provides specific examples of inappropriate and prohibited test practices, including, but not limited to:

- Failing to sign and submit your state's security agreement to the district
- Applying the Early Stopping Rule (pages 34–35 [TAM]) for any reason other than lack of an observable response
- Changing the wording of test directions, test items, answer options, or any text as it is written in the DTA
- Using any materials not indicated in the DTA
- Providing students a preview of the Test at any time
- Providing answers, clues, or cueing to students in advance of or during Test administration
- Manipulating testing materials in a way that hints at a correct or incorrect answer or reduces answer options
- Changing a student's answer
- Using any of the MSAA test materials (including items and/or DTA) for instructional purposes
- Sharing test items, test content, or test forms, either written or verbally, or through photography, phone cameras, recording devices, note taking, or any other manner, with colleagues, other staff members, students, parents, media, or the general public
- Leaving the MSAA Online Assessment System unattended while logged in to the Test or the DTA
- Administering the Test by a staff member who has not completed the online training modules and passed the Final Quiz

This section emphasizes that each person participating in the state assessment program is directly responsible for immediately reporting any violation or suspected violation of test security or confidentiality. TAs and other staff are required to notify their school or district TC if they witness or become aware of an inappropriate test practice or suspect one has occurred.

5.5.12 TAM Appendix A: MSAA Scribe ACCOMMODATION Protocol

Appendix A-MSAA Scribe Accommodation Protocol addresses the scribe accommodation for a student who has the Scribe Accommodation where a scribe enters the student's answers into the MSAA Online Assessment System. For the writing prompt, the scribe will record the student's response on the response templates in the MSAA Online Assessment System. A scribe must have the following qualifications:

- Be a state-certified educator or district employee of the district
- Complete all training for the Test
- Sign and submit state test security agreements according to state policy
- Be familiar to the student
- Be familiar with all the accommodations in the student's IEP

- Scribe under the direction of a qualified, trained TA who is administering the Test

Scribes are expected to:

- Familiarize themselves with the Test prior to testing
- Familiarize themselves with the accessibility features and accommodations that are available on the Test
- Know and understand how to properly administer the accessibility features and accommodations that the student must receive
- Practice the scribing protocol before testing

5.5.13 Scribe Accommodation Protocol for ELA and Mathematics

- The scribe may not question or correct student choices, alert students to errors or mistakes, guide the student to a correct answer, or otherwise influence a student's answer or answer choice in any way.
- The student must be tested in a setting that does not permit their responses to test items to be heard by other students.
- The scribe will comply with student requests for use of all available and allowable Assessment Features on the MSAA Online Assessment System (e.g., when to turn a feature on or off, when to change the size of a graphic, etc.).
- A TA may provide answers to procedural questions (e.g., test directions, navigation within the test environment, etc.).
- For paper-based administration, the scribe must enter student responses directly into the MSAA Online Assessment System.
- The scribe may ask the student to repeat a response.
- The scribe must allow the student to indicate when they want to move to the next test item.
- The scribe must provide an opportunity for the student to review and modify what the scribe has recorded.
- After testing, the scribe must collect any scratch paper, graphic organizers, and other ancillary materials and give them to the TC for secure shredding. Neither the scribe nor the TA may keep any testing materials after testing is complete.

5.5.14 Scribe Accommodation Protocol for the Writing Prompt

- For computer-based administration, the scribe types exactly what the student communicates directly on the response template in the MSAA Online Assessment System, including any necessary annotations.
- For paper-based administration, the scribe writes exactly what the student communicates on a Paper Version of the response template, and then the scribe transcribes exactly what was written into the MSAA Online Assessment System, including any necessary annotations (refer to the section below regarding *Procedures for Annotation*).
- The scribe correctly spells all words (spelling is not scored).
- The scribe does not capitalize words or punctuate text unless indicated by the student.
- The scribe allows the student to edit for punctuation, capitalization, or other edits as described in the DTA.
- The scribe makes student-requested changes, even if incorrect.
- In the case of commonly confused homophones (e.g., *than* and *then*; *to*, *two*, and *too*; *there*, *their*, and *they're*), the scribe orally confirms the meaning of the word.
  After testing, the scribe must collect any scratch paper, graphic organizers, and other ancillary materials and give them to the school TC for secure shredding. Scribes and/or teachers may not keep any testing materials after testing is complete.

5.5.15 Procedures for Annotation

In cases in which a student's written product may not be easily interpreted by a novel reader (e.g., because of inventive spelling, hard-to-read penmanship, or use of symbols), the TA must write annotations directly on the student's written work or in the MSAA Online Assessment System to ensure an accurate interpretation of a student's response. Annotations must not alter the intent of the student's original response or make any comments or explanations about what the student wrote.

After the student has finished composing his or her written responses, the TA reads the student's response and does the following:

- Makes annotations that clarify the student's response.
- For annotations made directly on the student's work, uses a different color pen or pencil to distinguish from the student's original response.
- For annotations typed into the computer, insert brackets around them. For example: The cat were jpzing rl ht [jumping really high].
- Writes in parentheses directly following an uninterpretable word (e.g., inventive spelling) in the MSAA Online Assessment System if the student typed a response.
- Provides an opportunity for the student to review and modify what has been annotated.

5.5.16 TAM Appendix B: Augmentative and Alternative Communication Guidelines

Appendix B-MSAA Augmentative and Alternative Communication Guidelines explains that the TA must record the student's response(s) for all constructed or open-ended responses either on the paper version of the test or directly into the MSAA Online Assessment System.

- The TA must allow the student to access words, symbols, pictures, and phrases within the communication mode/system in the same manner and process as during instruction.
- The word banks, books, and phrase boards that the student already uses during daily instruction should be used for administration of the Test. It is recommended that the ELA and Mathematics vocabulary lists in Appendix D: English Language Arts and Mathematics Vocabulary Lists, and any appropriate graphics from the answer options, be added to the student's word banks, books, and phrase boards, to be used during testing so that they are familiar with the words that will appear on the Test. The TA must delete all Test-related graphics from all devices after testing.
- Refer to Figures 5–8 for examples of how to organize a variety of subject-specific word and phrase boards. If a student already has word boards or word books they use on a daily basis, there is no requirement that the TA reorganizes or rearranges them in a specific format.

When administering the writing prompt, the TA must adhere to the AAC Protocol to ensure that the student's response is generated in a manner that allows for accurate measurement of the student's writing ability (see Table 5-5 below). TAs are referred to the TAM Appendix A: Scribe Accommodation Protocol for further scribe and annotation protocols.

Table 5-5. 2016-17 MSAA: AAC Protocol for Completing the Writing Prompt

Allowed	*Not Allowed*
The student completed a process directed by the TA that uses words, symbols, pictures, or phrases that the student typically uses during instruction.	A response to the writing prompt may *not* be the result of a series of words, phrases, or sentences selected by the TA. • For example, the TA may not ask, "Do you want to say that the girl was tall or short?" or "Do you want to say the girl ran or swam?"
The TA may add any content represented in the grade-specific stimulus materials to the student's AAC device (e.g., list of temporal words, problem/solution cards, words from mentor text or sample essay). The TA should ensure that the words, symbols, pictures, or phrases used from the stimulus materials are familiar or can readily be understood.	The TA may *not* arrange words, symbols, pictures, or phrases on the student's communication board so that any selection would be correct.
The TA may introduce vocabulary related to the prompt. • For example, if the prompt refers to supporting a claim related to "means of travel," the TA may define and describe "means of travel" and its uses in order to familiarize the student with the related symbol(s).	The TA may *not* practice the prompt or teach vocabulary in the context of the prompt. • For example, if the prompt refers to supporting a claim related to "means of travel," the TA may not practice having the student write a persuasive essay using "means of travel" as the context.

Where appropriate, the TAM refers TAs to the *MSAA Online Assessment System User Guide for Test Administrators*, which outlines using the system to accomplish the tasks for which TAs are responsible. User guides provide step-by-step instruction with MSAA system screenshots to facilitate use of the system.

5.5.17 TAM Appendix C: Sign Language Protocol

Although it is understood that the nature of this assessment requires individualized delivery in the communication method familiar to the student, individuals providing the sign language accommodation for the MSAA assessment must follow these procedures, as shown in Figure 5-6 below, during testing to ensure standardization of delivery.

Figure 5-6. Procedures for Providing the Sign Language Accommodation

1. Signers must be trained on test administration policies as indicated on page 9 of the TAM. Individuals providing the sign language accommodation must sign the security agreement for their state.
2. Signers should use signs that are conceptually accurate, with or without simultaneous voicing, translating only the content that is presented, without changing, emphasizing, or adding information. Signers may not clarify (except for test directions), provide additional information, assist, or influence the student's selection of a response in any way. Signers must do their best to use the same signs if the student requests a portion repeated.

continued

3. Signers must sign (or sign and speak when using Sim-Com [Simultaneous Communication]) in a clear and consistent manner throughout the test administration, using correct pronunciation, and without inflections that may provide clues to, or mislead, a student.
4. Signers should emphasize only the words printed in boldface, italics, or capital letters and inform the student that the words are printed that way. No other emphasis or inflection is permitted.
5. Signers may repeat passages, test items, and answer options as requested, according to the needs of the student. Signers should not rush through the Test and should ask the student if he or she is ready to move to the next item.
6. Signers may not attempt to solve mathematics problems, or determine the correct answer to a test item while signing, as this may result in pauses or changes in inflection that may mislead the student.
7. Signers must use facial expressions consistent with sign language delivery and must not use expressions that may be interpreted by the student as approval or disapproval of the student's answers.
8. TAs must be familiar with the student's IEP and should know in advance which accommodations are required by the student. TAs must be aware of whether a student requires additional tools, devices, or adaptive equipment that has been approved for use during the Test, such as a magnifier, closed circuit television (CCTV), abacus, brailler, slate, stylus, etc., and if use of these tools impacts the translation of the Test, the signer should be made aware of this.
9. Upon review of the Test, if a human signer is unsure how to sign and/or pronounce an unfamiliar word, the signer should collaborate with a content expert who is fluent in sign language (if available) to determine which sign is most appropriate to use. If the signer is unable to obtain this information before the Test, the signer should advise the student of the uncertainty and spell the word.
10. When using a sign that can represent more than one concept or English word, the signer must adequately contextualize the word in order to reduce ambiguity. The signer may also spell the word after signing it if there is any doubt about which word is intended.
11. Signers must spell any words requested by the student during the test administration.
12. When test items refer to a particular part of a passage, the signer must re-sign the lines before signing the question and answer options. For example, the signer should sign, "Question X refers to the following lines…," then sign the passage part to the student, followed by question X and the answer options.
13. When signing selected-response items, signers must be careful to give equal emphasis to each answer option and to sign all answer options before waiting for the student's response.
14. When answers options will be scribed, the signer should inform the student at the beginning of the Test that if the student designates a response choice by letter only ("B," for example), the signer will ask the student if he or she would like the response to be signed again before the answer is recorded.
15. If the student chooses an answer before the signer has signed all the answer options, the human signer must ask if the student wants the other answer options to be signed.
16. After the signer finishes signing a test item and all answer options, the signer must allow the student to pause before responding. If the pause has been lengthy, the signer should ask: "Do you want me to sign the question or any part of it again?" When signing questions again, signers must avoid emphasis on words not bolded, italicized, or capitalized.
17. Signers should refer to Appendix D: English Language Arts and Mathematics Vocabulary Lists for technical vocabulary in order to ensure consistency in providing the accommodation.

Sign-System-Specific Procedures

Signers must deliver the accommodation in the language or communication mode used by the student according to the student's IEP.

American Sign Language (ASL)

Signers delivering the accommodation via ASL must use appropriate ASL features (including signs, sentence structure, nonmanual markers, classifiers, etc.) while protecting the construct being measured by the assessment. The signer must be careful not to cue the student.

English-Based Sign Systems (PSE, Sim-Com, etc.)

Signers delivering the accommodation via an English-based signing system (PSE, Sim-Com, etc.) must use the features of the communication mode used by the student. Signers delivering the Test in English-based signing systems should use the rules of those signing systems (conceptually accurate signs, English word order, etc.), with or without simultaneous voicing.

Mathematics and English Language Arts Vocabulary Lists

Signers should refer to Appendix D: English Language Arts and Mathematics Vocabulary Lists of the TAM for guidance on how to deliver terms found in the ELA test and symbols and terms found in the Mathematics test. The guidance provided in the vocabulary lists provides a standardized approach for students who use sign language accommodations. The vocabulary lists provide words that can be used for both ASL and English-based sign systems.

5.6 TEST COORDINATOR AND TEST ADMINISTRATOR USER GUIDES

The *MSAA Online Assessment System User Guide for Test Coordinators* and *MSAA Online Assessment System User Guide for Test Administrators* were revised in 2017 by the Manuals, User Guides, and Training Subcommittee to reflect changes in functionality as well as for clarity, conciseness, reducing redundancies, user friendliness, and consistency with the TAM. The language load in the guides was reduced, and more screenshots of the relevant functionality were used. The guides were reorganized to present information in the order it would be used and grouping relevant information together. For example, the *MSAA Online Assessment System User Guide for Test Administrators* provided an overview of the assessment process, user roles and responsibilities, support information, system functionality information for the MSAA Online Assessment System, troubleshooting guidance, and a walkthrough of the tasks to be completed before, during, and after test administration. For the purposes of this report, some content in the following sections was copied directly from the user guides for consistency.

5.6.1 Document Overview

This section appears in both the MSAA Online Assessment System User Guide for Test Coordinators and *MSAA Online Assessment System User Guide for Test Administrators.* It displays the roles and

responsibilities table as discussed in section 5.5.7 of this report and as shown in Table 5-4, as well as a chart showing the TA and TC steps in the testing process and the corresponding page numbers for more information about each step. The document overview also lists the contact information for the MSAA Service Center and a link to the MSAA Online Assessment System. This information was placed near the beginning of the guide for easy reference by users.

5.6.2 Troubleshooting

This section appears in both the *MSAA Online Assessment System User Guide for Test Coordinators* and *MSAA Online Assessment System User Guide for Test Administrators* and contains the same chart as described in section 5.5.2 of this guide [MSAA Technical Support].

5.6.3 How to Access the MSAA Online Assessment System

This section appears only in the *MSAA Online Assessment System User Guide for Test Administrators*. It details the instructions for gaining access to the MSAA Online Assessment System, logging in for the first time, and how to unlock an account if it becomes locked from multiple failed login attempts. The section then shows a large screenshot of the login landing page, or Dashboard. The image highlights each link on the landing page, its name, and functionality. This screenshot was intended to function as a system "map" so the user can become familiar with the navigation, and subsequent sections do not need to include a screenshot of how to access the page.

5.6.4 Before Testing

This section describes the steps to be completed before administering the test to students, including training modules and final quiz and the steps to complete the student profile. The detailed Student Response Check information updated in the TAM is included in this section.

5.6.5 Administer and Navigate the Test

This section appears only in the *MSAA Online Assessment System User Guide for Test Administrators*. It describes how to locate, start, resume, pause, and submit a test, access test materials, navigate the test and use the features of the navigation toolbar, and use the test accessibility features. This section also includes updated instructions for administering and submitting writing items to reflect improvements in the evidence upload functionality.

5.6.6 After Testing

This section appears only in the *MSAA Online Assessment System User Guide for Test Administrators*. This section details the tasks to be completed after test administration, including the

Accommodations: After Test section of the student profile, End-of-Test Survey, and returning test materials (if applicable). These instructions were grouped together so that TAs could easily refer to all activities to be completed after testing.

5.6.7 Appendix A

Appendix A appears in both the *MSAA Online Assessment System User Guide for Test Coordinators* and *MSAA Online Assessment System User Guide for Test Administrators*. This section describes the accessibility features available for both online and paper-based assessments, as well as the assistive technology devices supported by the MSAA Online Assessment System.

5.6.8 Appendix B

Appendix B appears in both the *MSAA Online Assessment System User Guide for Test Coordinators* and *MSAA Online Assessment System User Guide for Test Administrators*. This section details the technology requirements for the MSAA Online Assessment System, including supported devices, operating systems, and browsers.

5.6.9 How to Navigate the MSAA Online Assessment System

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators.* This section is largely the same as How to Access the MSAA Online Assessment System section in the *MSAA Online Assessment System User Guide for Test Administrators* but includes functionality specific to the TC role, such as My Organizations, Order Test Materials, and My Reports.

5.6.10 Order Test Materials

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators.* The Online Ordering System (OOS) was new functionality for the 2016–17 administration, which allowed TCs to order TAMs and test materials through the MSAA Online Assessment System. This section details the instructions for using the OOS.

5.6.11 Manage Users

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators. Manage Users* details the instructions for bulk uploading users, adding a single user, and editing users in the MSAA Online Assessment System. These actions are available only to the TC role.

5.6.12 Manage Organizations

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators. Manage Organizations* focuses on the instructions for creating and using classrooms in the MSAA Online Assessment System, as this is the functionality that most TCs would use, given that districts and schools are pre-loaded in the MSAA Online Assessment System. However, instructions for adding a school are included in this section.

5.6.13 Test Administration Training

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators.* This section contains the same instructions as the *MSAA Online Assessment System User Guide for Test Administrators* for accessing and completing Test Administration Training, but it also includes instructions for tracking the training status of TAs in their district or school.

5.6.14 Managing Students and Completing Testing Activities

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators* and prepares TCs to track test administration progress and manage students in the MSAA Online Assessment System. It includes instructions for transferring students to a new school or classroom, changing a student's grade assignment, and closing a test for the early stopping rule.

5.6.15 My Reports

This section appears only in the *MSAA Online Assessment System User Guide for Test Coordinators.* My Reports is available only to TCs and is used to access reporting files after administration. This section describes the instructions for accessing and downloading reports.

5.6.16 Operational Test Administration

The test administration window was March 27 to May 12, 2017. The tests were delivered for the online administration using the MSAA system, following the MSAA two-stage adaptive test design requiring test administration in three separate sessions for ELA and two sessions for mathematics.

MSAA was not a timed test. Testing time varied for each student with testing paused and resumed, based on a student's needs. If a student became sick or exhibited frustration, lack of engagement, or refusal to participate during the administration of MSAA, TAs were directed to pause the testing and take a break, which could be for a few minutes to a few days, depending on the student's needs. MSAA protocols allowed the TA to pause and resume the administration of the test as often as necessary during the test window, based on a student's needs.

5.6.17 Session Structure and Two-Stage Adaptive Design

TAs could begin with either the mathematics test or the ELA test. Once a content-area test was started, TAs were required to complete that test before beginning the test in the other content area. Each content-area test consisted of a set of testing sessions. Students were administered the test sessions in consecutive order for a given content area. ELA consisted of three test sessions (see Table 5-6) and mathematics consisted of two test sessions (see Table 5-7) at each grade level.

Table 5-6. 2016–17 MSAA: ELA Test Sessions

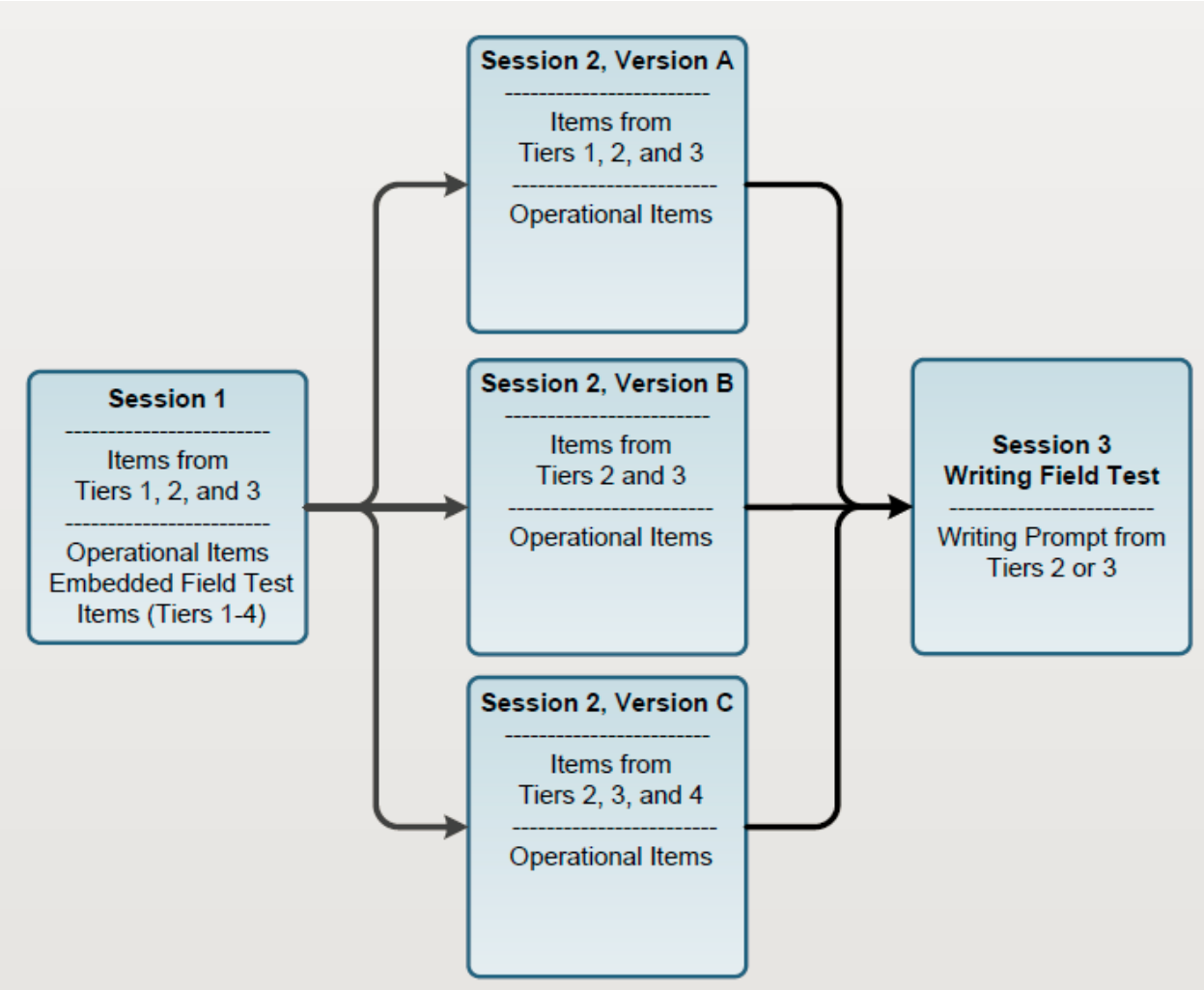
Session 1: ELA	*Session 2: ELA*	*Session 3: ELA – Writing Prompt*
Literary and informational reading passages and associated **selected-response reading** items	Literary and informational reading passages and associated **selected-response reading** items **Selected-response writing items**	One **constructed- response writing** item (Field-tested)

Table 5-7. 2016–17 MSAA: Mathematics Test Sessions

Session 1: Mathematics	*Session 2: Mathematics*
Selected-response mathematics items **Constructed-response mathematics completion** items in selected grades	**Selected-response mathematics** items **Constructed-response mathematics completion** items in selected grades

For the two-stage adaptive design, student performance on operational items in Session 1 determined which version of Session 2 the student was assessed. The same process applies for both ELA and mathematics. In Session 2, Version A is the least complex, Version B is slightly more complex than Version A, and Version C is the most complex. For ELA, all students then took either a Tier 2 or Tier 3 constructed-response field test writing prompt in Session 3 based on form assignment only. This session was not stage adapted and therefore not determined by student performance. The visual below provides a demonstration of the flow between sessions (note: only ELA had a Session 3):

Figure 5-7. MSAA Stage Adaptive Test Design



5.6.18 MSAA Service Center

To provide additional support to schools before, during, and after testing, the test administration vendor operated and provided technical support through the MSAA Service Center. The MSAA Service Center was available for those involved in test administration through e-mail or call to a toll-free number, to ask specific questions or report problems they may be experiencing. MSAA Service Center operators were responsible for receiving, responding to, and tracking reported issues, then routing issues to the appropriate person(s) for resolution. The MSAA Service Center was available for extended hours throughout registration and the test window (from 7:00 a.m. to 8:00 p.m. EST, Monday through Friday) to accommodate the multiple time zones in which the test was administered.

The TAM directed TAs and TCs to contact the MSAA Service Center with questions pertaining to the MSAA system and test administration procedures. The MSAA Service Center's toll-free support number and e-mail address were promoted to the field through the MSAA system and related communications.

Functionally, support was provided in a tiered manner, where Tier 1 support designated direct support to the caller by MSAA Service Center representatives, Tier 2 support designated support by the program

management team for items such as policy questions, and Tier 3 support designated technical requests that were escalated to the technology vendor for attention. Wherever possible, callers were directed to the appropriate section of the TAM, *MSAA Online Assessment System User Guide for Test Administrators,* or *MSAA Online Assessment System User Guide for Test Coordinators,* available to users within the MSAA system.

All activity was tracked in the new MSAA Service Center ticketing system, ServiceNow, and included in weekly status reports that were provided to MSAA State Leads. These reports summarized ticket activity, call analysis data (e.g., call duration, hold time), and per-grade/-content and per-state test status summaries throughout the administration window.

5.6.19 Additional Supports

In addition to the MSAA Service Center, the test administration vendor program management team periodically provided direct phone and e-mail support to the MSAA State Leads. In cases where logistical or procedural support was needed, program management worked with MSAA State Leads to resolve questions or issues. In cases with policy or consortium-wide implications, however, program management referred the State Lead to the Partner States and related policy documentation.

A banner messaging system in the MSAA system was implemented to notify users of important information during the administration window. Upon logging in to the system, a banner message appeared at the top of the screen to notify users of system information and upcoming system activities, such as known issues and scheduled system maintenance, as well as courtesy messages regarding upcoming test administration deadlines.

5.6.20 Monitoring and Quality Control

To ensure that proper testing procedures and appropriate test practices were maintained throughout administration, numerous measures were taken both to communicate participants' responsibilities and to monitor the appropriateness, accuracy, and completion of key procedures and tasks. The TAM outlined the procedure for reporting any violation or suspected violation of test security or confidentiality by notifying the school or district TC. TCs were then instructed to follow state procedures regarding reporting the issue or suspected issue; however, district TCs were informed that they must report to the State MSAA Coordinator any incidents involving alleged or suspected violations that would be considered a serious irregularity. The TAM further explained that the consequences for inappropriate test practices would be determined by their state's professional codes of ethics and state law.

The online MSAA system contains built-in measures to ensure proper testing procedures, as seen in the session-based test design. As described in the Session Structure section of this chapter, tests were administered in item groupings referred to as test sessions. A change to the end-of-session functionality was made for the 2016–17 administration. Instead of a discrete end-of-session page at the end of each session,

when the user clicked the Next button while on the last question of a session, a prompt window appeared, notifying the user that he or she had reached the end of the session, displaying the number of unanswered items, and options for the user to proceed to the next session, return to the current session, or Save & Exit. If the user chose to Save & Exit, the test resumed on the last item answered. This new prompt eliminated the risk of users accidentally submitting a session.

Throughout the administration window the test administration vendor monitored and provided weekly updates to State Leads on the test statuses across MSAA Partner States and trends identified in support calls. This provided a mechanism for concerns to be identified early and the appropriate measures to be taken, such as creation of assessment-wide or state-level materials and communications. This high level of communication and responsiveness throughout the assessment process contributed to a proper and valid administration of MSAA.

5.6.21 Operational Test Survey Results

An End-of-Test Survey (EOTS) was developed to gain knowledge from the experience of each TA administering MSAA. TAs were instructed to complete one EOTS after submitting or closing one of his or her students' content-area tests. Specific directions for completing the EOTS were provided in the *MSAA Online Assessment System User Guide for Test Administrators*. The survey questions focused on several themes:

- Challenges experienced while using and providing accommodations
- Challenges experienced while using the embedded supports and materials
- Instructional time and resources spent teaching the State Content Standards
- Teacher viewpoints and priorities when developing instruction for students
- Technical challenges with the online system
- Students' ability to communicate and access the test

In addition to identifying issues that were unknown to the MSAA Partners, the results of the EOTS also highlighted several issues that the MSAA Partners has addressed prior to reviewing this data. The EOTS data confirmed the need for MSAA previously initiated plans to address several known issues. These issues included:

- Providing clarification about what is and is not a Consistent Observable Response for the Early Stopping Rule, allowing TCs to close a student's test
- Providing further details in the directions and stimulus materials for the writing prompts
- Resolving issues surrounding locked tests

The survey data also identified the effectiveness of several improvements to correct issues identified in the 2015-16 administration. These included:

- Improving the online training modules to address allowable supports to students in a clearer, more explicit manner
- Restricting the application of the Early Stopping Rule to test coordinators, rather than test administrators, and defining what a Consistent Observable Response is and is not
- Simplifying directions for converting writing responses from a PDF into a JPG or PNG file format
- Improving the online messages for submission of tests.

One issue that the survey continues to reveal that will take thoughtful, long-range planning to resolve is how students and teachers scroll to see the entire test item in the online platform. Currently, the item display is such that the whole item cannot be seen on the screen. This has proven difficult to fix as it requires code changes and changes to the APIP for each item. Another issue raised by the teachers is the lack of familiarity and relatability with the contexts and scenarios used in the writing prompts and other items. The MSAA Partners' focus on developing test items and writing prompts that contain contexts and scenarios which are more relatable to students in this population will be a sustained goal requiring several testing cycles.

Several questions on the survey addressed teachers' viewpoints and philosophies regarding teaching students with significant cognitive disabilities. The results continue to indicate the need for more instructional materials to illustrate how students in this population can learn rigorous academic content. Additionally, the perception is that the test is still too difficult for most of the targeted population. The 2016-17 administration introduced a stage adaptive design. The MSAA Partners anticipated that this design would help to alleviate the concerns that many teachers have, by directing students to an appropriate stage level of difficulty within the test at each content area. The MSAA Partner States are working to ensure that future administrations' test forms have higher differentiation, while still maintaining the required match to the blueprint.

The EOTS data also show that teachers are seeking additional support for classroom instruction in several academic areas. These include fractions and data and statistics in mathematics, and writing an argument and reading informational texts in ELA. Given that education for students in this population has traditionally centered on life and functional skills, the heavier focus on academics is something that teachers may not feel adequately prepared for. The EOTS data show several academic areas in which teachers had difficulty instructing their students. In order to effectively help teachers, the MSAA Partners will need more information on teaching difficulties in the areas identified above.

CHAPTER 6 SCORING

6.1 ITEM SCORING PROCESS

MSAA was completed through an online administration. Students responded to a variety of item types, including selected-response items and constructed-response items. The selected-response items were scored according to the answer keys provided in each test package. The mathematics constructed-response items were scored as a correct or incorrect student response and this was entered by the test administrator (TA).

6.1.1 Scoring Processes and Rules for Selected-Response and Constructed-Response Items in Mathematics and Selected-Response Items in Reading and Writing

6.1.1.1 *OVERVIEW OF SCORING PROCESS BY ITEM TYPE*

Selected-Response: Reading, Mathematics, and Writing

Selected-response items (multiple-choice) were presented to students in a standardized and consistent format. All directions and materials needed for administering selected-response items were provided in the secure *Directions for Test Administration* (DTA) that accompanied each test form. The TAs received training in the administration of selected-response reading, writing, and mathematics items in the online training modules. The DTA provided the full items, including the teacher scripts, to be read aloud to the student and any direction to the teacher related to the item and item setup, such as what to point to in the item as the script was read to the student. Every item was presented in the following order:

- Item stimulus (which may include a passage, passage part, picture, graphic, or other illustration)
- Item question
- Answer options presented in stacked, or vertical, formation

Students selected a response from the options in a variety of ways, as appropriate to their preferred modes of communication (e.g., using the computer mouse, verbalizing, gesturing, using eye gaze or communication devices, assistive technology). Many students entered responses directly into the MSAA system. If the student had the scribe accommodation, the scribe entered the student-selected response on behalf of the student.

Constructed-Response: Mathematics Completion

The constructed-response items, in selected grades for mathematics, required students to develop an answer instead of selecting an answer from response options. Constructed-response items were presented as novel tasks using materials and content presented in a test format that allows the TA to print out materials and manipulatives for the student to interact with. Each item was presented to the student in a standardized, scripted sequence of steps culminating in the TA scoring the student performance using the Mathematics Scoring Rubrics provided for the item. The Mathematics Scoring Rubrics provided scoring standards that were used to evaluate student responses. TAs received training in the administration and scoring of constructed-response mathematics items in the online training modules. Directions and materials needed for administering mathematics constructed-response items were included in the secure DTA that accompanied each mathematics test form. The TA entered a student's constructed-response score into the MSAA system as either correct or incorrect.

Overview of Scoring Process within the Assessment System

The MSAA system provided automated machine scoring for all item types, aside from the field-tested constructed-response writing items, which required human scoring. The system also allowed for teacher entry of student responses to be used for paper-based test delivery. The MSAA system automatically scored question types that were machine-scorable as entered by the student or TA. At the completion of the operational test, all test data were extracted from the system and were then compiled to generate full result sets for each student's tests.

The selected-response items were scored according to the answer keys provided in each test package. All item responses were exported from the system and provided to the Measured Progress Data and Reporting Services (DRS) Department. DRS then applied the scoring rules. Items were scored as correct or incorrect, with each of them contributing a score of 1 or 0 to the content-area raw score.

Administrator/Scorer Training

All TAs were required to participate in administration training modules and pass a final quiz in order to be certified to administer MSAA, as described in detail in Chapter 5. During the test administration, TAs used the content-area DTAs to administer each item. The DTAs included the teacher scripting and directions related to any item setup, providing directions for the teacher to follow during administration. For the mathematics constructed-response items, the DTA included any templates required by the items, the directions related to how to present the items to the student, and the rubrics used to score the items.

Further direction was provided to TAs on the entering of item responses in the MSAA system through the *MSAA Online Assessment System User Guide for Test Administrators*. The guide outlined the use of the system, including how to enter student responses and submit each content-area test.

During the administration window TAs were able to call or e-mail the MSAA Service Center with any questions related to the administration of test items and submission of the student responses within the MSAA system.

CHAPTER 7 REPORTING

7.1 INTRODUCTION

To ensure that reported results for MSAA were accurate relative to collected data, a decision rules document delineating processing rules was prepared and approved by all participating Partner States prior to processing of the results. The decision rules and included participation status structure provided the framework for the reporting requirements, which were defined for each unique report and similarly approved by all participating Partner States prior to reporting.

7.2 DEVELOPMENT AND APPROVAL

The decision rules document was developed by Measured Progress in collaboration with the MSAA Reports Subcommittee. The decision rules document contains the hierarchy by which the participation statuses were assigned for each individual test incorporating data elements collected by the test platform and directly from the Partner States. The reporting requirements and corresponding report design templates were developed by Measured Progress with the guidance of the MSAA Reports Subcommittee. Both documents underwent iterative review processes that included draft reviews by the appropriate committee, incorporation of edits, draft reviews by all participating Partner States, and committee review and integration of feedback, until final revisions were approved by all participating Partner States. The approved decision rules are provided in Appendix E.

To develop the report design templates, Measured Progress worked with the MSAA Reports Subcommittee to identify modifications to the templates used for last year that would ensure the data elements, layout, and report text were meaningful for reporting the spring 2017 MSAA results. Once finalized, the results of this collaborative process were presented to participating MSAA State Leads for final approval.

Measured Progress worked with the MSAA Reports Subcommittee to update the *MSAA 2017 Guide for Score Report Interpretation* and collaborated to provide information that would be most helpful to district and school staff, as they reviewed reports and discussed reports with parents or guardians. The guide included an overview of MSAA, student participation criteria, score reporting overview, and samples of the various types of reports available to schools and districts. Guidelines were provided to inform the interpretation and utilization of MSAA scores. The guide also included explanations for all special reporting codes and messages, as well as performance-level scale score ranges. States were permitted to remove codes not used in their state. Measured Progress revised the base document through an iterative process with the MSAA State

Leads. Appendices included in the guide contain the Performance-Level Descriptors for ELA and Mathematics, a sample individual student report, and the field test writing prompt scoring rubrics. The final, approved document was delivered to the MSAA Partner States for state-specific revisions and distribution (see Appendix I).

7.3 PRIMARY REPORTS

Measured Progress, in collaboration with the MSAA Reporting Committee, created the following primary reports for MSAA:

- Student reports
- School roster reports
- School, district, and state summary reports

These reports, along with student results data files, were posted online via the MSAA Online Assessment System's secure data and reporting portal, with access controlled by user-permissioned accounts, as illustrated in Table 7-1:

Table 7-1. 2016–17 MSAA: Matrix by Users by Report

	State TC	*District TC*	*School TC*
Student Reports	Yes	Yes	Yes
School Roster Reports	Yes	Yes	Yes
School Summary Reports	Yes	Yes	Yes
District Summary Reports	Yes	Yes	No
State Summary Reports	Yes	No	No

As determined by MSAA State Leads, only test coordinators (TCs) were granted access to the online reports. For the purposes of the assessment system, MSAA State Leads were regarded as state TCs. As such, they were able to add new district and school TCs to the online system and to block users no longer in the TC role from accessing the system. Reports were generated for each school, district, or state that had results, as defined by the MSAA decision rules and reporting requirements.

The primary results reported were the student's scaled score and performance-level classification for mathematics and ELA. The performance-level classifications, with cuts determined through the standard setting process, were reported under the generic titles of: Level 1, Level 2, Level 3, and Level 4, with Level 1 as the lowest level and Level 4 as the highest attainable performance level.

The average scale score and percent of students in each performance level were summarized by school, district, and state on both the roster and summary reports. This allowed for the comparison of individual student performance in relation to the state, as well as for comparison of school and district results against the overall state results.

7.3.1 Student Report

The student report was a two-sided single-page document generated for each student eligible to receive a performance level in at least one content area, as defined by the student report requirements. The report contained results for both content areas and was developed for parents and guardians of students who participated in MSAA. Reports were organized by school and posted via the secure-access portal for permissioned users to download, print, and disseminate to parents and guardians as appropriate. Each report contained the student name, test grade, and school on the front and back of the report. The back page also included the state student ID for additional confirmation of the student's identification. Additionally, some Partner States chose to print and distribute paper versions of these reports to districts/schools for distribution to students' parents/guardians. Sample student reports are provided in Appendix I.

The front page of the report contained a brief overview of MSAA, including examples of some of the built-in supports available during testing, and highlighted the compatibility of the assessment with various modes of communication. The front also contained a short overview of the results included on the back page, as well as a link to where more information could be accessed online. Parents and guardians were encouraged to communicate with their child's teacher regarding their specific mode of communication and performance.

The back page of the report contained the scaled score, performance level, and associated performance-level descriptor for the level obtained by the student for each content area. A sentence below the graphical display explained the standard error of measurement (SEM) in an easy-to-understand manner by providing the expected range of scores the student would likely earn if tested again.

For students who are unable to show an observable mode of communication, their tests were closed due to the Early Stopping Rule, and the lowest scaled score was assigned and displayed along with the Level 1 performance level. This was annotated, and in place of the Level 1 performance-level descriptor, the following text was displayed: *Your child did not show a consistent observable mode of communication during the test and the test was closed by the teacher. Since your child did not complete the test the results may not be an accurate representation of your child's skills. If you have additional questions, please contact your child's teacher.*

In the event that a student received a student report but did not receive results for one of the two content areas, results for the missing content area are replaced with text encouraging the parent or guardian to contact the child's teacher or school for more information.

7.3.2 Student Roster

The student roster was organized at the school level and provided a by-grade list of all students enrolled in MSAA, with a snapshot of their participation status and results for both content areas. The number of tested students, the average scaled score, and the percent of students by performance level were summarized for the school, district, and state at the top of the roster. Roster reporting requirements identified

which of the participation status codes were included on the roster and which of the participation status codes were included in each calculation.

The summary information at the top of the student roster supported interpretation of results by users, typically those at the school and district levels. Given that many schools have a relatively small number of students in this population, MSAA Partner States did not suppress information when the number of students participating was small. This practice placed a burden on users to understand the data in the context of small numbers and to use all information provided to understand the results, as explained in the *MSAA 2017 Guide for Score Report Interpretation* (see Appendix F).

Student results were listed below the summary section and were identified by name and state student identification number. For each content area the following student-level elements were reported:

- Participation Status
- Scaled Score
- Performance Level
- Comparison to the State Average

It is intended that these data points are to be used in conjunction with the *MSAA 2017 Guide for Score Report Interpretation* (see Appendix F).

7.3.3 Summary Report

Summary reports were organized at the school, district, and state levels, for each entity with at least one student included in summary report calculations. Inclusion in these calculations was defined by the decision rules and summary report requirements. The following information was summarized by grade and content area and displayed for the school, district, and state, based on the level of the report:

- Number of students enrolled
- Number of valid student tests
- Number of enrolled students that did not test
- Average scaled score
- Number and percent of students at each performance level

This summary provided a comparative snapshot of results and participation information at a high level and included both participation and performance summary information, allowing users to evaluate both aspects of their assessment results as guided by the *MSAA 2017 Guide for Score Report Interpretation* (see Appendix F).

7.3.4 Quality Assurance

Proprietary quality-assurance measures at Measured Progress were embedded throughout the entire process of analysis and reporting. The data processors and data analysts who worked on the project implemented quality-control checks of their respective computer programs. Moreover, when data were handed off to different functions within the Data and Reporting Services (DRS) Department, the sending function verified that the data were accurate prior to handoff. Additionally, when a function received a data set, the first step was to verify the data for accuracy.

A second level of quality-assurance measure was parallel processing. One data analyst was responsible for writing all programs required to populate the student and aggregate reporting tables for the administration. Each reporting table was assigned to another data analyst on staff who used the decision rules to independently program the reporting table. The production and quality-assurance tables were compared, and only once there was 100% agreement were the tables released for report generation.

The third aspect of quality control at Measured Progress involved the procedures implemented by the quality-assurance group to check the accuracy of reported data. Using a sample of schools and districts, the quality-assurance group verified that reported information was correct.

The second set of samples included districts or schools that had unique reporting situations as indicated by decision rules. This set was necessary to check that each rule was applied correctly. The third set included districts and schools identified by the client for its review and approval before reports were produced for distribution.

The quality-assurance group used a checklist to implement its procedures. Once the checklist was completed, it underwent an internal parallel verification and then sample reports were circulated for psychometric checks and program management review. Samples of the final reports were then sent for client review and signoff. Simultaneously, Arizona ran successful independent confirmations of the results contained in their state data file. Once signoff was received from all Partner States, the final reports were uploaded into the MSAA Online Assessment System reporting portal.

CHAPTER 8 CLASSICAL ITEM ANALYSIS

As noted in Brown (1983), "A test is only as good as the items it contains." A complete evaluation of a test's quality must include an evaluation of each item. Both *Standards for Educational and Psychological Testing* (AERA et al., 2014) and *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) include standards for identifying quality items. Items should assess only knowledge or skills that are identified as part of the domain being tested and should avoid assessing irrelevant factors. Items should also be unambiguous and free of grammatical errors, potentially insensitive content or language, and other confounding characteristics. In addition, items must not unfairly disadvantage students, particularly racial, ethnic, or gender groups.

Both qualitative and quantitative analyses are conducted to ensure that MSAA ELA and mathematics items meet these standards. Qualitative analyses are described in earlier chapters of this report; this chapter focuses on quantitative evaluations. Statistical evaluations are presented in three parts: (1) difficulty indices, (2) item-test correlations, and (3) differential item functioning (DIF) statistics. The item analyses presented here are based on the administration of MSAA in spring 2017.

8.1 CLASSICAL DIFFICULTY AND DISCRIMINATION INDICES

All items are evaluated in terms of item difficulty according to standard classical test theory practices. Classical statistics provided in this chapter should be cautiously interpreted because some items are only administered to a subgroup of examinees, and each subgroup can be quite different in their underlying proficiencies. One thing to note is that the 2016–17 MSAA assessment was a stage adaptive test. Hereinafter, each form will be referred to as:

- Form 1: Stage 1 and Stage 2 Version A
- Form 2: Stage 1 and Stage 2 Version B
- Form 3: Stage 1 and Stage 2 Version C.

As mentioned earlier, each version in Stage 2 was intended to be slightly more complex than the previous version. Examinees were routed to one of the three versions in Stage 2 based on their performance on Stage 1, which was administered to all examinees. (Note: As noted in section 5.6.17, stage correlates with session number.) The lowest-achieving examinees were routed to Stage 2 Version A, and so on. Thus, the examinees who were administered a particular form exhibited a much smaller range of achievement as compared to the entire population of examinees who took the assessment in past years. This specific range varied in the obvious way across the three forms. Because of this restriction of range and because of the differences across forms, the classical statistics are not comparable between items on different forms and are

not comparable to statistics based on all the examinees (e.g., statistics for the Stage 1 items and statistics from past years).

Difficulty is defined as the average proportion of points achieved on an item and is measured by obtaining the average score on an item and dividing it by the maximum possible score for the item. Selected-response and one-point open-response items are scored dichotomously (correct versus incorrect); for these items, the difficulty index is simply the proportion of students who correctly answered the item. An index of 0.0 indicates that all students received no credit for the item; an index of 1.0 indicates that all students received full credit for the item. Discrimination is defined as the correlation between student performance on a single item and total test score on the particular form. Within classical test theory, the item-test correlation is referred to as the item's discrimination because it indicates the extent to which successful performance on an item discriminates between high and low scores on the particular form on which the item occurred. Because of the restriction of range complications mentioned above, the increase in the number of items with poor discrimination statistics (as compared to past years) was expected.

A summary of the item difficulty and item discrimination statistics for each content area and grade is presented in Table 8-1. The mean difficulty and discrimination values shown in the table are within typically observed ranges. A total of 24 out of 685 items displayed negative discrimination statistics. A closer examination revealed that 23 out of 24 items with negative discrimination statistics appeared in either Stage 2 Version A only or Stage 2 Versions A and B only. As mentioned above, this is not surprising given the nature of the adaptive test.

Table 8-1. 2016–17 MSAA: Summary of Item Difficulty and Discrimination Statistics by Content Area and Grade

Content Area	*Grade*	*Number of Items*	*p-value*				*Discrimination*			
			Min	*Max*	*Mean*	*SD*	*Min*	*Max*	*Mean*	*SD*
ELA	3	41	0.34	0.86	0.61	0.14	-0.11	0.51	0.33	0.12
	4	43	0.37	0.85	0.61	0.13	0.09	0.47	0.29	0.10
	5	41	0.33	0.88	0.58	0.13	-0.07	0.48	0.29	0.13
	6	45	0.34	0.86	0.59	0.14	0.07	0.48	0.29	0.11
	7	45	0.33	0.84	0.59	0.11	0.06	0.50	0.28	0.13
	8	43	0.38	0.86	0.60	0.12	0.04	0.51	0.29	0.11
	11	43	0.28	0.81	0.58	0.12	-0.02	0.49	0.28	0.14
Mathematics	3	55	0.23	0.93	0.50	0.15	-0.02	0.47	0.25	0.12
	4	55	0.25	0.76	0.45	0.13	-0.20	0.41	0.24	0.14
	5	55	0.08	0.73	0.44	0.15	-0.12	0.45	0.21	0.13
	6	55	0.29	0.92	0.53	0.14	-0.02	0.46	0.25	0.13
	7	54	0.24	0.90	0.51	0.14	-0.04	0.44	0.22	0.13
	8	55	0.28	0.79	0.49	0.13	-0.13	0.42	0.25	0.11
	11	55	0.28	0.71	0.48	0.11	-0.15	0.48	0.23	0.15

Note: *p*-values are dependent on the number of options within the items. All *p*-values are calculated on items having either two (chance correct is .50) or three (chance correct is .33) options.

The individual item statistics can be found in Appendix G. Note that the classical statistics should be interpreted with caution because the items are primarily two- or three-option selected-response items, and

some items were only administered to a subset of examinees. Because the items were developed to correspond to different tiers, the item statistics have been summarized by tier (Tables 8-2 and 8-3). Also, the item statistics were summarized by form representing the different paths in the stage adaptive design (Tables 8-4 and 8-5). The classical statistics are not comparable between items on different tiers and between items on different forms because of the restriction of range and the differences across forms mentioned above.

Table 8-2. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Summary by Grade, Content, and Tier—ELA

Content Area	*Grade*	*Tier*	*Number of Items*	p-*value*				*Discrimination*			
				Min	*Max*	*Mean*	*SD*	*Min*	*Max*	*Mean*	*SD*
ELA	3	1	9	0.42	0.86	0.67	0.14	-0.11	0.41	0.29	0.16
		2	16	0.34	0.75	0.56	0.13	0.12	0.49	0.32	0.13
		3	11	0.35	0.74	0.55	0.10	0.22	0.51	0.38	0.09
		4	5	0.64	0.83	0.76	0.08	0.27	0.37	0.33	0.04
	4	1	11	0.47	0.84	0.69	0.13	0.09	0.45	0.28	0.12
		2	11	0.40	0.67	0.54	0.08	0.16	0.47	0.34	0.09
		3	15	0.37	0.75	0.58	0.10	0.09	0.44	0.28	0.10
		4	6	0.46	0.85	0.7	0.15	0.20	0.33	0.27	0.05
	5	1	10	0.49	0.83	0.69	0.11	-0.07	0.41	0.28	0.15
		2	10	0.33	0.67	0.52	0.11	0.05	0.48	0.28	0.14
		3	16	0.33	0.69	0.52	0.09	0.11	0.48	0.33	0.11
		4	5	0.52	0.88	0.67	0.15	0.09	0.34	0.23	0.09
	6	1	13	0.51	0.86	0.7	0.14	0.17	0.45	0.31	0.10
		2	10	0.38	0.72	0.56	0.12	0.19	0.48	0.36	0.09
		3	15	0.34	0.62	0.52	0.08	0.07	0.47	0.25	0.12
		4	7	0.35	0.83	0.56	0.15	0.13	0.35	0.23	0.08
	7	1	11	0.55	0.84	0.68	0.09	0.06	0.40	0.27	0.11
		2	11	0.53	0.72	0.62	0.07	0.25	0.50	0.39	0.08
		3	16	0.33	0.63	0.5	0.09	0.06	0.49	0.25	0.15
		4	7	0.48	0.67	0.6	0.06	0.15	0.32	0.22	0.06
	8	1	10	0.46	0.86	0.69	0.14	0.04	0.41	0.28	0.12
		2	12	0.48	0.76	0.63	0.09	0.28	0.51	0.40	0.07
		3	15	0.38	0.65	0.52	0.09	0.11	0.41	0.25	0.09
		4	6	0.50	0.74	0.6	0.10	0.14	0.32	0.22	0.07
	11	1	11	0.49	0.81	0.65	0.10	-0.01	0.35	0.22	0.12
		2	15	0.46	0.69	0.59	0.08	0.15	0.49	0.35	0.12
		3	11	0.28	0.69	0.48	0.14	-0.02	0.48	0.23	0.18
		4	6	0.37	0.70	0.6	0.13	0.22	0.31	0.28	0.04

Table 8-3. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Summary by Grade, Content, and Tier—Mathematics

Content Area	*Grade*	*Tier*	*Number of Items*	p-*value*				*Discrimination*			
				Min	*Max*	*Mean*	*SD*	*Min*	*Max*	*Mean*	*SD*
Mathematics	3	1	10	0.52	0.74	0.62	0.07	0.06	0.32	0.19	0.10
		2	20	0.27	0.93	0.49	0.16	0.03	0.47	0.25	0.11
		3	20	0.23	0.70	0.43	0.13	-0.02	0.44	0.26	0.14
		4	5	0.40	0.82	0.58	0.18	0.12	0.38	0.28	0.10

continued

Content Area	Grade	Tier	Number of Items	p-value				Discrimination			
				Min	Max	Mean	SD	Min	Max	Mean	SD
Mathematics	4	1	10	0.48	0.76	0.61	0.10	-0.20	0.29	0.08	0.18
		2	20	0.25	0.59	0.41	0.08	-0.13	0.40	0.25	0.13
		3	20	0.27	0.64	0.41	0.11	0.20	0.41	0.30	0.06
		4	5	0.33	0.62	0.49	0.12	0.13	0.38	0.24	0.11
	5	1	10	0.46	0.73	0.59	0.11	-0.10	0.35	0.17	0.13
		2	20	0.22	0.70	0.44	0.13	-0.12	0.45	0.20	0.14
		3	20	0.08	0.61	0.35	0.14	0.05	0.45	0.23	0.12
		4	5	0.38	0.67	0.51	0.11	0.05	0.34	0.20	0.12
	6	1	10	0.49	0.79	0.65	0.11	0.04	0.34	0.20	0.11
		2	21	0.32	0.92	0.51	0.15	-0.02	0.46	0.25	0.15
		3	19	0.30	0.68	0.49	0.11	0.05	0.44	0.28	0.13
		4	5	0.29	0.77	0.53	0.19	0.09	0.37	0.28	0.12
	7	1	10	0.48	0.81	0.64	0.10	-0.02	0.28	0.15	0.10
		2	19	0.30	0.90	0.51	0.16	-0.04	0.40	0.22	0.12
		3	20	0.24	0.56	0.43	0.09	-0.02	0.44	0.24	0.14
		4	5	0.34	0.71	0.56	0.15	0.31	0.41	0.35	0.04
	8	1	10	0.43	0.75	0.61	0.11	-0.13	0.38	0.22	0.17
		2	20	0.32	0.79	0.47	0.14	-0.03	0.42	0.24	0.10
		3	20	0.28	0.70	0.46	0.12	0.06	0.40	0.28	0.11
		4	5	0.30	0.64	0.45	0.13	0.18	0.36	0.27	0.08
	11	1	10	0.47	0.71	0.61	0.09	0.06	0.34	0.20	0.11
		2	20	0.33	0.70	0.46	0.12	-0.06	0.48	0.24	0.17
		3	20	0.28	0.58	0.43	0.08	-0.15	0.46	0.22	0.16
		4	5	0.37	0.66	0.48	0.12	0.12	0.36	0.27	0.12

Table 8-4. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Summary by Grade, Content, and Form— ELA

Grade	Form	Number of Items	p-value				Discrimination			
			Min	Max	Mean	SD	Min	Max	Mean	SD
3	01	32	0.34	0.86	0.59	0.13	-0.11	0.51	0.35	0.12
	02	32	0.34	0.86	0.59	0.13	0.12	0.51	0.34	0.11
	03	32	0.34	0.86	0.62	0.14	0.18	0.51	0.36	0.09
4	01	32	0.40	0.84	0.60	0.12	0.09	0.47	0.31	0.10
	02	32	0.37	0.84	0.60	0.12	0.09	0.47	0.31	0.10
	03	32	0.40	0.85	0.62	0.13	0.15	0.47	0.33	0.09
5	01	32	0.33	0.83	0.57	0.13	-0.07	0.48	0.32	0.13
	02	32	0.33	0.83	0.56	0.13	0.05	0.48	0.32	0.12
	03	32	0.33	0.88	0.58	0.14	0.09	0.48	0.32	0.11
6	01	32	0.38	0.86	0.61	0.14	0.17	0.48	0.33	0.09
	02	32	0.34	0.86	0.59	0.15	0.07	0.48	0.31	0.12
	03	32	0.35	0.86	0.60	0.15	0.13	0.48	0.33	0.09
7	01	32	0.35	0.84	0.61	0.10	0.06	0.50	0.33	0.12
	02	32	0.33	0.84	0.58	0.12	0.06	0.50	0.31	0.14
	03	32	0.35	0.84	0.60	0.10	0.10	0.50	0.32	0.12
8	01	32	0.38	0.86	0.62	0.12	0.04	0.51	0.33	0.11
	02	32	0.38	0.86	0.60	0.13	0.11	0.51	0.32	0.10

continued

Grade	Form	Number of Items	p-value				Discrimination			
			Min	Max	Mean	SD	Min	Max	Mean	SD
8	03	32	0.38	0.86	0.62	0.12	0.14	0.51	0.32	0.10
11	01	32	0.28	0.81	0.58	0.13	-0.02	0.49	0.28	0.16
	02	32	0.28	0.81	0.58	0.13	-0.02	0.49	0.30	0.15
	03	32	0.28	0.81	0.58	0.14	-0.02	0.49	0.31	0.14

Table 8-5. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Summary by Grade, Content, and Form—Mathematics

Grade	Form	Number of Items	p-value				Discrimination			
			Min	Max	Mean	SD	Min	Max	Mean	SD
3	01	35	0.23	0.74	0.46	0.15	-0.02	0.47	0.21	0.12
	02	35	0.27	0.74	0.48	0.14	0.03	0.47	0.28	0.10
	03	35	0.28	0.93	0.55	0.15	0.12	0.47	0.31	0.08
4	01	35	0.25	0.76	0.44	0.13	-0.20	0.40	0.22	0.17
	02	35	0.25	0.76	0.45	0.13	-0.13	0.41	0.26	0.11
	03	35	0.25	0.76	0.47	0.13	0.11	0.41	0.26	0.08
5	01	35	0.08	0.73	0.41	0.16	-0.12	0.45	0.17	0.13
	02	35	0.22	0.73	0.44	0.14	-0.12	0.45	0.22	0.13
	03	35	0.25	0.73	0.49	0.14	0.05	0.45	0.26	0.10
6	01	35	0.30	0.79	0.50	0.14	-0.02	0.46	0.21	0.13
	02	35	0.32	0.79	0.53	0.13	-0.02	0.46	0.29	0.12
	03	35	0.29	0.92	0.59	0.13	0.09	0.46	0.33	0.08
7	01	35	0.24	0.81	0.49	0.13	-0.04	0.40	0.17	0.12
	02	35	0.30	0.81	0.50	0.11	-0.04	0.44	0.24	0.11
	03	34	0.34	0.90	0.56	0.14	0.10	0.44	0.30	0.08
8	01	35	0.28	0.75	0.46	0.13	-0.13	0.40	0.22	0.12
	02	35	0.32	0.73	0.49	0.12	-0.03	0.40	0.27	0.10
	03	35	0.30	0.79	0.54	0.11	0.06	0.42	0.31	0.08
11	01	35	0.28	0.71	0.46	0.12	-0.15	0.43	0.17	0.15
	02	35	0.33	0.71	0.47	0.11	-0.06	0.46	0.25	0.13
	03	35	0.33	0.71	0.52	0.11	0.12	0.48	0.32	0.09

8.2 DIFFERENTIAL ITEM FUNCTIONING

The *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) explicitly states that subgroup differences in performance should be examined when sample sizes permit and that actions should be taken to ensure that differences in performance are due to construct-relevant, rather than irrelevant, factors. Chapter 3 of *Standards for Educational and Psychological Testing* (AERA et al., 2014) includes similar guidelines. As part of the effort to identify such problems, MSAA items were evaluated in terms of DIF statistics.

For MSAA, the standardization DIF procedure (Dorans & Kulick, 1986) was employed to evaluate subgroup differences. The standardization DIF procedure is designed to identify items for which subgroups of interest perform differently, beyond the impact of differences in overall achievement. The DIF procedure

calculates the difference in item performance for two groups of students (at a time) matched for achievement on the total test. Specifically, average item performance is calculated for students at every total score. Then an overall average is calculated, weighting the total score distribution so that it is the same for the two groups.

When differential performance between two groups occurs on an item (i.e., a DIF index in the "low" or "high" categories, explained below), it may or may not be indicative of item bias. Course-taking patterns or differences in school curricula can lead to DIF but for construct-relevant reasons. On the other hand, if subgroup differences in performance can be traced to differential experience (such as geographical living conditions or access to technology), the inclusion of such items should be reconsidered.

For the 2016–17 MSAA, six subgroup comparisons were evaluated for DIF:

- Male vs. female
- White vs. Black
- White vs. Hispanic
- White vs. American Indian
- Not low socioeconomic status (SES) vs. low SES.
- Not Limited English Proficiency (LEP) vs. LEP (including current, exited one year, and exited two year).

The DIF statistics were calculated based only on the members of the subgroup in question in the computations; values are calculated only for subgroups with 100 or more students. The tables in Appendix H present the number of items classified as either "low" or "high" DIF, overall and by group favored. Computed DIF indices have a theoretical range from –1.0 to 1.0 for selected-response items. Dorans and Holland (1993) suggested that index values between –0.05 and 0.05 should be considered negligible. The preponderance of MSAA items fell within this range (see Tables H-1 and H-2 in Appendix H). Dorans and Holland further stated that items with values between –0.10 and –0.05 and between 0.05 and 0.10 (i.e., "low" DIF) should be inspected to ensure that no possible effect is overlooked, and that items with values outside the –0.10 to 0.10 range (i.e., "high" DIF) are more unusual and should be examined very carefully.

The number of items with a "high" DIF index for each tier are shown in Tables 8-6 and 8-7. Since an item can exhibit DIF for multiple comparisons, the item was counted once if any of the comparisons showed "high" DIF.

Table 8-6. 2016–17 MSAA: Number of Items with "High" DIF by Tier—ELA

Grade	*Tier 1*	*Tier 2*	*Tier 3*	*Tier 4*
3	0(9)	0(16)	1(11)	0(5)
4	0(11)	0(11)	3(15)	1(6)
5	0(10)	1(10)	2(16)	0(5)
6	1(13)	1(10)	1(15)	0(7)
7	1(11)	0(11)	0(16)	0(7)

continued

Grade	Tier 1	Tier 2	Tier 3	Tier 4
8	2(10)	0(12)	1(15)	0(6)
11	0(11)	0(15)	0(11)	0(6)

Note: The numbers in the parentheses are the total number of items in each tier.

Table 8-7. 2016–17 MSAA: Number of Items with "High" DIF by Tier—Mathematics

Grade	Tier 1	Tier 2	Tier 3	Tier 4
3	0(10)	0(20)	1(20)	0(5)
4	1(10)	1(20)	0(20)	0(5)
5	0(10)	3(20)	2(20)	0(5)
6	0(10)	1(21)	3(19)	1(5)
7	0(10)	0(19)	1(20)	0(5)
8	1(10)	1(20)	2(20)	1(5)
11	0(10)	0(20)	0(20)	0(5)

Note: The numbers in the parentheses are the total number of items in each tier.

In addition to the values seen in Appendix H (Tables H-1 and H-2), Tables 8-6 and 8-7 also show that only a few items were classified as "high" DIF for each grade and each tier.

8.3 DIMENSIONALITY ANALYSIS

Because tests are constructed with multiple content-area subcategories, and their associated knowledge and skills, the potential exists for a large number of dimensions being invoked beyond the common primary dimension. Generally, the subcategories are highly correlated with each other; therefore, the primary dimension they share typically explains an overwhelming majority of variance in test scores. In fact, the presence of just such a dominant primary dimension is the psychometric assumption that provides the foundation for the unidimensional item response theory (IRT) models that are used for calibrating, linking, scaling, and equating the 2016–17 MSAA test forms.

The purpose of dimensionality analysis is to investigate whether violation of the assumption of test unidimensionality is statistically detectable and, if so, (a) the degree to which unidimensionality is violated and (b) the nature of the multidimensionality. Findings from dimensionality analyses performed on the 2016–17 MSAA core items for ELA and mathematics are reported below. (Note: Only core items were analyzed since they are used for score reporting.)

The dimensionality analyses were conducted using the nonparametric IRT-based methods DIMTEST (Stout, 1987; Stout, Froelich, & Gao, 2001) and DETECT (Zhang & Stout, 1999). Both of these methods use as their basic statistical building block the estimated average conditional covariances for item pairs. A conditional covariance is the covariance between two items conditioned on expected total score for the rest of

the test, and the average conditional covariance is obtained by averaging across every possible conditioning score. When a test is strictly unidimensional, all conditional covariances are expected to take on values within random noise of zero, indicating statistically independent item responses for examinees with equal expected total test scores. Nonzero conditional covariances are essentially violations of the principle of local independence, and local dependence implies multidimensionality. Thus, nonrandom patterns of positive and negative conditional covariances are indicative of multidimensionality.

DIMTEST is a hypothesis-testing procedure for detecting violations of local independence. The data are first divided into a training sample and a cross-validation sample. Then an exploratory analysis of the conditional covariances is conducted on the training sample data to find the cluster of items that displays the greatest evidence of local dependence. The cross-validation sample is then used to test whether the conditional covariances of the selected cluster of items displays local dependence, conditioned on total score on the nonclustered items. The DIMTEST statistic follows a standard normal distribution under the null hypothesis of unidimensionality.

The DETECT statistic is an effect-size measure of multidimensionality. As with DIMTEST, the data are first divided into a training sample and a cross-validation sample. The training sample is used to find a set of mutually exclusive and collectively exhaustive clusters of items that best fit a systematic pattern of positive conditional covariances for pairs of items from the same cluster and negative conditional covariances from different clusters. Next, the clusters from the training sample are used with the cross-validation sample data to average the conditional covariances: Within-cluster conditional covariances are summed, from this sum the between-cluster conditional covariances are subtracted, this difference is divided by the total number of item pairs, and this average is multiplied by 100 to yield an index of the average violation of local independence for an item pair. DETECT values less than 0.2 indicate very weak multidimensionality (or near unidimensionality); values of 0.2 to 0.4, weak to moderate multidimensionality; values of 0.4 to 1.0, moderate to strong multidimensionality; and values greater than 1.0, very strong multidimensionality (Roussos & Ozbek, 2006).

DIMTEST and DETECT were separately applied to three operational forms of each grade on the 2016–17 MSAA ELA and mathematics tests. The data for each form were split into a training sample and a cross-validation sample. Every form had at least 640 student examinees, so every training sample and cross-validation sample had at least 320 students. DIMTEST was then applied to every form. DETECT was applied to each data set for which the DIMTEST null hypothesis was rejected to estimate the effect size of the multidimensionality.

Even though the sample sizes were not large for the MSAA test forms, the DIMTEST null hypothesis was rejected at a significance level of 0.01 for every data set except Forms 3 for grades 6, 7, and 8 ELA. The nonrejection for the three ELA forms was likely due to the combined effects of the presence of weak multidimensionality and small sample size. Next, DETECT was used to estimate the effect size for the violations of local independence for all the tests for which DIMTEST rejection occurred. Table 8-8 displays

the multidimensional effect size estimates from DETECT. (Note: The 2015–16 MSAA had only one operational form.)

Table 8-8. 2016–17 MSAA: Average Multidimensional Effect Sizes by Content Area and Grade[1]

Form	*Content Area*	*Grade*	*Multidimensionality Effect Size*	
			2015–16	*2016–17*
1	ELA	3	1.39	1.49
		4	1.27	1.80
		5	0.72	0.93
		6	1.07	1.73
		7	0.98	1.68
		8	0.96	1.71
		11	0.78	2.10
		Average	1.02	1.64
	Mathematics	3	1.09	1.81
		4	1.10	1.30
		5	1.12	1.37
		6	1.18	2.20
		7	1.22	1.95
		8	0.92	0.84
		11	0.71	1.57
		Average	1.05	1.58
2	ELA	3	1.39	0.87
		4	1.27	0.68
		5	0.72	1.49
		6	1.07	0.30
		7	0.98	1.23
		8	0.96	0.40
		11	0.78	0.83
		Average	1.02	0.83
	Mathematics	3	1.09	1.12
		4	1.10	1.12
		5	1.12	1.20
		6	1.18	1.02
		7	1.22	1.75
		8	0.92	1.08
		11	0.71	1.49
		Average	1.05	1.26
3	ELA	3	1.39	0.18
		4	1.27	0.14
		5	0.72	0.33
		6	1.07	-[2]
		7	0.98	-

continued

Form	Content Area	Grade	Multidimensionality Effect Size	
			2015–16	2016–17
3	ELA	8	0.96	-
		11	0.78	0.20
		Average	1.02	0.21
3	Mathematics	3	1.09	0.39
		4	1.10	0.54
		5	1.12	0.41
		6	1.18	0.30
		7	1.22	0.47
		8	0.92	1.00
		11	0.71	0.34
		Average	1.05	0.49

[1] MSAA only had one operational form in 2015-16, so the DETECT values are repeated three times in the table.
[2] DETECT values are not reported for 2016-17 grades 6, 7, and 8 ELA Form 3 because the DIMTEST null hypothesis was retained.

Due to the stage adaptive design, the DETECT results showed an interesting trend. Form 1 generally showed strong or very strong multidimensionality (similar to 2015–16) whereas Form 3 generally showed very weak and weak to moderate multidimensionality. The DETECT values for ELA Form 2 ranged from indicating weak to moderate multidimensionality, moderate to strong multidimensionality, and very strong multidimensionality. However, all the mathematics Form 2 displayed very strong multidimensionality.

Given the unusually large DETECT indices produced for Form 1 and sometimes for Form 2, it was important to identify the source(s) of the violations of local independence. Hence, we investigated how DETECT divided the tests into clusters to see if there were any discernable patterns with respect to known substantive item characteristics. In previous years we found a strong and consistent pattern related to the answer keys of the items in each cluster—the placement of the correct-response key option was a very strong indicator of the cluster membership of nearly every item. We repeated this investigation this year, and found that this same pattern occurred for Form 1 for all the grades for both mathematics and ELA. As a reminder of this pattern, consider the following example for grade 3 mathematics Form 1. This test form had 35 items, and the DETECT analysis reported a three-cluster solution. The first cluster contained 12 items, the second had 13 items, and the third had 10 items. The first cluster included all 11 items for which “A” was the correct response option, and the remaining one item in that cluster was an open-response item. The second cluster contained all 13 items for which the middle response option (“B” for three-option items) was the correct response option. The third cluster contained all 11 items for which the last response option (“B” for two-option items and “C” for three-option items) was the correct response option.

The same pattern in regard to the answer keys was also found to be present for nearly every Form 2—only grades 6 and 8 ELA did not show significant separation of keys, but they were also the ones with the

smallest DETECT values (0.3 for grade 6 and 0.4 for grade 8). Interestingly, Form 3 for most of the grade/content combinations did not show significant separation with regard to key options. Form 3 showed significant separation of keys only for grades 4, 7, and 8 mathematics, and these had the largest DETECT values (0.54, 0.47, and 1, respectively), all indicating moderate to strong multidimensionality.

As in the past years, these dimensionality analysis results (especially Form 1 and Form 2) continue to indicate a violation of local independence having to do with how some student scores are related to the placement of the correct response options. Recall that the clustering from the DETECT outputs indicated that the conditional covariances for pairs of items from the same cluster were positive, while the conditional covariances from different clusters were mostly negative. Thus, the conditional covariances suggested that if a group of examinees (with the same level of proficiency) correctly responded to an item where the first option ("A") is the correct-response key option, those examinees tended to correctly respond to other items where "A" is the correct-response key option; while the same group of examinees tended to incorrectly respond to other items where the correct-response key option is either the middle option ("B" for three-option selected-response items) or the last option ("B" for two-option selected-response items and "C" for three-option selected-response items).

After further investigation, we determined that these violations of local independence were caused by a small but substantial percentage of the students responding to a substantial number of consecutive items by always choosing one particular response option for those items. For convenience, we shall use the term "stringers" to refer to examinees who exhibit this behavior.

While this item clustering pattern related to answer keys was also noted in previous years, the manifestation of this pattern this year was slightly different. The pattern varied by MST form. The pattern was much stronger in Form 1 as compared to past years. The pattern in Form 2, while still strong, was weaker than Form 1; and the pattern was nearly absent from Form 3. Because the MST routed examinees according to their Stage 1 performance, these results clearly indicate that the lower the performance level of a group of students, the greater the tendency for stringer behavior.

In general, it is important that violations of local independence be understood, monitored, and controlled on tests. The violations of local independence that are related to the ordering of the correct-response option in selected-response items are a phenomenon that will continue to require close study.

CHAPTER 9 ITEM RESPONSE THEORY SCALING AND EQUATING

This chapter describes the procedures used to calibrate, equate, and scale the MSAA tests. During the course of these psychometric analyses, a number of quality-control procedures and checks on the processes were implemented. These procedures included evaluation of item parameters and their standard errors for reasonableness, examining test characteristic curves (TCCs) and test information functions (TIFs) for reasonableness, evaluation of model fit, and evaluation of the scaling results (e.g., parallel processing by the Data and Reporting Services and Psychometrics and Research Departments, comparison of lookup tables to the previous year's lookup tables).

9.1 ITEM RESPONSE THEORY

All MSAA items were calibrated using item response theory (IRT). IRT uses mathematical models to define a relationship between an unobserved measure of student performance, usually referred to as theta (θ), and the probability (p) of getting a dichotomous item correct. In IRT, all items are assumed to be independent measures of the same construct (i.e., of the same θ). Another way to think of θ is as a mathematical representation of the latent trait of interest. Several common IRT models are used to specify the relationship between θ and p (Hambleton & Swaminathan, 1985; Hambleton & van der Linden, 1997). The process of determining the specific mathematical relationship between θ and p is called item calibration. After items are calibrated, they are defined by a set of parameters that specify a nonlinear, monotonically increasing relationship between θ and p. Once the item parameters are known, an estimate of θ for each student can be calculated based on the student's observed responses to the items. This estimate, $\hat{\theta}$, is considered to be an estimate of the student's true score or a general representation of student performance. It has characteristics that may be preferable to those of raw scores for equating purposes.

For the 2016–17 MSAA tests, the two-parameter logistic (2PL) model was used for dichotomous items. The 2PL model for dichotomous items can be defined as:

$$P_i(\theta_j) = \frac{\exp[Da_i(\theta_j - b_i)]}{1+\exp[Da_i(\theta_j - b_i)]},$$

where
i indexes the items,
j indexes students,
α represents item discrimination,
b represents item difficulty, and
D is a normalizing constant equal to 1.701.

For more information about item calibration and determination, the reader is referred to Lord and Novick (1968), Hambleton and Swaminathan (1985), or Baker and Kim (2004).

9.2 ITEM RESPONSE THEORY RESULTS

The tables in Appendix I give the IRT item parameters for all the core items on the 2016–17 MSAA tests by grade and content area. The statistics for the core items are summarized in Tables 9-1 through 9-3. The mean item parameter estimates shown in the tables below are within generally acceptable and expected ranges. For easy reference, Table 9-1 displays the means and standard deviations averaged across all core items for each grade and content area.

Table 9-1. 2016–17 MSAA: IRT Summary Statistics Overall

Content Area	*Grade*	*Number of Items*	*a*	*SD (a)*	*b*	*SD (b)*
ELA	3	41	0.66	0.26	-0.58	0.66
	4	43	0.71	0.34	-0.48	0.66
	5	41	0.68	0.32	-0.32	0.73
	6	45	0.75	0.41	-0.20	0.89
	7	45	0.74	0.45	-0.38	0.60
	8	43	0.75	0.40	-0.45	0.60
	11	43	0.80	0.43	-0.36	0.86
Mathematics	3	55	0.67	0.39	0.05	0.78
	4	55	0.54	0.28	0.39	1.03
	5	55	0.56	0.28	0.49	0.93
	6	55	0.67	0.25	-0.09	0.73
	7	54	0.63	0.24	0.04	0.85
	8	55	0.63	0.22	0.01	0.71
	11	55	0.67	0.22	0.13	0.57

Although the IRT statistics appear slightly more variable than the classical statistics, they remain consistent with them; the difference between the content areas is somewhat expected and the design of the assessments calls for ELA items to be administered in sets while the mathematics design does not. Because the items were developed to correspond to different tiers, the item statistics have also been summarized by tier for ELA (Table 9-2) and mathematics (Table 9-3).

Table 9-2. 2016–17 MSAA: IRT Summary Statistics by Grade and Tier—ELA

Grade	*Tier*	*Number of Items*	*a*	*SD* (*a*)	*b*	*SD* (*b*)
3	1	9	0.89	0.17	-1.29	0.36
	2	16	0.60	0.25	-0.34	0.73
	3	11	0.60	0.24	-0.36	0.47
	4	5	0.56	0.24	-0.56	0.24
4	1	11	1.00	0.30	-1.26	0.40
	2	11	0.54	0.26	-0.33	0.44
	3	15	0.65	0.33	-0.27	0.49
	4	6	0.68	0.33	0.12	0.56

continued

Grade	Tier	Number of Items	*a*	*SD* (*a*)	*b*	*SD* (*b*)
5	1	10	1.06	0.29	-1.13	0.26
	2	10	0.59	0.26	-0.12	0.57
	3	16	0.56	0.20	-0.05	0.72
	4	5	0.53	0.24	0.04	0.50
6	1	13	1.20	0.29	-1.08	0.23
	2	10	0.75	0.34	-0.15	0.66
	3	15	0.53	0.22	0.09	0.79
	4	7	0.39	0.23	0.72	0.83
7	1	11	1.25	0.47	-1.10	0.31
	2	11	0.76	0.34	-0.54	0.32
	3	16	0.53	0.27	0.00	0.41
	4	7	0.39	0.12	0.11	0.41
8	1	10	1.08	0.49	-1.11	0.33
	2	12	0.93	0.31	-0.57	0.40
	3	15	0.50	0.18	-0.17	0.51
	4	6	0.42	0.16	0.20	0.33
11	1	11	1.06	0.51	-1.13	0.29
	2	15	0.89	0.28	-0.58	0.31
	3	11	0.57	0.46	0.37	1.05
	4	6	0.53	0.13	0.27	0.74

Table 9-3. 2016–17 MSAA: IRT Summary Statistics by Grade and Tier—Mathematics

Grade	Tier	Number of Items	*a*	*SD* (*a*)	*b*	*SD* (*b*)
3	1	10	0.63	0.16	-0.98	0.28
	2	20	0.78	0.45	-0.06	0.41
	3	20	0.56	0.35	0.51	0.61
	4	5	0.72	0.54	0.74	1.03
4	1	10	0.44	0.18	-1.08	0.65
	2	20	0.56	0.31	0.76	0.74
	3	20	0.60	0.29	0.59	0.76
	4	5	0.39	0.19	1.10	1.09
5	1	10	0.67	0.30	-0.75	0.30
	2	20	0.57	0.26	0.41	0.54
	3	20	0.52	0.27	1.02	0.87
	4	5	0.48	0.35	1.18	0.81
6	1	10	0.64	0.21	-0.99	0.24
	2	21	0.76	0.25	-0.06	0.59
	3	19	0.62	0.19	0.10	0.41
	4	5	0.57	0.48	0.79	1.16
7	1	10	0.63	0.22	-1.09	0.28
	2	19	0.75	0.25	-0.07	0.48
	3	20	0.54	0.20	0.52	0.64
	4	5	0.47	0.18	0.88	1.05
8	1	10	0.73	0.31	-0.93	0.46
	2	20	0.60	0.15	-0.01	0.45
	3	20	0.65	0.22	0.22	0.40
	4	5	0.42	0.17	1.08	0.85
11	1	10	0.78	0.21	-0.77	0.30
	2	20	0.72	0.23	0.16	0.28
	3	20	0.62	0.17	0.36	0.31
	4	5	0.44	0.16	0.90	0.61

Item difficulty tends to have a positive relationship with tier; as the tier increases the items tend to be more difficult. The Tier 1 items appear to be less similar from the other tiers in terms of magnitude of difficulty, and the Tier 2 and Tier 3 items rarely overlap. This reversal of difficulty (between adjacent tiers) happens in grade 4 mathematics and grade 3 ELA. Further investigation may be warranted in the two tests where the intended tier structure does not appear to hold.

The IRT statistics were also summarized by different forms (Tables 9-4 and 9-5).

Table 9-4. 2016—17 MSAA: IRT Summary Statistics by Grade and Form—ELA

Grade	*Form*	*Number of Items*	*a*	*SD (a)*	*b*	*SD (b)*
3	01	32	0.68	0.25	-0.62	0.73
	02	32	0.64	0.25	-0.49	0.68
	03	32	0.63	0.25	-0.50	0.65
4	01	32	0.69	0.35	-0.62	0.63
	02	32	0.68	0.33	-0.46	0.55
	03	32	0.63	0.31	-0.36	0.60
5	01	32	0.72	0.34	-0.40	0.78
	02	32	0.66	0.29	-0.29	0.74
	03	32	0.63	0.28	-0.22	0.75
6	01	32	0.89	0.38	-0.54	0.61
	02	32	0.76	0.40	-0.24	0.80
	03	32	0.75	0.41	-0.16	0.80
7	01	32	0.87	0.47	-0.59	0.56
	02	32	0.70	0.38	-0.34	0.52
	03	32	0.67	0.38	-0.30	0.51
8	01	32	0.84	0.42	-0.63	0.54
	02	32	0.77	0.38	-0.49	0.57
	03	32	0.73	0.39	-0.39	0.57
11	01	32	0.85	0.47	-0.43	0.90
	02	32	0.78	0.39	-0.36	0.87
	03	32	0.74	0.38	-0.16	0.89

Table 9-5. 2016—17 MSAA: IRT Summary Statistics by Grade and Form—Mathematics

Grade	*Form*	*Number of Items*	*a*	*SD (a)*	*b*	*SD (b)*
3	01	35	0.64	0.28	-0.11	0.75
	02	35	0.68	0.35	0.03	0.69
	03	35	0.68	0.42	0.13	0.79
4	01	35	0.57	0.27	0.06	0.95
	02	35	0.61	0.30	0.35	0.95
	03	35	0.53	0.28	0.59	1.07
5	01	35	0.61	0.29	0.29	0.90
	02	35	0.58	0.28	0.48	0.95
	03	35	0.55	0.28	0.60	1.00
6	01	35	0.69	0.23	-0.31	0.65
	02	35	0.72	0.24	-0.16	0.60
	03	35	0.68	0.26	-0.03	0.73
7	01	35	0.65	0.22	-0.21	0.77
	02	35	0.63	0.23	0.00	0.72
	03	34	0.60	0.23	0.15	0.86

continued

Grade	Form	Number of Items	a	SD (a)	b	SD (b)
8	01	35	0.66	0.23	-0.18	0.64
	02	35	0.65	0.19	-0.01	0.51
	03	35	0.61	0.21	0.09	0.70
11	01	35	0.70	0.21	-0.06	0.56
	02	35	0.67	0.21	0.12	0.47
	03	35	0.65	0.22	0.24	0.57

The average item difficulty increased as the complexity of the form increased as intended. Due to the limitation of the item pool, the three versions in Stage 2 had overlapping items; hence, the observed small differences among the forms were expected.

The TCCs provide a more complete picture of the various forms. TCCs display the expected (average) raw score associated with each θ_j value between –4.0 and 4.0. Mathematically, the TCC is computed by summing the expected score on all the ICCs of all items that contribute to the raw score. Using the notation introduced in the previous section, the expected raw score at a given value of θ_j is

$$E(X|\theta_j) = \sum_{i=1}^{n} E(X_i|\theta_j),$$

where
X indexes total raw test score,
X_i indexes the scored response on an item,
i indexes the items (and n is the number of items contributing to the raw score),
j indexes students (here, θ_j runs from –4 to 4), and
$E(X|\theta_j)$ is the expected raw score on the test for a student of ability θ_j.

The expected raw score monotonically increases with θ_j, consistent with the notion that students of high ability tend to earn higher raw scores than do students of low ability. Most TCCs are "S-shaped"—flatter at the ends of the distribution and steeper in the middle.

The TIF, $I(\theta)$ (see Lord, 1980, for theoretical definitions and examples of equations), displays the amount of statistical information the test provides at each value of θ_j. Information functions depict test precision across the entire latent trait continuum. There is an inverse relationship between the information of a test and its standard error of measurement (SEM). The SEM at a given θ_j is approximately equal to the inverse of the square root of the statistical information at θ_j (Hambleton, Swaminathan, & Rogers, 1991), as follows:

$$SEM(\theta_j) = \frac{1}{\sqrt{I(\theta_j)}}.$$

Compared to the tails, TIFs are often higher near the middle of the θ distribution where most students generally are located and where most items are sensitive by design. Appendix J shows graphs of the TCCs and TIFs for each grade/content area.

9.3 EQUATING

The purpose of equating is to ensure that scores obtained from different forms of a test are equivalent to each other. Equating may be used if multiple test forms are administered in the same year, as well as to equate one year's forms to those given in the previous year. Equating ensures that students are not advantaged or disadvantaged because the test form they took is easier or harder than those taken by other students.

All 2016–17 MSAA tests used item pre-equating methodology as described in Kolen and Brennan (2014). Item pre-equating allows the raw-to-scale score conversion to be produced before the form is administered, which in turn allows for faster reporting and turnaround times. In item pre-equating, new forms are built from a pool of preexisting IRT-calibrated items. In addition to these operational items, new non-operational items (e.g., field-test items) can also be included on the forms. The operational items are then used as a set of common items for transforming the item parameters of the non-operational items so that they are the same θ scale as the IRT-calibrated item pool. This allows for the item pool to be expanded continually.

However, with pre-equating there are a number of cautions that need to be taken into consideration. Kolen and Brennan (2014) state that to ensure items behave the same on each administration the items should appear in the same contexts and positions operationally as they did non-operationally. Thus, care must be taken to avoid significant shifts in position and context. Any drift must be carefully monitored and controlled to ensure comparability between forms of the test. Section 11.1 describes the scale validation, post-equated check procedures.

Item parameters for the 2016–17 operational administration were calibrated after the 2015–16 MSAA operational administration. As such, no new calibrations were run for the operational items on these pre-equated tests. Raw score to scale score lookups are displayed in Appendix K.

9.4 ACHIEVEMENT STANDARDS

Cutpoints for MSAA in ELA and mathematics were set in August 2015. Details of the standard setting procedures can be found in the standard setting report (Measured Progress, 2015). The cuts on the theta scale, established at those meetings, are presented in Table 9-6. As alluded to in the discussion of equating above, the scale was established during that base year and the forms serve as the reference for subsequent equating. Also shown in the table are the cutpoints on the reporting score scale (described next). Note that examinees classified in Levels 3 and 4 are considered "proficient." These cutpoints will remain fixed throughout the assessment program unless standards are reset for any reason.

Table 9-6. 2016–17 MSAA: Cut Scores on the Theta Metric and Reporting Scale

Content Area	Grade	Theta			Scale Score				
		Cut 1	Cut 2	Cut 3	Minimum	Cut 1	Cut 2	Cut 3	Maximum
ELA	3	-0.70	-0.18	0.72	1,200	1,234	1,240	1,251	1,290
	4	-0.53	-0.01	1.43	1,200	1,234	1,240	1,258	1,290
	5	-0.84	-0.13	1.16	1,200	1,232	1,240	1,256	1,290
	6	-0.63	0.18	1.19	1,200	1,231	1,240	1,253	1,290
	7	-0.59	-0.20	0.95	1,200	1,236	1,240	1,255	1,290
	8	-0.75	0.04	0.78	1,200	1,230	1,240	1,250	1,290
	11	-0.77	-0.37	0.90	1,200	1,236	1,240	1,255	1,290
Mathematics	3	-0.65	-0.28	0.77	1,200	1,236	1,240	1,254	1,290
	4	-0.55	0.01	0.82	1,200	1,233	1,240	1,251	1,290
	5	-0.84	-0.11	0.99	1,200	1,231	1,240	1,255	1,290
	6	-0.61	-0.10	0.53	1,200	1,234	1,240	1,249	1,290
	7	-0.91	-0.25	0.77	1,200	1,232	1,240	1,254	1,290
	8	-0.66	-0.18	0.44	1,200	1,234	1,240	1,249	1,290
	11	-0.70	-0.19	0.44	1,200	1,234	1,240	1,249	1,290

Table 9-7 shows the percentage of students by performance-level categories along with the average and standard deviation of the scale scores for each grade/content-area combination. Also, the percentages of Levels 3 and 4 within each grade and content area are provided in the table.

Table 9-7. 2016–17 MSAA: Percentage of Students by Performance-Level Categories

Content Area	Grade	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	Level 2	Level 3	Level 4	Levels 3 & 4		
ELA	3	3,683	37.96	19.09	20.77	22.18	42.95	1,239.09	18.29
	4	3,883	41.90	16.69	29.51	11.90	41.41	1,238.11	17.45
	5	3,941	29.46	26.08	32.28	12.18	44.46	1,239.08	16.72
	6	4,084	37.68	26.96	21.33	14.03	35.36	1,236.38	16.64
	7	4,047	36.97	14.88	29.03	19.13	48.16	1,240.78	16.67
	8	4,292	32.27	29.45	17.47	20.81	38.28	1,237.49	16.12
	11	3,646	33.05	18.76	33.98	14.21	48.19	1,240.58	15.23
Mathematics	3	3,703	32.00	17.55	33.97	16.47	50.44	1,240.48	17.14
	4	3,895	31.25	21.80	31.76	15.20	46.96	1,237.88	16.13
	5	3,960	18.94	33.36	33.84	13.86	47.70	1,240.29	15.99
	6	4,101	32.99	26.36	18.19	22.46	40.65	1,239.29	16.62
	7	4,063	16.10	35.88	30.69	17.33	48.02	1,241.43	16.68
	8	4,295	28.20	22.96	25.77	23.07	48.84	1,240.19	15.91
	11	3,458	22.70	29.87	25.77	21.66	47.43	1,240.42	15.69

Additionally, graphs of the performance-level distributions are presented in Figures L-1 and L-2 in Appendix L.

Table 9-8. 2016-17 MSAA: Performance Level Distributions by Form

Content Area	Grade	Form	Number of Students	Levels					Average Scale Score	SD of Scale Score
				Level 1	Level 2	Level 3	Level 4	Levels 3 & 4		
ELA	3	01	1,397	85.47	13.67	0.86		0.86	1,223.08	12.13
		02	983	19.84	44.46	34.59	1.12	35.71	1,238.49	5.22
		03	1,303	0.69	5.76	31.70	61.86	93.56	1,256.71	13.46
	4	01	1,877	81.78	15.56	2.66		2.66	1,225.30	10.98
		02	647	13.14	41.42	45.44		45.44	1,239.78	5.34
		03	1,359	0.52	6.48	59.01	34.00	93.01	1,255.02	13.28
	5	01	1,428	74.79	24.86	0.35		0.35	1,224.11	11.44
		02	1,174	7.84	50.77	41.31	0.09	41.40	1,238.51	5.11
		03	1,339	0.07	5.75	58.40	35.77	94.17	1,255.54	12.24
	6	01	2,036	74.02	24.85	1.13		1.13	1,224.55	10.16
		02	687	4.37	62.88	29.26	3.49	32.75	1,238.51	6.04
		03	1,361	0.15	11.98	47.54	40.34	87.88	1,253.02	12.99
	7	01	1,455	87.63	11.62	0.76		0.76	1,225.50	11.75
		02	1,047	20.73	33.62	44.51	1.15	45.66	1,240.05	5.32
		03	1,545	0.26	5.24	45.18	49.32	94.50	1,255.66	11.71
	8	01	2,039	67.68	30.51	1.81		1.81	1,225.59	10.20
		02	827	0.60	64.21	31.68	3.51	35.19	1,238.71	5.13
		03	1,426		7.78	31.63	60.59	92.22	1,253.81	12.16
	11	01	1,291	82.49	16.27	1.24		1.24	1,227.46	12.33
		02	994	13.68	40.54	45.67	0.10	45.77	1,239.87	4.36
		03	1,361	0.29	5.22	56.50	37.99	94.49	1,253.55	11.46
Mathematics	3	01	1,507	71.00	19.18	9.82		9.82	1,227.06	13.62
		02	856	13.08	34.58	52.10	0.23	52.33	1,240.50	4.61
		03	1,340	0.22	4.85	49.55	45.37	94.92	1,255.56	12.64
	4	01	1,342	75.19	19.60	5.22		5.22	1,223.49	13.21
		02	1,414	14.14	37.84	46.32	1.70	48.02	1,238.89	6.11
		03	1,139	0.70	4.48	44.95	49.87	94.82	1,253.59	12.06
	5	01	1,331	54.32	41.85	3.83		3.83	1,226.00	12.81
		02	1,489	1.81	50.03	47.15	1.01	48.16	1,240.41	5.49
		03	1,140		1.67	51.49	46.84	98.33	1,256.80	12.10
	6	01	1,650	74.97	23.45	1.58		1.58	1,226.32	11.93
		02	769	14.30	60.99	22.89	1.82	24.71	1,237.58	4.50
		03	1,682	0.36	13.38	32.34	53.92	86.26	1,252.78	13.27
	7	01	1,293	48.96	45.55	5.49		5.49	1,226.93	13.38
		02	1,535	1.30	54.33	43.71	0.65	44.36	1,239.99	4.87
		03	1,235	0.08	2.83	40.89	56.19	97.08	1,258.40	13.71
	8	01	1,545	69.77	26.54	3.69		3.69	1,226.42	12.29
		02	920	12.83	44.35	38.04	4.78	42.82	1,239.37	4.80
		03	1,830	0.82	9.18	38.25	51.75	90.00	1,252.22	12.25
	11	01	1,047	69.15	26.65	4.20		4.20	1,226.06	13.79
		02	1,149	5.22	59.70	33.51	1.57	35.08	1,238.93	3.98
		03	1,262	0.08	5.39	36.61	57.92	94.53	1,253.69	12.38

Table 9-8 shows the percentage of students in each performance-level category by form, along with the average and standard deviation of the scale scores for each grade/content-area combination. Note that the

percentage of examinees being classified as Level 3 and Level 4 increased as we move from Form 1 to Form 3. This trend was expected due to the stage adaptive nature of the 2016–17 MSAA assessment.

9.5 Reported Scaled Scores

Because the θ scale used in IRT calibrations is not readily understood by most stakeholders, reporting scales were developed for MSAA. The reporting scales are simple linear transformations of the underlying θ scale. The reporting scales are developed such that they range from 1200 through 1290 for all grade/content combinations. The second cut is fixed at 1240 for each grade level. In other words, to be classified in Level 3 or above, a minimum scale score of 1240 was required at all grades.

By providing information that is more specific about the position of a student's results, scale scores supplement performance-level scores. Students' raw scores (i.e., total number of points) on the 2016–17 MSAA tests were translated to scale scores using a data analysis process called *scaling*. Scaling simply converts from one scale to another scale. In the same way that a given temperature can be expressed on either Fahrenheit or Celsius scales, or the same distance can be expressed in either miles or kilometers, student scores on the 2016–17 MSAA tests can be expressed in raw or scale scores.

It is important to note that converting from raw scores to scale scores does not change students' performance-level classifications. Given the relative simplicity of raw scores, it is fair to question why scale scores for MSAA are reported instead of raw scores. Scale scores make for more consistent reporting of results. The psychometric advantage of scale scores over raw scores is that scale scores are linear transformations of θ. Raw scores are not comparable from year to year (nor across Forms 1, 2, and 3) because they are affected by differences in group ability and/or difficulty of the items that appear on each test form. Equating is a statistical procedure that is used to adjust for differences in form difficulty so that scores on alternate forms can be used interchangeably (Kolen & Brennan, 2014). Since the θ scale is used for equating, scale scores are comparable from one year to the next.

The scale scores are obtained by a simple translation of ability estimates ($\hat{\theta}$) using the linear relationship between threshold values on the θ metric and their equivalent values on the scale score metric. Students' ability estimates are based on their raw scores and are found by mapping through the TCC. Scale scores are calculated using the linear equation:

$$SS = m\hat{\theta} + b,$$

where
m is the slope, and
b is the intercept.

For MSAA operational scaling, a scaling method with a proficient cut of 1240 and standard deviation of 15 with a lowest obtainable scale score (LOSS) of 1200 and a highest obtainable scale score (HOSS) of 1290 was adopted. A separate linear transformation is used for each grade and content-area combination. As previously stated, the transformation function was determined by fixing the Level 2/Level 3 cut score and the standard deviation of the scale—that is, the cut score set at 1240 and the scale score standard deviation of the base year fixed at 15. Because only one point within the θ scale score space and the standard deviation of the scale is fixed, the scale score cutpoints between Level 1 and Level 2 and between Level 3 and Level 4 are free to vary across the grade and content-area combinations.

Table 9-9 shows the slope and intercept terms used to calculate the scale scores for each content area and grade. Note that the values in Table 9-9 will not change unless the standards are reset. Also, in a given year it may not be possible to attain a particular scale score, but the scale score cuts will remain the same.

Table 9-9. 2016–17 MSAA: Scale Score Slope and Intercept by Content Area and Grade

Content Area	*Grade*	*Slope*	*Intercept*
ELA	3	11.7202	1,242.054
	4	12.0593	1,240.091
	5	12.4236	1,241.615
	6	12.3522	1,237.813
	7	12.2964	1,242.433
	8	12.6082	1,239.457
	11	11.4922	1,244.224
Mathematics	3	13.0552	1,243.665
	4	13.1002	1,239.867
	5	13.0769	1,241.410
	6	12.8203	1,241.253
	7	12.9093	1,243.244
	8	13.0213	1,242.358
	11	12.9897	1,242.480

Appendix K contains raw score to scale score lookup tables for the 2016–17 MSAA tests. These are the actual tables used to determine student scale scores, error bands, and performance levels.

Appendix L presents the impact data for each grade by content area. Also, graphs of the scaled score cumulative frequency distributions for the last two years are presented in Appendix L. The cumulative graphs show the proportion of students at or below each scale score.

CHAPTER 10 RELIABILITY

Although an individual item's performance is an important focus for evaluation, a complete evaluation of an assessment must also address the way items function together. Tests that function well provide a dependable assessment of the student's level of ability. Unfortunately, no test can do this perfectly. A variety of factors can contribute to a given student's score being either higher or lower than his or her true ability. For example, a student may misread an item or mistakenly fill in the wrong bubble when he or she knew the answer. Collectively, extraneous factors that affect a student's score are referred to as "measurement error." Any assessment includes some amount of measurement error; that is, no measurement is perfect. This is true of all academic assessments—some students will receive scores that underestimate their true ability and other students will receive scores that overestimate their true ability. When tests have a high amount of measurement error, student scores are very unstable. Students with high ability may get low scores or vice versa. Consequently, one cannot reliably measure a student's true level of ability with such a test. Assessments that have less measurement error (i.e., errors made are small on average and student scores on such a test will consistently represent their ability) are described as reliable.

There are a number of ways to estimate an assessment's reliability. One possible approach is to give the same test to the same students at two different points in time. If students receive the same scores on each test, the extraneous factors affecting performance are small and the test is reliable. (This is referred to as "test-retest reliability.") A potential problem with this approach is that students may remember items from the first administration or may have gained (or lost) knowledge or skills in the interim between the two administrations. A solution to the remembering items problem is to give a different but parallel test at the second administration. If student scores on each test correlate highly, the test is considered reliable. (This is known as "alternate forms reliability" because an alternate form of the test is used in each administration.) This approach, however, does not address the problem that students may have gained (or lost) knowledge or skills in the interim between the two administrations. In addition, the practical challenges of developing and administering parallel forms generally preclude the use of parallel forms reliability indices. One way to address the latter two problems is to split the test in half and then correlate students' scores on the two half-tests; this in effect treats each half-test as a complete test. By doing this, the problems associated with an intervening time interval and with creating and administering two parallel form of the test are alleviated. This is known as a "split-half estimate of reliability." If the two half-test scores correlate highly, items on the two half-tests must be measuring very similar knowledge or skills. This is evidence that the items complement one another and function well as a group. This also suggests that measurement error will be minimal.

The split-half method requires psychometricians to select items that contribute to each half-test score. This decision may have an impact on the resulting correlation, since each different possible split of the test into halves will result in a different correlation. Another problem with the split-half method of calculating

reliability is that it underestimates reliability, because test length is cut in half. All else being equal, a shorter test is less reliable than a longer test. Cronbach (1951) provided a statistic, α (alpha), that eliminates the problem of the split-half method by comparing individual item variances to total test variance. Cronbach's α was used to assess the reliability of the 2016–17 MSAA tests:

$$\alpha \equiv \frac{n}{n-1}\left[1 - \frac{\sum_{i=1}^{n} \sigma^2_{(Y_i)}}{\sigma^2_x}\right],$$

where
i indexes the item,
n is the total number of items,
$\sigma^2_{(Y_i)}$ represents individual item variance, and
σ^2_x represents the total test variance.

10.1 Reliability and Standard Errors of Measurement

Tables 10-1 and 10-2 present descriptive statistics, Cronbach's α coefficient, and raw score standard errors of measurement (SEMs) for ELA and mathematics by grade and form. (Statistics are based on core items, which counted toward students' reported scores only.) The reliability of a test can also be exhibited in terms of the SEMs. SEMs can facilitate the interpretation of individual scores. With any given observed raw score point, the reasonable limits of the true score for the examinees can be calculated by using the SEMs. For more detailed description about the use of SEMs, the reader is referred to Gulliksen (1950) or Anastasi and Urbina (1997). SEM was also used to assess the reliability of the 2016–17 MSAA tests:

$$SEM \equiv \sigma_x\sqrt{1-\alpha},$$

where
σ_x represents the total test standard deviation, and
α represents the reliability coefficient, Cronbach's alpha.

Table 10-1. 2016–17 MSAA: Reliability by Form—ELA

Grade	Form	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	1	1,160	32	12.75	3.99	0.57	2.61
	2	983	32	18.25	3.12	0.30	2.61
	3	1,303	32	25.43	3.66	0.68	2.07
4	1	1,671	32	14.36	4.08	0.57	2.67
	2	647	32	19.97	2.96	0.25	2.57
	3	1,359	32	24.84	3.57	0.64	2.15
5	1	1,234	32	12.22	3.91	0.56	2.60
	2	1,174	32	17.79	2.94	0.20	2.63
	3	1,339	32	24.21	3.48	0.60	2.20

continued

Grade	Form	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
6	1	1,826	32	14.85	4.43	0.65	2.63
	2	687	32	20.07	2.94	0.29	2.47
	3	1,361	32	24.64	3.37	0.62	2.08
7	1	1,253	32	13.31	4.08	0.59	2.63
	2	1,047	32	18.14	3.07	0.25	2.67
	3	1,545	32	24.31	3.44	0.58	2.22
8	1	1,848	32	14.79	4.22	0.60	2.66
	2	827	32	20.40	2.79	0.19	2.51
	3	1,426	32	25.30	3.23	0.58	2.10
11	1	1,126	32	12.45	3.83	0.52	2.64
	2	994	32	18.13	3.24	0.32	2.66
	3	1,361	32	23.33	3.57	0.62	2.19

Table 10-2. 2016–17 MSAA: Reliability by Form—Mathematics

Grade	Form	Number of Students	Raw Score			Alpha	SEM
			Maximum	Mean	Standard Deviation		
3	1	1,272	35	12.21	3.70	0.48	2.68
	2	856	35	15.78	3.04	0.15	2.80
	3	1,340	35	23.24	5.07	0.75	2.52
4	1	1,137	35	11.32	4.04	0.58	2.60
	2	1,414	35	15.26	3.42	0.34	2.79
	3	1,139	35	21.02	4.71	0.69	2.63
5	1	1,137	35	10.52	3.13	0.32	2.57
	2	1,489	35	14.56	3.01	0.15	2.78
	3	1,140	35	21.67	4.67	0.68	2.62
6	1	1,441	35	13.54	3.83	0.47	2.78
	2	769	35	17.17	3.37	0.30	2.82
	3	1,682	35	24.43	5.10	0.77	2.42
7	1	1,091	35	12.88	3.63	0.43	2.74
	2	1,535	35	16.34	3.02	0.12	2.84
	3	1,235	34	23.71	4.90	0.76	2.42
8	1	1,355	35	11.86	3.85	0.52	2.66
	2	920	35	16.08	3.12	0.15	2.87
	3	1,830	35	22.52	5.11	0.74	2.61
11	1	882	35	11.22	3.86	0.53	2.64
	2	1,149	35	14.64	2.74	-0.08	2.85
	3	1,262	35	22.40	5.57	0.79	2.58

Because different grades have different test designs, it is inappropriate to make inferences about the quality of one test by comparing its reliability to that of another test from a different grade. Additionally, the reliability statistics provided in the table above should be cautiously interpreted because each form is only administered to a subgroup of relatively homogeneous examinees, resulting in less score variability within the

subgroups. Because of this restriction of range mentioned earlier, the reliability coefficients are not comparable between different forms and are not comparable to reliability based on all the examinees (e.g., Cronbach's α's from past years).

10.2 Subgroup Reliability

The reliability coefficients discussed in the previous section were based on all students who took a particular form of the 2016–17 MSAA tests. Appendix M presents reliabilities for various subgroups of interest. Subgroup Cronbach's α's and SEMs were calculated using the formula defined above based only on the members of the subgroup in question in the computations; values are calculated only for subgroups with 100 or more students.

For several reasons, the results of this section should be interpreted with caution. First, inherent differences between tests preclude making valid inferences about the quality of a test based on statistical comparisons with other tests. Second, reliabilities are dependent not only on the measurement properties of a test but on the statistical distribution of the studied subgroup. For example, it can readily be seen in Appendix M that subgroup sample sizes may vary considerably, which results in natural variation in reliability coefficients. Alternatively, α, which is a type of correlation coefficient, may be artificially depressed for subgroups with little variability (Draper & Smith, 1998). Third, there is no industry standard to interpret the strength of a reliability coefficient. This is particularly true when the population of interest is a single subgroup. Again, the reliability statistics provided in the tables in Appendix M should be cautiously interpreted because of the restriction of range mentioned earlier. The α coefficients are not comparable between different forms and are not comparable to reliability based on all the examinees (e.g., Cronbach's α's from past years).

10.3 Reliability of Performance-Level Categorization

While related to reliability, the accuracy and consistency of classifying students into performance categories are even more important statistics in a standards-based reporting framework (Livingston & Lewis, 1995). After the performance levels were specified and students were classified into those levels, empirical analyses were conducted to determine the statistical accuracy and consistency of the classifications. For MSAA, students are classified into one of four performance levels: Level 1, Level 2, Level 3, and Level 4. This section of the report explains the methodologies used to assess the reliability of classification decisions, and results are provided.

Accuracy refers to the extent to which decisions based on test scores match decisions that would have been made if the scores did not contain any measurement error. Accuracy must be estimated because errorless test scores do not exist. Consistency measures the extent to which classification decisions based on test scores match the decisions based on scores from a second, parallel form of the same test. Consistency can be

evaluated directly from actual responses to test items if two complete and parallel forms of the test are given to the same group of students. In operational test programs, however, such a design is usually impractical. Instead, techniques have been developed to estimate both the accuracy and the consistency of classification decisions based on a single administration of a test. The Livingston and Lewis (1995) technique was used for the 2016–17 MSAA because it is easily adaptable to all types of testing formats, including mixed format tests.

The accuracy and consistency estimates reported in Appendix K make use of "true scores" in the classical test theory sense. A true score is the score that would be obtained if a test had no measurement error. Of course, true scores cannot be observed and so must be estimated. In the Livingston and Lewis (1995) method, estimated true scores are used to categorize students into their "true" classifications.

For the 2016–17 MSAA, after various technical adjustments (described in Livingston & Lewis, 1995), three 4×4 contingency tables of accuracy were created, one for each of the MST forms (Form 1, Form 2, Form 3) for each grade/content area combination, where cell [i, j] represented the estimated proportion of students whose true score fell into classification i (where i = 1 to 4) and whose observed score fell into classification j (where j = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students whose true and observed classifications matched) signified overall accuracy.

To calculate consistency, true scores were used to estimate the joint distribution of classifications on two independent, parallel test forms. Following statistical adjustments, per Livingston and Lewis (1995), a new set of three 4×4 contingency tables was created for each grade/content area combination in ELA and mathematics and populated by the proportion of students who would be categorized into each combination of classifications according to the two (hypothetical) parallel test forms. Cell [i, j] of this table represented the estimated proportion of students whose observed score on the first of the two parallel forms would fall into classification i (where i = 1 to 4) and whose observed score on the second parallel form would fall into classification j (where j = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students categorized by the two forms into exactly the same classification) signified overall consistency.

Another way to measure consistency is to use Cohen's (1960) coefficient κ (kappa), which assesses the proportion of consistent classifications after removing the proportion of consistent classifications that would be expected by chance. It is calculated using the following formula:

$$\kappa = \frac{\text{(Observed agreement)} - \text{(Chance agreement)}}{1 - \text{(Chance agreement)}} = \frac{\sum_i C_{ii} - \sum_i C_{i.} C_{.i}}{1 - \sum_i C_{i.} C_{.i}},$$

where

$C_{i.}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the first hypothetical parallel form of the test;

$C_{.i}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the second hypothetical parallel form of the test; and

C_{ii} is the proportion of students whose observed performance level would be Level i (where i = 1–4) on both hypothetical parallel forms of the test.

Because κ is corrected for chance, its values are lower than other consistency estimates.

10.3.1 Accuracy and Consistency

The decision accuracy and consistency (DAC) analyses described above are provided in Tables N-1, N-2, and N-3 of Appendix N. The tables include overall accuracy and consistency indices, including kappa. Accuracy and consistency values conditional on performance level are also given. For these calculations, the denominator is the proportion of students associated with a given performance level. For example, the conditional accuracy value is 0.88 for Level 1 for grade 3 ELA Form 1. This table indicates that among the students whose true scores placed them in this classification, 88% would be expected to be in this classification when categorized according to their observed scores. Similarly, a consistency value of 0.87 indicates that 87% of students with observed scores in Level 1 would be expected to score in this classification again if a second, parallel test form were used. The relatively lower accuracy and consistency values conditional on performance levels, in particular the ones for Level 2, result from the relatively small number of students who fall into this category and the narrower score ranges of the performance level. However, it is also a clear indication of where test development should focus on to improve the quality of the tests, even though the overall indexes are satisfactory. Note that the sample size for Level 4 for Form 1 was so small that we collapsed Levels 3 and 4 into a single category for purposes of the DAC analysis conditional on performance level. This was as expected because the MST was designed so that higher achieving students were not intended to be routed to Form 1. Similar sample size issues with Form 2 resulted in the collapsing of Levels 1 and 2 into a single category, as well as the collapsing of Levels 3 and 4 into a single category. Similarly, for Form 3, Levels 1 and 2 needed to be collapsed into a single category.

For some testing situations, the greatest concern may be decisions around level thresholds. For example, in testing done for No Child Left Behind accountability purposes, the primary concern is distinguishing between students who are proficient and those who are not yet proficient. For the 2016–17 MSAA, Tables N-4, N-5, and N-6 in Appendix N provides accuracy and consistency estimates at each cutpoint, as well as false positive and false negative decision rates. A false positive is the proportion of students whose observed scores were above the cut and whose true scores were below the cut. A false negative is the proportion of students whose observed scores were below the cut and whose true scores were above the cut. Note that the same collapsing of performance levels as occurred with the DAC analysis conditional on performance level also needed to be implemented for the DAC analysis conditional on cutpoint.

As with other methods of evaluating reliability, DAC statistics calculated based on small groups can be expected to be lower than those calculated based on larger groups. For this reason, the values presented in Appendix N should be interpreted with caution. In addition, it is important to remember that it is inappropriate to compare DAC statistics between grades and content areas.

CHAPTER 11 VALIDITY

11.1 SCALE VALIDATION AND POST-EQUATED CHECK OF PRE-EQUATED TESTS

As described in Section 9.3, all MSAA tests were equated using item pre-equating. However, with pre-equating there are a number of cautions that need to be taken into consideration. Kolen and Brennan (2014) state that to ensure that items behave the same on each administration the items should appear in the same contexts and positions operationally as they did non-operationally (e.g., field-tested). Thus, care must be taken to avoid significant shifts in position and context. Any drift must be carefully monitored and controlled to ensure comparability between forms of the test. The MSAA items came from a large item bank whose scale is constantly monitored to ensure the stability of the items. This section describes the processes used to conduct this monitoring. In order for the monitoring to be conducted in a reliable fashion, the equating items used in the post-equated check are limited to only those items that had been taken by the full population of examinees. It is well known that when items are calibrated using highly skewed samples of examinees, the item calibrations can produce seriously biased results. Thus, equating items used in the post-equated check excluded all items that appeared only in Stage 2 Versions A, B, or C.

To provide scale validation evidence, Measured Progress performs a rigorous post-equated check of the test data. One primary aim of the check is to use item bank parameters selectively to exclude the adverse effect of parameter drift on the stability and health of the item bank. Another advantage of the check is the use of more recent calibration samples to get the most up-to-date and accurate parameter estimates.

The procedures for the post-equated check generally mirror the procedures for post-equating. For any equating design, it is critical that rigorous procedures are implemented to monitor the quality of the equating and check that the assumptions underlying the equating are not violated. Measured Progress psychometricians have conducted research studies (Hagge & Keller, 2009; Keller et al., 2008; Keller et al., 2007; Parker et al., 2009) in this regard and have developed tools to estimate equating error across years under realistic violations of the equating assumptions. The Psychometrics and Research Department monitors particular well-known violations of item response theory (IRT) equating assumptions and uses the research to estimate their effects on the reliability and validity of the equating. Additionally, the team analyzes the equating data in detail for scale drift through traditional delta analyses and *b*-*b* analyses. The delta analysis converts *p*-values to a type of *z*-score called delta scores using the inverse of the normal cumulative function, followed by a linear transformation to a metric with a mean of 13 and a standard deviation of 4 (Dorans & Holland, 1993; Michaelides, 2003). The delta analysis then compares the old delta to the new delta using linear regression analysis. A standardized perpendicular difference from the regression line is calculated for each item; any item with a difference of a magnitude of 3 or greater is flagged for drift. The *b*-*b* analyses are similar in nature, with the main difference being that the IRT *b*-parameters are used rather than transformed *p*-values.

Furthermore, special procedures are enacted during the calibration phase to check that the quality of the equating items is maintained consistently across years. Equating items that display lack of stability (e.g., standard error of the *b* parameters being large, inadequate model-data fit, etc.) are flagged and removed from equating usage.

Item parameter estimates for the current year's tests are placed on the base-year scale (i.e., the item bank scale) by using the method of Stocking and Lord (1983), which is based on the IRT principle of item parameter invariance. According to this principle, the equating items for both the base year and current year tests should have the same item parameters. After the item parameters for each current year's test are estimated using PARSCALE (Muraki & Bock, 2003), the Stocking and Lord method is employed to find the linear transformation (slope and intercept) that adjusts the equating items' parameter estimates such that the current year's test characteristic curve (TCC) for the equating items is as close as possible to that of the base year's tests.

In addition, the calibrated and equated parameters are evaluated to further investigate drift at both the item and test levels. At the item level, the individual item parameters are compared and investigated, and at the test level the TCC, test information function (TIF), and raw score cuts are compared. Finally, the operational item parameters resulting from this process are updated in the item bank, and these updated parameters are used in the calibration of field-test items and will be used for future test form development.

11.2 Test Score Validation Evidence

Because interpretations of test scores, and not a test itself, are evaluated for validity, the purpose of the 2016–17 MSAA Technical Report is to describe several technical aspects of the MSAA tests in support of score interpretations (AERA et al., 2014). Each chapter contributes an important component in the investigation of score validation: test development and design; test administration; scoring, scaling, and equating; item analyses; reliability; and score reporting. In addition, the Technical Advisory Committee provides technical guidance on any questions related to the reliability and validity of the MSAA. Please reference Appendix O for a list of the Technical Advisory Committee members.

As stated in the overview chapter, *Standards for Educational and Psychological Testing* (AERA et al., 2014) provides a framework for describing sources of evidence that should be considered when constructing a validity argument. The evidence around test content, response processes, internal structure, relationship to other variables, and consequences of testing speaks to different aspects of validity, but those aspects are not distinct *types* of validity. Instead, each contributes to a body of evidence about the comprehensive validity of score interpretations.

Evidence on test content validity is meant to determine how well the assessment tasks represent the curriculum and standards for each content area. Content validation is informed by the item development process, including how the test blueprints and test items align to the curriculum and standards. Viewed through this lens provided by the standards, evidence based on test content was extensively described in

Chapters 3 and 4. Item alignment with the States' Content Standards and the MSAA Core Content Connectors (CCCs); item bias, sensitivity, and content appropriateness review processes; adherence to the test blueprint; use of multiple item types; use of standardized administration procedures, with accommodated options for participation; and appropriate test administration training are all components of validity evidence based on test content. As discussed earlier, all MSAA questions undergo several rounds of review for content fidelity and appropriateness. Items are presented to students in multiple formats (constructed-response and selected-response). Finally, tests are administered according to MSAA-mandated standardized procedures, with allowable accommodations, and all TAs are required to attend annual training sessions and pass a qualifying quiz prior to being allowed to administer tests.

Evidence based on internal structure is presented in great detail in the discussions of item analyses, reliability, and scaling and equating in Chapters 8 through 10. Technical characteristics of the internal structure of the assessments are presented in terms of classical item statistics (item difficulty, item-test correlation), differential item functioning (DIF) analyses, reliability, standard errors of measurement (SEM), and IRT parameters and procedures. Each test is equated to the same content test from the prior year to preserve the meaning of scores over time. In general, item difficulty and discrimination indices were in acceptable and expected ranges. Very few items were answered correctly by nearly zero percent or nearly 100 percent of the students. Similarly, the positive discrimination indices found on most items indicate that they were assessing consistent constructs, and that students who performed well on individual items tended to perform well overall.

Evidence based on the consequences of testing is addressed in the scale scores information in Chapter 9 and the reporting information in Chapter 7, as well as in the test interpretation guide (*MSAA 2017 Guide for Score Report Interpretation*; see Appendix F), which is a separate document referenced in the discussion of reporting. Each of these chapters speak to the efforts undertaken to promote accurate and clear information provided to the public (parents/guardians and educators in particular) regarding test scores. Scale scores offer the advantage of simplifying the reporting of results across content areas and subsequent years. Performance levels provide users with reference points for mastery at each content area, which is another useful and simple way to interpret scores. Several different standard reports are provided to stakeholders. Additional evidence of the consequences of testing could be supplemented with broader investigation of the impact of testing on student learning.

To further support the validation of the assessment program, additional studies might be considered to provide evidence regarding the relationship of MSAA results to other variables including the extent to which scores from MSAA converge with other measures of similar constructs, and the extent to which they diverge from measures of different constructs. Relationships among measures of the same or similar constructs can sharpen the meaning of scores and appropriate interpretations by refining the definition of the construct.

The evidence presented in this report supports inferences of student achievement on the content represented from the States' Content Standards and the MSAA Core Content Connectors (CCCs) for the

MSAA for the purposes of program and instructional improvement and as a component of school accountability.

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APPENDICES

APPENDIX A—ACCOMMODATION FREQUENCIES

Table A-1. 2016–17 MSAA: Accommodation Frequencies—Mathematics

Accommodations	*Grades*						
	3	*4*	*5*	*6*	*7*	*8*	*11*
LCI_Vision[1]	203	213	199	221	234	229	157
SAR_Assistive_Presentation_After[2]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SAR_Assistive_Response_After[2]	289	287	311	350	293	331	303
SAR_No_Accomm_Needed_After[3]	784	900	993	1,046	1,128	1,172	1,098
SAR_Paper_Version_After[4]	317	303	220	242	200	167	155
SAR_Scribe_After[5]	1,188	1,233	1,215	1,237	1,085	1,080	571
SAR_Sign_Interpretation_After[6]	48	48	48	49	24	29	36

[1]: LCI_Vision - Input could occur through alternate keyboards, eye-gaze, switch devices, speech-to-text, and other similar input devices. Students are also expected to access text using AT devices (e.g., screen readers), but refreshable Braille display is not supported for presentation of text-based content for the first operational year.
[2]: SAR_Assistive_Presentation_After – For the 2016-17 administration this field was eliminated from the MSAA Online Assessment System due to the other Assistive Technology (AT) accommodation option captured below in SAR_Assistive_Response_After.
[2]: SAR_Assistive_Response_After - Assistive Technology (AT) for viewing, responding, or interacting with test items.
[3]: SAR_No_Accomm_Needed_After - No accommodations needed.
[4]: SAR_Paper_Version_After - Paper version of item/s.
[5]: SAR_Scribe_After - A scribe will enter in the MSAA Online Assessment System the student-indicated answer to a selected-response item. For the constructed-response writing item, the scribe will record the student's response to the writing prompt on the response templates in the MSAA Online Assessment System.
[6]: SAR_Sign_Interpretation_After - TA may communicate passages, items and response options using sign language to student.

Table A-2. 2016–17 MSAA: Accommodation Frequencies—ELA

Accommodations	*Grades*						
	3	*4*	*5*	*6*	*7*	*8*	*11*
LCI_Vision[1]	203	212	198	219	233	230	164
SAR_Assistive_Presentation_After[2]	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SAR_Assistive_Response_After[2]	288	283	308	348	291	332	308
SAR_No_Accomm_Needed_After[3]	782	900	990	1,044	1,124	1,175	1,145
SAR_Paper_Version_After[4]	316	302	219	239	198	168	159
SAR_Scribe_After[5]	1,184	1,229	1,209	1,235	1,082	1,080	613
SAR_Sign_Interpretation_After[6]	48	48	48	50	24	30	35

[1]: LCI_Vision - Input could occur through alternate keyboards, eye-gaze, switch devices, speech-to-text, and other similar input devices. Students are also expected to access text using AT devices (e.g., screen readers), but refreshable Braille display is not supported for presentation of text-based content for the first operational year.
[2]: SAR_Assistive_Presentation_After – For the 2016-17 administration this field was eliminated from the MSAA Online Assessment System due to the other Assistive Technology (AT) accommodation option captured below in SAR_Assistive_Response_After.
[2]: SAR_Assistive_Response_After - Assistive Technology (AT) for viewing, responding, or interacting with test items.
[3]: SAR_No_Accomm_Needed_After - No accommodations needed.
[4]: SAR_Paper_Version_After - Paper version of item/s.
[5]: SAR_Scribe_After - A scribe will enter in the MSAA Online Assessment System the student-indicated answer to a selected-response item. For the constructed-response writing item, the scribe will record the student's response to the writing prompt on the response templates in the MSAA Online Assessment System.
[6]: SAR_Sign_Interpretation_After - TA may communicate passages, items and response options using sign language to student.

Table A-3. 2016–17 MSAA: Accommodation Summary

Content Area	*Grade*	*Number of Students Tested*	
		With	*Without*
ELA	03	2,232	1,451
	04	2,387	1,496
	05	2,473	1,468
	06	2,580	1,504
	07	2,498	1,549
	08	2,552	1,740
	11	2,079	1,567
Mathematics	03	2,238	1,465
	04	2,393	1,502
	05	2,483	1,477
	06	2,588	1,513
	07	2,509	1,554
	08	2,548	1,747
	11	1,984	1,474

APPENDIX B—PARTICIPATION RATES

Table B-1. 2016–17 MSAA: Summary of Participation by Demographic Category—Mathematics

Description	*Tested*		*Total Tested*	*Total Percent*
	# Complete	*# No Observable Mode of Communication*[1]		
All Students	26,075	1,400	27,475	100.00
Female	5,516	382	5,898	21.47
Male	10,546	593	11,139	40.54
Gender Undefined	10,013	425	10,438	37.99
Hispanic or Latino	4,354	278	4,632	16.86
American Indian or Alaska Native	365	18	383	1.39
Asian	279	21	300	1.09
Black or African American	3,638	216	3,854	14.03
Native Hawaiian or Pacific Islander	160	5	165	0.60
White (non-Hispanic)	9,149	544	9,693	35.28
Two or More Races (non-Hispanic)	489	17	506	1.84
No Primary race/Ethnicity Undefined	7,641	301	7,942	28.91
Currently receiving LEP services	692	35	727	2.65
Not receiving LEP services	12,319	770	13,089	47.64
LEP: All Other Students	13,064	595	13,659	49.71
Economically Disadvantaged Students	6,388	325	6,713	24.43
Non-economically Disadvantaged Students	6,623	480	7,103	25.85
SES: All Other Students	13,064	595	13,659	49.71
Migrant	21	4	25	0.09
Non- migrant	12,853	801	13,654	49.70
Undefined Migrant Status	13,201	595	13,796	50.21
Augmentative Communication	3,855	366	4,221	15.36
No Augmentative Communication	22,060	1,029	23,089	84.04
Undefined Augmentative Communications	160	5	165	0.60
Hearing Loss	664	232	896	3.26
Within Normal Limits	25,308	1,167	26,475	96.36
Undefined Hearing Loss	103	1	104	0.38
Visual Impairment	963	493	1,456	5.30
Within Normal Limits	24,958	903	25,861	94.13
Undefined Visual Impairment	154	4	158	0.58

continued

Description	Tested		Total Tested	Total Percent
	# Complete	# No Observable Mode of Communication[1]		
Sensory Stimuli Response	1,650	1,078	2,728	9.93
Follow Directions	24,411	322	24,733	90.02
Undefined Receptive Language	14	0	14	0.05
Special School	2,404	345	2,749	10.01
Regular School Self-contained	17,108	984	18,092	65.85
Regular School Resource Room	3,982	58	4,040	14.70
Regular School Primarily Self-contained	1,873	6	1,879	6.84
Regular School General Education	694	7	701	2.55
Undefined Classroom Setting	14	0	14	0.05
Student Communicates Primarily Through Cries	1,334	1,025	2,359	8.59
Uses Intentional Communication	5,062	293	5,355	19.49
Uses Symbolic Language	19,665	82	19,747	71.87
Undefined Expressive Communication	14	0	14	0.05

[1] No Observable Mode of Communication indicates that the students' test was closed because they had no visible means of communication.

Table B-2. 2016–17 MSAA: Summary of Participation by Demographic Category—ELA

Description	*Tested*		*Total Tested*	*Total Percent*
	# Complete	*# No Observable Mode of Communication*[1]		
All Students	26,171	1,405	27,576	100.00
Female	5,567	385	5,952	21.58
Male	10,623	595	11,218	40.68
Gender Undefined	9,981	425	10,406	37.74
Hispanic or Latino	4,341	278	4,619	16.75
American Indian or Alaska Native	357	18	375	1.36
Asian	282	21	303	1.10
Black or African American	3,702	217	3,919	14.21
Native Hawaiian or Pacific Islander	160	5	165	0.60
White (non-Hispanic)	9,205	548	9,753	35.37
Two or More Races (non-Hispanic)	495	17	512	1.86
No Primary race/Ethnicity Undefined	7,629	301	7,930	28.76
Currently receiving LEP services	692	35	727	2.64
Not receiving LEP services	12,451	775	13,226	47.96
LEP: All Other Students	13,028	595	13,623	49.40
Economically Disadvantaged Students	6,392	328	6,720	24.37
Non-economically Disadvantaged Students	6,751	482	7,233	26.23
SES: All Other Students	13,028	595	13,623	49.40
Migrant	21	4	25	0.09
Non- migrant	12,985	806	13,791	50.01
Undefined Migrant Status	13,165	595	13,760	49.90
Augmentative Communication	3,841	367	4,208	15.26
No Augmentative Communication	22,171	1,033	23,204	84.15
Undefined Augmentative Communications	159	5	164	0.59
Hearing Loss	666	233	899	3.26
Within Normal Limits	25,404	1,171	26,575	96.37
Undefined Hearing Loss	101	1	102	0.37
Visual Impairment	965	494	1,459	5.29
Within Normal Limits	25,054	907	25,961	94.14
Undefined Visual Impairment	152	4	156	0.57

continued

Description	Tested		Total Tested	Total Percent
	# Complete	# No Observable Mode of Communication[1]		
Sensory Stimuli Response	1,635	1,083	2,718	9.86
Follow Directions	24,523	322	24,845	90.10
Undefined Receptive Language	13	0	13	0.05
Special School	2,409	347	2,756	9.99
Regular School Self-contained	17,191	987	18,178	65.92
Regular School Resource Room	3,995	58	4,053	14.70
Regular School Primarily Self-contained	1,871	6	1,877	6.81
Regular School General Education	692	7	699	2.53
Undefined Classroom Setting	13	0	13	0.05
Student Communicates Primarily Through Cries	1,310	1,030	2,340	8.49
Uses Intentional Communication	5,051	293	5,344	19.38
Uses Symbolic Language	19,797	82	19,879	72.09
Undefined Expressive Communication	13	0	13	0.05

[1] No Observable Mode of Communication indicates that the students' test was closed because they had no visible means of communication.

Table B-3. 2016–17 MSAA: Participation Rates by Subgroup

Description	Total Tested	Invalidated	Did Not Test
ELA	27,576	192	1,522
Mathematics	27,475	173	1,642

APPENDIX C—TEST BLUEPRINTS

English Language Arts Test Blueprint MSAA

Operational English Language Arts Test Blueprint

The tables presented in this appendix constitute the MSAA operational E L A blueprint targets. The tables incorporate the overall content distributions targeted for the operational test. Each grade level/content area is represented by a table which first describes the content category (e.g., Reading: Literary) standards (CCCs), item types, number of items, number of passages, and reports the approximate overall scoring weights by content category by grade.

Please note that the content of the tables are targets and the eligible items in the bank affect how closely the test is constructed.

Table C1. MSAA Operational Test Blueprint – ELA Grade 3

Content Category	Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	37.5%	3.RL.h1 Answer questions related to the relationship between characters, setting, events, or conflicts (e.g., characters and events, characters and conflicts, setting and conflicts)	SR	3-4	3-4
		3.RL.i2 Answer literal questions and refer to text to support your answer	SR	4-5	
		3.RL.k2 Determine the central message, lesson, moral, and key details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally	SR	4-8	
Reading: Informational	43.75%	3.RI.h1 Identify the purpose of a variety of text features	SR	4-5	1-3
		3.RI.h4 Use illustrations (e.g., maps, photographs, diagrams, timelines) in informational texts to answer questions	SR	2-3	
		3.RI.i2 Determine the main idea of text read or read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally	SR	2-3	
		3.RI.k5 Determine the main idea of a text; recount the key details and explain how they support the main idea	SR	0-3	
Reading: Vocabulary	9.375%	3.RWL.i2 Use sentence context as a clue to the meaning of a new word, phrase, or multiple meaning word	SR	3-4	0
Reading: Foundational	0%	3.RWL.h2 Identify grade level words with accuracy	SR	0	0
Writing	9.375%	3.WI.l4 Sort evidence (e.g., graphic organizer) collected from print and/or digital sources into provided categories	SR	2-3	0
		3.WI.p1 Include text features (e.g., numbers, labels, diagrams, charts, graphics) to enhance clarity and meaning	SR	1-3	
		3.WL.o1With guidance and support from adults, produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g., to entertain), or audience	SR	0	
Total*				32	

*The intended operational score is to be derived from 32 raw score points.

Table C2. MSAA Operational Test Blueprint – ELA Grade 4

Content Category	Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	40.6%	4.RL.i1 Refer to details and examples in a text when explaining what the text says explicitly	SR	4-6	2-3
		4.RL.k2 Determine the theme of a story, drama, or poem; refer to text to support answer	SR	2-4	
		4.RL.l1 Describe character traits (e.g., actions, deeds, dialogue, description, motivation, interactions); use details from text to support description	SR	0-5	
Reading: Informational	40.6%	4.RI.h4 Use information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) to answer questions	SR	4-6	3-4
		4.RI.i3 Determine the main idea of an informational text	SR	3-4	
		4.RI.l1 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears	SR	6-8	
Reading: Vocabulary	9.3%	4.RWL.i2 Use context as a clue to determine the meaning of unknown words, multiple meaning words, or words showing shades of meaning	SR	2-3	0
		4.RWL.j1 Use general academic and domain specific words and phrases accurately	SR	0	
Reading: Foundational	0%	4.RWL.h2 Identify grade level words with accuracy and on successive attempts NOT 2-PART	SR	0	0
Writing	9.3%	4.WI.q1 Provide a concluding statement or section to support the information presented	SR	2-3	0
		4.WI.p1 Include formatting (e.g., headings, bulleted information), illustrations, and multimedia when useful to promote understanding	SR	1-3	
		4.WL.o1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g. to entertain), or audience	SR	0	
Total*				32	

*The intended operational score is to be derived from 32 raw score points.

Table C3. MSAA Operational Test Blueprint – ELA Grade 5

Content Category	Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	41%	5.RL.b1 Refer to details and examples in a text when explaining what the text says explicitly	SR	5	3
		5.RL.c2 Summarize a text from beginning to end in a few sentences 3-PART	SR	3-4	
		5.RL.d1 Compare characters, settings, events within a story; provide or identify specific details in the text to support the comparison	SR	4	
Reading: Informational	37.5%	5.RI.d5 Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts	SR	0-1	3
		5.RI.c4 Determine the main idea, and identify key details to support the main idea	SR	5-6	
		5.RI.e2 Explain how an author uses reasons and evidence to support particular points in a text	SR	5-6	
Reading: Vocabulary	13%	5.RWL.a2 Use context to determine the meaning of unknown or multiple meaning words or phrases	SR	4-5	0
Writing	9%	5.WI.b3 Organize ideas, concepts, and information (using definition, classification, comparison/contrast, and cause/effect)	SR	2-3	0
		5.WI.d1 Support a topic with relevant facts, definitions, concrete details, quotations, or other information and examples	SR	0	
		5.WL.h1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g. to entertain), or audience	SR	0	
Total*				32	

*The intended operational score is to be derived from 32 raw score points.

Also, note that paired passage sets are used for one of the Informational passages in grades 5–8 and 11.

Table C4. MSAA Operational Test Blueprint – ELA Grade 6

Content Category	Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	41%	6.RL.b2 Refer to details and examples in a text when explaining what the text says explicitly	SR	0-1	2-3
		6.RL.b3 Use specific details from the text (words, interactions, thoughts, motivations) to support inferences or conclusions about characters including how they change during the course of the story	SR	2-3	
		6.RL.c3* Summarize a text from beginning to end in a few sentences without including personal opinions	SR	6-9	
Reading: Informational	41%	6.RI.b4 Summarize information gained from a variety of sources including media or texts	SR	2	3-4
		6.RI.c2 Provide a summary of the text distinct from personal opinions or judgments	SR	0	
		6.RI.g4 Determine how key individuals, events, or ideas are elaborated or expanded on in a text	SR	6-8	
		6.RI.g6 Evaluate the claim or argument; determine if it is supported by evidence	SR	5-6	
Reading: Vocabulary	9%	6.RWL.a1 Use context to determine the meaning of unknown or multiple meaning words or phrases	SR	0	0
		6.RWL.c1 Use general academic and domain specific words and phrases accurately	SR	3-4	
Writing	9%	6.WL.c1 Organize ideas and event so that they unfold naturally	SR	2-3	0
		6.WL.c3 Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another	SR	1-3	
		6.WI.h2 Produce a clear, coherent, permanent product that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (e.g., reader)	SR	0	
Total*				32	

*The intended operational score is to be derived form 32 raw score points.

Also, note that paired passage sets are used for one of the Informational passages in grades 5–8 and 11

Table C5. MSAA Operational Test Blueprint – ELA Grade 7

Content Category	Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	38%	7.RL.i2 Use two or more pieces of textual evidence to support inferences, conclusions, or summaries of text	SR	9-10	3
		7.RL.j1 Analyze the development of the theme or central idea over the course of the text	SR	3-4	
Reading: Informational	44%	7.RI.j1 Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR	4-5	2-3
		7.RI.j5 Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events)	SR	2-3	
		7.RI.l1Compare/contrast how two or more authors write about the same topic	SR	4	
		7.RI.k4 Evaluate the claim or argument to determine if they are supported by evidence	SR	1-2	
Reading: Vocabulary	9%	7.RWL.g1 Use context as a clue to determine the meaning of a grade appropriate word or phrase	SR	3	0
Writing	9%	7.WL.o1 Select or provide a concluding statement or paragraph that follows from the narrated experiences or events.	SR	0	0
		7.WL.l1 Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events	SR	2-3	
		7.WI.o1 Produce a clear, coherent, permanent product (e.g. select/generate responses to form paragraph/essay) that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (reader)	SR	1-3	
Total*				32	

*The intended operational score is to be derived from 32 raw score points.

Also, note that paired passage sets are used for one of the Informational passages in grades 5–8 and 11.

Table C6. MSAA Operational Test Blueprint – ELA Grade 8

Content Category	Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	34%	8.RL.i2 Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR	4-8	2-3
		8.RL.j2 Analyze the development of the theme or central idea over the course of the text including its relationship to the characters, setting, and plot	SR	2-3	
Reading: Informational	44%	8.RI.j1 Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR	5-8	3-4
		8.RI.l1 Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation	SR	2-4	
		8.RI.k2 Determine how the information in each section contribute to the whole or to the development of ideas	SR	3-4	
		8.RI.k4 Identify an argument or claim that the author makes	SR	3-4	
Reading: Vocabulary	13%	8.RWL.g1 Use context as a clue to the meaning of a grade-appropriate word or phrase	SR	2-3	0
		8.RWL.i1 Use general academic and domain specific words and phrases accurately	SR	0-1	
Writing	9%	8.WP.k2 Create an organizational structure in which ideas are logically grouped to support the writer's claim	SR	2-3	0
		8.WP.j1 Gather relevant information (e.g., highlight in text, quote or paraphrase from text or discussion) from print and/or digital sources	SR	1-3	
		8.WI.o1 Produce a clear, coherent, permanent product (e.g. select/generate responses to form paragraph/essay) that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (e.g., reader)	SR	0	
Total*				32	

*The intended operational score is to be derived from 32 raw score points.

Also, note that paired passage sets are used for one of the Informational passages in grades 5–8 and 11.

Table C7. MSAA Operational Test Blueprint – ELA Grade 11

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items	# of Passages
Reading: Literary	38%	1112.RL.b1Use two or more pieces of evidence to support inferences, conclusions, or summaries of the plot, purpose, or theme within a text	SR	4-6	2-3
		1112.RL.d1 Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning	SR	4-6	
Reading: Informational	41-44%	1112.RI.b1 Use two or more pieces of evidence to support inferences, conclusions, or summaries or text	SR	5-8	3-4
		1112.RI.b5 Determine how key details support the development of the central idea of a text	SR	4-6	
		1112.RI.d1 Determine the author's point of view or purpose in a text	SR	3-4	
		1112.RI.e1 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem	SR	0-1	
Reading: Vocabulary	9-13%	1112.RWL.b1 Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position in a sentence) as a clue to the meaning of a word or phrase	SR	2	0
		1112.RWL.c3 Develop and explain ideas for why authors made specific word choices within text	SR	0-2	
Writing	9%	1112.WI.b2 Create an organizational structure for writing that groups information logically (e.g., cause/effect, compare/contrast, descriptions and examples) to support paragraph focus	SR	2-3	0
		1112.WI.b4 Select the facts, extended definitions, concrete details, quotations, or other information and examples that are most relevant to the focus and appropriate for the audience	SR	1-3	
		1112.WP.f1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (to persuade), and audience	SR	0	
Total*				32	

*The intended operational score is to be derived from 32 raw score points.

Also, note that paired passage sets are used for one of the Informational passages in grades 5–8 and 11.

The ELA chart below specifies where the Operational passage sets, operational writing items, and field test slots will be in the sessions.

	Session One (Tiers 1, 2, 3) ***OP Points = 15*** ***FT Points = 9***	***Session Two A (Tiers 1, 2, 3)*** ***17 OP Points*** ***Three Reading passage sets*** ***T1-T3 Writing Standalones***	***Session Two B (Tiers 2 &3)*** ***17 OP Points*** ***Three Reading passage sets*** ***T1-T3 Writing Standalones***	***Session Two C (Tiers 2,3, 4)*** ***17 OP Points*** ***Three Reading passage sets*** ***T2-T4 Writing Standalones***	***Session Three FT ONLY*** ***(Tiers 2 and 3 Writing Prompt)***
Form 1	**Passage set #1**	**Passage set # 6 (T1)**	**Passage set # 7 (T2 OR T3)**	**Passage set # 8 (T4)**	FT Writing Prompt 2 (T2)
	Passage set #2	**Passage set #4 (T2)**	**Passage set #4 (T2)**	**Passage set #4 (T2)**	
	Passage set #3	**Passage set #5 (T3)**	**Passage set #5 (T3)**	**Passage set #5 (T3)**	
	FT Positions 16-24 = FT passage set plus standalone writing items	**3 Writing standalones (T1, T2, T3)**	**3 Writing standalones (T1, T2, T3)**	**3 Writing Standalones (T2, T3, T4)**	
Form 2	**Passage set #1**	same as above	same as above	same as above	FT Writing Prompt 2 (T2) same prompt as above
	Passage set #2				
	Passage set #3				
	FT Positions 16-24 = FT passage set plus standalone writing items				
Form 3	**Passage set #1**	same as above	same as above	same as above	FT Writing Prompt 3 (T3)
	Passage set #2				
	Passage set #3				
	FT Positions 16-24 = FT passage set plus standalone writing items				

* Field test slots are color-coded peach, orange, and green.

** Identical items in Session 2 A, B, and C are shown in yellow and blue.

Mathematics Blueprint MSAA Operational

Mathematics Test Blueprint

The tables presented in this appendix constitute the MSAA operational mathematics blueprint targets. The tables incorporate the overall content distributions targeted for the operational test. Each grade level/content area is represented by a table, which first describes the content category (e.g., Number and Operations Base 10), weights per CCC, standards (CCCs), item types, number of items, and reports the approximate overall scoring weights by content category by grade.

Please note that the content of the tables are targets and the eligible items in the bank affect how closely the test is constructed.

Table C8. MSAA Operational Test Blueprint – Mathematics Grade 3

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Operations and Algebraic Thinking	29-31%	3.NO.2d3 Solve multiplication problems with neither number greater than 5	SR	10—11
		3.NO.2e1* Solve or solve and check one- or two-step word problems requiring addition, subtraction, or multiplication with answers up to 100		
		3.PRF.2d1 Identify multiplication patterns in a real word setting		
Number and Operations Base Ten	20%	3.NO.1j3 Use place value to round to the nearest 10 or 100	SR	7
		3.NO.2c1 Solve multi-step addition and subtraction problems up to 100		
Number and Operations Fractions	20%	3.NO.1l3 Identify the fraction that matches the representation (rectangles and circles; halves, fourths, thirds, and eighths)	SR	7
		3.SE.1g1 Use =, <, or > to compare 2 fractions with the same numerator or denominator		
Measurement and Data	20%	3.DPS.1g1 Collect data; organize into picture or bar graph	SR/CR	7
		3.ME.1d2 Measure area of rectilinear figures by counting squares		
Geometry	9-11%	3.GM.1i1 Partition rectangles into equal parts with equal area	SR	3–4
Total**				35

* This CCC requires a pair of math item versions.

**The intended operational score is to be derived from 35 raw score points.

Table C9. MSAA Operational Test Blueprint – Mathematics Grade 4

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Operations and Algebraic Thinking	29—31%	4.NO.2d7 Determine how many objects go into each group when given the total number of objects and groups where the number in each group or number of groups is	SR	10—11
		4.PRF.1e3 Solve multiplicative comparisons with an unknown using up to 2-digit numbers with information presented in a graph or word problem (e.g., an orange hat cost $3. A purple hat cost 2 times as much. How much does the purple hat cost? [3 x 2 = p])		
		4.NO.2e2* Solve or solve and check one or two step word problems requiring addition, subtraction, or multiplication with answers up to 100		
Number and Operations Base Ten	9-11%	4.NO.1j5 Use place value to round to any place (i.e., ones, tens, hundreds, thousands)	SR	3–4
Number and Operations Fractions	29-31%	4.NO.1m1 Determine equivalent fractions	SR	10—11
		4.NO.1n2 Compare up to 2 given fractions that have different denominators		
		4.SE.1g2 Use =, <, or > to compare 2 fractions (fractions with a denominator or 10 or less)		
Measurement and Data	20%	4.ME.1g2 Solve word problems using perimeter and area where changes occur to the dimensions of a rectilinear	SR/CR	7
		4.DPS.1g3 Collect data; organize in graph (e.g. picture graph, line plot, bar graph)		
Geometry	9-11%	4.GM.1h2 Classify two-dimensional shapes based on attributes (# of angles)	SR/CR	3–4
Total**				35

* This CCC requires a pair of math item versions.

**The intended operational score is to be derived from 35 raw score points.

Table C10. MSAA Operational Test Blueprint – Mathematics Grade 5

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Operations and Algebraic Thinking	9-11%	5.PRF.2b1 Generate or select a comparison between two graphs from a similar situation	SR	3–4
Number and Operations Base Ten	40%	5.NO.1b1 Read, write, or select a decimal to the hundredths place	SR	14
		5.NO.1b4 Round decimals to the next whole number		
		5.NO.2c1 Solve one-step problems using decimals		
		5.NO.2a5 Solve word problems that require multiplication or division		
Number and Operations Fractions	20%	5.NO.2c2 Solve word problems involving the addition, subtraction, multiplication, or division of fractions	SR	7
		5.PRF.1a1 Determine whether the product will increase or decrease based on the multiplier		
Measurement and Data	20%	5.ME.1b2 Convert standard measurements of length	SR	7
		5.ME.2a1 Use a calculator to solve one-step problems involving conversions of standard measurement units of area, volume, time, mass in the same system		
Geometry	9-11%	5.GM.1c3 Use order pairs to graph given points	SR/CR	3–4
Total*				35

*The intended operational score is to be derived from 35 raw score points.

Table C11. MSAA Operational Test Blueprint – Mathematics Grade 6

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Ratio and Proportions	29-31%	6.PRF.1c1 Describe the ratio relationship between two quantities for a given situation	SR	10—11
		6.ME.2a2 Solve one-step real world measurement problems involving unit rates with ratios of whole numbers when given the unit rate (3 inches of snow falls per hour, how much in 6 hours?)		
		6.NO.1f1 Find a percent of a quantity as rate per 100		
Expressions and Equations	20%	6.PRF.1d1 Solve real world single-step linear equations	SR	7
		6.NO.2a6 Solve problems or word problems using up to three-digit numbers and any of the four operations		
The Number System	29-31%	6.NO.2c3 Solve one-step, addition, subtraction, multiplication, or division problems with fractions or decimals	SR	10—11
		6.NO.1d4 Select the appropriate meaning of a negative number in a real world situation		
		6.NO.1d2* Locate positive and negative numbers on a number line		
Statistics and Probability	9-11%	6.DPS.1d3* Select the statement that matches mean, mode, and spread of data for 1 measure of central tendency for a given data set	SR	3–4
Geometry	9-11%	6.GM.1d1 Find area of quadrilaterals	SR	3–4
Total**				35

* This CCC requires a pair of math item versions.

**The intended operational score is to be derived from 35 raw score points.

Table C12. MSAA Operational Test Blueprint – Mathematics Grade 7

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Ratio and Proportions	40%	7.NO.2f1 Identify the proportional relationship between two quantities (use rules or symbols to show quantitative relationships)	SR	14
		7.NO.2f2 Determine if two quantities are in a proportional relationship using a table of equivalent ratios or points graphed on a coordinate plane		
		7.NO.2f6 Solve word problems involving ratios		
		7.PRF.1f1 Use proportional relationships to solve multistep percent problems in real world situations.		
Expressions and Equations	9-11%	7.PRF.1g2 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities	SR	3–4
The Number System	20%	7.NO.2i1 Solve multiplication problems with positive/negative numbers	SR	7
		7.NO.2i2 Solve division problems with positive/negative numbers		
Statistics and Probability	9-11%	7.DPS.1k1 Analyze graphs to determine or select appropriate comparative inferences about two samples or populations	SR	3–4
Geometry	20%	7.ME.2d1 Apply formula to measure area and circumference of circles	SR	7
		7.GM.1h2 Find the surface area of three-dimensional figures using nets of rectangles or triangles		
Total*				35

*The intended operational score is to be derived from 35 raw score points.

Table C13. MSAA Operational Test Blueprint – Mathematics Grade 8

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Functions	20%	8.PRF.2e2* Identify the rate of change (slope) and initial value (*y*-intercept) from graphs	SR	7
		8.PRF.1f2 Describe or select the relationship between the two quantities given a line graph of a situation		
Expressions and Equations	20%	8.PRF.1e2 Represent proportional relationships on a line graph	SR	7
		8.PRF.1g3 Solve linear equations with 1 variable		
The Number System	9-11%	8.NO.1k3 Use approximations of irrational numbers to locate them on a number line	SR	3–4
Statistics and Probability	20%	8.DPS.1h1* Graph bivariate data using scatter plots and identify possible associations between the variables	SR/CR	7
		8.DPS.1k2 Analyze displays of bivariate data to develop or select appropriate claims about those data		
Geometry	29-31%	8.ME.1e1 Describe the changes in surface area, area, and volume when the figure is changed in some way (e.g., scale drawings)	SR	10–11
		8.GM.1g1* Recognize congruent and similar figures		
		8.ME.2d2 Apply the formula to find the volume of 3-dimensional shapes (i.e., cubes, spheres, and cylinders)		
Total**				35

* This CCC requires a pair of math item versions.

**The intended operational score is to be derived from 35 raw score points.

Table C14. MSAA Operational Test Blueprint – Mathematics Grade 11

Content Category	Actual Weight	Core Content Connector	Item Type	# of Items
Algebra And Functions	49-51%	H.PRF.2b1 Translate a real-world problem into a one-variable linear equation	SR	17–18
		H.PRF.2b2 Solve equations with one or two variables using equations or graphs		
		H.ME.1b2 Solve a linear equation to find a missing attribute given the area, surface area, or volume and the other attribute		
		H.PRF.1c1 Select the appropriate graphical representation of a linear model based on real world events		
		H.PRF.2c1 Make predictions based on a given model (for example, a weather model, data for athletes over years)		
Number and Quantity	20%	H.ME.1a2 Solve real world problems involving units of measurement	SR	7
		H.NO.1a1 Simplify expressions that include exponents		
Statistics and Probability	20%	H.DPS.1b1 Complete a graph given the data, using dot plots, histograms, or box plots	SR/CR	7
		H.DPS.1c1 Use descriptive stats, range, median, mode, mean, outliers/gaps, to describe data set		
Geometry	9-11%	H.GM.1b1 Use definitions to demonstrate congruency and similarity in figures	SR	3–4
Total*				35

*The intended operational score is to be derived from 35 raw score points.

Table C15. MSAA Operational Test Blueprint – Mathematics Distribution

Guidelines for MSAA Mathematics Tier Distribution

Stage	Tier 1	Tier 2	Tier 3	Tier 4
1	5	5	5	0
2A	5	10*	5	0
2B	0	10*	10*	0
2C	0	5	10*	5

***These 10 items are identical**

Guidelines for MSAA Mathematics CR items

(Number of items)

Grade	3	4	5	6	7	8	11
Number of CR items	1 – 2	2 – 4	2 – 3	0	0	1 – 2	1 – 2

Field Test Positions: 4, 5, 9, 10, 14, 15, 19, 20, 24, 25

APPENDIX D—ITEM REVIEW AND BIAS AND SENSITIVITY REVIEW COMMITTEE MEMBERS

MSAA 2017 Item Content and Bias Review Meeting

Final Panelist List

ELA Content Grades 3-6

Name	State
Robin Dunlap	AR
Marcia Karls	AZ
Valerie Guerrero	PAC6
Genevive Goodman	MD
Caitlin Jones	MD
Joellen Merry	ME
Abigail Trask	ME
Kayla Bucciarelli	MD
Heather Hinners	SD
Rachael Rhinehart	TN

Math Content 3-6

Name	State
Melanie Home Gun	MT
Mark Dennett	ME
Sara Kempler	MD
Jodi Barber	ME
Helene Cruz	PAC6
Lisa C. Oliver	AZ
Catherine Acosta	AR
Sheryl Serano Griffith	USVI
Krista Bolen	TN

ELA Content Grades 7,8,11

Name	State
Shelley Bohy	SD
Pam Lang	RI
Lori Cole	AR
Christy Callahan	ME
Bess Cropper	MD
Kerri Bocker	TN
Rhonda Gross	PAC6
Sandra Laine	AZ
Kelli Gordon	AR
Dr. Renee Charleswell	USVI

Math Content 7,8,11

Name	State
Ryan Borden	RI
Erin Stabnow	SD
Cecilia Dumlao	TN
Melissa Hardman	MT
Timothy Billings	AR
Tracy Fazio	AZ
Lizabeth Hofschneider	PAC6
Sarah Stare	MD
Carissa Hollinger	MD
Sandra Cookson	ME
Becky Whitlock	SD

ELA Bias All Grades

Name	State
Don Breedwell	TN
Paula VanBiervliet	AR
Carolyn Norful	AR
Pam Kelk	AZ
Tracy Del Rosario	PAC6
Joe Benamati	MD
Johanna Connell	ME
Meredith Verrill	ME
Leslie Brow	RI

Math Bias All Grades

Name	State
Windy Phillips	MD
Tara Ann Turbanada-Umlas	USVI
Elmie Manley	PAC6
Alexis Dion	AZ
Herbert Bautista	USVI
Alison Wilhelm	TN
Maureen Fox	ME
Jennifer Brown	AR
Angela Bell	MD

APPENDIX E—DECISION RULES

Multi-State Alternate Assessment (MSAA) Spring 2017 Analysis and Reporting Decision Rules

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Multi-State Alternate Assessment (MSAA) Spring 2017

This document details rules for analysis and reporting of the Multi-State Alternate Assessment (MSAA). This document is considered a draft until sign off has been granted. If there are rules that need to be added or modified after said sign-off, subsequent sign off will be obtained for each rule.

I. Contract Overview

A. Test Administration(s)

1. Eligible students are expected to test in Math and ELA in grades 03-08 and 11.
2. ELA includes reading and writing; in 16-17 scores for the writing prompt do not contribute to the overall ELA score and are not reported.
3. Tests have moved to a Staged Adaptive design for 16-17. The raw score from core items in Session 1 determines what version of Session 2 is presented.

B. Deliverables

1. Student Report: online with print options below
   a. State Option - Print Copies (Parent): AR, TN
   b. State Option – Print Copies (Parent & School): MD, RI
2. Roster Report (School): online
3. Summary Report (School, District, State): online
4. Student Results Data File (School, District, State): online
5. Duplicate/Void Test Data (State): online
6. State Option - Early Release Data File (State): SD

II. Data Sources

A. Student Demographic Cleanup

1. For the purpose of performing demographic cleanup, including identification of the final set of students to be reported via the MSAA, states are provided the complete list of all students registered in TAO (except those moved to the Do Not Process school: “0000-000”), regardless of test status or completion status.
2. The demographic cleanup process enables states to:
   a. Identify and resolve instances of duplicate or erroneous registration records. States may indicate records to “merge” in order to resolve duplicates, “remove”, or add, as necessary.
   b. Update and add up-to-date demographic data.
   c. Update the school and district a student should be at for reporting and aggregations.
   d. Provide state-supplied test status information, such as exemptions and invalidations.
   e. Confirm or update the grade level expected for testing for each student. The grade level returned by states is the grade level the student is expected to be reported in.
3. See the *Demographic Clean up Instructions* document for additional details.

B. Student Test Cleanup

1. All tests associated with a final student (demographic row of record), including tests from student records merged during the demographic cleanup process, will be compiled for the test cleanup process.

2. The test cleanup process will independently determine the final Math test and the final ELA test to be used for analysis and reporting for each student. These tests are considered the *Analysis and Reporting Dataset*. All other tests are considered *Duplicate/Void* tests and are provided to states separately for informational purposes only.

3. **Off-Grade Tests**:
   a. If a student's expected grade level for testing from the demographic file does not match the test grade the test is "off-grade".
   b. Off-grade tests are classified as *Duplicate/Void* and are excluded from the *Analysis and Reporting Dataset* prior to completion of additional test cleanup steps.
   c. Measured Progress will create a discrepancy alert for states of any case(s) where the tests associated with a student are off-grade. For these cases, the state may:
      i. Leave the data as-is.
         - The off-grade test will be considered *Duplicate/Void*.
         - The student will be included in the *Analysis and Reporting dataset* without a test, see *C. Student Build Outs*.
      ii. Update the student's expected grade level for testing to match the test grade, if appropriate.
         - The test will be considered on-grade and processed per normal rules at the test grade level.
      iii. In either case above the state may also provide Measured Progress with an updated state-supplied status code for the student if they determine one is applicable for reporting while reviewing the scenario.

4. Duplicate/Multiple Test Reconciliation
   a. After off-grade tests have been resolved, if a student still has more than one associated test for the same subject, the final test for *Analysis and Reporting* is determined using the following hierarchy:
      i. Submitted/Completed Test
      ii. Closed – Early Stopping Rule Applied
      iii. In Progress
   b. If two or more tests have the same status above the test associated with the last (latest) date-time stamp will be used.

5. States should provide Measured Progress with all unique test-clean up scenarios that need to be handled outside of the process defined above. This "Bull Pen" file will be handled manually to ensure the correct test, as identified by the state, is used for analysis and reporting.

C. Student Build Outs

Student demographic rows of record from the state that do not have an on-grade test for one or both subjects are included in the *Analysis and Reporting dataset* with no test data.

D. Organization Cleanup

1. The schools and districts returned by states for each demographic row of record in the demographic cleanup file are considered the final school and district codes to be used for analysis and reporting, regardless of where a student's test was taken.
2. Measured Progress will work with states to identify the complete set of these school and district organizations, along with organization names for reporting, during the demographic file acceptance and organization cleanup process with each state.
3. The complete set of organizations in the *Analysis and Reporting dataset* will be loaded in Breakthrough's reporting platform to enable access to the reports. States may restrict access through control of the user-accounts associated with each organization.

E. Scoring

1. The Tier 2 (or above) writing prompt is scored by Measured Progress resulting in a final score or score-condition code for each of the three traits:
   a. Traits:
      i. Organization
      ii. Idea Development
      iii. Conventions
   b. Writing prompt scores are field-test in 16-17 and not included in the overall ELA score.
   c. Valid Scores for each trait:

Original Score / Code	Description	Reported Value (Not Applicable in 16-17)	Translated Score Value
0, 1-3	Final Score	0, 1-3	0 = No Evidence of Trait 1 = Limited Evidence 2 = Partial Evidence 3 = Full Evidence
B	Blank Prompt	0	B = No Evidence Submitted
U	Unreadable	0	U = Unreadable
F	Foreign Language	0	F = Foreign Language
P	Copy of Prompt	0	P = Copy of Prompt
N	No Score	0	N = No Score
5	Off-Topic	0	O = Off Topic
6	Section is Blank	0	B = Section is Blank

2. All other item scores are taken from the Breakthrough testing system. Non-responses (blank responses) to any item are scored as 0 points.

III. Student Participation and Reporting Status

A. Overview

1. Participation statuses are assigned independently for Math and ELA for each student in the final *Analysis and Reporting dataset* using state-supplied test status information in conjunction with test submission and closure data, per the hierarchy below *(Section B)*.

B. Participation Status Assignment Hierarchy (by subject: Math, ELA)

1. If the state has supplied a test status code for the subject then the Participation Status is the state provided code:
   a. **Administration Irregularity**
   b. **Invalidated**
   c. **Parental Refusal**
   d. **ELL Exempt (ELA tests only)**
   e. **Exempt**
   f. **Withdrew**
   g. **No Longer Eligible**
2. Otherwise, if the test is *Submitted* then the Participation Status is **Tested**, regardless of the number of item responses.
3. Otherwise, if the test is *Closed – No Observable Communication Mode*:
   a. And no item responses are recorded then the Participation Status is **Early Stopping Rule Applied**.
   b. And has one or more item responses recorded then the Participation Status is **Early Stopping Rule Misadministration**.
4. Otherwise, if the test is *In Progress*:
   a. And has no item responses recorded then the Participation Status is **Did Not Test**.
   b. And has one or more item responses recorded then the Participation Status is **Tested – Incomplete**.
5. Otherwise the Participation Status is **Did Not Test**.
6. Duplicate/Void tests, including off-grade tests, are not assigned participation statuses and are excluded from the *Analysis and Reporting dataset*.

C. Participation Status Summary

Participation Status	Description	Abbrev.	MP Code	State Data File (All Scores[1])	School, District Data Files:		In Agg. Calcs
					Scaled Score	Perf. Level	
Tested	Tested	TES	A	Yes	Yes	Yes	Yes
Early Stopping Rule	Closed – No Observable Communication Mode, no responses.	ESR	B	Yes	Yes	Yes	Yes
Early Stopping Rule Misadministration	Closed – No Observable Communication Mode with at least 1 response.	ESM	C	Yes	Yes	No	No
Incomplete	In Progress with at least 1 response.	INC	D	Yes	Yes	No	No
* Administration Irregularity	Administration Irregularity was reported but the does not necessitate an invalidation. Scores should be interpreted with caution.	IRR	E	Yes	Yes	Yes	Yes
* Invalidated	Student-based *or* administration-based irregularity resulting in invalidation.	INV	F	Yes	No	No	No
* Parental Refusal	Parental Refusal	PRF	G	No	No	No	No
* ELL Exempt (ELA Only)	Student meets the requirements for ELL 1st Year in the U.S. exemption from ELA.	ELL	H	No	No	No	No
* Exempt (Emergency, Medical, Other)	Student meets the requirements for exemption from the test.	EXE	I	No	No	No	No
* Withdrew	Student withdrew	WDR	K	No	No	No	No
* No Longer Eligible	Student is no longer eligible for testing.	NLE	L	No	No	No	No
Did Not Test	No test or an In Progress test with no responses.	DNT	J	No	No	No	No
Void/Duplicate	Test is a Duplicate or Void; excluded from Analysis and Reporting Dataset.	N/A	M	Separate File from Student Results; raw (unscored) data only.			
REMOVE	Student demographic record marked by state as REMOVE	These students and all associated tests are excluded from the analysis and reporting dataset entirely and are not provided to the state.					

** Only available through a state-supplied status code.*

[1] All Scores: State Student Results Files include Item Responses, Raw Scores, Scaled Scores, and Performance Levels, as applicable by status.

IV. Calculations

A. Raw Score

1. Overall raw scores are calculated based on scores to items that are classified as "core" items for the test form. All other item response scores are excluded.
2. The "core" item list was determined in collaboration with the states.
    a. For 16-17 the writing prompt is not eligible to be included as a "core" item.

B. Writing Trait Raw Scores

1. For 16-17, student level writing trait scores are not included in reporting, and an overall writing score is not calculated or reported.
2. Measured Progress will work closely with states during and after scoring to provide feedback on the writing prompt results to inform item selection and for instructional purposes. This feedback will be defined outside the scope of this document.

C. Scaling and Equating

1. Psychometrics provides the raw score to scaled score lookup for each grade and subject and adaptive version of the test.

D. Performance Levels and Cut Scores

1. The following performance levels are used for MSAA Reporting:

Level	Title
1 (lowest)	Level 1
2	Level 2
3	Level 3
4 (highest)	Level 4

2. MSAA cut scores for each performance level were generated during NCSC 2015 standard setting.

E. Aggregate Calculations

1. Eligible Students:
    a. For school, district, and state level aggregate calculations all students are eligible to be included based on their participation status.
    b. For MSAA level aggregate calculations (technical report, item statistics) all students are eligible to be included based on their participation status.
2. Participation Counts:
    a. All eligible students are included in participation summaries based on participation status for the subject if their participation status is reported.
    b. Classification of participation statuses into reported groupings (i.e.: "the number of *Tested* students") is documented for each individual report deliverable as necessary.
3. Results Aggregations:
    a. Results-based aggregations include, but are not limited to:
        i. Min, Max, Average Raw Score and SEM
        ii. Min, Max, Average Scaled Score and SEM
        iii. Number and percent of students by performance level

b. Eligible students with the following participation statuses are included in results-based aggregate calculations for reporting:

   i. Tested

   ii. Early Stopping Rule

   iii. Administration Irregularity

c. Only eligible students with a participation status of Tested (A) are included in item statistic calculations for the technical report.

d. New for 16-17, aggregations with less than 10 students included in the denominator will be suppressed from state level reports only.

V. Data and Reporting Deliverable Requirements

A. General (all deliverables)

1. Only tests included in the *Analysis and Reporting Dataset* are eligible for final reporting.

   a. *Duplicate/Void* tests, although not reported, are provided to States in the State Duplicate/Void data file hand off, which will include off-grade tests.

2. Students classified as "Withdrew" or "No Longer Enrolled" for *both* ELA and Math are excluded from the Roster Report, Student Report, and Summary Report entirely. They are included in the Student Results data files still.

3. Final reports and data files are generated by Measured Progress for all organizations with reported students in the *Analysis and Reporting dataset*, as applicable for their organization level.

4. Access to reports for specific schools or districts can be restricted via management of the log-in credentials through the Breakthrough system.

5. All school and district level reports are marked "Confidential" on all pages.

6. N-size suppression is done on state level reports only. Any aggregations with less than 10 students included are suppressed from the state level reports.

B. Student Report Specifics

1. Each student report consists of a 1-page cover letter followed by 1-page with results for ELA and Math. Both pages are marked "Confidential".
2. Student reports are generated for all students in the *Analysis and Reporting dataset* **earning a performance level** in at least one content are:

a. Tested (A)

b. Early Stopping Rule (B)

c. Administration Irregularity (E).

3. Since both content areas are always displayed, alternate text is provided for each status that does not receive a student report in the event that a student receives a report for the other content area, see the Participation Status Summary – Student Report table below.
4. For all statuses that have scaled scores but are not receiving a reported Performance Level [Early Stopping Rule Misadministration (C), Tested-Incomplete (D), and Invalid (F)], the school and district will have access to the earned scaled score in the student results data file. Since these statuses do not earn a performance level they do not receive student reports.
5. For statuses receiving a report:

a. The scaled score and performance level earned are printed at the top.

b. The sentence explaining the standard error of measurement associated with the student's scaled score is displayed.

c. The performance level description associated with the earned performance level is printed below the graph.

d. For students classified as Early Stopping Rule (ESR):

i. An asterisk (*) is added to the earned performance level at the top: Level 1*

ii. The asterisk corresponds to the alternate text to be displayed below the bar graph – see Participation Status Summary Table: Alternate Text.

iii. The PLD text for Level 1 is not shown.

6. For statuses that do not receive a report but must appear because the other content area is reported:

a. The sentences for "Your child's scaled score" and "Your child's performance level" are not shown.

b. The graph is replaced with alternate text directing parents to contact their school or teacher, see the Participation Status Summary Table: Alternate Text.

7. States electing to receive printed student reports will receive report packages packed by school and shipped to the district. If a state is receiving parent and school copies, two identical packages per school are created and shipped.

8. Participation Status Summary – Full List Available to States - **Student Report**:

Participation Status	Abbrev.	MP Code	Student Report Specifics		
			Scaled Score	Perf Level	Alternate Text
Tested	TES	A	Yes	Yes	
Early Stopping Rule	ESR	B	Yes (lowest)	Yes (Level 1) PLD 1 Text is NOT Shown.	Your child did not show a consistent observable mode of communication during the test and the test was closed by the teacher. Since your child did not complete the test the results may not be an accurate representation of your child's skills. If you have additional questions, please contact your child's teacher.
Early Stopping Rule Misadministration	ESM	C	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Tested – Incomplete	INC	D	No Student Report		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Administration Irregularity	IRR	E	Yes	Yes	
Invalidated	INV	F	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Parental Refusal	PRF	G	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
ELL Exempt (ELA Only)	ELL	H	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Exempt (Emergency, Medical, Other)	EXE	I	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Did Not Test	DNT	J	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Withdrew	WDR	K	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
No Longer Eligible	NLE	L	No Student Report.		Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.

C. School Roster Report Specifics

1. Rosters are generated for each school in the *Analysis and Reporting dataset* and will list all students, regardless of participation status, except:
   a. Student's classified as "Withdrew" or "No Longer Enrolled" for *both* ELA and Math.
2. Comparison to State
   a. The state average scaled score is calculated using the earned scaled score for all students included in aggregations calculations: Tested (A), Early Stopping Rule (B), and Administration Irregularity (E).
   b. The standard error of measurement (SEM) associated with the student's obtained score is used to identify the range around the state average scaled score to classify the student as above, similar to, or below the state average:

Classification	Performance	Display
Student Score < (State Average – Student SEM)	Lower than the state average	-
(State Average – Student SEM) <= Student Score <= (State Average + Student SEM)	Similar to the state average	=
Student Score > (State Average + Student SEM)	Above the state average	+

3. For Test Status print the "Test Status" column from the Participation Status Summary – Roster Report table.
4. For participation statuses that do not receive a state comparison, scaled score, or performance level (listed as "No" in the Participation Status Summary Table) these fields appear blank on the roster.
5. School Summary Table on the Roster:
   a. School, District, and State Summary data are displayed at the top of the report. Since reports are marked "confidential" there is no suppression rules applied.
   b. The number **Enrolled** is equal to the total number of students listed on the roster. This includes all students in the Reporting and Analysis dataset except those that are "Withdrew" or "No Longer Eligible" in *both* Math and ELA and are therefore not listed on the roster.
   c. The number **Tested** is equal to the set of students receiving a reported *performance level*: Tested (A), Early Stopping Rule (B), and Administration Irregularity (E).
6. The Average Scaled Score and Percent of Students by Performance level calculations are based on the number of **Tested** students.

7. Participation Status Summary – Full List Available to States - **Roster Report**:

Participation Status	Abbrev.	MP Code	Roster Report Specifics:			
			Display Test Status	State Compare	Scaled Score	PerfLevel
Tested	TES	A		Yes	Yes	Yes
Early Stopping Rule	ESR	B	ESR	Yes	Yes	Yes (Level 1)
Early Stopping Rule Misadministration	ESM	C	MIS	Yes	Yes	No
Tested – Incomplete	INC	D	INC	Yes	Yes	No
Administration Irregularity	IRR	E	IRR	Yes	Yes	Yes
Invalidated	INV	F	INV	No	No	No
Parental Refusal	PRF	G	PRF	No	No	No
ELL Exempt (ELA Only)	ELL	H	ELL	No	No	No
Exempt (Emergency, Medical, Other)	EXE	I	EXE	No	No	No
Did Not Test	DNT	J	DNT	No	No	No
Withdrew	WDR	K	WDR	Not Included on Roster Reports. If appearing for 1 content area, then State Compare, Scaled Score, and PerfLevel are blank,		
No Longer Eligible	NLE	L	NLE			

D. Summary Report Specifics

1. Summary Reports are generated for each school, district, and state in the *Analysis and Reporting dataset* with at least one student who is not classified as "Withdrew" or "No Longer Enrolled" in *both* ELA and Math.
2. The number **Enrolled** is equal to the total number of students listed on the roster. This includes all students in the Reporting and Analysis dataset except those that are "Withdrew" or "No Longer Eligible" in *both* Math and ELA (same as Roster).
3. The number **Tested** is equal to the set of students receiving a reported *performance level*: Tested (A), Early Stopping Rule (B), and Administration Irregularity (E). (Same as Roster).
4. The number that **Did Not Test** is equal to the number of students classified as: Did Not Test (J), Parental Refusal (G), ELL Exempt (H), Exempt (I), Withdrew (K), No Longer Eligible (L), Invalidated (F), Tested-Incomplete (D) or Early Stopping Rule Misadministration (C).
    a. Note: Withdrew and No Longer Eligible students are only included if they are included in the number Enrolled, as a result of being reported in the other content area.
5. The number and percent at each performance level calculations are based on the number of **Tested** students.

E. Student Results Data File Specifics

1. All students in the *Analysis and Reporting Dataset* are included in the Student Results data files for their school, district, and state, per the Student Results Data File Layout. One file is created containing all grades for each entity with reporting results.
2. Refer to the file layout for specific data elements and valid values, as well as identification of which fields are included in the school and district files. All fields are included in the state file.
3. Student Results Data Files are comma delimited (CSV).
    a. Measured Progress will remove embedded commas from character fields in the data prior to exporting.
4. There will be one (1) record per student containing the final Math and ELA test results used for reporting.
5. For students with reporting statuses that do not receive item scores, raw score, scaled scores, and performance levels, these fields will be set to blank in the school, district, and state student results data files. See the Participation Status Summary Table (Pg. 5).
6. School, District Files – Additional Notes:
    a. All fields marked as "No" in the Student Results Data File layout for the "School or District data" column are excluded from school and district data files.
    b. Raw scores, scaled scores, and performance levels are set to blank for students with a participation status showing "No" for these scores in the Participation Status summary table (See Decision Rules Page 5).
7. Item responses to core items (items that contribute to a student's raw score for reporting) are included in the state file for Math and ELA, following MP's "+-data" format. See the layout for specific value details.
8. For 16-17, the field-test writing prompt scores are not available at the time of reporting and, if left in the layout, will be set to blank. They will be excluded from all school and district data files entirely.
9. The Test_Proctor_ID associated with each test is included in the state file. This ID corresponds to an additional lookup file that will be delivered to states (via MP FTP) with Test Proctor information.

F. State Duplicate / Void Data File

1. One file is created per state containing all non-reported tests classified as Duplicate/Void, including off-grade tests.
2. The Duplicate/Void data file will follow the same layout as the State Student Results data file layout, however, there may be several records per student depending on the number of Duplicate/Void tests. Each record may contain results for only one or both subjects.
3. The grade will reflect the grade level of the test. For off-grade tests this will differ from the grade level the student is reported under, and may differ for a single student within this file if they took tests at multiple grades.
4. Scores and performance levels are not calculated for these tests and may be blank. All available data will be provided as-is, and is provided to states for informational purposes only and should be interpreted with caution as it has not been through the full cleanup process that is applied to reported data.

G. Early Release Data File-Applicable to South Dakota only.

1. A preliminary results file will be generated for South Dakota this year. The file will be produced after removing students moved to the Do Not Process School "9999".
2. The following issues may be present in the preliminary results, and will be resolved through the standard MP cleanup and processing rules defined by this document for final reporting:
    a. Duplicate student records.
    b. Duplicate tests.
    c. Incorrect and/or incomplete demographics, missing demographics will be left blank.
    d. Incorrect school/district assignments.
    e. No state-supplied invalidations or exemptions applied. All tests will be assigned one of the MP-calculated participation statuses.
    f. No writing scores.
    g. Blank or invalid values for fields expected to be resolved during cleanup.
    h. The grade level will reflect the grade level of the test.
    i. Scaled scores, performance levels are assigned based on available information and calculated statuses.
    j. The same blanking rules of scores and results that are defined for the state student results file based on test status are applied per the calculated test statuses available.
3. The State is required to follow the standard demographic cleanup process (separate from this preliminary results file), and preliminary results are subject to change as a result of cleanup.
4. The preliminary results file will follow the same layout as the State Student Results data file layout, however, as a result of the data being incomplete and the capacity for a student to have multiple tests per content area; fields may contain blank or invalid values.

APPENDIX F—MSAA 2017 GUIDE FOR SCORE REPORT INTERPRETATION

Multi-State Alternate Assessment

(MSAA)

2017 Guide
for
Score Report Interpretation

State Specific Information

Listed below is the contact information for each state's MSAA State Lead:

Arizona Audra Ahumada 602-542-5450 Audra.Ahumada@azed.gov Bethany Zimmerman 602-542-4061 Bethany.Zimmerman@azed.gov	**Arkansas** Ann Finch 501-682-5303 Ann.Finch@arkansas.gov	**District of Columbia** Nikki Stewart 202-741-5538 nikki.stewart@dc.gov Michael Craig Michael.craig@dc.gov
Maine Sue Nay 207-624-6774 Sue.Nay@maine.gov	**Maryland** Ann Herrmann 410-767-0086 Ann.Herrmann@maryland.gov Marsie Torchon 410-767-2498 martha.torchon@maryland.gov	**Montana** Yvonne Field 406-444-0748 yfield@mt.gov
Rhode Island Heather Heineke 401-222-8493 Heather.Heineke@ride.ri.gov	**South Dakota** Jan Martin 605-773-3246 Jan.Martin@state.sd.us Ben Morrison 605-773-6119 Ben.Morrison@state.sd.us	**Tennessee** Lori Nixon 615-741-5113 Lori.Nixon@tn.gov
United States Virgin Islands Alexandria Baltimore-Hookfin 340-773-1095 ext. 7084 alexandria.baltimore@vide.vi	**PAC-6** June De Leon (Guam / CNMI) 671-735-2494 June.DeLeon@guamcedders.org Terese Crisostomo (Guam) 671-300-1323 tdcrisostomo@gdoe.net Fasefulu Tigilau (CNMI) 670-237-3199 Fasefulu.Tigilau@cnmipss.org Laura Brown (CNMI) 670-237-3022 Laura.Brown@cnmipss.org	

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Introduction to the MSAA

Purpose

The Multi-State Alternate Assessment (MSAA) is a comprehensive assessment system designed to promote increasing higher academic outcomes for students with significant cognitive disabilities in preparation for a broader array of post-secondary outcomes. The MSAA is designed to measure academic content that is aligned to and derived from your state's content standards. This test contains many built-in supports that allow students to use materials they are most familiar with and communicate what they know and can do as independently as possible. The MSAA is administered in the areas of English Language Arts (ELA) and mathematics in grades 3-8 and 11.

This assessment was developed through the research and development completed by the National Center and State Collaborative (NCSC) and has been carried forward by the MSAA State Partners. MSAA is currently being administered by eleven participating states: Arizona, Arkansas, Maine, Maryland, Montana, the Pacific Assessment Consortium (PAC-6)[1], Rhode Island, South Dakota, Tennessee, U.S. Virgin Islands, and Washington, D.C.

This guide provides information regarding the administration and results of the spring 2017 MSAA to district and school personnel.

[1] The Pacific Assessment Consortium (including the entities of American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Republic of Palau, and Republic of the Marshall Islands) are collectively considered one state, led by the University of Guam Center for Excellence in Developmental Disabilities Education, Research, and Service (CEDDERS).

Student Participation

The criteria for student participation in the MSAA reflect the pervasive nature of a significant cognitive disability. All content areas should be considered when determining who should participate in this assessment. The table below shows the participation criteria and the descriptors used to determine eligibility for participation for each student.
Students must meet the following eligibility criteria:

Participation Criteria	Participation Criteria Descriptors
1. The student has a significant cognitive disability.	Review of student records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior.* *Adaptive behavior is defined as essential for someone to live independently and to function safely in daily life.
2. The student is learning content linked to (derived from) the State's Content Standards.	Goals and instruction listed in the IEP for this student are linked to the enrolled grade-level State's Content Standards and address knowledge and skills that are appropriate and challenging for this student.
3. The student requires extensive direct individualized instruction and substantial supports to achieve measureable gains in the grade and age-appropriate curriculum.	The student (a) requires extensive, repeated, individualized instruction and support that is not of a temporary or transient nature, and (b) uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings.

Assessments for students with significant cognitive disabilities rely on a foundation of communicative competence. Students who do not have receptive and expressive communication are unlikely to be able to demonstrate what they know and can do on an assessment. Students who do not have a mode of communication are identified during the assessment process.
Post assessment, teachers may use the Communication Toolkit developed by NCSC to help these students develop a mode of communication. The toolkit can be found here:
https://wiki.ncscpartners.org/index.php/Communication_Tool_Kit.

Overview of the MSAA Format

The MSAA assesses ELA (reading and writing) and mathematics at grades 3-8 and 11 and is aligned to the State's Content Standards and the MSAA Core Content Connectors. The MSAA is a computer–based, on demand, stage adaptive assessment consisting mostly of selected response and some constructed response items written at four levels of complexity. These complexity levels represent different levels of skill acquisition by students.

Students with significant cognitive disabilities often need materials and instructional strategies that are substantially adapted, scaffolded, and have built-in supports to meet their individual needs.

The MSAA levels of complexity are designed to follow instructional practices. When students begin to learn a new skill, or acquire new knowledge, they need more support. As students learn and develop mastery of that skill or knowledge, they need less support. The test items on the MSAA are developed with many scaffolds and supports embedded within the items. Supports not embedded in the test items may be provided as accommodations, as well as other allowable ways to present the item to a student, based on their individual requirements.

The assessment is a computer based test (CBT) designed to be administered one-on-one. Based on the needs of the student, the assessment may also be delivered in a paper–pencil format. The needs of the student may also be addressed through other supports and accommodations such as: reading the test aloud, having a scribe, using manipulatives, object replacement, translating the test into ASL, among others.

Each content area consists of 30-40 items that are mostly selected response. The writing portion of the ELA test contains a scaffolded writing prompt at each grade level. Each content test is divided into test sessions. Test administrators have substantial leeway in developing a testing schedule with the ability to start and stop a test depending on the engagement of the student.

Scoring

Scoring of most items is accomplished within the online test platform. The selected response items are scored as correct or incorrect by the test platform based on the answer keys programmed into the system. Other constructed response items are scored by the Test Administrator and then marked correct or incorrect in the test platform. Items without responses receive a score of zero.

The writing prompts at each grade level were field tested this year. Student responses are hand-scored. Results from the writing prompts will not be included on score reports and are not part of the overall ELA score for the 2016-17 year.

MSAA Score Reports

Overview

This guide describes the types of score reports provided for the 2016-17 MSAA administration. The data in the sample reports are for illustrative purposes only and are not intended to reflect performance of any student(s).

Information included on the score reports:

- *Performance Levels* describe how the student performed in relation to the knowledge and skills of that content area and grade level. Each performance level has two components: the scale scores that make up each level and the performance level descriptors. The performance level descriptors are broad and general statements regarding skills and abilities of students who have attained each level. Performance levels for the MSAA were established by committees of educators after the first NCSC administration of the assessment in 2015. Performance level descriptors for each content area and grade level can be found in Appendix A of this document. The scale score ranges that make up each performance level can be found in Appendix B.
- *Scale scores* report the performance level the student achieved. Scale scores are more precise than performance levels and may be used to make comparisons between groups of students, schools, and districts. In Appendix B, Table 1 shows the scale score ranges for each performance level, content area, and grade level.
- *Descriptive and informative reports*. In addition to including student demographic information, performance level, and scale scores, the Individual Student Report contains supportive information about student performance and MSAA measures.

Interpreting and Using the MSAA Scores

The MSAA tests student performance in ELA and mathematics, based on States Content Standards. The student's performance level is based on alternate achievement standards. Results for the MSAA are reported by a scale score and performance level for each content area.

MSAA scores should be used in conjunction with the Individualized Education Program (IEP) progress reports, student work, diagnostic assessments, district-required assessments, and report cards in order to place the student's performance on academic content and skills in context and to provide a complete picture of the student's progress across a wide range of categories.

It is helpful to read the Performance Level Descriptors to understand the expectations for the performance level and grade level for each student. This information can provide a concrete link from the test to instructional planning.

Talking to Parents and Guardians

When talking to parents and guardians about their child's score, it may be helpful to keep the following in mind:

- The MSAA is a fairly new alternate assessment this school year for states, and we recognize that student achievement may differ between MSAA and the previous state assessments for ELA (reading and writing) and mathematics.
- Previous state assessments measured the old state standards whereas MSAA measures progress toward post-secondary options using the new Common Core Connectors; which are aligned to the States' Content Standards.
- Unless you were part of the NCSC assessment, do not compare results in ELA and mathematics from previous state alternate assessments, with the results of MSAA because they are different tests that measure different standards.
- The MSAA assessments are based on higher learning standards than states have had before, and the MSAA assessment results are still a new baseline for all states.
- MSAA assessment results should be used along with local assessment results and other information to determine what changes in curriculum and instruction may be needed to support students learning.
- MSAA scores alone should not be used to make placement or eligibility decisions.

Special Reporting Codes and Messages

In some cases students were assigned a special reporting code. A complete list of special reporting codes and their associated descriptions is provided below. For additional information or interpretation of special reporting codes, contact your MSAA State Lead.

Test Status		
Code	**Test Status**	**Description**
ESR	Early Stopping Rule	If the TA did not observe a student response after the presentation of 4 items, the test was closed by the TA
ESM	Early Stopping Rule Misadministration	Testing may have ended early on the basis that a consistent mode of communication was not observed. At least one response was recorded for the student, but the student may not have had the opportunity to complete the entire test.
INC	Tested - Incomplete	The student's test was not submitted by the close of testing. The student may not have had the opportunity to complete the entire test.
IRR	Administration Irregularity	An administration irregularity not necessitating an invalidation of scores was reported for the student's test.
INV	Invalidated	The results of the student's test have been invalidated.
PRF	Parental Refusal	The student did not test due to a Parent/Guardian refusal.
ELL	ELL Exempt (ELA Only)	The student was exempt from ELA testing due to being a first year English Language Learner.
EXE	Exempt (Emergency, Medical, Other)	The student was exempt from testing.
DNT	Did Not Test	The student did not test via the MSAA assessment.
WDR	Withdrew	The student withdrew.
NLE	No Longer Eligible	The student is not eligible to test via the MSAA assessment.

Types of Score Reports

Below are the types of MSAA score reports that will be available on the MSAA Reporting Portal. Only District testing coordinators using their current MSAA username and password may access the MSAA reports here: https://www.msaaassessment.org under the Reporting Tab. All MSAA score reports are confidential documents.

- Reports for the District
  - District Summary Report
  - Student Results File CSV
- Reports for the School
  - School Summary report
  - School Roster Report
  - Student Results File CSV
  - Individual Student Report

If you have any questions about accessing these MSAA reports, contact your MSAA State Lead. Contact information can be found at the beginning of this document.

Student Results File CSV

A CSV file of all student results will be available to District Test Coordinators through the MSAA Reporting Portal. For information regarding this file, contact your MSAA State Lead.

Testing Participation Requirements by Content Area

All students in grades 3 – 8 and 11 are required to be assessed in ELA and mathematics. Participation Status is assigned independently for ELA and mathematics.

All Submitted tests receive a Participation Status, regardless of the number of item responses.

For additional information regarding the reported test status, contact your MSAA State Lead. Contact information can be found at the beginning of this document.

Reports for District

District Summary Report

The *District Summary Report* (DSR) provides district staff with a summary of student participation and performance by district and school. See Figure 1 below.

Figure 1 – Sample District Summary Report

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Multi-State Alternate Assessment

1 English Language Arts

SUMMARY REPORT
2 Demonstration State
Demonstration District A

		4 Enrolled	Tested	Did Not Test	Average Scale Score	5 Performance Level Level 1		Level 2		Level 3		Level 4	
						N	%	N	%	N	%	N	%
3 Grade 03	State	9	2	7	1241	1	50	0	0	1	50	0	0
	District	8	2	6	1241	1	50	0	0	1	50	0	0
Grade 04	State	10	5	5	1232	3	60	2	40	0	0	0	0
	District	7	4	3	1231	3	75	1	25	0	0	0	0
Grade 05	State	10	8	2	1241	3	38	1	13	3	38	1	13
	District	8	6	2	1245	2	33	0	0	3	50	1	17
Grade 06	State	10	5	5	1236	2	40	2	40	1	20	0	0
	District	7	4	3	1238	1	25	2	50	1	25	0	0
Grade 07	State	10	8	2	1249	3	38	0	0	1	13	4	50
	District	8	6	2	1247	2	33	0	0	1	17	3	50
Grade 08	State	10	9	1	1247	1	11	3	33	2	22	3	33
	District	7	7	0	1244	1	14	2	29	2	29	2	29
Grade 11	State	10	10	0	1261	1	10	1	10	3	30	5	50
	District	8	8	0	1263	1	13	1	13	2	25	4	50

The District Summary Report contains the following features, highlighted above:

1. Content Area of the report.
2. State and District included in the report.
3. Summary of results by Grade Level. The state and district data shown here are other third graders in the state and district.
4. Number of students Enrolled, Tested, Invalid and Did Not Test, and Average Scale Score by State, District and School. Refer to the Special Reporting Codes and Messages for information regarding test status.
5. The number and percentage of students at each performance level by grade in the state, district.

Reports for the School

School Summary Report

Figure 2 – Sample School Summary Report

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1 English Language Arts

SUMMARY REPORT
2 Demonstration State
Demonstration District A
Demonstration School 1

3 4 5

		Enrolled	Tested	Did Not Test	Average Scale Score	Performance Level							
						Level 1		Level 2		Level 3		Level 4	
						N	%	N	%	N	%	N	%
Grade 03	State	9	2	7	1241	1	50	0	0	1	50	0	0
	District	8	2	6	1241	1	50	0	0	1	50	0	0
	School	3	0	3									
Grade 04	State	10	5	5	1232	3	60	2	40	0	0	0	0
	District	7	4	3	1231	3	75	1	25	0	0	0	0
	School	4	2	2	1233	1	50	1	50	0	0	0	0
Grade 05	State	10	8	2	1241	3	38	1	13	3	38	1	13
	District	8	6	2	1245	2	33	0	0	3	50	1	17
	School	3	2	1	1246	1	50	0	0	0	0	1	50
Grade 06	State	10	5	5	1236	2	40	2	40	1	20	0	0
	District	7	4	3	1238	1	25	2	50	1	25	0	0
	School	3	1	2	1236	0	0	1	100	0	0	0	0
Grade 07	State	10	8	2	1249	3	38	0	0	1	13	4	50
	District	8	6	2	1247	2	33	0	0	1	17	3	50
	School	4	2	2	1244	1	50	0	0	0	0	1	50
Grade 08	State	10	9	1	1247	1	11	3	33	2	22	3	33
	District	7	7	0	1244	1	14	2	29	2	29	2	29
	School	3	3	0	1243	1	33	1	33	0	0	1	33
Grade 11	State	10	10	0	1261	1	10	1	10	3	30	5	50
	District	8	8	0	1263	1	13	1	13	2	25	4	50
	School	3	3	0	1283	0	0	0	0	0	0	3	100

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The School Summary Report contains the following features, highlighted above:

1. Content Area of the report.
2. State, District and School included in the report.
3. Summary of results by Grade Level. The state and district data shown here are other third graders in the state, district and school.
4. Number of students Enrolled, Tested, Invalid and Did Not Test, and Average Scale Score by State, District and School. Refer to the Special Reporting Codes and Messages for information regarding test status.
5. The number and percentage of students at each performance level by grade in the state, district and school.

School Roster Report

The school roster report provides student performance information at the school level for each grade, including each student's test status, scale score and performance level. See Figure 3 below.

Figure 3 – Sample School Roster Report

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Multi-State Alternate Assessment

SCHOOL ROSTER REPORT
Demonstration State
Demonstration District A
Demonstration School 1
Grade 04

1

2

3

	English Language Arts							Mathematics						
	Enrolled	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)
State	10	5	1232	60	40	0	0	7	1230	57	43	0	0
District	7	4	1231	75	25	0	0	6	1231	50	50	0	0
School	4	2	1233	50	50	0	0	4	1229	50	50	0	0

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4

Student Name Student ID	English Language Arts				Mathematics			
	Test Status*	State Compare	Scale Score	Performance Level	Test Status*	State Compare	Scale Score	Performance Level
LastName11, First11 17669	DNT					-	1220	Level 1
LastName13, First13 17665		-	1226	Level 1		+	1238	Level 2
LastName17, First17 17558	DNT					+	1238	Level 2
LastName19, First19 17560		+	1239	Level 2		-	1220	Level 1

6

State Comparison Key
- \- Performance is lower than state average
- = Performance is similar to state average
- \+ Performance is greater than state average

*For descriptions of the Test Statuses, see your State's Guide for Score Report Interpretation.

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Page 1

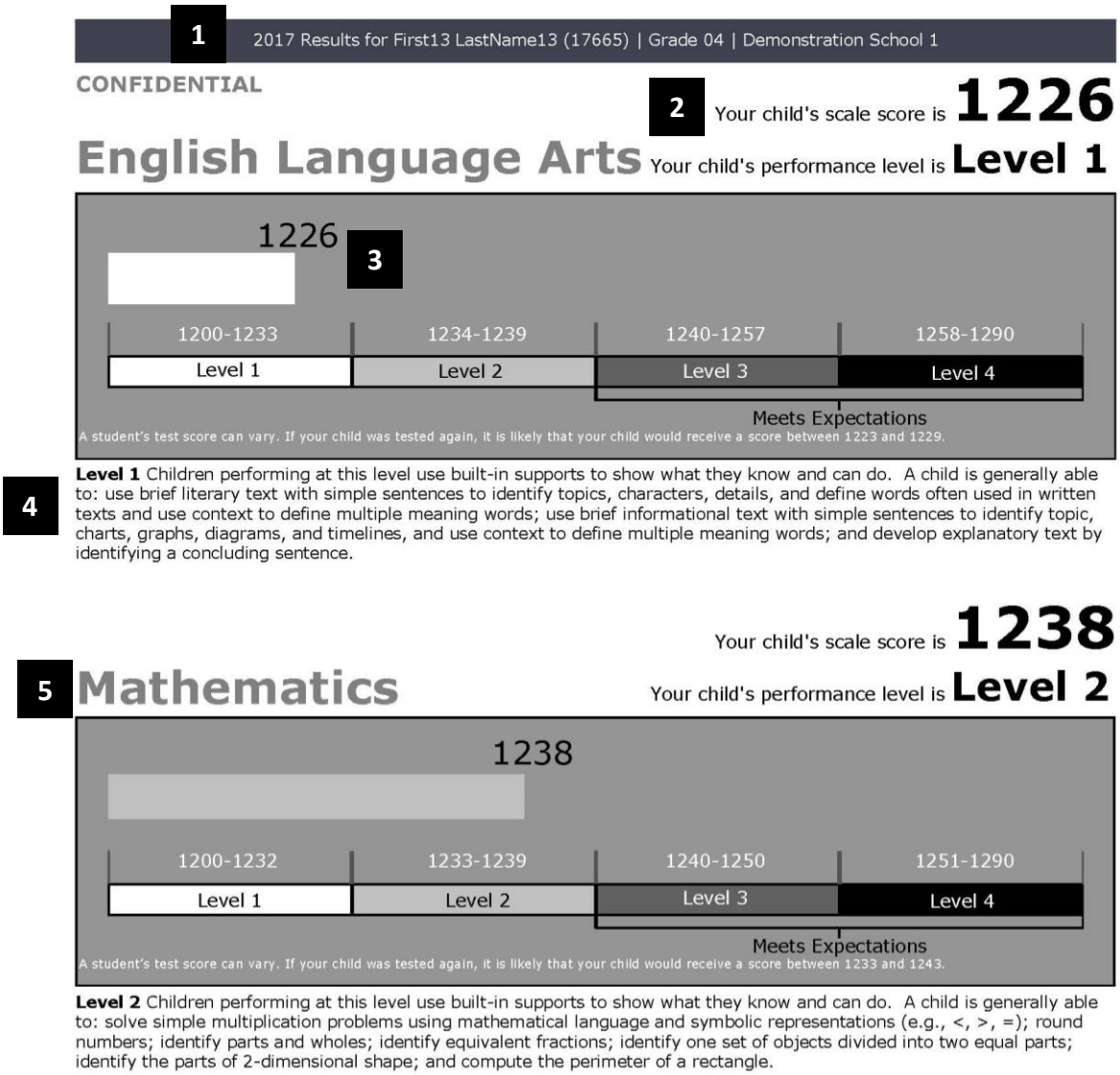
The School Roster Report contains the following features, highlighted above:

1. The state, district and school included in the report.
2. The results are displayed by Content Area.
3. A summary of enrolled and tested students and the average scale score for the state, district and reported school.
4. This section of the report includes all students tested at the school for the specified grade.
5. For each content area the student's test status, comparison to other students in the same grade level in the state, scale score and performance level is displayed.
6. This key shows symbols used in the "State Compare" column.

Individual Student Report

The Individual Student Report (ISR) provides scale score and performance level information for a specific student. Figure 4 shows page 2 of the ISR. A full sample ISR is included in Appendix B.

Figure 4 – Sample Individual Student Report



The Individual Student Report contains the following features, highlighted above:

1. The report header includes the student's full name, student ID, Grade and School.
2. The student's scale score and performance level for each content area is shown.
3. This display shows the student's score compared to the performance level scale.
4. This text shows the performance level descriptor for the student's performance level.
5. The results for each content area are displayed separately on the report.

Appendix A

Performance Level Descriptors

Performance Level Descriptors for ELA and Mathematics

MSAA developed Performance Level Descriptors for ELA and mathematics at grades 3-8 and 11 through an iterative process involving multiple stakeholder groups. The MSAA partnership developed grade-level PLDs to summarize the knowledge, skills, and abilities (KSAs) prioritized for the MSAA that students need to attain at each level of achievement (Level 1- Level 4). Each performance level is understood to include the knowledge, skills and abilities of the preceding performance levels.

The performance descriptors included in Appendix A provide a detailed description for teachers, parents, and the public to see not only what grade-level content a student should know and be able to do in order to meet high expectations, but also the depth, breadth, and complexity of that content.

By using the PLDs, test results become multi-dimensional. Test results in the form of scale scores are one way educators, parents, and guardians find out where a student's performance is in relation to other students. The PLDs provide another dimension that completes the description of how a student interacts with the standards the test measures. Both of the scale score and the PLDs provide information that helps teachers, schools, parents and guardians build a path to student learning.

Grade 3 ELA Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, he/she is able to: • identify the topic of a literary text • identify a detail from a literary text • identify a character or setting in a literary text • identify the topic of an informational text • identify a title, caption, or heading in an informational text • identify an illustration related to a given topic • identify a topic presented by an illustration • identify the meaning of words (i.e., nouns)	**In reading, he/she is able to:** • determine the central idea and supporting details in literary text • determine the main idea and identify supporting details in informational text • determine the main idea of visually presented information • identify the purpose of text features in informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use context to identify the meaning of multiple meaning words	**In reading, he/she is able to:** • determine the central idea and supporting details in literary text • determine the main idea and identify supporting details in informational text • determine the main idea of visually presented information • identify the purpose of text features in informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use context to identify the meaning of multiple meaning words	**In reading, he/she is able to:** • determine the central idea and supporting details in literary text • determine the main idea and identify supporting details in informational text • determine the main idea of visually presented information • identify the purpose of text features in informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use context to identify the meaning of multiple meaning words
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details from a literary text to answer specific questions • describe the relationship between characters, and character and setting in literary text	• use details from a literary text to answer specific questions • describe the relationship between characters, and character and setting in literary text	
	•	•	
AND in writing, he/she is able to: • identify a statement related to an everyday topic	**AND in writing, he/she is able to:** • identify the category related to a set of facts	**AND in writing, he/she is able to:** • identify a text feature (e.g., captions, graphs or diagrams) to present information in explanatory text	

Grade 4 ELA Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, he/she is able to: • identify a topic of a literary text • identify a detail from a literary text • identify a character in a literary text • identify charts, graphs, diagrams, or timelines in an informational text • identify a topic of an informational text • use context to identify the meaning of multiple meaning words • identify general academic words	**In reading, he/she is able to:** • determine the theme of literary text and identify supportive details • describe character traits using text-based details in literary text • determine the main idea of informational text • locate information in charts, graphs, diagrams, or timelines • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words	**In reading, he/she is able to:** • determine the theme of literary text and identify supportive details • determine the main idea of informational text • explain how the information provided in charts, graphs, diagrams, or timelines contributes to an understanding of informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words	**In reading, he/she is able to:** • determine the theme of literary text and identify supportive details • determine the main idea of informational text • explain how the information provided in charts, graphs, diagrams, or timelines contributes to an understanding of informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details from a literary text to answer specific questions • use context to identify the meaning of multiple meaning words	• use details from a literary text to answer specific questions • describe character traits using text-based details in literary text • use context to identify the meaning of multiple meaning words	
	•	•	
AND in writing, he/she is able to: • identify the concluding sentence in a short explanatory text	**AND in writing, he/she is able to:** • identify a concluding sentence related to information in explanatory text	**AND in writing, he/she is able to:** • identify a text feature (e.g., headings, charts, or diagrams) to present information in explanatory text	

Grade 5 ELA Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td rowspan="3">In reading, he/she is able to:
• identify an event from the beginning of a literary text
• identify a detail from a literary text
• identify a character, setting and event in a literary text
• identify the topic of an informational text
• identify the main idea of an informational text
• identify the difference in how information is presented in two sentences</td><td>In reading, he/she is able to:
• compare characters, settings, and events in literary text
• determine the main idea and identify supporting details in informational text
• use details from the text to support an author’s point in informational text
• compare and contrast how information and events are presented in two informational texts
• use context to identify the meaning of multiple meaning words</td><td>In reading, he/she is able to:
• compare characters, settings, and events in literary text
• determine the main idea and identify supporting details in informational text
• use details from the text to support an author’s point in informational text
• compare and contrast how information and events are presented in two informational texts
• use context to identify the meaning of multiple meaning words</td><td rowspan="4">In reading, he/she is able to:
• compare characters, settings, and events in literary text
• determine the main idea and identify supporting details in informational text
• use details from the text to support an author’s point in informational text
• compare and contrast how information and events are presented in two informational texts
• use context to identify the meaning of multiple meaning words</td></tr>
<tr><td>AND with Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>AND with High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td>• summarize a literary text from beginning to end
• use details from a literary text to answer specific questions</td><td>• summarize a literary text from beginning to end
• use details from a literary text to answer specific questions</td></tr>
<tr><td>AND in writing, he/she is able to:
• identify the category related to a set of common nouns</td><td>AND in writing, he/she is able to:
• identify a sentence that is organized for a text structure such as comparison/contrast</td><td>AND in writing, he/she is able to:
• support an explanatory text topic with relevant information</td></tr>
</table>

Grade 6 ELA Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td rowspan="3">In reading, he/she is able to:
• identify an event from the beginning or end of a literary text
• identify a detail from a literary text
• identify a character in a literary text
• identify the topic of an informational text
• identify the main idea of an informational text
• identify a fact from an informational text
• identify a description of an individual or event in an informational text
• use context to identify the meaning of multiple meaning words
• identify the meaning of general academic words</td><td>In reading, he/she is able to:
• summarize a literary text from beginning to end without including personal opinions
• support inferences about characters using details in literary text
• use details from the text to elaborate a key idea in informational text</td><td>In reading, he/she is able to:
• summarize a literary text from beginning to end without including personal opinions
• support inferences about characters using details in literary text
• summarize an informational text without including personal opinions
• use details from the text to elaborate a key idea in informational text
• use evidence from the text to support an author’s claim in informational text
• summarize information presented in two informational texts
• use domain specific words accurately</td><td rowspan="4">In reading, he/she is able to:
• summarize a literary text from beginning to end without including personal opinions
• use details from a literary text to answer specific questions
• support inferences about characters using details in literary text
• use details from the text to elaborate a key idea in an informational text
• use evidence from the text to support an author’s claim in informational text
• use domain specific words accurately</td></tr>
<tr><td>AND with Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>AND with High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td>• use details from a literary text to answer specific questions
• use context to identify the meaning of multiple meaning words</td><td>• use details from a literary text to answer specific questions
• use context to identify the meaning of multiple meaning words</td></tr>
<tr><td>AND in writing, he/she is able to:
• identify an everyday order of events</td><td>AND in writing, he/she is able to:
• identify the next event in a brief narrative</td><td>AND in writing, he/she is able to:
• identify transition words and phrases to convey a sequence of events in narrative text</td></tr>
</table>

Grade 7 ELA Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, he/she is able to: • identify a theme from a literary text • identify an inference from a literary text • identify a conclusion from an informational text • identify a claim the author makes in an informational text • compare and contrast two statements related to the same topic • use context to identify the meaning of words	**In reading, he/she is able to:** • identify the relationship between individuals or events in an informational text • use evidence from the text to support an author's claim in informational text in informational text	**In reading, he/she is able to:** • use details to support a conclusion from informational text • use details to explain how the interactions between individuals, events or ideas in informational texts are influenced by each other • use evidence from the text to support an author's claim in informational text • compare and contrast how two authors write about the same topic in informational texts • use context to identify the meaning of grade-level phrases	**In reading, he/she is able to:** • use details to support a conclusion from informational text • use details to explain how the interactions between individuals, events or ideas in informational texts are influenced by each other • use evidence from the text to support an author's claim in informational text • compare and contrast how two authors write about the same topic in informational texts • use context to identify the meaning of grade-level phrases
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• use details to support themes from literary text • use details to support inferences from literary text	• use details to support themes from literary text • use details to support inferences from literary text	
AND in writing, he/she is able to: • identify a graphic that includes an event as described in a text	**AND in writing, he/she is able to:** • identify the next event in a brief narrative	**AND in writing, he/she is able to:** • identify a sentence that provides a conclusion in narrative text	

Grade 8 ELA Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td rowspan="4">In reading, he/she is able to:
• identify a theme from a literary text
• identify an inference from a literary text
• identify a fact related to a presented argument in informational text
• identify a similar topic in two informational texts
• use context to identify the meaning of multiple meaning words
• identify the meaning of general academic words</td><td>In reading, he/she is able to:
• use details to support a conclusion from literary text
• identify an inference drawn from an informational text
• identify the portion of text which contains specific information
• identify an argument the author makes in informational text
• examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation
• use domain specific words or phrases accurately</td><td>In reading, he/she is able to:
• use details to support a conclusion from literary text
• use details to support an inference from informational text
• identify the information (e.g., facts or quotes) in a section of text that contributes to the development of an idea
• identify an argument the author makes in informational text
• examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation
• use domain specific words and phrases accurately</td><td rowspan="4">In reading, he/she is able to:
• use details to support a conclusion from literary text
• use details to support an inference from informational text
• identify the information (e.g., facts or quotes) in a section of text that contributes to the development of an idea
• identify an argument the author makes in informational text
• examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation
• use domain specific words and phrases accurately</td></tr>
<tr><td></td><td>AND with Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>AND with High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td></td><td>• analyze the development of a theme including the relationship between a character and an event in literary text
• use context to identify the meaning of grade-level words and phrases</td><td>• analyze the development of a theme including the relationship between a character and an event in literary text
• use context to identify the meaning of grade-level words and phrases</td></tr>
<tr><td>AND in writing, he/she is able to:
• identify a writer’s opinion</td><td>AND in writing, he/she is able to:
• identify an idea relevant to a claim</td><td>AND in writing, he/she is able to:
• identify relevant information to support a claim</td></tr>
</table>

Grade 11 ELA Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, he/she is able to: • identify a summary of a literary text • identify an event from a literary text • identify the central idea of an informational text • identify facts from an informational text • identify what an author tells about a topic in informational text • use context to identify the meaning of multiple meaning words • identify a word used to describe a person, place, thing, action or event	**In reading, he/she is able to:** • use details to support a summary of literary text • identify a conclusion from an informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts	**In reading, he/she is able to:** • use details to support a summary of literary text • use details to support a conclusion presented in informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts	**In reading, he/she is able to:** • use details to support a summary of literary text • use details to support a conclusion presented in informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• evaluate how the author's use of specific details in literary text contributes to the text • determine an author's point of view about a topic in informational text • use context to identify the meaning of grade-level phrases	• evaluate how the author's use of specific details in literary text contributes to the text • determine an author's point of view about a topic in informational text • use context to identify the meaning of grade-level phrases	
AND in writing, he/she is able to: • identify information which is unrelated to a given topic	**AND in writing, he/she is able to:** • identify how to group information for a specific text structure	**AND in writing, he/she is able to:** • identify relevant information to address a given topic and support the purpose of a text	

Grade 3 Mathematics Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>High task complexity -
Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements</td></tr>
<tr><td rowspan="3">He/she is able to:
• solve addition problems
• identify growing number patterns
• identify an object showing a specified number of parts shaded
• identify which object has the greater number of parts shaded
• identify an object equally divided in two parts
• identify the number of objects to be represented in a pictograph</td><td>He/she is able to:
• solve addition and subtraction word problems
• identify an arrangement of objects which represents factors in a problem
• solve multiplication equations in which both numbers are equal to or less than five
• identify multiplication patterns
• identify a set of objects as nearer to 1 or 10
• identify a representation of the area of a rectangle</td><td>He/she is able to:
• solve addition and subtraction word problems
• check the correctness of an answer in the context of a scenario
• solve multiplication equations in which both numbers are equal to or less than five
• identify multiplication patterns
• match fraction models to unitary fractions
• compare fractions with different numerators and the same denominator
• transfer data from an organized list to a bar graph</td><td rowspan="3">He/she is able to:
• solve addition and subtraction word problems
• check the correctness of an answer in the context of a scenario
• solve multiplication equations in which both numbers are equal to or less than five
• identify multiplication patterns
• match fraction models to unitary fractions
• compare fractions with different numerators and the same denominator
• transfer data from an organized list to a bar graph</td></tr>
<tr><td>AND with Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>AND with High task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td></tr>
<tr><td>• identify geometric figures which are divided into equal parts</td><td>• round numbers to nearest 10
• identify geometric figures which are divided into equal parts
• count unit squares to compute the area of a rectangle</td></tr>
</table>

Grade 4 Mathematics Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
He/she is able to: • identify an array with the same number of objects in each row • identify values rounded to nearest tens place • identify equivalent representations of a fraction (e.g., shaded diagram) • compare representations of a fraction (e.g., shaded diagram) • identify a rectangle with the larger or smaller perimeter • identify a given attribute of a shape • identify the data drawn in a bar graph that represents the greatest value	**He/she is able to:** • match a model to an multiplication expression using two single digit numbers • identify a model of a multiplicative comparison • show division of objects into equal groups • round numbers to nearest 10, 100 or 1000 • differentiate parts and wholes • compute the perimeter of a rectangle	**He/she is able to:** • solve multiplication word problems • show division of objects into equal groups • round numbers to nearest 10, 100, or 1000 • compare two fractions with different denominators • sort a set of 2-dimensional shapes • compute the perimeter of a rectangle • transfer data to a graph	**He/she is able to:** • solve multiplication word problems • show division of objects into equal groups • round numbers to nearest 10, 100 or 1000 • compare two fractions with different denominators • sort a set of 2-dimensional shapes • compute the perimeter of a rectangle • transfer data to a graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify equivalent fractions • select a 2-dimensional shape with a given attribute	• solve a multiplicative comparison word problem using up to two-digit numbers • check the correctness of an answer in the context of a scenario • identify equivalent fractions	

Grade 5 Mathematics Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
He/she is able to: • solve one-step subtraction word problems • divide sets (no greater than 6) into two equal parts • identify values in the tenths place • identify a number in the ones, tens or hundreds place • identify a given axis of a coordinate plan • match the conversion of 3 feet to 1 yard to a model • calculate elapsed time (i.e., hours) • identify whether the values increase or decrease in a line graph	**He/she is able to:** • identify if the total will increase or decrease when combining sets • perform operations with decimals • identify a symbolic representation of the addition of two fractions • identify place values to the hundredths place • convert standard measurements	**He/she is able to:** • solve multiplication and division word problems • perform operations with decimals • solve word problems involving fractions • identify place values to the hundredths place • locate a given point on a coordinate plane when given an ordered pair • convert standard measurements • convert between minutes and hours • make quantitative comparisons between data sets shown as line graphs	**He/she is able to:** • solve multiplication and division word problems • perform operations with decimals • solve word problems involving fractions • identify place values to the hundredths place • locate a given point on a coordinate plane when given an ordered pair • convert standard measurements • convert between minutes and hours • make quantitative comparisons between data sets shown as line graphs
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• compare the values of two products based upon multipliers • round decimals to nearest whole number	• compare the values of two products based upon multipliers • round decimals to nearest whole number	

Grade 6 Mathematics Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>High task complexity -
Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements</td></tr>
<tr><td rowspan="4">He/she is able to:
• identify a model of a given percent
• match a given unit rate to a model
• identify a representation of two equal sets
• identify a number less than zero on a number line
• identify the meaning of an unknown in a modeled equation
• count the number of grids or tiles inside a rectangle to find the area of a rectangle
• identify the object that appears most frequently in a set of data (mode)
• identify a representation of a set of data arranged into even groups (mean)</td><td>He/she is able to:
• match a given ratio to a model
• recognize a representation of the sum of two halves
• solve real world measurement problems involving unit rates
• identify a representation of a value less than zero
• identify the median or the equation needed to determine the mean of a set of data</td><td>He/she is able to:
• perform operations using up to three-digit numbers
• solve real world measurement problems involving unit rates
• identify positive and negative values on a number line
• determine the meaning of a value from a set of positive and negative integers
• solve word problems with expressions including variables
• compute the area of a parallelogram
• identify the median or the equation needed to determine the mean of a set of data</td><td rowspan="4">He/she is able to:
• solve real world measurement problems involving unit rates
• identify positive and negative values on a number line
• solve word problems with expressions including variables
• compute the area of a parallelogram
• identify the median or the equation needed to determine the mean of a set of data</td></tr>
<tr><td>AND with Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>AND with High task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td></tr>
<tr><td>• perform one-step operations with two decimal numbers
• solve word problems using a percent</td><td>• perform one-step operations with two decimal numbers
• solve word problems using a percent
• solve word problems using ratios and rates</td></tr>
</table>

Grade 7 Mathematics Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>High task complexity -
Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements</td></tr>
<tr><td rowspan="4">He/she is able to:
• identify a representation which represents a negative number and its multiplication or division by a positive number
• identify representations of area and circumference of a circle
• identify representations of surface area
• make qualitative comparisons when interpreting a data set presented on a bar graph or in a table</td><td>He/she is able to:
• match a given ratio to a model
• identify the meaning of an unknown in a modeled equation
• describe a directly proportional relationship (i.e., increases or decreases)
• find the surface area of three-dimensional right prism</td><td>He/she is able to:
• solve division problems with positive/negative whole numbers
• solve word problems involving ratios
• use a proportional relationship to solve a percentage problem
• identify proportional relationships between quantities represented in a table
• identify unit rate (constant of proportionality) in tables and graphs of proportional relationships
• compute the area of a circle
• find the surface area of a three-dimensional right prism</td><td rowspan="4">He/she is able to:
• solve division problems with positive/negative whole numbers
• solve word problems involving ratios
• identify proportional relationships between quantities represented in a table
• compute the area of a circle
• find the surface area of a three-dimensional right prism</td></tr>
<tr><td>AND with Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>AND with High task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td></tr>
<tr><td>• solve multiplication problems with positive/negative whole numbers
• interpret graphs to qualitatively contrast data sets</td><td>• solve multiplication problems with positive/negative whole numbers
• evaluate variable expressions that represent word problems
• interpret graphs to qualitatively contrast data sets</td></tr>
</table>

Grade 8 Mathematics Performance Level Descriptors

Level 1	Level 2	Level 3	Level 4
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
He/she is able to: • locate a given decimal number on a number line • identify the relatively larger data set when given two data sets presented in a graph • identify congruent rectangles • identify similar rectangles • identify an attribute of a cylinder • identify a rectangle with the larger or smaller area as compared to another rectangle • identify an ordered pair and its point on a graph	**He/she is able to:** • identify the solution to an equation which contains a variable • identify the y-intercept of a linear graph • match a given relationship between two variables to a model • identify a data display that represents a given situation • interpret data presented in graphs to identify associations between variables	**He/she is able to:** • locate approximate placement of an irrational number on a number line • solve a linear equation which contains a variable • identify the relationship shown on a linear graph • calculate slope of a positive linear graph • compute the change in area of a figure when its dimensions are changed • solve for the volume of a cylinder • plot provided data on a graph	**He/she is able to:** • locate approximate placement of an irrational number on a number line • solve a linear equation which contains a variable • identify the relationship shown on a linear graph • compute the change in area of a figure when its dimensions are changed • plot provided data on a graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify congruent figures • use properties of similarity to identify similar figures • interpret data tables to identify the relationship between variables	• interpret data presented in graphs to identify associations between variables • interpret data tables to identify the relationship between variables • use properties of similarity to identify similar figures • identify congruent figures	

<table>
<tr><th>Level 1</th><th>Level 2</th><th>Level 3</th><th>Level 4</th></tr>
<tr><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>High task complexity -
Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements</td></tr>
<tr><td rowspan="4">He/she is able to:
• arrange a given number of objects into two sets in multiple combinations
• match an equation with a variable to a provided real world situation
• determine whether a given point is or is not part of a data set shown on a graph
• identify an extension of a linear graph
• use a table to match a unit conversion
• complete the formula for area of a figure</td><td>He/she is able to:
• identify the model that represents a square number
• identify variable expressions which represent word problems
• identify the hypotenuse of a right triangle
• identify the greatest or least value in a set of data shown on a number line
• identify the missing label on a histogram
• calculate the mean and median of a set of data</td><td>He/she is able to:
• compute the value of an expression that includes an exponent
• identify variable expressions which represent word problems
• solve real world measurement problems that require unit conversions
• find the missing attribute of a three-dimensional figure
• determine two similar right triangles when a scale factor is given
• make predictions from data tables and graphs to solve problems
• plot data on a histogram
• calculate the mean and median of a set of data</td><td rowspan="4">He/she is able to:
• identify variable expressions which represent word problems
• solve real world measurement problems that require unit conversions
• determine two similar right triangles when a scale factor is given
• make predictions from data tables and graphs to solve problems
• plot data on a histogram
• calculate the mean and median of a set of data</td></tr>
<tr><td>AND with Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>AND with High task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td></tr>
<tr><td>• identify the linear representation of a provided real world situation
• use an equation or a linear graphical representation to solve a word problem</td><td>• identify the linear representation of a provided real world situation
• use an equation or a linear graphical representation to solve a word problem
• identify a histogram which represents a provided data set</td></tr>
</table>

Appendix B

Individual Student Report

Multi-State Alternate Assessment

Spring 2017 English Language Arts and Mathematics Results for First13 LastName13 | Demonstration School 1 | Grade 04

Dear Parents and Guardians,

This report shows your child's scale score and performance level for the 2017 Multi-State Alternate Assessment (MSAA) in Mathematics and English Language Arts (ELA).

The MSAA is a group of states that have partnered to develop and administer your state's online alternate assessment for Mathematics and ELA for grades 3 - 8 and 11. The MSAA is designed to assess students with significant cognitive disabilities and measures academic content that is aligned to and derived from your state's content standards. The test contains many built-in supports that allow students to take the test using materials they are most familiar with and to communicate what they know and can do as independently as possible. These are some of the built-in supports found in the MSAA:

- shortened ELA reading passages
- pictures, charts, tables, and maps to help students understand the reading passages
- models and examples that explain important ideas and concepts that students can use during the ELA and mathematics tests
- common geometric shapes such as circles, triangles, and squares
- smaller numbers on the mathematics tests
- the option to have the entire test read aloud

In order to support communication independence to the greatest extent possible, the MSAA is designed to work with different communication modes and systems. Please discuss the supports your child used on the MSAA with your child's teacher.

On the following pages, the scale score and performance levels for each content area summarizes your child's performance on the ELA and mathematics. The performance level descriptors describe the knowledge and skills that children who perform at this level generally demonstrate.

More information and resources for helping your child are available at your state's alternate assessment web page or by talking with your child's teacher. If you require this letter or your child's report in a different format, please contact your state's department of education.

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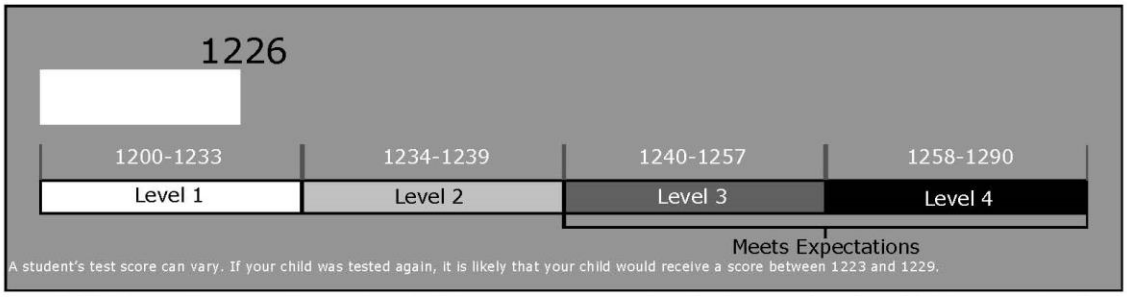
Your child's scale score is **1226**

English Language Arts

Your child's performance level is **Level 1**

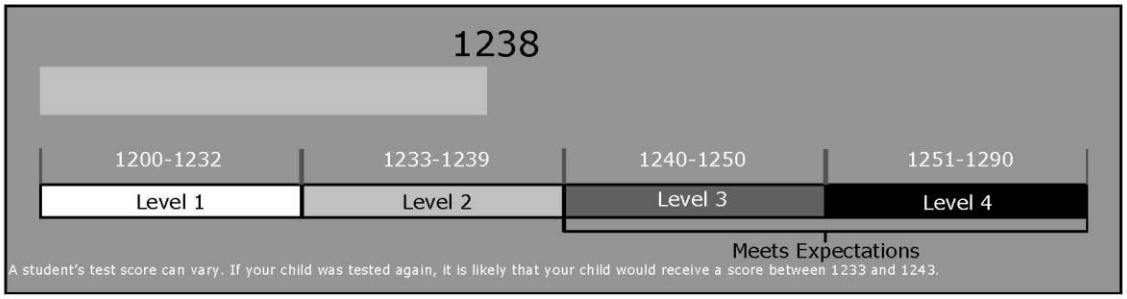


Level 1 Children performing at this level use built-in supports to show what they know and can do. A child is generally able to: use brief literary text with simple sentences to identify topics, characters, details, and define words often used in written texts and use context to define multiple meaning words; use brief informational text with simple sentences to identify topic, charts, graphs, diagrams, and timelines, and use context to define multiple meaning words; and develop explanatory text by identifying a concluding sentence.

Your child's scale score is **1238**

Mathematics

Your child's performance level is **Level 2**



Level 2 Children performing at this level use built-in supports to show what they know and can do. A child is generally able to: solve simple multiplication problems using mathematical language and symbolic representations (e.g., <, >, =); round numbers; identify parts and wholes; identify equivalent fractions; identify one set of objects divided into two equal parts; identify the parts of 2-dimensional shape; and compute the perimeter of a rectangle.

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Table 1

2017 Performance-Level Scale Score Ranges by Content Area and Grade

Performance Level	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11
English Language Arts							
Level 4	1251-1290	1258-1290	1256-1290	1253-1290	1255-1290	1250-1290	1255-1290
Level 3	1240-1250	1240-1257	1240-1255	1240-1252	1240-1254	1240-1249	1240-1254
Level 2	1234-1239	1234-1239	1232-1239	1231-1239	1236-1239	1230-1239	1236-1239
Level 1	1200-1233	1200-1233	1200-1231	1200-1230	1200-1235	1200-1229	1200-1235
Mathematics							
Level 4	1254-1290	1251-1290	1255-1290	1249-1290	1254-1290	1249-1290	1249-1290
Level 3	1240-1253	1240-1250	1240-1254	1240-1248	1240-1253	1240-1248	1240-1248
Level 2	1236-1239	1233-1239	1231-1239	1234-1239	1232-1239	1234-1239	1234-1239
Level 1	1200-1235	1200-1232	1200-1230	1200-1233	1200-1231	1200-1233	1200-1233

Appendix C

Writing Scoring Rubrics

Grade 3 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The narrative establishes a situation (i.e., activity and setting) and includes a character with relevant descriptive statements. The response provides a conclusion.	The narrative includes at a minimum: ☐ character and situation (activity and setting) ☐ two descriptions related to a character ☐ a conclusion that connects to the situation	The narrative includes at a minimum: ☐ character and situation (activity or setting) ☐ one description related to a character ☐ a conclusion that may not connect to the situation	The narrative includes at a minimum some evidence related to a character, details or descriptive words related to a character, situation, or conclusion.	There is no evidence of organization or the evidence is off topic.
Idea Development – The narrative includes a sequence of events that unfold naturally and develops the story using temporal words.	The narrative includes at a minimum: ☐ two sequenced events related to the situation ☐ both events include a detail ☐ appropriate use of temporal words that signal order of events	The narrative includes at a minimum: ☐ two events related to the situation ☐ one of the events includes a detail ☐ one temporal word that may or may not be used appropriately	The narrative includes at a minimum an event related to the situation.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The narrative includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for more than one thought unit ☐ one simple sentence that contains a complete thought with subject/verb agreement Ex: “Dog runs” or “dog runs”	The narrative includes at a minimum two of the following: ☐ capitalization to begin one thought unit ☐ end punctuation for one thought unit ☐ one simple sentence with or without subject/verb agreement	The narrative includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The narrative establishes a situation (i.e., activity and setting) and includes a character with relevant descriptive statements. The response provides a conclusion.	The narrative includes at a minimum: ☐ character and situation (activity and setting) ☐ a concluding statement that connects to the situation	The narrative includes at a minimum: ☐ character and situation (activity or setting) ☐ a concluding statement that may not connect to the situation	The narrative includes at a minimum some evidence related to a character, situation or conclusion.	There is no evidence of organization or the evidence is off topic.
Idea Development – The narrative includes a sequence of events that unfold naturally and develops the story using temporal words.	The narrative includes at a minimum: ☐ a sequence of two events related to the situation ☐ both events include a detail	The narrative includes at a minimum: ☐ two events related to the situation ☐ one of the events includes a detail	The narrative includes at a minimum an event related to the situation.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The narrative includes more than one sentence and at a minimum: ☐ end punctuation for more than one thought unit ☐ one simple sentence that contains a complete thought with subject/verb agreement Ex: “Dog runs” or “dog runs”	The narrative includes at a minimum: ☐ end punctuation for one thought unit ☐ one thought unit with or without subject/verb agreement	The narrative includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Grade 4 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The narrative establishes a situation (i.e., activity and setting) and includes a character. The response provides a conclusion.	The narrative includes at a minimum: ☐ character and situation (activity and setting) ☐ description of character and situation (activity or setting) ☐ a conclusion that connects to the situation	The narrative includes at a minimum: ☐ character and situation (activity or setting) ☐ description of the character or the situation (activity or setting) ☐ a conclusion that may not connect to the situation	The narrative includes at a minimum some evidence related to a character, details or descriptive words related to a character, situation, or conclusion.	There is no evidence of organization or the evidence is off topic.
Idea Development – The narrative includes a description of events using concrete words or sensory details (e.g., how things look, sound, taste, smell or feel) related to the events.	The narrative includes at a minimum: ☐ two events related to the situation ☐ both events include a detail related to a character's action or response to a situation	The narrative includes at a minimum: ☐ two events related to the situation ☐ one of the events includes a detail related to a character's action or response to a situation	The narrative includes at a minimum an event related to the situation.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (e.g., subject/verb agreement).	The narrative includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for more than one thought unit ☐ one complex thought unit that expresses a complete idea with subject/verb agreement Ex: "The dog runs" or "the dog runs"	The narrative includes at a minimum: ☐ capitalization to begin one thought unit ☐ punctuation to end one thought unit ☐ one complex thought unit that expresses a complete idea with or without subject/verb agreement	The narrative includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The narrative establishes a situation (i.e., activity or setting) and includes a character. The response provides a conclusion.	The narrative includes at a minimum: ☐ character and situation ☐ a concluding statement that connects to the situation	The narrative includes at a minimum: ☐ character and situation ☐ a concluding statement that may not connect to the situation	The narrative includes at a minimum some evidence related to a character, situation, or conclusion.	There is no evidence of organization or the evidence is off topic.
Idea Development – The narrative includes a description of events using concrete words or sensory details (e.g., adverbs, adjectives, clause, or prepositional phrase) related to the events.	The narrative includes at a minimum: ☐ two events related to the situation ☐ both of the events include a detail related to character's action or response to a situation	The narrative includes at a minimum: ☐ two events related to the situation ☐ one of the events includes a detail related to a character's action or response to a situation	The narrative includes at a minimum an event related to the situation.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (e.g., subject/verb agreement).	The essay includes more than one sentence and at a minimum: ☐ end punctuation to end more than one thought unit ☐ one complex thought unit that expresses a complete idea with subject/verb agreement Ex: "The dog runs" or "the dog runs"	The narrative includes at a minimum: ☐ end punctuation to end one thought unit ☐ one complex thought unit with or without subject/verb agreement	The narrative includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Grade 5 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The narrative establishes a situation (i.e., activity and setting) for the story and includes characters. The response provides a conclusion.	The narrative includes at a minimum: ☐ two characters unchanged through narrative ☐ description of the situation (i.e., activity and setting) ☐ a conclusion that connects to the situation	The narrative includes at a minimum: ☐ two characters ☐ a description of the setting or the activity ☐ a conclusion that may not connect to the situation	The narrative includes at a minimum some evidence related to a character or conclusion.	There is no evidence of organization or the evidence is off topic.
Idea Development – The narrative includes dialogue, and events supported with relevant details and descriptive statements.	The narrative includes at a minimum: ☐ two sequenced events related to the situation ☐ both events include a detail related to a character's action or response to a situation ☐ represents one relevant conversation between two characters Ex.: I said "No! I don't want to go to bed." Mom said "OK".	The narrative includes at a minimum: ☐ two events related to a character's action or response to a situation ☐ one of the events includes a detail related to a character's action or response to a situation ☐ a relevant piece of dialogue showing what one character said to the other	The narrative includes at a minimum an event related to the situation.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The narrative includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for the majority of thought units ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The narrative includes at a minimum: ☐ capitalization to begin one thought unit ☐ end punctuation for one thought unit ☐ one complete sentence with subject/verb agreement	The narrative includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The narrative establishes a situation (i.e., activity and setting) for the story and includes characters. The response provides a conclusion.	The narrative includes at a minimum: ☐ two characters unchanged through narrative ☐ establish a situation (i.e., activity and setting) ☐ a concluding statement that connects to the situation	The narrative includes at a minimum: ☐ two characters ☐ a setting or activity ☐ a concluding statement that may not connect to the situation	The narrative includes at a minimum some evidence related to a character, situation, or conclusion.	There is no evidence of organization or the evidence is off topic.
Idea Development – The narrative includes dialogue, and events supported with relevant details and descriptive statements.	The narrative includes at a minimum: ☐ two events that connect to the narrative ☐ both events include a detail related to a character's action or response to a situation ☐ one dialogue statement from one character to the other character relevant to the narrative Ex.: I said "No, I want to play."	The narrative includes at a minimum: ☐ two events related to a characters' action or response to a situation ☐ one of the events includes a detail related to a character's action or response to a situation ☐ one dialogue statement from one character to the other character which may not be relevant to the narrative	The narrative includes at a minimum an event related to the situation.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The narrative includes more than one sentence and at a minimum: ☐ end punctuation for more than one thought unit ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The narrative includes at a minimum: ☐ end punctuation for one thought unit ☐ one complete sentence with or without subject/verb agreement	The narrative includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Grade 6 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses a specified topic and is organized to describe two opposing conditions (e.g., compare/contrast).	The essay includes at a minimum: ☐ an introduction that presents the two opposing conditions ☐ a body that includes: ○ one activity common to both conditions ○ one activity related to each of the two opposing conditions ☐ a conclusion that states the two opposing conditions	The essay includes at a minimum: ☐ an introduction that presents the topic ☐ a body that includes: ○ one activity common to both conditions ○ one activity related to one of the two opposing conditions ☐ a conclusion that states the topic	The essay includes at a minimum some evidence related to the specified topic (i.e., introduction, compare/contrast relationship, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The essay develops a topic, includes relevant facts and details, to promote meaning and create clarity.	The essay includes at a minimum: ☐ one activity related to both conditions with a relevant detail ☐ one activity related to each of the two opposing conditions, each with relevant details	The essay includes at a minimum: ☐ two activities with relevant details	The essay includes at a minimum an activity or a detail that describes an activity.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject-verb agreement).	The essay includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for the majority of thought units ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization to begin one thought unit ☐ end punctuation for one thought unit ☐ one complete sentence with subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses a specified topic and is organized to describe two opposing conditions (e.g., compare/contrast).	The essay includes at a minimum: ☐ an introduction that states the essay is about two opposing conditions ☐ a body that includes: ○ one activity for each of the two opposing conditions; and ○ one activity common to both conditions ☐ a conclusion that states two opposing conditions or summarizes the content	The essay includes at a minimum: ☐ an introduction that states one activity or topic ☐ a body that relates two conditions with activities ☐ a conclusion that states an activity or the topic	The essay includes at a minimum some evidence related to the specified topic (i.e., introduction, compare/contrast relationship, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The essay develops a topic, includes relevant facts and details to promote meaning and create clarity.	The essay includes at a minimum: ☐ three activities, each with relevant details (the same detail may be used for all activities if relevant to each)	The essay includes at a minimum: ☐ one activity with a relevant detail	The essay includes at a minimum a detail that describes an activity.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject-verb agreement).	The essay includes more than one sentence and at a minimum: ☐ end punctuation for more than one thought unit ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for one thought unit ☐ one complete sentence with or without subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Grade 7 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses a specified topic and is organized with an effect related directly to a cause (e.g., cause/effect).	The essay includes at a minimum: ☐ an introduction that presents the cause and its effects ☐ a body that includes two effects and refers them to the cause ☐ a conclusion that states the essay is about a cause and its effects	The essay includes at a minimum: ☐ an introduction that presents a topic ☐ a body that includes one effect and refers it to the cause ☐ a conclusion that states the topic	The essay includes at a minimum some evidence related to the specified topic (i.e., introduction, on-topic cause/effect relationship, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The essay develops a topic, includes details and transitional words to promote meaning and create clarity.	The essay includes at a minimum: ☐ two effects, each with a relevant detail ☐ transitional words to connect the cause to each of the two effects	The essay includes at a minimum: ☐ one effect with a relevant detail ☐ transitional word to connect one cause and effect relationship	The essay includes at a minimum a detail that describes the cause or effect or a transition word.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject-verb agreement).	The essay includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for the majority of thought units ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization to begin one thought unit ☐ end punctuation for one thought unit ☐ one complete sentence with subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses a specified topic and is organized with an effect related directly to a cause (e.g., cause/effect).	The essay includes at a minimum: ☐ introduction that states the topic/cause ☐ a body that relates the effect to the provided cause ☐ a conclusion that states the essay is about a cause and its effect	The essay includes at a minimum: ☐ introduction that states the topic/cause ☐ a body that includes an effect that may not relate to the provided cause ☐ a conclusion that states a cause or the effect	The essay includes at a minimum some evidence related to the specified topic (i.e., introduction, cause/effect relationship, or conclusion)	There is no evidence of organization or the evidence is off topic.
Idea Development – The essay develops a topic, includes details to promote meaning and create clarity.	The essay includes at a minimum: ☐ a relevant detail to describe the effect	The essay includes at a minimum: ☐ one effect with no relevant detail	The essay includes at a minimum a related idea to the effect.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject-verb agreement).	The essay includes more than one sentence and at a minimum: ☐ end punctuation for more than one thought unit ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for one thought unit ☐ one complete sentence with or without subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Grade 8 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses the specified topic and is organized with a solution related directly to the problem (e.g., problem/solution).	The essay includes at a minimum: ☐ an introduction that states both parts of the problem ☐ a body that includes a solution and refers to the problem ☐ a conclusion that states the essay is about the problem and its solution	The essay includes at a minimum: ☐ an introduction that states one part of the problem ☐ a body that includes a related solution ☐ a conclusion that states the problem or the solution	The essay includes at a minimum some evidence related to the specified topic (i.e., introduction, on-topic problem/solution relationship, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The essay develops a topic, includes details and transitional words to promote meaning and create clarity.	The essay includes at a minimum: ☐ a problem with a relevant detail ☐ a solution with a relevant detail ☐ a transitional word(s) that connects the problem to the solution	The essay includes at a minimum: ☐ a problem or solution with a relevant detail ☐ a transitional word(s) that is in relation to the problem or the solution	The essay includes at a minimum a detail or word that describes the problem or the solution.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The essay includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for the majority of thought units ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization to begin one thought unit ☐ end punctuation for one thought unit ☐ one complete sentence with subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses the specified topic and is organized with a solution related directly to the problem (e.g., problem/solution).	The essay includes at a minimum: ☐ an introduction that states both parts of the problem ☐ a body that relates how the solution can be applied to the problem ☐ a conclusion that states the problem and the solution	The essay includes at a minimum: ☐ an introduction that states the problem ☐ one solution that may not relate to the problem ☐ a conclusion that states the problem or the solution	The essay includes at a minimum some evidence related to the specified topic (i.e., introduction, on-topic problem/solution relationship, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The essay develops a topic, includes details to promote meaning and create clarity.	The essay includes at a minimum: ☐ a relevant detail to describe the problem ☐ a relevant detail to describe the solution	The essay includes at a minimum: ☐ a relevant detail to describe the problem or the solution	The essay includes at a minimum a detail or word that describes the problem or the solution.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The essay includes more than one sentence and at a minimum: ☐ end punctuation for more than one thought unit ☐ one complete sentence that expresses an idea with subject/verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for one thought unit ☐ one complete sentence with or without subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Grade 11 Writing Scoring Rubrics

Tier 3

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses a specified claim supported with organized complex ideas.	The essay includes at a minimum: ☐ an introduction that states the claim supported by two rational reasons ☐ a body that includes two reasons related to the claim ☐ a conclusion that states the claim supported by two rational reasons	The essay includes at a minimum: ☐ an introduction that states the claim ☐ a body that includes one reason related to the claim ☐ a conclusion that states the claim with a rational reason or relevant evidence	The essay includes at a minimum some evidence related to the specified claim/topic (i.e., introduction, claim/topic, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The defended claim includes relevant evidence, and uses words, phrases, and clauses to clarify the relationship among claim, reasons and evidence.	The essay includes at a minimum: ☐ one piece of relevant evidence follows each of the two provided reasons ☐ words or phrases that connects each of the two reasons with relevant evidence	The essay includes at a minimum: ☐ a body with one reason and one piece of relevant evidence ☐ word or phrase that connects one reason with a piece of relevant evidence	The essay includes at a minimum a word related to the reason or a connecting word/phrase.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The essay includes more than one sentence and at a minimum: ☐ capitalization at the beginning of the majority of thought units ☐ end punctuation for the majority of thought units ☐ one complete sentence with subject/verb agreement	The essay includes at a minimum: ☐ capitalization to begin one thought unit ☐ end punctuation for one thought unit ☐ one complete sentence with subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

Tier 2

Rubric Elements	Full Evidence	Partial Evidence	Limited Evidence	Unrelated Evidence
Organization – The essay addresses a specified claim supported with organized complex ideas.	The essay includes at a minimum: ☐ an introduction that states the claim and a rational reason ☐ a conclusion that states the claim and the rational reason	The essay includes at a minimum: ☐ an introduction that states the claim or a reason ☐ a conclusion that states the claim or the reason	The essay includes at a minimum some evidence related to the specified claim/topic (i.e., introduction, claim/topic, or conclusion).	There is no evidence of organization or the evidence is off topic.
Idea Development – The defended claim includes relevant evidence, and uses words, phrases, and clauses to clarify the relationship among claim, reasons and evidence	The essay includes at a minimum: ☐ the body includes two relevant facts or examples ☐ words or phrases to connect the reason with one relevant facts or example	The essay includes at a minimum: ☐ the body includes only one relevant fact or example ☐ word or phrases to connect the reason with one fact or example	The essay includes at a minimum a word related to the reason.	There is no evidence of idea development or the evidence is off topic.
Conventions – Students use standard English conventions (subject/verb agreement).	The essay includes more than one sentence and at a minimum: ☐ end punctuation for more than one thought unit ☐ one complete sentence that expresses an idea with subject/verb agreement	The essay includes at a minimum: ☐ end punctuation for one thought unit ☐ one complete sentence with or without subject/verb agreement	The essay includes at a minimum one use of Standard English conventions.	There is no evidence of Standard English conventions.

APPENDIX G—ITEM-LEVEL CLASSICAL STATISTICS

Table G-1. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 3

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
113681A	MC	0.83	0.30	0
113682A	MC	0.79	0.34	0
113747A	MC	0.44	0.15	0
113749A	MC	0.56	0.21	1
114008A	MC	0.68	0.49	1
114010A	MC	0.70	0.40	1
114011A	MC	0.45	0.21	1
114957A	MC	0.79	0.41	1
114958A	MC	0.83	0.41	1
114960A	MC	0.58	0.20	1
115985A	MC	0.63	0.51	1
115986A	MC	0.54	0.50	1
115987A	MC	0.63	0.33	1
116202A	MC	0.53	0.34	1
116203A	MC	0.53	0.43	0
116204A	MC	0.60	0.47	1
116205A	MC	0.74	0.41	1
117686A	MC	0.68	0.44	1
117687A	MC	0.75	0.48	0
117688A	MC	0.35	0.18	1
120785A	MC	0.63	0.34	2
120786A	MC	0.42	-0.11	1
120787A	MC	0.62	0.33	2
120879A	MC	0.35	0.26	1
120880A	MC	0.50	0.22	1
120912A	MC	0.81	0.36	0
120914A	MC	0.64	0.27	0
120922A	MC	0.48	0.34	1
120926A	MC	0.52	0.18	0
120927A	MC	0.54	0.12	0
120967A	MC	0.86	0.38	1
121194A	MC	0.53	0.32	3
121423A	MC	0.63	0.29	3
121545A	MC	0.53	0.41	1
121726A	MC	0.61	0.39	1
121731A	MC	0.34	0.28	1
122070A	MC	0.55	0.43	1
124168A	MC	0.68	0.36	1
124170A	MC	0.54	0.34	0
124175A	MC	0.72	0.39	2
124181A	MC	0.74	0.37	0

MSAA MC items have either 2 or 3 options.

Table G-2. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 4

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
113087A	MC	0.82	0.33	0
113088A	MC	0.85	0.30	0
113089A	MC	0.80	0.30	0
113090A	MC	0.63	0.21	0
113091A	MC	0.70	0.22	0
113092A	MC	0.75	0.27	0
113093A	MC	0.67	0.23	0
113094A	MC	0.62	0.18	1
113097A	MC	0.56	0.09	1
113098A	MC	0.66	0.23	1
113099A	MC	0.68	0.20	1
113100A	MC	0.47	0.16	1
113280A	MC	0.64	0.43	0
113281A	MC	0.55	0.36	0
113283A	MC	0.63	0.44	1
114053A	MC	0.60	0.47	0
114054A	MC	0.50	0.36	0
114055A	MC	0.48	0.25	0
114056A	MC	0.67	0.45	0
116574A	MC	0.82	0.38	1
116576A	MC	0.84	0.36	0
116577A	MC	0.83	0.30	1
116618A	MC	0.60	0.31	1
116620A	MC	0.58	0.30	1
116621A	MC	0.61	0.38	1
117323A	MC	0.50	0.26	0
117324A	MC	0.45	0.35	0
117326A	MC	0.49	0.15	1
121279A	MC	0.78	0.43	0
121426A	MC	0.75	0.45	0
121539A	MC	0.55	0.30	1
121550A	MC	0.58	0.35	1
121551A	MC	0.57	0.21	1
121570A	MC	0.68	0.23	1
121580A	MC	0.40	0.39	1
121985A	MC	0.46	0.20	0
121987A	MC	0.37	0.09	0
122582A	MC	0.53	0.16	0
124194A	MC	0.50	0.20	1
124196A	MC	0.58	0.32	1
124199A	MC	0.62	0.25	0
124205A	MC	0.57	0.37	0
512069	MC	0.45	0.28	1

MSAA MC items have either 2 or 3 options.

Table G-3. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 5

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
114072A	MC	0.88	0.28	0
114329A	MC	0.58	0.27	1
114331A	MC	0.53	0.18	1
114332A	MC	0.43	0.11	0
114338A	MC	0.49	0.09	3
114339A	MC	0.60	0.31	2
114340A	MC	0.63	0.29	2
114341A	MC	0.55	-0.07	2
115053A	MC	0.72	0.38	0
115054A	MC	0.83	0.37	1
115055A	MC	0.81	0.31	1
115056A	MC	0.71	0.35	1
117109A	MC	0.49	0.32	1
117110A	MC	0.33	0.13	1
117111A	MC	0.63	0.46	1
117112A	MC	0.45	0.30	3
117523A	MC	0.55	0.33	1
117524A	MC	0.48	0.30	1
117525A	MC	0.47	0.33	1
119271A	MC	0.63	0.47	1
119970A	MC	0.33	0.26	1
119971A	MC	0.41	0.22	1
119973A	MC	0.58	0.48	1
120909A	MC	0.58	0.43	1
120910A	MC	0.60	0.44	1
121222A	MC	0.77	0.41	1
121457A	MC	0.66	0.25	0
121458A	MC	0.52	0.09	0
121459A	MC	0.73	0.34	0
121478A	MC	0.58	0.40	1
121479A	MC	0.63	0.33	8
121564A	MC	0.55	0.27	1
121568A	MC	0.51	0.34	0
121571A	MC	0.44	0.20	1
121672A	MC	0.69	0.48	0
121733A	MC	0.44	0.05	0
122062A	MC	0.45	0.11	1
124213A	MC	0.42	0.34	0
124219A	MC	0.75	0.39	0
124228A	MC	0.55	0.20	0
124234A	MC	0.67	0.46	0

MSAA MC items have either 2 or 3 options.

Table G-4. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 6

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
113612A	MC	0.55	0.31	1
113614A	MC	0.53	0.33	1
114380A	MC	0.72	0.48	1
114382A	MC	0.70	0.43	1
115183A	MC	0.59	0.39	1
115502A	MC	0.50	0.30	1
115503A	MC	0.55	0.42	1
119997A	MC	0.47	0.13	0
119998A	MC	0.61	0.27	0
119999A	MC	0.52	0.27	0
120000A	MC	0.52	0.16	0
120011A	MC	0.39	0.08	1
120012A	MC	0.50	0.07	0
120013A	MC	0.34	0.08	0
120014A	MC	0.52	0.14	0
120042A	MC	0.77	0.17	3
120043A	MC	0.67	0.19	1
120044A	MC	0.55	0.29	1
120389A	MC	0.86	0.35	1
120390A	MC	0.86	0.36	1
120391A	MC	0.80	0.45	1
120392A	MC	0.85	0.39	1
121225A	MC	0.56	0.28	1
121226A	MC	0.56	0.31	1
121349A	MC	0.35	0.15	0
121353A	MC	0.83	0.35	0
121358A	MC	0.55	0.21	0
121359A	MC	0.59	0.22	0
121373A	MC	0.51	0.25	1
121374A	MC	0.51	0.31	1
121375A	MC	0.62	0.18	1
121482A	MC	0.82	0.43	0
121483A	MC	0.75	0.45	1
121521A	MC	0.56	0.32	1
121522A	MC	0.40	0.30	1
121529A	MC	0.51	0.25	1
121802A	MC	0.59	0.38	1
121803A	MC	0.71	0.41	1
121804A	MC	0.56	0.42	1
122258A	MC	0.40	0.29	1
122263A	MC	0.38	0.28	1
124240A	MC	0.57	0.26	1
124242A	MC	0.62	0.47	1
124257A	MC	0.64	0.25	0
124263A	MC	0.47	0.19	1

MSAA MC items have either 2 or 3 options.

Table G-5. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 7

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
114482A	MC	0.65	0.35	1
114483A	MC	0.69	0.50	0
114484A	MC	0.53	0.25	1
114643A	MC	0.70	0.43	1
114644A	MC	0.53	0.43	1
114645A	MC	0.55	0.46	1
114646A	MC	0.72	0.42	1
115372A	MC	0.48	0.10	1
115373A	MC	0.53	0.36	1
115431A	MC	0.62	0.49	1
115432A	MC	0.58	0.45	1
115433A	MC	0.63	0.41	1
120060A	MC	0.62	0.20	0
120061A	MC	0.67	0.32	0
120072A	MC	0.50	0.19	1
120073A	MC	0.43	0.07	1
120098A	MC	0.66	0.32	4
120099A	MC	0.67	0.36	2
120465A	MC	0.84	0.36	1
120467A	MC	0.60	0.17	1
121313A	MC	0.62	0.46	1
121343A	MC	0.49	0.24	1
121347A	MC	0.55	0.37	1
121421A	MC	0.74	0.40	1
121425A	MC	0.79	0.38	1
121490A	MC	0.64	0.29	0
121491A	MC	0.42	0.13	0
121493A	MC	0.59	0.13	2
121494A	MC	0.48	0.23	0
121495A	MC	0.33	0.06	0
121497A	MC	0.55	0.21	2
121505A	MC	0.70	0.33	2
121507A	MC	0.51	0.21	1
121509A	MC	0.59	0.06	1
121513A	MC	0.60	0.17	0
121871A	MC	0.66	0.43	1
121874A	MC	0.61	0.34	1
122235A	MC	0.45	0.16	1
122380A	MC	0.55	0.26	1
123641A	MC	0.57	0.20	0
123649A	MC	0.46	0.11	1
124269A	MC	0.70	0.23	1
124271A	MC	0.35	0.17	1
124284A	MC	0.62	0.41	0
124286A	MC	0.61	0.15	0

MSAA MC items have either 2 or 3 options.

Table G-6. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 8

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
114228A	MC	0.52	0.19	1
114229A	MC	0.51	0.23	1
114230A	MC	0.54	0.35	1
114231A	MC	0.49	0.26	1
114796A	MC	0.69	0.31	1
114797A	MC	0.86	0.34	1
114798A	MC	0.85	0.36	1
114799A	MC	0.83	0.41	1
114876A	MC	0.64	0.41	1
114877A	MC	0.38	0.16	1
114879A	MC	0.64	0.39	1
115285A	MC	0.56	0.43	1
115286A	MC	0.62	0.44	1
115288A	MC	0.67	0.34	1
118798A	MC	0.71	0.39	0
118800A	MC	0.48	0.28	1
121030A	MC	0.68	0.40	2
121031A	MC	0.46	0.10	1
121032A	MC	0.61	0.23	1
121033A	MC	0.53	0.04	1
121036A	MC	0.52	0.18	0
121037A	MC	0.74	0.32	0
121038A	MC	0.67	0.28	0
121040A	MC	0.39	0.21	0
121041A	MC	0.45	0.21	0
121042A	MC	0.62	0.19	0
121075A	MC	0.73	0.43	1
121078A	MC	0.76	0.51	1
121107A	MC	0.56	0.27	1
121148A	MC	0.38	0.11	0
121149A	MC	0.59	0.12	0
121164A	MC	0.65	0.14	0
121165A	MC	0.54	0.16	0
121202A	MC	0.48	0.37	1
121203A	MC	0.65	0.40	0
121205A	MC	0.64	0.46	0
121805A	MC	0.50	0.25	1
122082A	MC	0.52	0.31	1
122562A	MC	0.67	0.44	1
124300A	MC	0.65	0.32	1
124302A	MC	0.79	0.31	0
124309A	MC	0.54	0.31	1
124311A	MC	0.50	0.22	0

MSAA MC items have either 2 or 3 options.

Table G-7. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—ELA Grade 11

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
113726A	MC	0.46	0.26	9
113727A	MC	0.48	0.20	1
113728A	MC	0.66	0.49	1
114166A	MC	0.37	0.22	0
114167A	MC	0.70	0.25	0
114193A	MC	0.62	0.15	1
114194A	MC	0.65	0.34	1
114205A	MC	0.60	0.08	5
114207A	MC	0.60	0.28	2
114208A	MC	0.53	0.22	1
116323A	MC	0.66	0.48	1
116324A	MC	0.69	0.39	1
116325A	MC	0.47	0.26	1
116326A	MC	0.49	0.30	8
117167A	MC	0.55	0.41	0
117168A	MC	0.63	0.37	0
117169A	MC	0.40	0.12	1
119078A	MC	0.60	0.45	11
119080A	MC	0.66	0.47	1
119081A	MC	0.69	0.48	1
120148A	MC	0.81	0.30	1
120149A	MC	0.72	0.33	1
120150A	MC	0.70	0.33	1
120151A	MC	0.79	0.29	2
121065A	MC	0.36	0.01	1
121229A	MC	0.70	0.35	1
121695A	MC	0.54	0.31	0
121702A	MC	0.47	0.18	1
121703A	MC	0.65	0.34	1
121711A	MC	0.63	0.31	0
121714A	MC	0.70	0.29	0
121718A	MC	0.56	0.15	2
121719A	MC	0.49	-0.01	2
121745A	MC	0.51	0.24	1
121746A	MC	0.63	0.46	1
121875A	MC	0.59	0.31	1
121953A	MC	0.28	0.02	0
122000A	MC	0.61	0.47	1
122538A	MC	0.47	0.18	1
124319A	MC	0.64	0.13	1
124321A	MC	0.33	-0.02	0
124328A	MC	0.65	0.31	0
124334A	MC	0.63	0.45	1

MSAA MC items have either 2 or 3 options.

Table G-8. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 3

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
110842A	MC	0.61	0.37	1
110855A	MC	0.27	0.19	1
110864A	MC	0.46	0.03	0
110865A	MC	0.40	0.12	0
110866A	MC	0.36	-0.02	1
110873A	MC	0.32	0.32	1
110876A	MC	0.54	0.35	0
110920A	MC	0.43	0.30	0
110923A	MC	0.56	0.23	1
110928A	MC	0.34	0.25	1
110959A	MC	0.67	0.24	1
110964A	MC	0.52	0.06	0
110966A	MC	0.64	0.25	0
110974A	MC	0.30	0.28	0
110975A	MC	0.58	0.37	0
111376A	MC	0.61	0.15	1
111377A	MC	0.51	0.15	3
111382A	MC	0.70	0.35	0
111386A	MC	0.51	0.38	1
111390A	MC	0.46	0.12	1
111397A	MC	0.53	0.27	1
111399A	MC	0.61	0.08	1
111400A	MC	0.63	0.32	0
111411A	MC	0.40	0.03	1
111420A	MC	0.56	0.37	0
111425A	MC	0.93	0.28	0
111426A	MC	0.49	0.42	0
111432A	MC	0.45	0.37	0
111434A	MC	0.74	0.32	3
111435A	MC	0.35	0.08	2
111883A	MC	0.23	0.18	2
112544A	MC	0.60	0.13	1
112551A	MC	0.64	0.26	1
112552A	MC	0.69	0.28	0
112553A	MC	0.45	0.40	0
112555A	MC	0.69	0.32	1
112560A	MC	0.44	0.12	1
112564A	MC	0.63	0.26	1
112565A	MC	0.29	0.20	1
112566A	MC	0.42	0.37	0
112569A	MC	0.52	0.12	1
112570A	MC	0.43	0.25	0
112571A	MC	0.27	0.25	1
112575A	MC	0.58	0.36	2
112576A	MC	0.28	0.29	1
112585A	MC	0.27	0.18	1
112586A	MC	0.31	0.29	1
112595A	MC	0.53	0.47	1

continued

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
112615A	MC	0.57	0.26	1
112616A	MC	0.36	0.27	0
112622A	MC	0.39	-0.02	2
120682A	MC	0.82	0.26	0
122087A	MC	0.70	0.38	0
122090A	MC	0.59	0.44	1
122104A	MC	0.35	0.34	1

MSAA MC items have either 2 or 3 options.

Table G-9. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 4

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
111123A	MC	0.46	0.40	1
111124A	MC	0.31	0.37	1
111135A	MC	0.58	0.16	1
111136A	MC	0.47	0.37	1
111139A	MC	0.57	-0.20	1
111148A	MC	0.35	0.26	1
111161A	MC	0.32	0.14	1
111162A	MC	0.28	0.28	2
111166A	MC	0.50	0.35	1
111179A	MC	0.43	0.23	0
111185A	MC	0.44	0.25	1
111663A	MC	0.76	0.29	1
111667A	MC	0.73	0.18	1
111676A	MC	0.40	0.39	1
111677A	MC	0.47	0.36	1
111678A	MC	0.62	0.38	0
111682A	MC	0.29	0.35	2
111685A	MC	0.56	0.22	1
111686A	MC	0.45	0.26	1
111688A	MC	0.60	0.23	0
111695A	MC	0.59	-0.09	4
111696A	MC	0.49	0.32	0
111698A	MC	0.26	0.11	1
111705A	MC	0.48	0.13	1
111711A	MC	0.51	0.26	0
111712A	MC	0.48	0.24	0
111715A	MC	0.74	0.28	2
111716A	MC	0.43	0.35	1
111717A	MC	0.64	0.35	0
111721A	MC	0.38	0.30	1
111727A	MC	0.32	0.06	1
111728A	MC	0.57	-0.10	2
111731A	MC	0.40	0.33	1
112783A	MC	0.56	0.41	0
112788A	MC	0.59	0.22	0

continued

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
112794A	MC	0.44	0.29	1
112797A	MC	0.37	-0.13	1
112803A	MC	0.63	0.31	0
112812A	MC	0.43	0.28	0
112817A	MC	0.44	0.29	0
112818A	MC	0.27	0.22	0
112824A	MC	0.41	0.28	1
112828A	MC	0.48	-0.08	2
112833A	MC	0.43	0.24	1
112839A	MC	0.43	0.14	0
120551A	MC	0.32	0.20	0
121661A	MC	0.42	0.22	0
121663A	MC	0.31	0.32	1
121665A	MC	0.29	0.38	1
121691A	MC	0.36	0.23	1
121737A	MC	0.41	0.18	1
122265A	MC	0.33	0.13	0
122267A	MC	0.49	0.37	1
122368A	MC	0.33	0.34	0
122432A	MC	0.25	0.32	1

MSAA MC items have either 2 or 3 options.

Table G-10. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 5

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
111234A	MC	0.61	0.16	0
111242A	MC	0.51	0.18	2
111243A	MC	0.46	0.45	1
111244A	MC	0.55	0.45	0
111258A	MC	0.22	0.13	0
111259A	MC	0.38	0.13	1
111262A	MC	0.63	0.18	1
111275A	MC	0.53	-0.10	2
111276A	MC	0.49	0.23	1
111277A	MC	0.53	0.29	0
111294A	MC	0.68	0.29	0
111295A	MC	0.41	0.30	1
111298A	MC	0.31	0.22	1
111299A	MC	0.38	0.19	0
111303A	MC	0.52	0.24	1
111308A	MC	0.36	0.06	0
112335A	MC	0.47	0.07	2
112342A	MC	0.43	0.07	1
112346A	MC	0.69	0.30	1
112348A	MC	0.56	0.33	0
112352A	MC	0.46	0.10	2
112354A	MC	0.20	0.13	1

continued

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
112358A	MC	0.27	0.19	1
112359A	MC	0.27	0.25	1
112363A	MC	0.36	0.28	1
112364A	MC	0.35	0.24	0
112365A	MC	0.38	0.05	0
112368A	MC	0.36	0.33	2
112369A	MC	0.21	0.19	1
112372A	MC	0.73	0.35	1
112373A	MC	0.70	0.30	0
112377A	MC	0.71	0.31	2
112384A	MC	0.34	0.29	1
112385A	MC	0.53	0.38	0
112386A	MC	0.50	0.13	0
112392A	MC	0.29	0.21	0
112408A	MC	0.30	0.19	1
112410A	MC	0.67	0.30	0
112416A	MC	0.51	-0.01	1
113856A	MC	0.43	0.16	0
113862A	MC	0.23	0.16	2
113863A	MC	0.46	0.01	1
113867A	MC	0.35	0.15	0
113872A	MC	0.22	0.07	1
113877A	MC	0.32	0.05	1
113878A	MC	0.43	-0.12	1
113883A	MC	0.55	0.23	0
113889A	MC	0.48	0.13	2
113892A	MC	0.52	0.26	0
113899A	MC	0.70	0.22	1
113902A	MC	0.45	0.29	1
120724A	MC	0.08	0.11	1
120737A	MC	0.35	0.43	0
120739A	MC	0.25	0.43	1
121514A	MC	0.57	0.34	0

MSAA MC items have either 2 or 3 options.

Table G-11. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 6

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
110891A	MC	0.74	0.32	0
110903A	MC	0.79	0.31	1
110909A	MC	0.65	0.13	1
110910A	MC	0.48	0.24	1
110938A	MC	0.37	0.06	1
110939A	MC	0.44	0.24	1
110944A	MC	0.70	0.39	1
110977A	MC	0.38	0.11	2
110980A	MC	0.60	0.37	1

MSAA MC items have either 2 or 3 options.

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
110981A	MC	0.58	0.37	0
110984A	MC	0.33	0.27	0
110986A	MC	0.56	0.35	1
110990A	MC	0.49	0.34	1
110991A	MC	0.47	0.30	1
110993A	MC	0.61	0.27	0
110996A	MC	0.32	0.15	1
111022A	MC	0.48	0.41	0
111025A	MC	0.45	0.27	1
111038A	MC	0.46	0.14	1
111441A	MC	0.32	0.00	2
111445A	MC	0.63	0.43	0
111450A	MC	0.77	0.30	1
111452A	MC	0.30	0.06	2
111455A	MC	0.62	0.38	1
111456A	MC	0.48	0.37	0
111465A	MC	0.58	0.33	0
111479A	MC	0.68	0.44	0
111482A	MC	0.45	0.21	1
111487A	MC	0.49	0.10	1
111496A	MC	0.57	0.11	1
111507A	MC	0.39	0.15	1
111508A	MC	0.42	0.08	1
111514A	MC	0.55	0.38	1
111517A	MC	0.63	0.46	1
111518A	MC	0.56	0.38	0
111630A	MC	0.77	0.34	1
112645A	MC	0.59	0.39	0
112655A	MC	0.40	0.26	0
112656A	MC	0.58	0.14	5
112658A	MC	0.61	0.26	0
112663A	MC	0.36	0.05	1
112667A	MC	0.32	-0.02	1
112671A	MC	0.53	0.23	2
112672A	MC	0.65	0.36	1
112676A	MC	0.56	0.04	1
112679A	MC	0.77	0.36	0
112692A	MC	0.92	0.26	0
112699A	MC	0.54	0.34	0
112956A	MC	0.38	0.11	1
120494A	MC	0.55	0.38	1
120854A	MC	0.67	0.37	0
120855A	MC	0.39	0.09	2
121487A	MC	0.63	0.43	0
121520A	MC	0.29	0.09	0
514235	MC	0.43	0.27	1

MSAA MC items have either 2 or 3 options.

Table G-12. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 7

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
111048A	MC	0.56	0.38	0
111055A	MC	0.45	0.29	1
111066A	MC	0.34	0.00	1
111067A	MC	0.47	0.31	0
111069A	MC	0.60	0.20	1
111070A	MC	0.51	0.28	1
111071A	MC	0.53	0.41	0
111075A	MC	0.85	0.35	0
111076A	MC	0.44	0.26	1
111080A	MC	0.44	0.29	1
111085A	MC	0.53	0.26	0
111093A	MC	0.50	0.32	1
111094A	MC	0.31	0.05	3
111098A	MC	0.71	0.25	1
111100A	MC	0.33	0.13	3
111104A	MC	0.47	0.24	1
111105A	MC	0.56	0.32	0
111106A	MC	0.34	0.33	0
111119A	MC	0.34	0.09	1
111127A	MC	0.48	0.32	1
111130A	MC	0.55	0.03	3
111131A	MC	0.38	0.18	1
111641A	MC	0.57	0.21	1
111734A	MC	0.57	0.40	1
111738A	MC	0.62	0.07	1
111744A	MC	0.55	0.19	1
111748A	MC	0.72	0.15	1
111749A	MC	0.90	0.25	0
111758A	MC	0.68	0.20	1
111761A	MC	0.40	0.22	0
111766A	MC	0.64	0.41	0
111769A	MC	0.60	0.34	1
111775A	MC	0.37	0.10	0
111778A	MC	0.81	0.28	1
111779A	MC	0.43	0.20	1
111780A	MC	0.24	-0.02	3
111795A	MC	0.44	0.44	0
111796A	MC	0.62	0.33	1
111799A	MC	0.41	0.10	1
111804A	MC	0.41	0.12	1
111841A	MC	0.48	0.29	0
112852A	MC	0.48	0.11	2
112870A	MC	0.34	-0.04	1
112871A	MC	0.49	0.20	1

continued

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
112880A	MC	0.57	-0.02	3
112882A	MC	0.49	0.28	1
112886A	MC	0.35	0.04	1
112887A	MC	0.53	0.35	0
112890A	MC	0.30	0.08	3
112899A	MC	0.64	0.22	1
112901A	MC	0.45	0.21	0
112910A	MC	0.67	0.36	0
112911A	MC	0.45	0.38	0
113101A	MC	0.71	0.39	0

MSAA MC items have either 2 or 3 options.

Table G-13. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 8

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
111247A	MC	0.70	0.38	1
111281A	MC	0.59	0.31	1
111283A	MC	0.30	0.18	0
111286A	MC	0.33	0.21	1
111335A	MC	0.36	0.26	1
111339A	MC	0.47	0.35	0
111352A	MC	0.73	0.34	1
111560A	MC	0.45	0.40	1
111562A	MC	0.75	0.00	1
111581A	MC	0.43	0.18	1
111583A	MC	0.44	0.34	0
111593A	MC	0.31	0.10	2
111594A	MC	0.64	0.22	0
111597A	MC	0.42	0.26	3
111615A	MC	0.58	0.31	1
111622A	MC	0.59	0.33	0
112452A	MC	0.43	-0.03	1
112460A	MC	0.43	0.30	1
112466A	MC	0.51	0.31	1
112470A	MC	0.60	0.23	0
112475A	MC	0.79	0.35	0
112476A	MC	0.46	0.06	1
112477A	MC	0.39	0.25	0
112480A	MC	0.36	0.14	1
112486A	MC	0.42	0.32	0
112490A	MC	0.68	0.25	0
112491A	MC	0.33	0.16	2
112494A	MC	0.73	0.18	1
112499A	MC	0.50	0.35	2
112500A	MC	0.35	0.13	3
112506A	MC	0.63	0.26	0
112509A	MC	0.58	0.30	1
112516A	MC	0.48	0.39	1
113909A	MC	0.52	0.30	1

continued

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
113917A	MC	0.70	0.36	0
113918A	MC	0.55	0.22	1
113932A	MC	0.49	0.40	0
113933A	MC	0.54	0.42	0
113937A	MC	0.43	0.38	0
113943A	MC	0.32	0.28	1
113952A	MC	0.32	0.18	1
113957A	MC	0.35	0.11	1
113959A	MC	0.45	0.36	0
113963A	MC	0.46	0.37	1
113968A	MC	0.28	0.15	1
113973A	MC	0.53	0.31	1
113978A	MC	0.39	0.22	1
117071A	MC	0.59	-0.13	0
117072A	MC	0.47	0.35	1
120560A	MC	0.64	0.35	0
120568A	MC	0.63	0.26	1
120571A	MC	0.49	0.22	1
122051A	MC	0.56	0.28	0
122099A	MC	0.33	0.15	2
519587	MC	0.28	0.25	1

MSAA MC items have either 2 or 3 options.

Table G-14. 2016–17 MSAA: Item-Level Classical Test Theory Statistics—Mathematics Grade 11

Item ID	Item Type	p-values	Item-Total Correlation	Omit Rates
110843A	MC	0.48	0.40	0
110858A	MC	0.52	0.29	0
110867A	MC	0.65	0.06	2
110881A	MC	0.49	0.33	2
110882A	MC	0.38	-0.06	1
110913A	MC	0.45	0.35	0
110914A	MC	0.63	0.48	0
110915A	MC	0.71	0.34	1
110921A	MC	0.52	0.35	0
110936A	MC	0.60	0.31	1
110968A	MC	0.52	0.16	0
111000A	MC	0.66	0.36	0
111002A	MC	0.58	0.29	0
111016A	MC	0.35	0.10	2
111024A	MC	0.69	0.24	4
111042A	MC	0.42	-0.11	2
111109A	MC	0.37	-0.02	2
111533A	MC	0.52	0.13	3
111537A	MC	0.47	0.36	0
111538A	MC	0.46	0.46	0
111544A	MC	0.33	0.17	2

continued

Item ID	*Item Type*	*p-values*	*Item-Total Correlation*	*Omit Rates*
111545A	MC	0.37	0.12	0
111546A	MC	0.53	0.07	2
111548A	MC	0.38	0.26	1
111553A	MC	0.39	0.35	1
111557A	MC	0.33	0.12	1
111809A	MC	0.37	-0.15	2
111810A	MC	0.70	0.45	0
111813A	MC	0.69	0.26	1
111815A	MC	0.47	0.43	1
111818A	MC	0.48	0.40	6
111819A	MC	0.28	0.10	1
111824A	MC	0.39	0.01	1
111828A	MC	0.38	0.30	2
111829A	MC	0.44	0.39	0
111830A	MC	0.53	0.06	5
111833A	MC	0.43	0.24	2
111840A	MC	0.36	0.11	2
112701A	MC	0.47	0.17	1
112702A	MC	0.59	0.43	0
112708A	MC	0.35	0.14	1
112709A	MC	0.37	0.34	0
112717A	MC	0.34	0.18	5
112722A	MC	0.45	0.20	1
112727A	MC	0.59	0.38	1
112732A	MC	0.40	0.09	2
112733A	MC	0.48	0.28	1
112743A	MC	0.31	0.13	4
112744A	MC	0.64	0.34	0
112924A	MC	0.66	0.31	1
112940A	MC	0.56	0.37	0
112945A	MC	0.45	0.01	1
112946A	MC	0.48	0.29	3
122021A	MC	0.39	0.15	1
122055A	MC	0.45	0.21	0

MSAA MC items have either 2 or 3 options.

APPENDIX H—DIFFERENTIAL ITEM FUNCTIONING RESULTS

Table H-1. 2016–17 MSAA: Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—Mathematics

Grade	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
03	Male	Female	55	3	1	2	0	0	0
	Non-EconDis	EconDis	55	5	3	2	0	0	0
	Non-LEP	LEP	15	3	1	2	1	1	0
	White	Black or African American	55	10	8	2	2	2	0
		Hispanic or Latino	55	6	4	2	0	0	0
04	Male	Female	55	2	1	1	0	0	0
	Non-EconDis	EconDis	55	6	5	1	2	0	2
	Non-LEP	LEP	15	2	1	1	1	1	0
	White	Black or African American	55	13	10	3	1	1	0
		Hispanic or Latino	55	7	4	3	1	0	1
05	Male	Female	55	5	3	2	0	0	0
	Non-EconDis	EconDis	55	9	1	8	0	0	0
	Non-LEP	LEP	15	5	2	3	1	0	1
	White	Black or African American	55	12	5	7	2	2	0
		Hispanic or Latino	55	6	4	2	2	2	0
06	Male	Female	55	2	1	1	1	1	0
	Non-EconDis	EconDis	55	5	2	3	0	0	0
	Non-LEP	LEP	15	4	2	2	1	1	0
	White	Black or African American	55	11	5	6	0	0	0
		Hispanic or Latino	55	4	1	3	1	1	0
07	Male	Female	54	1	1	0	0	0	0
	Non-EconDis	EconDis	54	10	5	5	2	0	2
	White	Black or African American	54	9	7	2	0	0	0
		Hispanic or Latino	54	2	1	1	1	1	0
08	Male	Female	55	6	2	4	0	0	0
	Non-EconDis	EconDis	55	4	0	4	0	0	0
	White	Black or African American	55	4	3	1	2	1	1
		Hispanic or Latino	55	7	4	3	0	0	0
11	Male	Female	55	6	1	5	0	0	0
	Non-EconDis	EconDis	55	7	3	4	0	0	0
	White	Black or African American	55	9	6	3	4	2	2
		Hispanic or Latino	55	3	1	2	1	0	1

Table H-2. 2016–17 MSAA: Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—ELA

Grade	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
03	Male	Female	41	2	0	2	0	0	0
	Non-EconDis	EconDis	41	1	0	1	0	0	0
	Non-LEP	LEP	27	5	5	0	0	0	0
	White	Black or African American	41	4	4	0	1	0	1
		Hispanic or Latino	41	5	4	1	0	0	0
04	Male	Female	43	7	6	1	0	0	0
	Non-EconDis	EconDis	43	5	2	3	0	0	0
	Non-LEP	LEP	26	5	3	2	1	0	1
	White	Black or African American	43	5	1	4	4	1	3
		Hispanic or Latino	43	7	3	4	0	0	0
05	Male	Female	41	3	1	2	1	1	0
	Non-EconDis	EconDis	41	2	1	1	2	0	2
	Non-LEP	LEP	27	8	5	3	0	0	0
	White	Black or African American	41	1	0	1	0	0	0
		Hispanic or Latino	41	4	1	3	0	0	0
06	Male	Female	45	3	2	1	0	0	0
	Non-EconDis	EconDis	45	4	1	3	0	0	0
	Non-LEP	LEP	25	4	3	1	1	1	0
	White	Black or African American	39	4	1	3	1	1	0
		Hispanic or Latino	45	4	4	0	1	0	1
07	Male	Female	45	5	3	2	1	1	0
	Non-EconDis	EconDis	45	5	1	4	1	1	0
	White	Black or African American	45	7	6	1	0	0	0
		Hispanic or Latino	45	4	1	3	1	1	0
08	Male	Female	43	3	1	2	1	1	0
	Non-EconDis	EconDis	43	2	0	2	0	0	0
	White	Black or African American	43	5	4	1	0	0	0
		Hispanic or Latino	43	5	4	1	2	2	0
11	Male	Female	43	3	2	1	0	0	0
	Non-EconDis	EconDis	43	7	2	5	1	0	1
	White	Black or African American	43	7	3	4	1	0	1
		Hispanic or Latino	43	5	2	3	1	1	0

Table H-3. 2016–17 MSAA: DIF by Form— Mathematics Grade 3

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	2	1	1	0	0	0
	Non-EconDis	EconDis	35	2	0	2	0	0	0
	Non-LEP	LEP	15	3	1	2	1	1	0
	White	Black or African American	35	6	5	1	2	2	0
		Hispanic or Latino	35	4	3	1	0	0	0
02	Male	Female	35	0	0	0	0	0	0
	Non-EconDis	EconDis	35	3	2	1	0	0	0
	Non-LEP	LEP	15	3	1	2	1	1	0
	White	Black or African American	35	6	4	2	0	0	0
		Hispanic or Latino	35	2	1	1	0	0	0
03	Male	Female	35	1	0	1	0	0	0
	Non-EconDis	EconDis	35	4	3	1	0	0	0
	Non-LEP	LEP	15	3	1	2	1	1	0
	White	Black or African American	35	5	4	1	0	0	0
		Hispanic or Latino	35	2	1	1	0	0	0

Table H-4. 2016–17 MSAA: DIF by Form— Mathematics Grade 4

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	2	1	1	0	0	0
	Non-EconDis	EconDis	35	3	2	1	1	0	1
	Non-LEP	LEP	15	2	1	1	1	1	0
	White	Black or African American	35	10	9	1	0	0	0
		Hispanic or Latino	35	2	2	0	1	0	1

continued

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
02	Male	Female	35	1	1	0	0	0	0
	Non-EconDis	EconDis	35	5	4	1	2	0	2
	Non-LEP	LEP	15	2	1	1	1	1	0
	White	Black or African American	35	7	6	1	1	1	0
		Hispanic or Latino	35	2	1	1	0	0	0
03	Male	Female	35	0	0	0	0	0	0
	Non-EconDis	EconDis	35	3	3	0	2	0	2
	Non-LEP	LEP	15	2	1	1	1	1	0
	White	Black or African American	35	7	4	3	1	1	0
		Hispanic or Latino	35	5	2	3	0	0	0

Table H-5. 2016–17 MSAA: DIF by Form— Mathematics Grade 5

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	3	2	1	0	0	0
	Non-EconDis	EconDis	35	5	0	5	0	0	0
	Non-LEP	LEP	15	5	2	3	1	0	1
	White	Black or African American	35	4	1	3	1	1	0
		Hispanic or Latino	35	2	2	0	0	0	0
02	Male	Female	35	1	0	1	0	0	0
	Non-EconDis	EconDis	35	4	0	4	0	0	0
	Non-LEP	LEP	15	5	2	3	1	0	1
	White	Black or African American	35	3	2	1	0	0	0
		Hispanic or Latino	35	4	3	1	0	0	0
03	Male	Female	35	2	1	1	0	0	0
	Non-EconDis	EconDis	35	6	1	5	0	0	0
	Non-LEP	LEP	15	5	2	3	1	0	1
	White	Black or African American	35	8	4	4	1	1	0
		Hispanic or Latino	35	5	3	2	2	2	0

Table H-6. 2016–17 MSAA: DIF by Form— Mathematics Grade 6

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	1	0	1	0	0	0
	Non-EconDis	EconDis	35	5	2	3	0	0	0
	Non-LEP	LEP	15	4	2	2	1	1	0
	White	Black or African American	35	8	4	4	0	0	0
		Hispanic or Latino	35	3	1	2	1	1	0
02	Male	Female	35	1	0	1	0	0	0
	Non-EconDis	EconDis	35	2	1	1	0	0	0
	Non-LEP	LEP	15	4	2	2	1	1	0
	White	Black or African American	35	8	5	3	0	0	0
		Hispanic or Latino	35	3	1	2	1	1	0
03	Male	Female	35	1	1	0	1	1	0
	Non-EconDis	EconDis	35	0	0	0	0	0	0
	Non-LEP	LEP	15	4	2	2	1	1	0
	White	Black or African American	35	4	2	2	0	0	0
		Hispanic or Latino	35	1	0	1	1	1	0

Table H-7. 2016–17 MSAA: DIF by Form— Mathematics Grade 7

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	1	1	0	0	0	0
	Non-EconDis	EconDis	35	4	2	2	2	0	2
	White	Black or African American	35	6	6	0	0	0	0
		Hispanic or Latino	35	2	1	1	0	0	0
02	Male	Female	35	0	0	0	0	0	0
	Non-EconDis	EconDis	35	4	1	3	1	0	1
	White	Black or African American	35	5	3	2	0	0	0
		Hispanic or Latino	35	1	1	0	0	0	0

continued

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
03	Male	Female	34	0	0	0	0	0	0
	Non-EconDis	EconDis	34	7	3	4	0	0	0
	White	Black or African American	34	4	2	2	0	0	0
		Hispanic or Latino	34	1	1	0	1	1	0

Table H-8. 2016–17 MSAA: DIF by Form— Mathematics Grade 8

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	4	2	2	0	0	0
	Non-EconDis	EconDis	35	2	0	2	0	0	0
	White	Black or African American	35	2	2	0	0	0	0
		Hispanic or Latino	35	3	2	1	0	0	0
02	Male	Female	35	4	2	2	0	0	0
	Non-EconDis	EconDis	35	3	0	3	0	0	0
	White	Black or African American	35	1	1	0	0	0	0
		Hispanic or Latino	35	2	1	1	0	0	0
03	Male	Female	35	4	1	3	0	0	0
	Non-EconDis	EconDis	35	3	0	3	0	0	0
	White	Black or African American	35	2	1	1	2	1	1
		Hispanic or Latino	35	4	2	2	0	0	0

Table H-9. 2016–17 MSAA: DIF by Form— Mathematics Grade 11

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	35	5	1	4	0	0	0
	Non-EconDis	EconDis	35	6	3	3	0	0	0
	White	Black or African American	35	6	4	2	3	2	1
		Hispanic or Latino	35	2	0	2	0	0	0
02	Male	Female	35	2	1	1	0	0	0
	Non-EconDis	EconDis	35	3	1	2	0	0	0
	White	Black or African American	35	5	2	3	1	0	1
		Hispanic or Latino	35	2	0	2	0	0	0
03	Male	Female	35	1	0	1	0	0	0
	Non-EconDis	EconDis	35	1	0	1	0	0	0
	White	Black or African American	35	5	4	1	1	0	1
		Hispanic or Latino	35	2	1	1	1	0	1

Table H-10. 2016–17 MSAA: DIF by Form— ELA Grade 3

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	1	0	1	0	0	0
	Non-EconDis	EconDis	32	1	0	1	0	0	0
	Non-LEP	LEP	27	5	5	0	0	0	0
	White	Black or African American	32	3	3	0	0	0	0
		Hispanic or Latino	32	5	4	1	0	0	0
02	Male	Female	32	1	0	1	0	0	0
	Non-EconDis	EconDis	32	0	0	0	0	0	0
	Non-LEP	LEP	27	5	5	0	0	0	0

continued

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
02	White	Black or African American	32	4	4	0	1	0	1
		Hispanic or Latino	32	3	3	0	0	0	0
03	Male	Female	32	0	0	0	0	0	0
	Non-EconDis	EconDis	32	0	0	0	0	0	0
	Non-LEP	LEP	27	5	5	0	0	0	0
	White	Black or African American	32	3	3	0	0	0	0
		Hispanic or Latino	32	3	3	0	0	0	0

Table H-11. 2016–17 MSAA: DIF by Form— ELA Grade 4

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	5	4	1	0	0	0
	Non-EconDis	EconDis	32	4	1	3	0	0	0
	Non-LEP	LEP	26	5	3	2	1	0	1
	White	Black or African American	32	2	1	1	4	1	3
		Hispanic or Latino	32	4	2	2	0	0	0
02	Male	Female	32	5	4	1	0	0	0
	Non-EconDis	EconDis	32	1	0	1	0	0	0
	Non-LEP	LEP	26	5	3	2	1	0	1
	White	Black or African American	32	4	1	3	2	1	1
		Hispanic or Latino	32	4	3	1	0	0	0
03	Male	Female	32	2	2	0	0	0	0
	Non-EconDis	EconDis	32	2	1	1	0	0	0
	Non-LEP	LEP	26	5	3	2	1	0	1
	White	Black or African American	32	3	1	2	1	1	0
		Hispanic or Latino	32	3	2	1	0	0	0

Table H-12. 2016–17 MSAA: DIF by Form— ELA Grade 5

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	2	1	1	0	0	0
	Non-EconDis	EconDis	32	2	1	1	1	0	1
	Non-LEP	LEP	27	8	5	3	0	0	0
	White	Black or African American	32	0	0	0	0	0	0
		Hispanic or Latino	32	2	1	1	0	0	0
02	Male	Female	32	2	1	1	1	1	0
	Non-EconDis	EconDis	32	2	1	1	1	0	1
	Non-LEP	LEP	27	8	5	3	0	0	0
	White	Black or African American	32	0	0	0	0	0	0
		Hispanic or Latino	32	2	1	1	0	0	0
03	Male	Female	32	1	1	0	0	0	0
	Non-EconDis	EconDis	32	2	1	1	0	0	0
	Non-LEP	LEP	27	8	5	3	0	0	0
	White	Black or African American	32	1	0	1	0	0	0
		Hispanic or Latino	32	2	1	1	0	0	0

Table H-13. 2016–17 MSAA: DIF by Form— ELA Grade 6

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	1	0	1	0	0	0
	Non-EconDis	EconDis	32	1	0	1	0	0	0
	Non-LEP	LEP	25	4	3	1	1	1	0
	White	Black or African American	32	2	1	1	0	0	0
		Hispanic or Latino	32	2	2	0	0	0	0
02	Male	Female	32	2	1	1	0	0	0
	Non-EconDis	EconDis	32	4	1	3	0	0	0
	Non-LEP	LEP	25	4	3	1	1	1	0

continued

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
02	White	Black or African American	26	2	1	1	0	0	0
		Hispanic or Latino	32	2	2	0	1	0	1
03	Male	Female	32	2	1	1	0	0	0
	Non-EconDis	EconDis	32	0	0	0	0	0	0
	Non-LEP	LEP	25	4	3	1	1	1	0
	White	Black or African American	32	4	1	3	1	1	0
		Hispanic or Latino	32	2	2	0	0	0	0

Table H-14. 2016–17 MSAA: DIF by Form— ELA Grade 7

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	3	1	2	1	1	0
	Non-EconDis	EconDis	32	3	0	3	0	0	0
	White	Black or African American	32	4	4	0	0	0	0
		Hispanic or Latino	32	2	0	2	1	1	0
02	Male	Female	32	2	0	2	0	0	0
	Non-EconDis	EconDis	32	3	1	2	1	1	0
	White	Black or African American	32	2	2	0	0	0	0
		Hispanic or Latino	32	3	1	2	1	1	0
03	Male	Female	32	4	2	2	0	0	0
	Non-EconDis	EconDis	32	0	0	0	0	0	0
	White	Black or African American	32	3	2	1	0	0	0
		Hispanic or Latino	32	1	0	1	1	1	0

Table H-15. 2016–17 MSAA: DIF by Form— ELA Grade 8

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	1	1	0	0	0	0
	Non-EconDis	EconDis	32	2	0	2	0	0	0
	White	Black or African American	32	1	1	0	0	0	0
		Hispanic or Latino	32	2	2	0	1	1	0
02	Male	Female	32	2	0	2	1	1	0
	Non-EconDis	EconDis	32	2	0	2	0	0	0
	White	Black or African American	32	2	1	1	0	0	0
		Hispanic or Latino	32	4	3	1	1	1	0
03	Male	Female	32	0	0	0	0	0	0
	Non-EconDis	EconDis	32	2	0	2	0	0	0
	White	Black or African American	32	4	4	0	0	0	0
		Hispanic or Latino	32	3	3	0	2	2	0

Table H-16. 2016–17 MSAA: DIF by Form— ELA Grade 11

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
01	Male	Female	32	1	1	0	0	0	0
	Non-EconDis	EconDis	32	2	1	1	0	0	0
	White	Black or African American	32	4	3	1	1	0	1
		Hispanic or Latino	32	5	2	3	0	0	0
02	Male	Female	32	0	0	0	0	0	0
	Non-EconDis	EconDis	32	4	2	2	1	0	1
	White	Black or African American	32	3	2	1	0	0	0
		Hispanic or Latino	32	2	1	1	1	1	0
03	Male	Female	32	2	1	1	0	0	0

continued

Form	Group		Number of Items	Number "Low"			Number "High"		
	Reference	Focal		Total	Favoring		Total	Favoring	
					Reference	Focal		Reference	Focal
03	Non-EconDis	EconDis	32	2	0	2	0	0	0
	White	Black or African American	32	4	2	2	0	0	0
		Hispanic or Latino	32	2	1	1	0	0	0

APPENDIX I—ITEM RESPONSE THEORY PARAMETERS

Table I-1. 2016–17 MSAA: IRT Parameters for ELA Grade 3

IREF	*a*	*SE (a)*	*b*	*SE (b)*
113681A	0.90739	0.06572	-0.52310	0.05392
113682A	0.46798	0.04716	-0.77351	0.10761
113747A	0.79636	0.05854	-0.11972	0.05538
113749A	1.00539	0.07112	-0.50083	0.05034
114008A	0.93279	0.04053	-0.66579	0.03040
114010A	0.53212	0.03269	-1.24036	0.07267
114011A	0.18812	0.02325	0.80017	0.15500
114957A	1.10430	0.05096	-1.12593	0.03722
114958A	0.93212	0.04780	-1.37103	0.05209
114960A	0.51408	0.03037	-0.72934	0.05324
115985A	0.72259	0.03486	-0.63105	0.03707
115986A	0.80025	0.03583	-0.38746	0.03040
115987A	0.36194	0.02765	-0.99291	0.08640
116202A	0.52082	0.02953	-0.19116	0.04248
116203A	0.83544	0.03634	-0.27818	0.02850
116204A	1.05454	0.04267	-0.46854	0.02490
116205A	0.60777	0.03474	-1.20922	0.06367
117686A	0.82679	0.06911	-1.08955	0.07922
117687A	0.88668	0.07430	-1.15409	0.07836
117688A	0.34218	0.04119	0.99909	0.15870
120785A	0.93825	0.04469	-1.58716	0.05270
120786A	1.04434	0.03731	-0.70349	0.02551
120787A	0.95053	0.04337	-1.47134	0.04728
120879A	0.58802	0.03099	0.48916	0.04606
120880A	0.23251	0.02428	-0.07651	0.09067
120912A	0.65621	0.05619	-0.82557	0.08188
120914A	0.24912	0.03683	-0.24789	0.15936
120922A	0.52534	0.02949	0.00291	0.04229
120926A	0.35010	0.04139	-0.19220	0.11521
120927A	0.35438	0.04158	-0.21981	0.11457
120967A	0.90795	0.04981	-1.57280	0.06308
121194A	0.49473	0.04684	-0.40493	0.08752
121423A	0.81602	0.03931	-1.59544	0.05809
121545A	0.72026	0.03343	-0.08615	0.03183
121726A	0.47039	0.02977	-0.86858	0.06294
121731A	0.38373	0.02780	0.97882	0.09051
122070A	0.52193	0.04845	-0.55211	0.08797
124168A	0.79997	0.04377	-1.47679	0.06337
124170A	0.35629	0.02664	-0.26459	0.06121
124175A	0.86330	0.04170	-1.06841	0.04305
124181A	0.51623	0.02976	-0.43410	0.04561

Table I-2. 2016–17 MSAA: IRT Parameters for ELA Grade 4

IREF	*a*	*SE (a)*	*b*	*SE (b)*
113087A	1.02037	0.06493	-0.17046	0.04395
113088A	0.89163	0.06055	-0.39826	0.05067
113089A	0.97390	0.06297	-0.20043	0.04562
113090A	0.43907	0.04215	0.14744	0.08815
113091A	1.13477	0.07240	-0.37040	0.04166
113092A	1.08641	0.07491	-0.73289	0.04879
113093A	0.86054	0.06167	-0.62949	0.05637
113094A	1.14882	0.07399	-0.45000	0.04203
113097A	1.32198	0.09599	-0.95563	0.04710
113098A	0.58399	0.06253	-1.93674	0.17733
113099A	0.75371	0.07070	-1.59799	0.11845
113100A	1.48988	0.10437	-0.85444	0.04024
113280A	0.71703	0.03641	-0.67230	0.03844
113281A	0.72505	0.03543	-0.35335	0.03190

IREF	*a*	*SE (a)*	*b*	*SE (b)*
113283A	0.84332	0.03900	-0.60597	0.03188
114053A	1.09370	0.04398	-0.40338	0.02293
114054A	0.70565	0.03472	-0.18928	0.03134
114055A	0.37949	0.02906	0.12309	0.05733
114056A	0.85743	0.04021	-0.74204	0.03457
116574A	0.95039	0.04901	-1.27590	0.05024
116576A	0.91807	0.04864	-1.33452	0.05435
116577A	0.67293	0.04300	-1.66821	0.08940
116618A	0.35084	0.03995	-0.62520	0.12526
116620A	0.33525	0.03949	-0.70961	0.13563
116621A	0.52870	0.04747	-0.80075	0.09400
117323A	0.31797	0.03826	-0.02139	0.11766
117324A	0.58505	0.04702	0.18866	0.06938
117326A	0.12577	0.02606	0.91047	0.34483
121279A	1.28075	0.05624	-0.97531	0.03026
121426A	1.22016	0.05190	-0.84409	0.02795

IREF	*a*	*SE (a)*	*b*	*SE (b)*
121539A	0.30471	0.03805	-0.38019	0.12963
121550A	0.72513	0.03559	-0.41150	0.03267
121551A	0.32922	0.02850	-0.58007	0.07437
121570A	0.72479	0.06880	-1.61948	0.12354
121580A	0.50548	0.04459	0.49920	0.08516
121985A	0.21419	0.03398	1.17891	0.24735
121987A	0.46485	0.04324	0.59892	0.09581
122582A	0.24976	0.02679	-0.45171	0.09032
124194A	1.07211	0.04658	-0.78850	0.02968
124196A	0.39705	0.02974	-0.59079	0.06273
124199A	0.51933	0.03133	0.15932	0.04337
124205A	0.54993	0.03239	-0.51163	0.04418
512069	0.34704	0.03914	0.22727	0.11069

Table I-3. 2016–17 MSAA: IRT Parameters for ELA Grade 5

IREF	*a*	*SE (a)*	*b*	*SE (b)*
114072A	0.75004	0.06016	-0.78858	0.06962
114329A	0.64100	0.05178	-0.43550	0.06856
114331A	0.38959	0.04095	-0.20679	0.10177
114332A	0.79361	0.05630	-0.02022	0.05465
114338A	1.61709	0.12046	-0.84182	0.03807
114339A	1.09495	0.09300	-1.14338	0.06733
114340A	0.92488	0.08656	-1.37851	0.09450
114341A	0.51931	0.05036	-0.86357	0.10127
115053A	1.19857	0.04671	-0.84400	0.02530
115054A	1.06562	0.05124	-1.44057	0.04384
115055A	0.77934	0.03930	-1.50664	0.05763
115056A	1.06076	0.04259	-0.89443	0.02879
117109A	0.43399	0.00000	-0.06065	0.04878
117110A	0.23102	0.02112	1.91235	0.19188
117111A	0.65975	0.02963	-0.75875	0.04016

IREF	*a*	*SE (a)*	*b*	*SE (b)*
117112A	0.50215	0.02451	0.07844	0.04335
117523A	0.61833	0.05068	-0.21016	0.06608
117524A	0.56250	0.04762	0.08162	0.07143
117525A	0.63763	0.05028	0.10580	0.06449
119271A	0.66143	0.02910	-0.62412	0.03768
119970A	0.31901	0.02186	0.95275	0.09048
119971A	0.24902	0.02064	0.71570	0.10162
119973A	1.00831	0.03674	-0.37634	0.02469
120909A	0.71208	0.05633	-0.47385	0.06250
120910A	0.65760	0.05420	-0.51412	0.06816
121222A	1.09563	0.04701	-1.12588	0.03290
121457A	0.61793	0.04861	0.21590	0.06886
121458A	0.17129	0.03047	0.52413	0.23723
121459A	0.71376	0.05292	-0.02441	0.05942

continued

IREF	*a*	*SE (a)*	*b*	*SE (b)*
121478A	0.58632	0.02651	-0.29161	0.03803
121479A	0.47630	0.02531	-0.74059	0.05347
121564A	0.39327	0.02362	-0.74287	0.06396
121568A	0.75868	0.02992	-0.19334	0.03032
121571A	0.18265	0.01954	1.07209	0.16027
121672A	0.97738	0.03953	-0.86712	0.03031
121733A	0.47857	0.04388	-0.02638	0.08334

IREF	*a*	*SE (a)*	*b*	*SE (b)*
122062A	0.34244	0.02198	0.08935	0.06127
124213A	0.56888	0.02563	0.28930	0.04081
124219A	1.27864	0.05765	-1.27162	0.03303
124228A	0.39590	0.00000	0.26553	0.05565
124234A	0.92625	0.03741	-0.81154	0.03075

Table I-4. 2016–17 MSAA: IRT Parameters for ELA Grade 6

IREF	*a*	*SE (a)*	*b*	*SE (b)*
113612A	0.56812	0.02629	-0.24396	0.03912
113614A	0.69028	0.02838	-0.09073	0.03256
114380A	1.30747	0.09294	-0.85881	0.04500
114382A	1.20020	0.08195	-0.71868	0.04459
115183A	0.78430	0.03137	-0.40386	0.03078
115502A	0.47059	0.04342	-0.08441	0.08016
115503A	0.76168	0.05429	-0.19611	0.05339
119997A	0.24003	0.03523	1.58384	0.26480
119998A	0.37075	0.03926	0.17795	0.10252
119999A	0.35912	0.03961	1.06995	0.14676
120000A	0.22051	0.03350	0.67262	0.19031
120011A	0.23330	0.03549	1.79864	0.29830
120012A	0.26145	0.03623	-0.18253	0.14119
120013A	0.20870	0.00000	2.13677	0.37364
120014A	0.30643	0.03798	-0.11625	0.11997
120042A	1.28383	0.06905	-1.54433	0.04735
120043A	1.13301	0.05326	-1.27894	0.03905
120044A	1.21574	0.04968	-0.92387	0.02740
120389A	1.43412	0.12686	-1.32580	0.05945
120390A	1.43842	0.11954	-1.20200	0.05206
120391A	1.50319	0.11304	-0.98378	0.04156
120392A	1.54497	0.12567	-1.14072	0.04645

IREF	*a*	*SE (a)*	*b*	*SE (b)*
121225A	0.63234	0.02800	-0.41762	0.03723
121226A	0.53972	0.02591	-0.32520	0.04171
121349A	0.24432	0.00000	1.88636	0.29882
121353A	0.88696	0.05928	-0.26315	0.04916
121358A	0.79118	0.05500	-0.11829	0.05140
121359A	0.66453	0.05075	-0.23445	0.06030
121373A	0.82949	0.03506	-0.81275	0.03515
121374A	1.37461	0.05364	-0.81011	0.02303
121375A	0.84869	0.03747	-1.00889	0.03918
121482A	1.28933	0.10703	-1.22625	0.05780
121483A	1.14536	0.08165	-0.84393	0.04757
121521A	0.45819	0.02438	-0.29297	0.04798
121522A	0.50480	0.02469	0.34265	0.04479
121529A	0.39043	0.02296	0.08717	0.05367
121802A	0.83887	0.05958	-0.55406	0.05574
121803A	0.89148	0.06822	-0.96794	0.06614
121804A	0.81098	0.05588	-0.24055	0.05260
122258A	0.41654	0.04147	0.87221	0.11601
122263A	0.48429	0.04349	0.77963	0.09717
124240A	0.56422	0.02828	-0.90649	0.05222
124242A	0.88718	0.03463	-0.53073	0.02892
124257A	0.39602	0.02313	-0.06775	0.05291
124263A	0.27952	0.02134	0.43057	0.07894

Table I-5. 2016–17 MSAA: IRT Parameters for ELA Grade 7

IREF	*a*	*SE (a)*	*b*	*SE (b)*
114482A	0.67909	0.05420	-0.68585	0.06846
114483A	0.80980	0.06294	-0.88292	0.06615
114484A	0.43389	0.04185	-0.03336	0.08554
114643A	1.47511	0.10306	-0.75542	0.03812
114644A	1.00875	0.06459	-0.04303	0.04397
114645A	1.07501	0.06907	-0.22799	0.04192
114646A	0.84294	0.06844	-1.03170	0.07275
115372A	0.29422	0.00000	-0.00222	0.06853
115373A	0.47889	0.02402	-0.19157	0.04392
115431A	1.34376	0.04739	-0.54276	0.01995
115432A	0.55938	0.02557	-0.24852	0.03850
115433A	0.84789	0.03287	-0.50550	0.02847
120060A	0.48151	0.04334	0.05028	0.07823
120061A	0.57137	0.04672	-0.08016	0.06697
120072A	0.36079	0.03965	-0.27797	0.10787
120073A	0.61232	0.04791	0.04003	0.06536
120098A	1.32751	0.06284	-1.34996	0.03498
120099A	1.19254	0.05962	-1.30593	0.03767
120465A	1.56441	0.13916	-1.22382	0.05556
120467A	0.43507	0.04313	-0.35979	0.09479
121313A	0.73277	0.02988	-0.46864	0.03189
121343A	0.28780	0.02085	0.13174	0.07100

IREF	*a*	*SE (a)*	*b*	*SE (b)*
121425A	0.97842	0.08265	-1.15631	0.07306
121490A	0.49165	0.04417	-0.20051	0.07726
121491A	0.36003	0.03904	0.35179	0.10989
121493A	1.80791	0.07800	-0.99356	0.01883
121494A	0.26470	0.03586	0.98436	0.18661
121495A	0.53220	0.04474	0.53528	0.08277
121497A	0.76094	0.03571	-1.22189	0.04703
121505A	1.37475	0.06340	-1.28824	0.03203
121507A	0.45697	0.04255	-0.00402	0.08409
121509A	1.29448	0.05267	-0.99648	0.02577
121513A	0.36114	0.03941	-0.07102	0.10137
121871A	0.74693	0.05723	-0.61377	0.06265
121874A	0.53029	0.04726	-0.59621	0.08441
122235A	0.41185	0.00000	0.35694	0.05407
122380A	0.29086	0.03731	-0.54869	0.13930
123641A	0.31321	0.03754	0.17301	0.11781
123649A	0.28294	0.03633	0.17531	0.13253
124269A	1.17183	0.05324	-1.27016	0.03527
124271A	0.44921	0.00000	0.97815	0.06577
124284A	0.44629	0.02396	-0.51939	0.05067
124286A	0.27556	0.02074	-0.11454	0.07296

Table I-6. 2016–17 MSAA: IRT Parameters for ELA Grade 8

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111247A	0.96014	0.04007	-0.80398	0.03166
111281A	0.30469	0.03722	-0.24176	0.11863
111283A	0.27449	0.03872	2.13293	0.31756
111286A	0.73861	0.03175	0.18573	0.03123

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111335A	0.70729	0.05531	-0.08266	0.05637
111339A	0.48178	0.02654	0.45073	0.04997
111352A	0.88763	0.07239	-1.05944	0.07311

continued

IREF	a	SE (a)	b	SE (b)
111560A	0.81213	0.05690	0.17675	0.04992
111562A	0.48603	0.05124	-1.89518	0.18484
111581A	0.42529	0.02609	-0.66405	0.05883
111583A	0.33745	0.02430	0.93847	0.08947
111593A	0.39367	0.04070	1.17126	0.13934
111594A	0.67978	0.03045	0.07574	0.03261
111597A	0.52736	0.04702	0.33856	0.07900
111615A	0.62115	0.05146	-0.54555	0.07102
111622A	0.74437	0.03187	0.14672	0.03070
112452A	0.53312	0.04788	-0.14422	0.07230
112460A	0.52310	0.04742	0.21294	0.07770
112466A	0.62836	0.02947	-0.10815	0.03444
112470A	0.38514	0.02545	-0.77479	0.06852
112475A	0.64937	0.05702	-0.93080	0.08501
112476A	0.15103	0.02000	0.43848	0.14662
112477A	0.25322	0.03675	1.71659	0.28133
112480A	0.46622	0.02620	0.37259	0.04969
112486A	0.58683	0.04951	0.62448	0.08192
112490A	0.71232	0.05581	-0.11277	0.05695
112491A	0.55744	0.04615	0.48606	0.07470
112494A	0.58434	0.05631	-1.32651	0.11991
112499A	1.25303	0.09295	-0.90234	0.04972
112500A	0.44563	0.04204	0.57650	0.09380
112506A	0.71589	0.03141	-0.13301	0.03083
112509A	0.64888	0.05107	-0.20273	0.06014

IREF	a	SE (a)	b	SE (b)
112516A	0.80173	0.05918	0.12500	0.05323
113909A	1.14562	0.08587	-0.89390	0.05287
113917A	0.90027	0.06705	-0.52709	0.05148
113918A	0.68441	0.03237	-0.79098	0.04151
113932A	0.60512	0.04806	0.34152	0.06627
113933A	0.56906	0.04915	0.40791	0.07739
113937A	0.54033	0.04753	0.48555	0.08215
113943A	0.79149	0.05945	-0.15808	0.05137
113952A	0.61486	0.02914	0.37551	0.03905
113957A	0.43988	0.04192	0.76092	0.10310
113959A	0.38684	0.04270	1.02100	0.14477
113963A	0.70358	0.05465	0.11762	0.05806
113968A	1.01758	0.03871	-0.11012	0.02311
113973A	0.82140	0.06132	-0.25193	0.05111
113978A	0.62064	0.02933	-0.12894	0.03486
117071A	0.31538	0.03858	-1.01142	0.15843
117072A	0.90607	0.03572	0.08414	0.02580
120560A	1.02251	0.07071	-0.17977	0.04251
120568A	0.61557	0.04870	0.11270	0.06185
120571A	0.44761	0.04386	0.36188	0.09180
122051A	0.71012	0.03112	0.08278	0.03148
122099A	0.61447	0.02906	0.09762	0.03570
519587	0.73966	0.05453	-0.08432	0.05284

Table I-7. 2016–17 MSAA: IRT Parameters for ELA Grade 11

IREF	a	SE (a)	b	SE (b)
110843A	0.57072	0.05473	0.43057	0.08605
110858A	0.65393	0.05540	0.10577	0.06193
110867A	0.69739	0.07320	-1.19768	0.11344
110881A	0.56649	0.05586	-0.07456	0.07686
110882A	0.60187	0.05455	0.27821	0.07361

IREF	a	SE (a)	b	SE (b)
110913A	0.66613	0.05550	0.46347	0.06932
110914A	0.81264	0.04557	0.23591	0.03991
110915A	0.96756	0.08904	-0.93577	0.07252
110921A	0.67563	0.04135	0.13590	0.04488

continued

IREF	a	SE (a)	b	SE (b)
110936A	0.69434	0.04380	-0.39045	0.04521
110968A	0.44155	0.04883	0.65669	0.11771
111000A	0.64190	0.05696	0.13335	0.06725
111002A	0.90917	0.07043	-0.17013	0.04830
111016A	0.68055	0.04122	0.30327	0.04715
111024A	0.78688	0.07059	-0.64556	0.06894
111042A	0.79504	0.06424	0.24562	0.05826
111109A	0.28562	0.03031	0.57070	0.11291
111533A	0.82602	0.05406	-1.02656	0.05919
111537A	0.54175	0.03705	0.67040	0.06760
111538A	0.82915	0.04593	0.35841	0.04132
111544A	0.44758	0.03458	0.77774	0.08413
111545A	0.25423	0.03880	1.64424	0.28154
111546A	0.48183	0.05023	-0.21135	0.08734
111548A	0.51731	0.05005	0.74512	0.10114
111553A	0.82269	0.06565	0.25106	0.05685
111557A	0.68536	0.04134	0.32596	0.04730
111809A	0.83677	0.06574	0.42677	0.06023
111810A	1.18704	0.05940	0.19022	0.02955
111813A	0.84293	0.07613	-0.79530	0.07267
111815A	0.69967	0.06250	-0.05578	0.06400
111818A	0.98430	0.07389	-0.07007	0.04560
111824A	0.72603	0.04318	0.04547	0.04145
111828A	0.50921	0.05181	0.75305	0.10960

IREF	a	SE (a)	b	SE (b)
111829A	0.67671	0.05596	0.42779	0.06730
111830A	0.46005	0.03827	-1.02292	0.09428
111833A	0.64633	0.05619	0.47888	0.07495
111840A	0.54485	0.05081	0.08117	0.07226
112701A	1.16311	0.08999	-0.76392	0.05088
112702A	0.56797	0.05462	0.41465	0.08582
112708A	0.80594	0.04571	0.08430	0.03834
112709A	0.31844	0.04114	1.37683	0.21111
112717A	0.87314	0.04798	0.09496	0.03607
112722A	1.09749	0.05848	-0.31854	0.02987
112727A	1.01744	0.07492	-0.31242	0.04347
112732A	0.66124	0.05747	0.25741	0.06771
112733A	0.46650	0.05004	0.43199	0.10187
112743A	0.62758	0.05416	0.15787	0.06489
112744A	0.64045	0.05517	-0.02615	0.06207
112924A	0.87327	0.07216	-0.75703	0.06342
112940A	0.53390	0.05001	0.41112	0.08132
112945A	0.41784	0.03442	-0.21528	0.06827
112946A	0.52323	0.03706	-0.00646	0.05471
122021A	0.36100	0.04331	0.96869	0.15186
122055A	0.23836	0.02890	0.60320	0.13520

Table I-8. 2016–17 MSAA: IRT Parameters for Mathematics Grade 3

IREF	a	SE (a)	b	SE (b)
110842A	0.87581	0.06541	-0.43642	0.05127
110855A	0.72744	0.03108	0.12789	0.03304
110864A	0.29240	0.03855	-0.22640	0.12998
110865A	0.21729	0.00000	2.12273	0.23075
110866A	0.33776	0.03964	1.00564	0.15901
110873A	0.55736	0.04780	0.72386	0.09086

IREF	a	SE (a)	b	SE (b)
110876A	0.57114	0.02768	0.62894	0.04792
110920A	0.45106	0.04746	1.36847	0.15419
110923A	1.11897	0.04675	-0.75661	0.02753
110928A	0.51293	0.04850	0.83411	0.10457
110959A	0.40919	0.02692	-1.15761	0.08372

continued

IREF	*a*	*SE (a)*	*b*	*SE (b)*
110964A	0.76094	0.03624	-0.91234	0.04200
110966A	0.32831	0.04236	-0.71790	0.14561
110974A	0.81549	0.03316	0.10823	0.03007
110975A	0.45308	0.02562	-0.07540	0.04859
111376A	0.79401	0.06927	-1.03964	0.08320
111377A	0.59110	0.02937	-0.48379	0.04163
111382A	0.63837	0.03039	-0.44615	0.03833
111386A	0.84752	0.03441	-0.10369	0.02848
111390A	0.45096	0.04428	-0.13215	0.08661
111397A	0.45060	0.02575	-0.20706	0.04939
111399A	0.34221	0.04320	-1.47324	0.19872
111400A	0.45132	0.04423	0.08271	0.08600
111411A	0.28889	0.02260	0.38485	0.07970
111420A	0.58810	0.02793	0.43433	0.04307
111425A	2.10200	0.14579	-0.65681	0.02800
111426A	0.77747	0.05700	0.29130	0.05839
111432A	0.62906	0.05189	0.41260	0.07204
111434A	0.72729	0.03707	-1.16261	0.05208
111435A	0.47533	0.04616	0.67433	0.10127
111883A	0.38984	0.02455	0.98695	0.07981
112544A	0.60070	0.05663	-1.12890	0.10379
112551A	0.56140	0.05257	-0.57955	0.08365

IREF	*a*	*SE (a)*	*b*	*SE (b)*
112552A	0.67892	0.03106	-0.35321	0.03529
112553A	0.65746	0.05303	0.39958	0.06918
112555A	0.85940	0.03956	-0.92080	0.03817
112560A	0.34916	0.04148	0.21318	0.11455
112564A	0.62087	0.03131	-0.78390	0.04620
112565A	0.57765	0.02778	0.58754	0.04658
112566A	0.63440	0.05296	0.59002	0.07788
112569A	0.60126	0.05276	-0.60535	0.07605
112570A	0.21046	0.01941	1.24139	0.14208
112571A	0.91753	0.03579	0.06030	0.02724
112575A	0.64634	0.03067	-0.47003	0.03824
112576A	0.49805	0.04868	1.32482	0.13492
112585A	0.78172	0.05903	0.31321	0.05909
112586A	0.54118	0.04922	0.95010	0.10352
112595A	1.04177	0.04019	-0.25315	0.02436
112615A	0.34724	0.02356	0.34979	0.06641
112616A	0.32652	0.02399	1.51817	0.12290
112622A	0.27825	0.03865	0.93084	0.18235
120682A	0.71751	0.03223	-0.41473	0.03423
122087A	1.62515	0.10425	-0.01691	0.03269
122090A	1.88090	0.11671	-0.01670	0.02865
122104A	1.66013	0.10773	-0.16810	0.03157

Table I-9. 2016–17 MSAA: IRT Parameters for Mathematics Grade 4

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111123A	0.56644	0.04939	-0.24500	0.07056
111124A	0.61788	0.05240	0.11906	0.06649
111135A	0.27523	0.02168	-0.84482	0.09810
111136A	0.90348	0.03488	-0.26531	0.02752
111139A	0.57491	0.05220	-0.87884	0.09294

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111148A	0.65022	0.05386	0.65408	0.07711
111161A	0.33553	0.04134	1.53329	0.20570
111162A	0.32547	0.04122	1.13727	0.17718
111166A	0.80828	0.03224	0.01454	0.02915

continued

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111179A	0.26518	0.03781	1.54848	0.25029
111185A	0.51254	0.04691	0.58198	0.08957
111663A	0.66840	0.03201	-1.26330	0.05663
111667A	0.41701	0.02763	-2.02329	0.12749
111676A	0.81529	0.03248	0.19156	0.02944
111677A	1.02791	0.03806	0.03797	0.02422
111678A	0.59689	0.04995	0.24768	0.06912
111682A	0.91856	0.03511	0.11767	0.02653
111685A	0.25335	0.03882	-1.31842	0.24453
111686A	0.62336	0.02800	0.29791	0.03753
111688A	0.56768	0.02670	-0.00034	0.03909
111695A	0.31509	0.02438	-2.02817	0.15865
111696A	0.29797	0.03876	0.79266	0.15937
111698A	0.37021	0.04510	1.84687	0.22824
111705A	0.24787	0.02086	0.08258	0.08396
111711A	0.28134	0.03895	0.92457	0.18039
111712A	0.42562	0.02408	0.50272	0.05604
111715A	0.73516	0.06394	-1.21470	0.09394
111716A	0.70052	0.02964	0.04548	0.03277
111717A	0.66323	0.02903	-0.35102	0.03613
111721A	0.50401	0.02564	0.51956	0.04851
111727A	0.47773	0.02502	0.40385	0.04878
111728A	0.58567	0.05537	-0.90452	0.09669
111731A	0.61928	0.02783	0.15237	0.03668

IREF	*a*	*SE (a)*	*b*	*SE (b)*
112783A	0.57724	0.04892	-0.01935	0.06783
112788A	0.35543	0.04086	0.37669	0.11388
112794A	0.30741	0.02179	0.88369	0.08865
112797A	0.14808	0.01883	1.29825	0.21196
112803A	0.72425	0.03033	-0.23747	0.03264
112812A	0.33983	0.04204	1.61829	0.21630
112817A	0.35117	0.04444	1.95252	0.25009
112818A	0.27521	0.04096	2.61099	0.39117
112824A	0.88935	0.06155	0.32320	0.05057
112828A	0.37318	0.04343	-0.44097	0.11322
112833A	0.53924	0.04744	0.54579	0.08291
112839A	0.33074	0.02234	0.92216	0.08472
120551A	0.32889	0.04332	2.27761	0.29814
121661A	0.34355	0.04073	1.01618	0.15588
121663A	0.24209	0.03691	0.94636	0.20733
121665A	0.44157	0.02476	0.83601	0.06304
121691A	0.49594	0.02560	0.61944	0.05132
121737A	1.28267	0.08571	-0.18771	0.03678
122265A	0.33351	0.02580	2.47940	0.18487
122267A	0.72533	0.03023	-0.01800	0.03182
122368A	1.49222	0.09787	0.71486	0.04116
122432A	1.01577	0.07406	0.98485	0.06545

Table I-10. 2016–17 MSAA: IRT Parameters for Mathematics Grade 5

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111234A	0.22375	0.02331	-0.62610	0.10971
111242A	0.89434	0.06923	-0.97589	0.06909
111243A	1.12295	0.07490	0.02916	0.04114
111244A	0.77509	0.03336	0.26898	0.03055
111258A	0.50391	0.05036	1.44851	0.14702
111259A	0.35557	0.04182	0.98568	0.14996

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111262A	0.35639	0.04312	-1.09229	0.15922
111275A	0.34350	0.04247	-0.82514	0.14458
111276A	0.63654	0.03050	0.10823	0.03447
111277A	0.45201	0.04500	0.19356	0.08914
111294A	0.76431	0.05762	0.28658	0.05838

continued

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111295A	0.51195	0.04654	0.60637	0.08716
111298A	0.42037	0.04565	1.28262	0.15568
111299A	0.31973	0.02566	1.41212	0.12454
111303A	0.49971	0.00000	-0.18552	0.04287
111308A	0.78779	0.05660	0.17939	0.05254
112335A	0.85400	0.06574	-0.69445	0.06072
112342A	0.50555	0.02798	0.14210	0.04253
112346A	0.89281	0.03869	-0.63396	0.03126
112348A	0.51887	0.04763	0.39711	0.08376
112352A	0.30654	0.03959	-0.01111	0.12283
112354A	0.35853	0.04317	1.72393	0.21339
112358A	0.47369	0.02789	0.88475	0.06443
112359A	0.39339	0.04473	1.55420	0.18528
112363A	0.45619	0.02758	0.90291	0.06735
112364A	0.42435	0.04555	1.50052	0.16587
112365A	0.14565	0.02943	2.29157	0.51897
112368A	1.12337	0.07410	0.12471	0.04093
112369A	0.90019	0.06374	0.16927	0.04976
112372A	1.21842	0.04965	-0.75829	0.02647
112373A	0.47293	0.00000	-0.11449	0.04459
112377A	0.79581	0.06579	-0.89233	0.07311
112384A	0.86851	0.06042	0.13748	0.04778

IREF	*a*	*SE (a)*	*b*	*SE (b)*
112385A	0.48478	0.02759	0.31537	0.04656
112386A	0.43375	0.04502	0.85563	0.12075
112392A	0.24409	0.04058	3.11506	0.52123
112408A	0.70517	0.05484	0.50459	0.06629
112410A	0.47016	0.04472	0.23658	0.08201
112416A	0.22409	0.02315	-0.24717	0.09335
113856A	0.28723	0.02536	1.70375	0.15976
113862A	0.33158	0.02591	1.41010	0.12052
113863A	0.43230	0.04356	-0.11845	0.08686
113867A	0.31933	0.02562	1.38593	0.12285
113872A	0.44056	0.04649	1.26086	0.14798
113877A	0.22622	0.02481	2.54526	0.28471
113878A	0.21960	0.03525	0.78915	0.20753
113883A	0.31225	0.00000	0.20950	0.06754
113889A	0.48917	0.02876	-0.62711	0.05287
113892A	0.65180	0.03077	0.17865	0.03432
113899A	0.55497	0.05157	-1.00140	0.10339
113902A	0.29488	0.04000	1.53172	0.23146
120724A	1.05046	0.07171	0.77014	0.05312
120737A	0.98714	0.04052	0.91058	0.03573
120739A	1.00009	0.06928	0.68807	0.05522
121514A	1.06758	0.04239	0.82469	0.03189

Table I-11. 2016–17 MSAA: IRT Parameters for Mathematics Grade 6

IREF	*a*	*SE (a)*	*b*	*SE (b)*
110891A	0.65048	0.03484	-1.22571	0.06038
110903A	0.83755	0.07176	-1.08911	0.07806
110909A	0.63149	0.03397	-1.19770	0.06048
110910A	0.50771	0.00000	0.09811	0.04233
110938A	0.56919	0.02744	-0.00525	0.03794
110939A	0.35134	0.03985	0.33893	0.11066
110944A	0.88657	0.06932	-0.81363	0.06124
110977A	0.74254	0.05687	-0.12549	0.05547
110980A	0.69180	0.05638	-0.46673	0.06287
110981A	0.71461	0.05414	-0.09885	0.05510
110984A	0.42093	0.04150	1.21511	0.13778
110986A	0.75830	0.03270	-0.32631	0.03066
110990A	1.22814	0.08371	-0.54037	0.03860
110991A	0.52409	0.04537	0.06054	0.07394
110993A	0.50503	0.04583	-0.03811	0.07455
110996A	0.80887	0.03265	0.06229	0.02850
111022A	0.70633	0.05185	0.59344	0.06762
111025A	0.97228	0.06920	-0.31838	0.04521
111038A	0.62138	0.05155	-0.44420	0.06830
111441A	0.42037	0.04226	0.92376	0.12236
111445A	0.65866	0.05222	0.33501	0.06717
111450A	1.00460	0.04567	-1.00271	0.03627
111452A	0.57738	0.04671	0.54999	0.07787
111455A	0.78472	0.05587	0.15911	0.05382
111456A	0.58487	0.04928	0.32126	0.07368
111465A	0.46592	0.04284	0.23922	0.08431
111479A	1.19367	0.07944	-0.17636	0.03812
111482A	1.15362	0.04528	-0.52798	0.02324
111487A	0.36189	0.02426	-0.61555	0.06804
111496A	0.52992	0.03011	-1.10956	0.06532
111507A	0.69066	0.03007	-0.00829	0.03216
111508A	0.58023	0.05089	-0.65517	0.07993
111514A	0.80214	0.03351	-0.25471	0.02873
111517A	1.20629	0.04527	-0.34347	0.02099
111518A	0.57392	0.00000	-0.14040	0.03780
111630A	0.81388	0.06968	-1.13180	0.08290
112645A	0.74409	0.03108	0.08544	0.03060
112655A	0.34459	0.03838	0.94178	0.14336
112656A	0.73902	0.06408	-1.04465	0.08288
112658A	0.42458	0.02488	-0.20939	0.05027
112663A	0.48099	0.00000	0.38296	0.04774
112667A	0.25876	0.02226	1.83846	0.16793
112671A	0.42354	0.04301	-0.53423	0.10029
112672A	0.57732	0.04784	0.21455	0.06902
112676A	0.44636	0.02700	-0.92360	0.06696
112679A	1.37120	0.08955	-0.20825	0.03442
112692A	0.85740	0.06546	-0.65304	0.05694
112699A	0.33587	0.02285	0.54886	0.07025
112956A	0.70979	0.05466	-0.12542	0.05658
120494A	0.78024	0.05996	-0.36307	0.05484
120854A	0.63767	0.05084	-0.04338	0.06078
120855A	0.70457	0.00000	-0.23223	0.03198
121487A	0.89926	0.03508	-0.01542	0.02595
121520A	0.17223	0.02063	2.68991	0.33271
514235	0.59215	0.02762	0.19698	0.03780

Table I-12. 2016–17 MSAA: IRT Parameters for Mathematics Grade 7

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111048A	0.72887	0.05724	-0.07583	0.05667
111055A	0.73301	0.03233	-0.03240	0.02966
111066A	0.34610	0.04092	0.99496	0.15400
111067A	0.29932	0.03747	1.14362	0.18230
111069A	0.96622	0.08344	-1.21071	0.07896
111070A	1.12712	0.08169	-0.55051	0.04262
111071A	0.88207	0.06100	0.09292	0.04760
111075A	0.99419	0.07395	-0.50001	0.04817
111076A	0.54269	0.00000	0.42326	0.04454
111080A	0.67743	0.03065	0.25309	0.03428
111085A	0.32388	0.03943	0.76104	0.14481
111093A	0.65642	0.03065	-0.01596	0.03266
111094A	0.59989	0.04845	0.37497	0.07080
111098A	0.75597	0.03734	-0.89387	0.04155
111100A	0.73178	0.05587	-0.17461	0.05361
111104A	1.02496	0.07173	-0.38754	0.04174
111105A	0.66182	0.05247	0.05497	0.06135
111106A	0.26691	0.03974	2.61591	0.39570
111119A	0.81598	0.05896	0.12629	0.05270
111127A	0.60111	0.00000	0.27709	0.03823
111130A	0.57174	0.05395	-0.88372	0.09283
111131A	0.47055	0.02670	0.63864	0.05647
111641A	0.91595	0.07383	-0.82153	0.06010
111734A	1.00480	0.03999	-0.28614	0.02291
111738A	0.86390	0.07540	-1.14302	0.07997
111744A	0.86501	0.03828	-0.59561	0.02971
111748A	0.40252	0.03011	-1.68534	0.12132
111749A	1.06852	0.04579	-0.73965	0.02753

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111758A	0.56278	0.03223	-1.02302	0.05870
111761A	0.33415	0.02072	1.04541	0.08230
111766A	0.64673	0.00000	0.22916	0.03528
111769A	0.88653	0.03801	-0.47003	0.02712
111775A	0.21976	0.03547	2.03402	0.35916
111778A	0.85753	0.04600	-1.35886	0.05685
111779A	0.74600	0.03317	-0.21015	0.02918
111780A	0.30779	0.03971	2.14511	0.28495
111795A	0.59934	0.04941	0.51266	0.07608
111796A	0.58610	0.04877	0.24642	0.07092
111799A	0.37558	0.04031	0.33879	0.10416
111804A	0.57246	0.02894	-0.02069	0.03677
111841A	0.36870	0.03990	0.63364	0.11916
112852A	0.61564	0.05556	-0.68832	0.08028
112870A	0.48684	0.02704	0.23292	0.04509
112871A	0.26767	0.02340	0.16445	0.07673
112880A	0.36009	0.04298	-1.04128	0.14827
112882A	0.47533	0.02688	0.17781	0.04521
112886A	0.61484	0.02932	0.37621	0.03919
112887A	0.59096	0.04899	0.23527	0.07021
112890A	0.59709	0.02895	0.48022	0.04228
112899A	0.37329	0.02686	-0.97940	0.08111
112901A	0.32370	0.00000	0.98979	0.09647
112910A	0.89818	0.06421	0.12302	0.04904
112911A	0.65813	0.03021	0.30216	0.03582
113101A	0.55796	0.04916	0.18577	0.07323

Table I-13. 2016–17 MSAA: IRT Parameters for Mathematics Grade 8

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111247A	0.96014	0.04007	-0.80398	0.03166
111281A	0.30469	0.03722	-0.24176	0.11863
111283A	0.27449	0.03872	2.13293	0.31756
111286A	0.73861	0.03175	0.18573	0.03123
111335A	0.70729	0.05531	-0.08266	0.05637
111339A	0.48178	0.02654	0.45073	0.04997
111352A	0.88763	0.07239	-1.05944	0.07311
111560A	0.81213	0.05690	0.17675	0.04992
111562A	0.48603	0.05124	-1.89518	0.18484
111581A	0.42529	0.02609	-0.66405	0.05883
111583A	0.33745	0.02430	0.93847	0.08947
111593A	0.39367	0.04070	1.17126	0.13934
111594A	0.67978	0.03045	0.07574	0.03261
111597A	0.52736	0.04702	0.33856	0.07900
111615A	0.62115	0.05146	-0.54555	0.07102
111622A	0.74437	0.03187	0.14672	0.03070
112452A	0.53312	0.04788	-0.14422	0.07230
112460A	0.52310	0.04742	0.21294	0.07770
112466A	0.62836	0.02947	-0.10815	0.03444
112470A	0.38514	0.02545	-0.77479	0.06852
112475A	0.64937	0.05702	-0.93080	0.08501
112476A	0.15103	0.02000	0.43848	0.14662
112477A	0.25322	0.03675	1.71659	0.28133
112480A	0.46622	0.02620	0.37259	0.04969
112486A	0.58683	0.04951	0.62448	0.08192
112490A	0.71232	0.05581	-0.11277	0.05695
112491A	0.55744	0.04615	0.48606	0.07470
112494A	0.58434	0.05631	-1.32651	0.11991
112499A	1.25303	0.09295	-0.90234	0.04972
112500A	0.44563	0.04204	0.57650	0.09380
112506A	0.71589	0.03141	-0.13301	0.03083
112509A	0.64888	0.05107	-0.20273	0.06014
112516A	0.80173	0.05918	0.12500	0.05323
113909A	1.14562	0.08587	-0.89390	0.05287
113917A	0.90027	0.06705	-0.52709	0.05148
113918A	0.68441	0.03237	-0.79098	0.04151
113932A	0.60512	0.04806	0.34152	0.06627
113933A	0.56906	0.04915	0.40791	0.07739
113937A	0.54033	0.04753	0.48555	0.08215
113943A	0.79149	0.05945	-0.15808	0.05137
113952A	0.61486	0.02914	0.37551	0.03905
113957A	0.43988	0.04192	0.76092	0.10310
113959A	0.38684	0.04270	1.02100	0.14477
113963A	0.70358	0.05465	0.11762	0.05806
113968A	1.01758	0.03871	-0.11012	0.02311
113973A	0.82140	0.06132	-0.25193	0.05111
113978A	0.62064	0.02933	-0.12894	0.03486
117071A	0.31538	0.03858	-1.01142	0.15843
117072A	0.90607	0.03572	0.08414	0.02580
120560A	1.02251	0.07071	-0.17977	0.04251
120568A	0.61557	0.04870	0.11270	0.06185
120571A	0.44761	0.04386	0.36188	0.09180
122051A	0.71012	0.03112	0.08278	0.03148
122099A	0.61447	0.02906	0.09762	0.03570
519587	0.73966	0.05453	-0.08432	0.05284

Table I-14. 2016–17 MSAA: IRT Parameters for Mathematics Grade 11

IREF	*a*	*SE (a)*	*b*	*SE (b)*
110843A	0.57072	0.05473	0.43057	0.08605
110858A	0.65393	0.05540	0.10577	0.06193
110867A	0.69739	0.07320	-1.19768	0.11344
110881A	0.56649	0.05586	-0.07456	0.07686
110882A	0.60187	0.05455	0.27821	0.07361
110913A	0.66613	0.05550	0.46347	0.06932
110914A	0.81264	0.04557	0.23591	0.03991
110915A	0.96756	0.08904	-0.93577	0.07252
110921A	0.67563	0.04135	0.13590	0.04488
110936A	0.69434	0.04380	-0.39045	0.04521
110968A	0.44155	0.04883	0.65669	0.11771
111000A	0.64190	0.05696	0.13335	0.06725
111002A	0.90917	0.07043	-0.17013	0.04830
111016A	0.68055	0.04122	0.30327	0.04715
111024A	0.78688	0.07059	-0.64556	0.06894
111042A	0.79504	0.06424	0.24562	0.05826
111109A	0.28562	0.03031	0.57070	0.11291
111533A	0.82602	0.05406	-1.02656	0.05919
111537A	0.54175	0.03705	0.67040	0.06760
111538A	0.82915	0.04593	0.35841	0.04132
111544A	0.44758	0.03458	0.77774	0.08413
111545A	0.25423	0.03880	1.64424	0.28154
111546A	0.48183	0.05023	-0.21135	0.08734
111548A	0.51731	0.05005	0.74512	0.10114
111553A	0.82269	0.06565	0.25106	0.05685
111557A	0.68536	0.04134	0.32596	0.04730
111809A	0.83677	0.06574	0.42677	0.06023
111810A	1.18704	0.05940	0.19022	0.02955
111813A	0.84293	0.07613	-0.79530	0.07267
111815A	0.69967	0.06250	-0.05578	0.06400
111818A	0.98430	0.07389	-0.07007	0.04560
111819A	0.58658	0.05317	0.68079	0.08872
111824A	0.72603	0.04318	0.04547	0.04145
111828A	0.50921	0.05181	0.75305	0.10960
111829A	0.67671	0.05596	0.42779	0.06730
111830A	0.46005	0.03827	-1.02292	0.09428
111833A	0.64633	0.05619	0.47888	0.07495
111840A	0.54485	0.05081	0.08117	0.07226
112701A	1.16311	0.08999	-0.76392	0.05088
112702A	0.56797	0.05462	0.41465	0.08582
112708A	0.80594	0.04571	0.08430	0.03834
112709A	0.31844	0.04114	1.37683	0.21111
112717A	0.87314	0.04798	0.09496	0.03607
112722A	1.09749	0.05848	-0.31854	0.02987
112727A	1.01744	0.07492	-0.31242	0.04347
112732A	0.66124	0.05747	0.25741	0.06771
112733A	0.46650	0.05004	0.43199	0.10187
112743A	0.62758	0.05416	0.15787	0.06489
112744A	0.64045	0.05517	-0.02615	0.06207
112924A	0.87327	0.07216	-0.75703	0.06342
112940A	0.53390	0.05001	0.41112	0.08132
112945A	0.41784	0.03442	-0.21528	0.06827
112946A	0.52323	0.03706	-0.00646	0.05471
122021A	0.36100	0.04331	0.96869	0.15186
122055A	0.23836	0.02890	0.60320	0.13520

APPENDIX J—TEST CHARACTERISTIC CURVES & TEST INFORMATION FUNCTIONS

Figure J-1. 2016–17 MSAA: Test Characteristic Curve for Grade 3 Mathematics

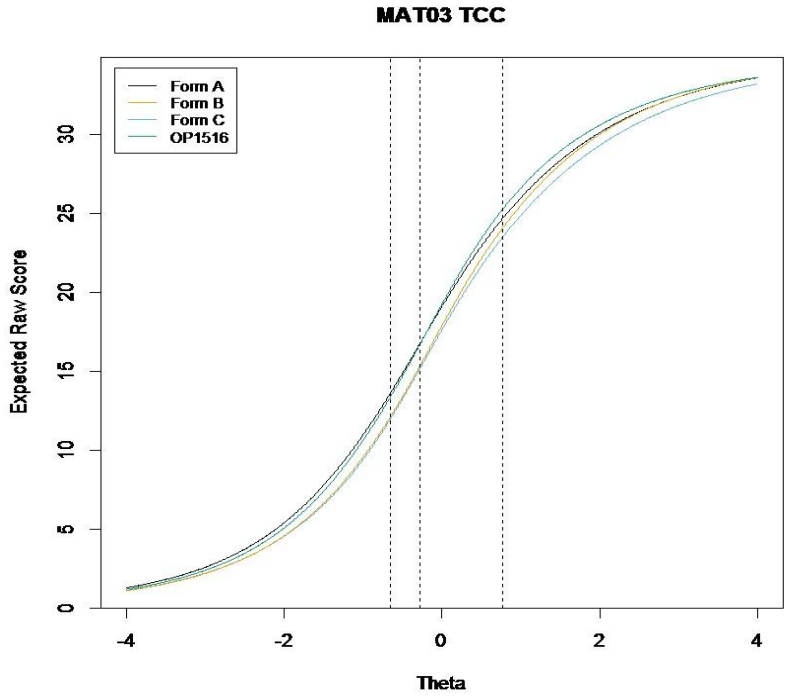


Figure J-2. 2016–17 MSAA: Test Information Function and Standard Error for Grade 3 Mathematics

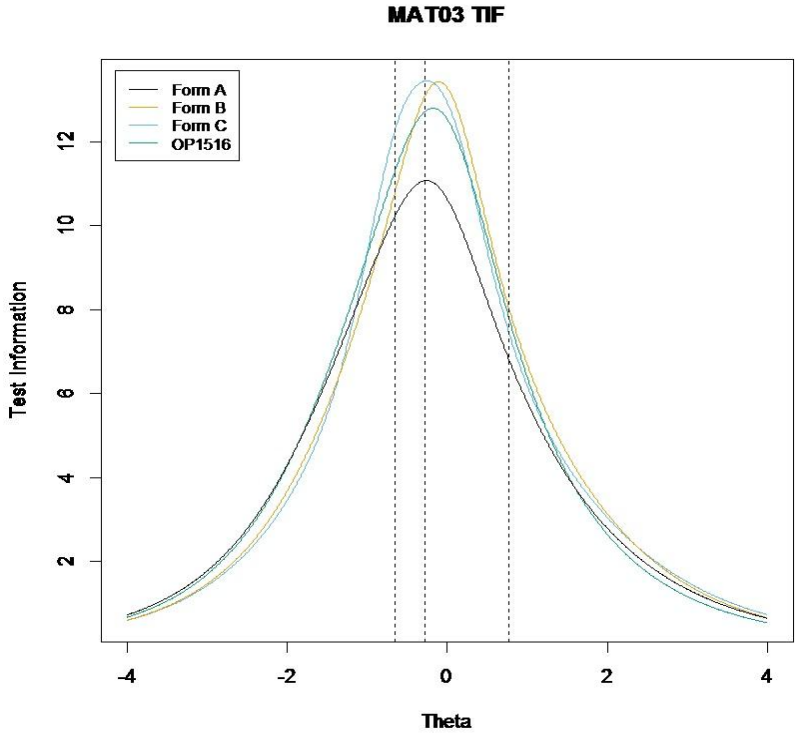


Figure J-3. 2016–17 MSAA: Test Characteristic Curve for Grade 4 Mathematics

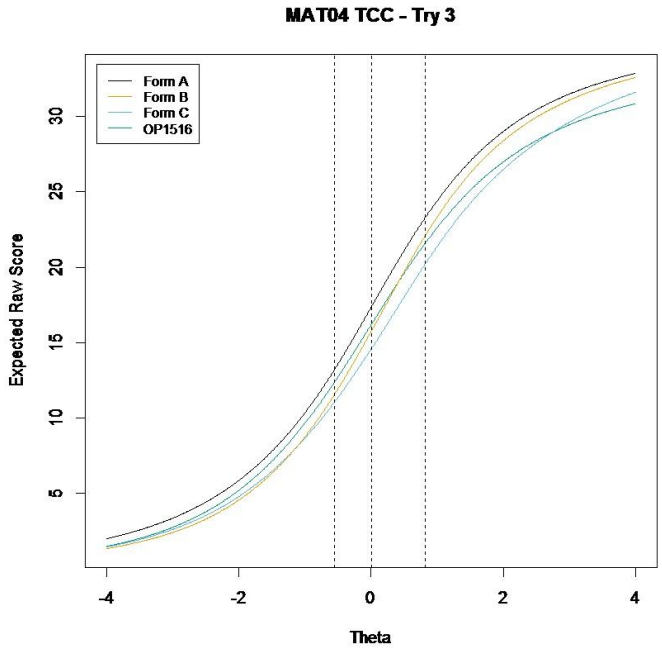


Figure J-4. 2016–17 MSAA: Test Information Function and Standard Error for Grade 4 Mathematics

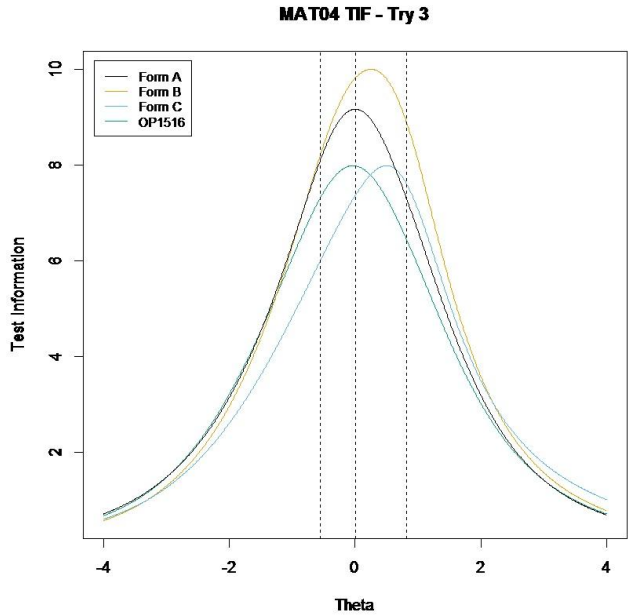


Figure J-5. 2016–17 MSAA: Test Characteristic Curve for Grade 5 Mathematics

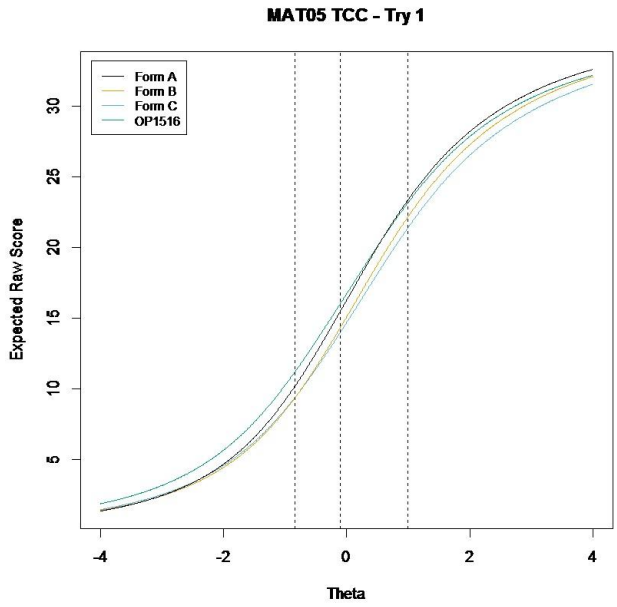


Figure J-6. 2016–17 MSAA: Test Information Function and Standard Error for Grade 5 Mathematics

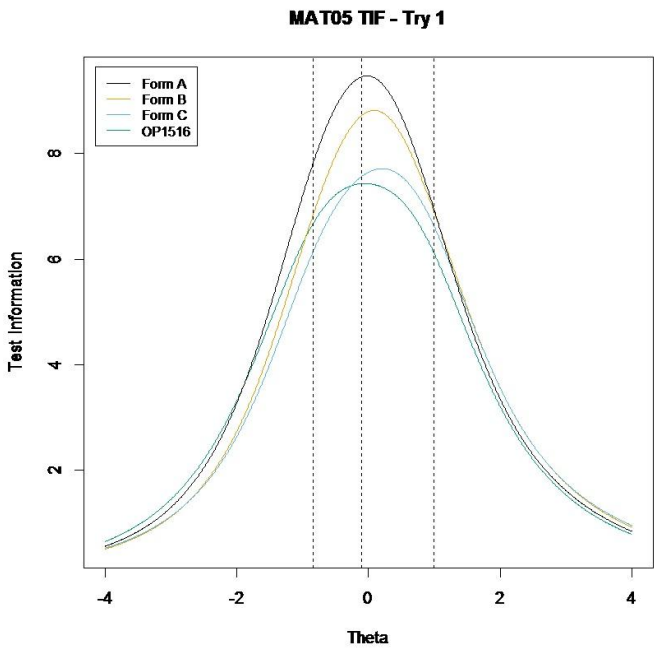


Figure J-7. 2016–17 MSAA: Test Characteristic Curve for Grade 6 Mathematics

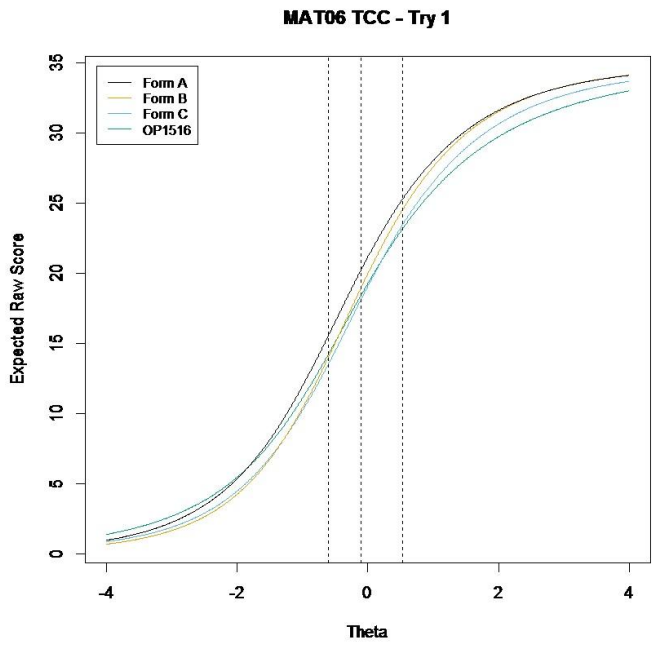


Figure J-8. 2016–17 MSAA: Test Information Function and Standard Error for Grade 6 Mathematics

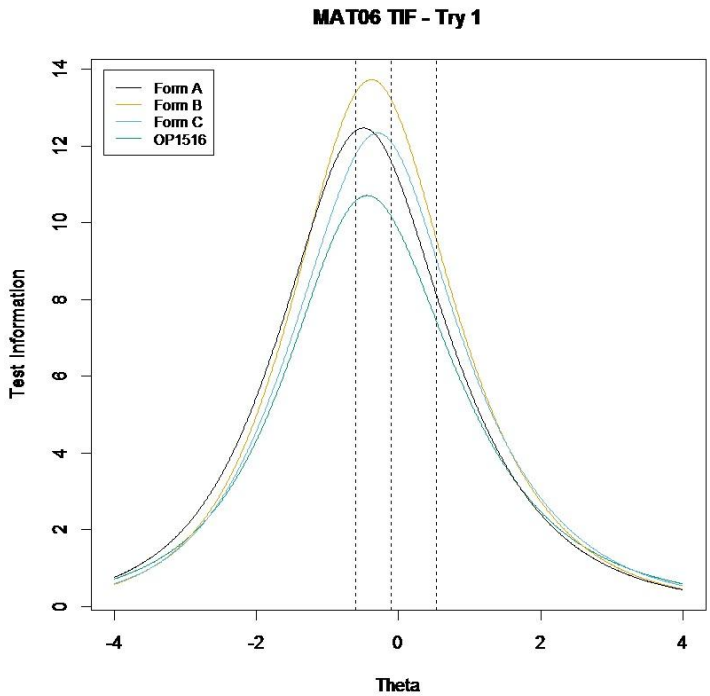


Figure J-9. 2016–17 MSAA: Test Characteristic Curve for Grade 7 Mathematics

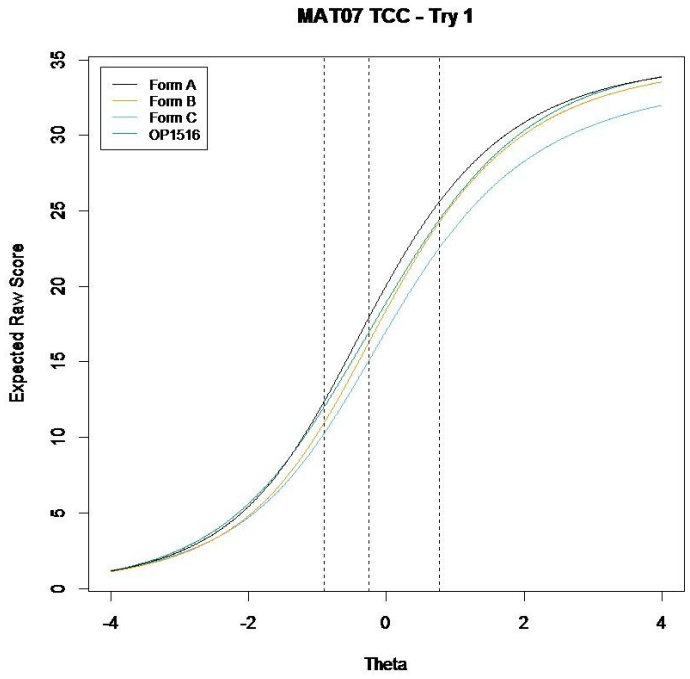


Figure J-10. 2016–17 MSAA: Test Information Function and Standard Error for Grade 7 Mathematics

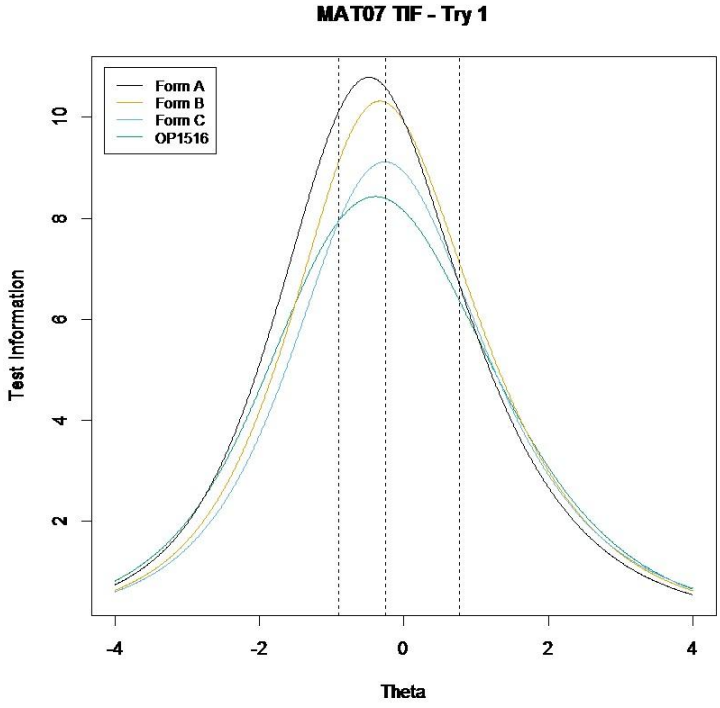


Figure J-11. 2016–17 MSAA: Test Characteristic Curve for Grade 8 Mathematics

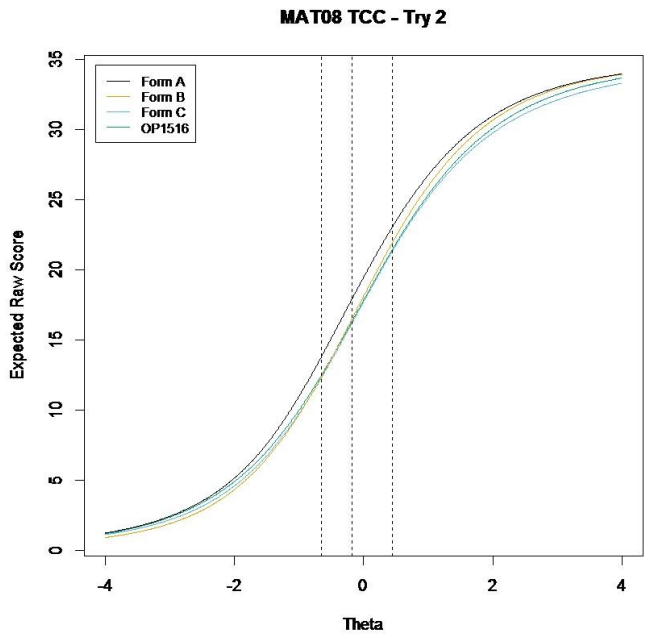


Figure J-12. 2016–17 MSAA: Test Information Function and Standard Error for Grade 8 Mathematics

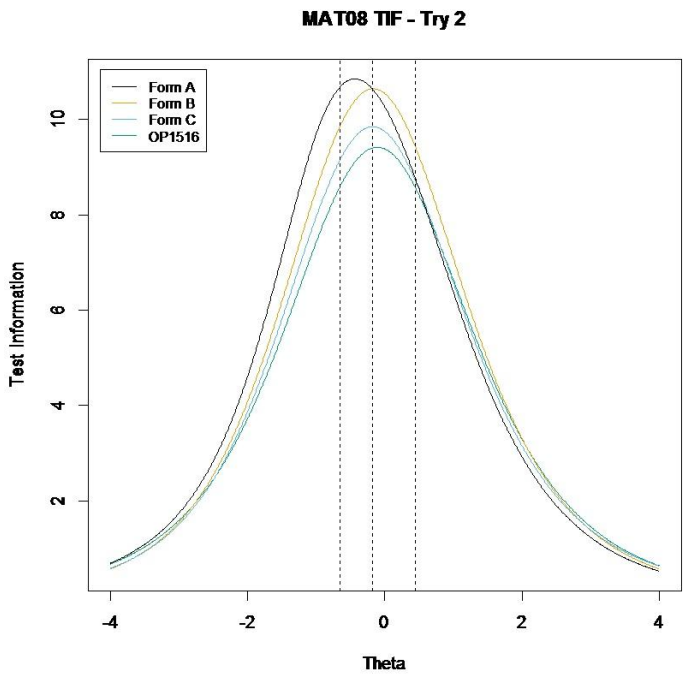


Figure J-13. 2016–17 MSAA: Test Characteristic Curve for Grade 11 Mathematics

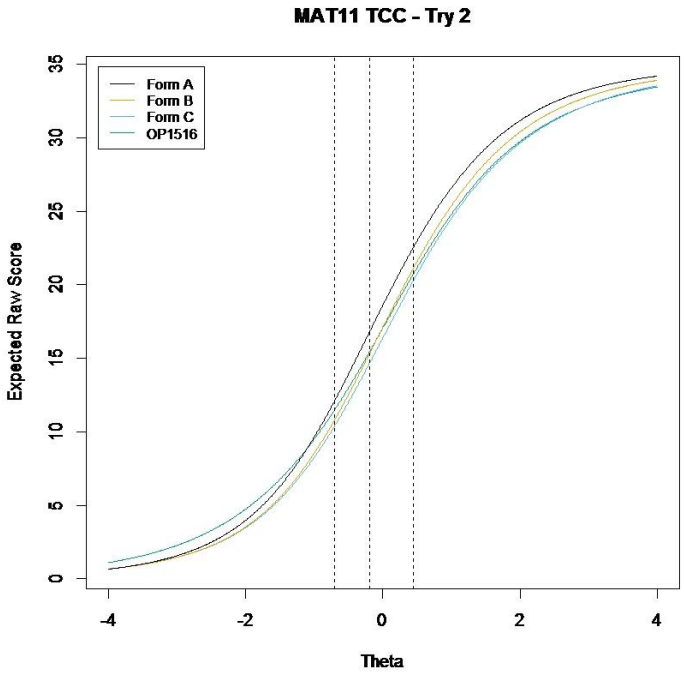


Figure J-14. 2016–17 MSAA: Test Information Function and Standard Error for Grade 11 Mathematics

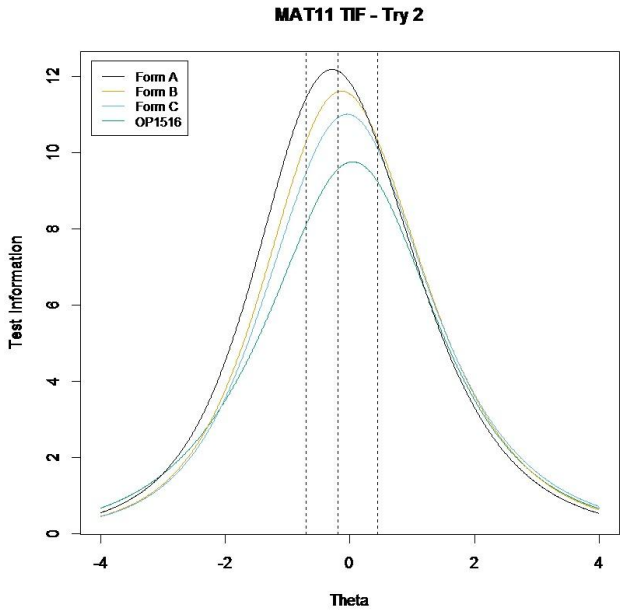


Figure J-15. 2016–17 MSAA: Test Characteristic Curve for Grade 3 ELA

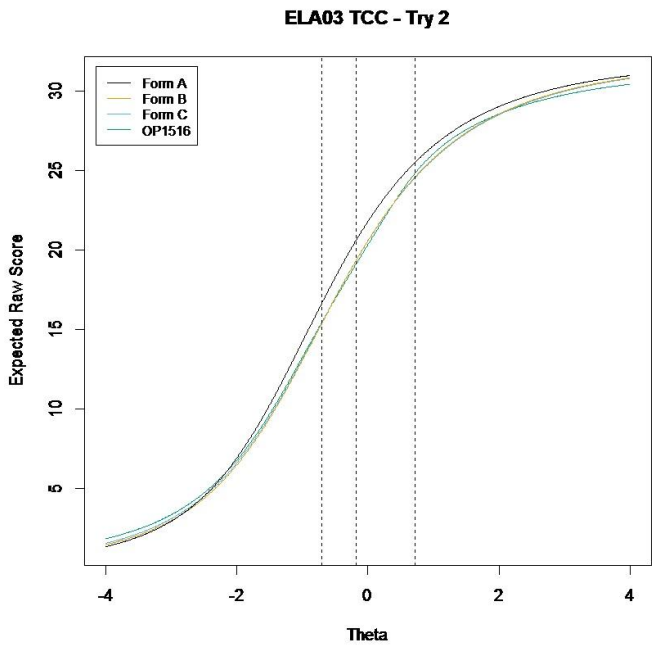


Figure J-16. 2016–17 MSAA: Test Information Function and Standard Error for Grade 3 ELA

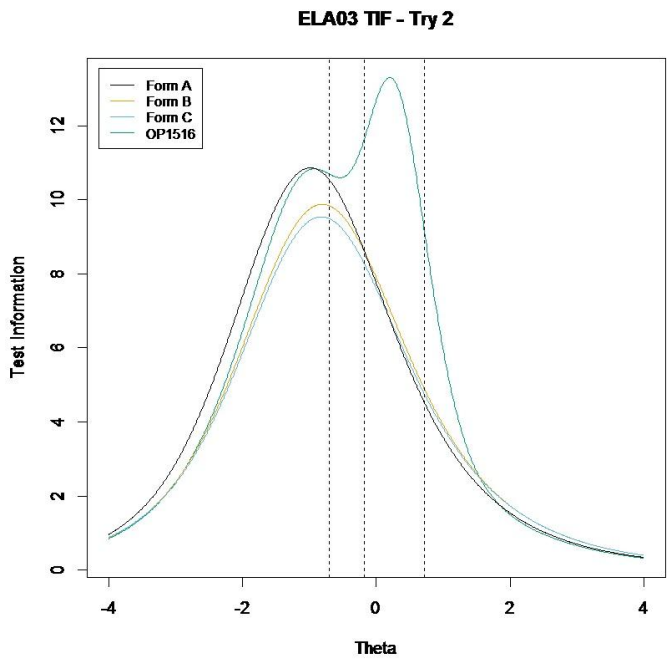


Figure J-17. 2016–17 MSAA: Test Characteristic Curve for Grade 4 ELA

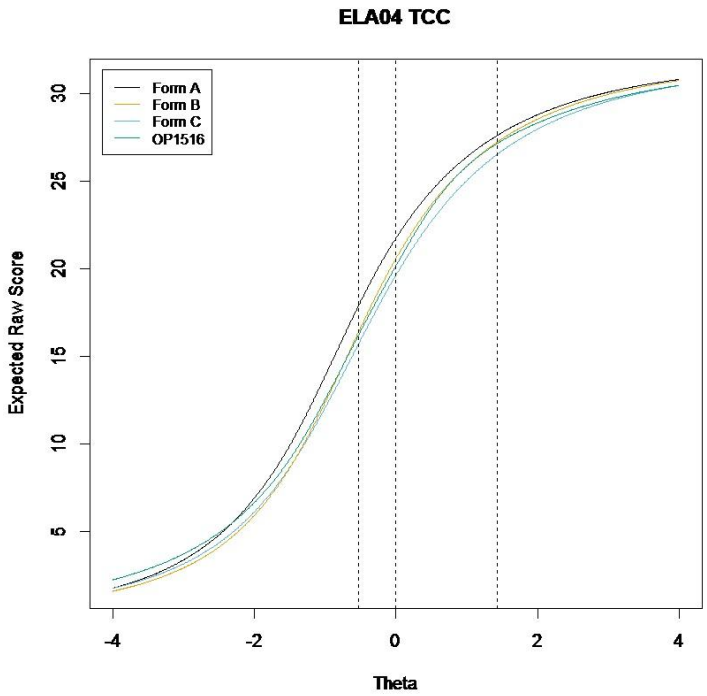


Figure J-18. 2016–17 MSAA: Test Information Function and Standard Error for Grade 4 ELA

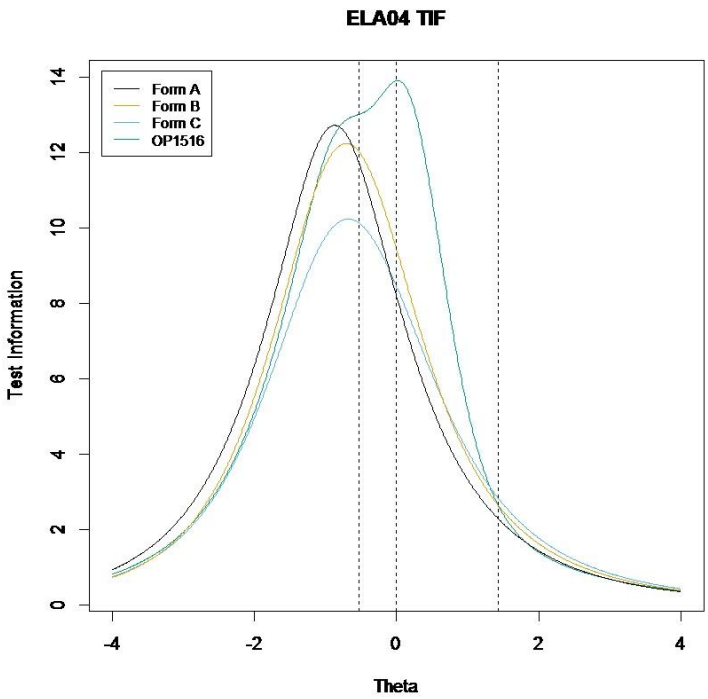


Figure J-19. 2016–17 MSAA: Test Characteristic Curve for Grade 5 ELA

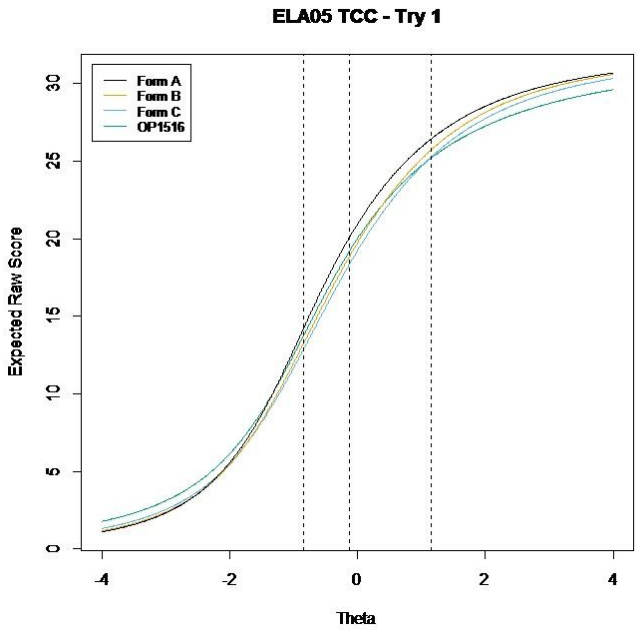


Figure J-20. 2016–17 MSAA: Test Information Function and Standard Error for Grade 5 ELA

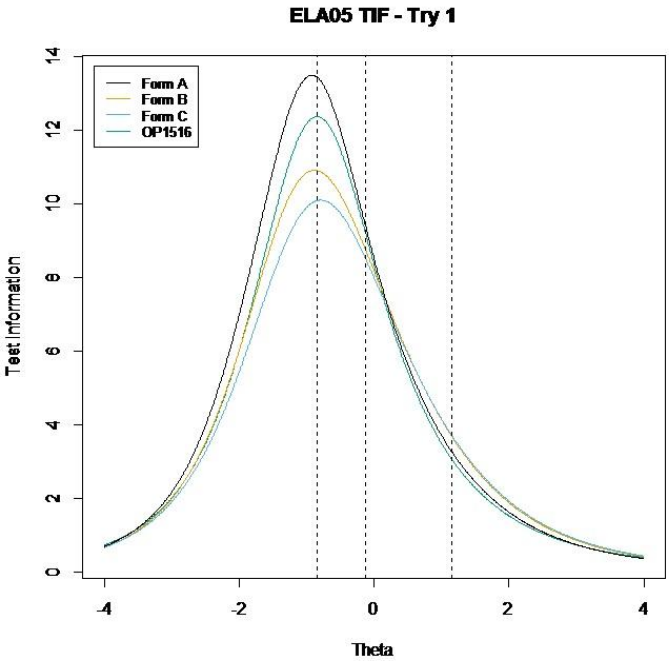


Figure J-21. 2016–17 MSAA: Test Characteristic Curve for Grade 6 ELA

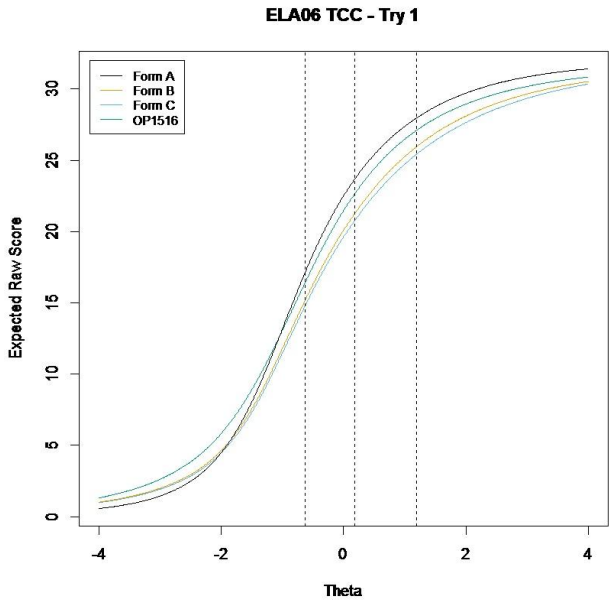


Figure J-22. 2016–17 MSAA: Test Information Function and Standard Error for Grade 6 ELA

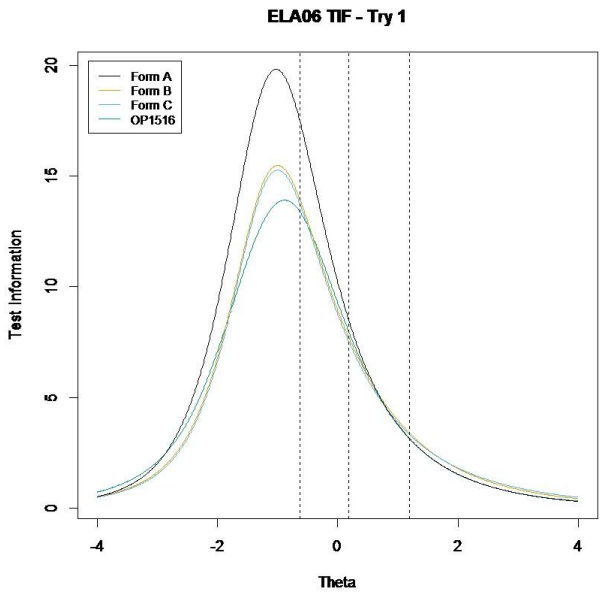


Figure J-23. 2016–17 MSAA: Test Characteristic Curve for Grade 7 ELA

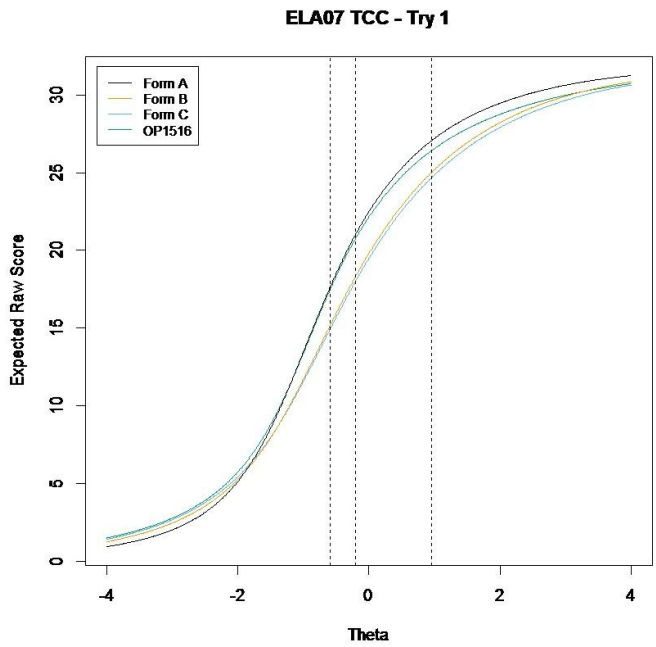


Figure J-24. 2016–17 MSAA: Test Information Function and Standard Error for Grade 7 ELA

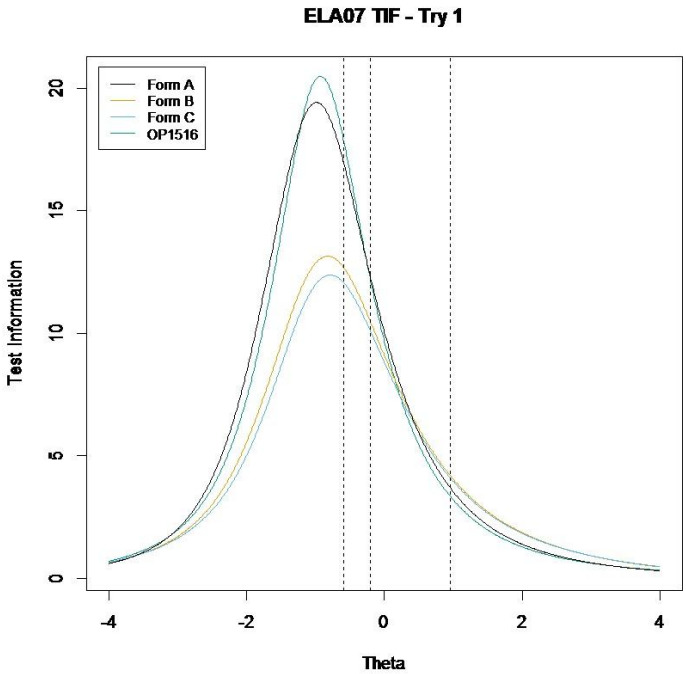


Figure J-25. 2016–17 MSAA: Test Characteristic Curve for Grade 8 ELA

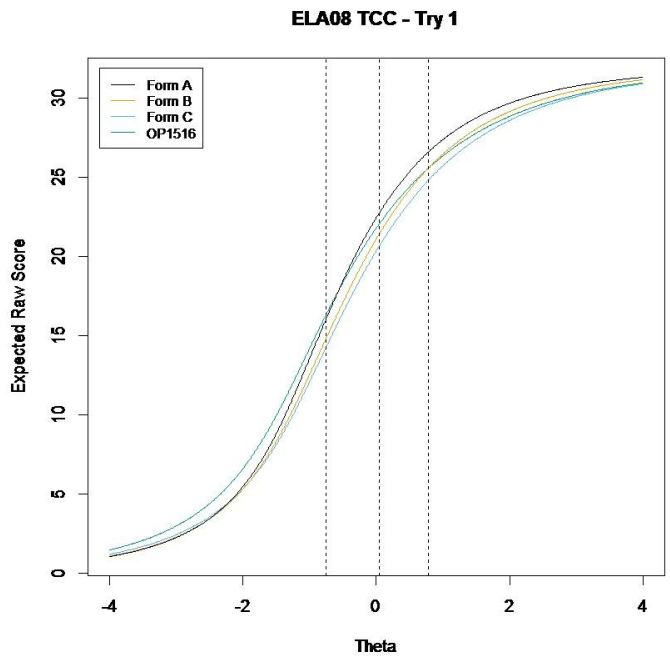


Figure J-26. 2016–17 MSAA: Test Information Function and Standard Error for Grade 8 ELA

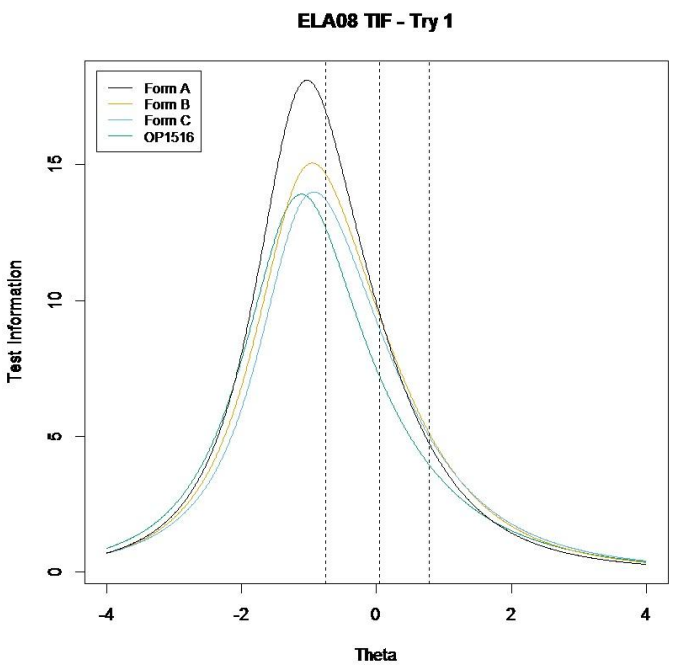


Figure J-27. 2016–17 MSAA: Test Characteristic Curve for Grade 11 ELA

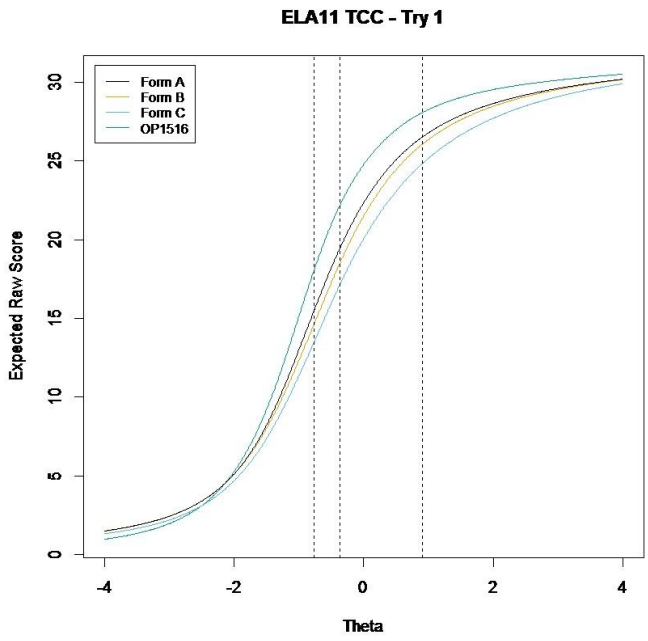
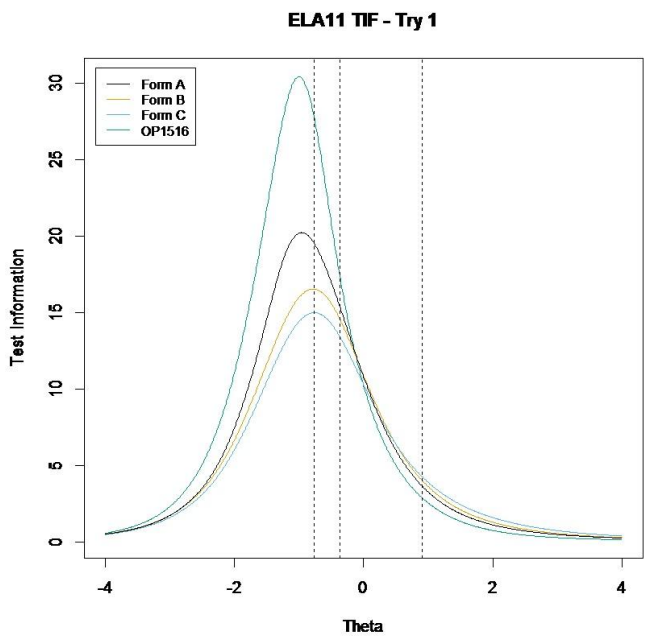


Figure J-28. 2016–17 MSAA: Test Information Function and Standard Error for Grade 11 ELA



APPENDIX K—RAW TO SCALED SCORE LOOK-UP TABLES

Table K-1. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 3

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	18.3	1	1200	22.2	1
	1	1200	13.3	1	1200	16.2	1
	2	1201	8.9	1	1200	11.0	1
	3	1207	6.8	1	1206	7.7	1
	4	1211	5.7	1	1211	6.1	1
	5	1214	5.0	1	1215	5.2	1
	6	1217	4.6	1	1218	4.6	1
	7	1219	4.3	1	1220	4.2	1
	8	1221	4.1	1	1222	3.8	1
	9	1222	3.9	1	1224	3.6	1
	10	1224	3.8	1	1226	3.4	1
	11	1226	3.7	1	1228	3.2	1
	12	1227	3.6	1	1230	3.1	1
	13	1229	3.6	1	1231	3.0	1
	14	1230	3.6	1	1233	2.9	1
	15	1231	3.6	1	1235	2.8	2
	16	1233	3.6	1	1236	2.7	2
	17	1234	3.6	2	1238	2.7	2
	18	1236	3.7	2	1240	2.6	3
	19	1237	3.8	2	1242	2.6	3
	20	1239	3.9	2	1244	2.7	3
	21	1241	4.1	3	1246	2.8	3
	22	1242	4.3	3	1248	3.0	3
	23	1244	4.5	3	1250	3.3	3
	24	1247	4.8	3	1252	3.7	4
	25	1249	5.2	3	1256	4.5	4
	26	1252	5.8	4	1260	5.9	4
	27	1255	6.6	4	1267	8.5	4
	28	1260	7.6	4	1278	13.8	4
	29	1265	9.4	4	1289	20.1	4
	30	1274	12.5	4	1290	20.1	4
	31	1289	20.1	4	1290	20.1	4
	32	1290	20.1	4	1290	20.1	4
02	0	1200	19.4	1	1200	22.2	1
	1	1200	14.4	1	1200	16.2	1
	2	1201	10.0	1	1200	11.0	1
	3	1207	7.5	1	1206	7.7	1
	4	1211	6.3	1	1211	6.1	1
	5	1215	5.5	1	1215	5.2	1
	6	1217	5.0	1	1218	4.6	1
	7	1220	4.6	1	1220	4.2	1
	8	1222	4.3	1	1222	3.8	1
	9	1224	4.1	1	1224	3.6	1
	10	1226	4.0	1	1226	3.4	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	11	1227	3.9	1	1228	3.2	1
	12	1229	3.8	1	1230	3.1	1
	13	1230	3.8	1	1231	3.0	1
	14	1232	3.7	1	1233	2.9	1
	15	1233	3.7	1	1235	2.8	2
	16	1235	3.8	2	1236	2.7	2
	17	1236	3.8	2	1238	2.7	2
	18	1238	3.9	2	1240	2.6	3
	19	1239	4.0	2	1242	2.6	3
	20	1241	4.1	3	1244	2.7	3
	21	1243	4.2	3	1246	2.8	3
	22	1245	4.4	3	1248	3.0	3
	23	1247	4.7	3	1250	3.3	3
	24	1249	5.0	3	1252	3.7	4
	25	1252	5.5	4	1256	4.5	4
	26	1254	6.1	4	1260	5.9	4
	27	1258	6.9	4	1267	8.5	4
	28	1262	8.0	4	1278	13.8	4
	29	1268	9.8	4	1289	20.1	4
	30	1277	12.9	4	1290	20.1	4
	31	1289	18.7	4	1290	20.1	4
	32	1290	18.7	4	1290	20.1	4
03	0	1200	19.4	1	1200	22.2	1
	1	1200	14.7	1	1200	16.2	1
	2	1200	10.3	1	1200	11.0	1
	3	1206	7.8	1	1206	7.7	1
	4	1211	6.5	1	1211	6.1	1
	5	1214	5.6	1	1215	5.2	1
	6	1217	5.1	1	1218	4.6	1
	7	1220	4.7	1	1220	4.2	1
	8	1222	4.4	1	1222	3.8	1
	9	1224	4.2	1	1224	3.6	1
	10	1225	4.1	1	1226	3.4	1
	11	1227	3.9	1	1228	3.2	1
	12	1229	3.9	1	1230	3.1	1
	13	1230	3.8	1	1231	3.0	1
	14	1232	3.8	1	1233	2.9	1
	15	1233	3.8	1	1235	2.8	2
	16	1235	3.8	2	1236	2.7	2
	17	1236	3.9	2	1238	2.7	2
	18	1238	3.9	2	1240	2.6	3
	19	1239	4.0	2	1242	2.6	3
	20	1241	4.2	3	1244	2.7	3
	21	1243	4.3	3	1246	2.8	3
	22	1245	4.5	3	1248	3.0	3
	23	1247	4.8	3	1250	3.3	3
	24	1249	5.1	3	1252	3.7	4
	25	1252	3.9	4	1256	4.5	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	26	1255	5.6	4	1260	5.9	4
	27	1258	6.2	4	1267	8.5	4
	28	1263	7.0	4	1278	13.8	4
	29	1268	8.1	4	1289	20.1	4
	30	1277	9.9	4	1290	20.1	4
	31	1289	13.1	4	1290	20.1	4
	32	1290	18.7	4	1290	20.1	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-2. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 4

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	20.2	1	1200	23.5	1
	1	1200	15.6	1	1200	18.4	1
	2	1200	11.5	1	1200	14.1	1
	3	1202	8.6	1	1200	10.0	1
	4	1207	7.0	1	1206	7.7	1
	5	1211	6.0	1	1211	6.3	1
	6	1214	5.3	1	1215	5.3	1
	7	1216	4.8	1	1218	4.6	1
	8	1218	4.4	1	1220	4.1	1
	9	1220	4.1	1	1222	3.7	1
	10	1222	3.8	1	1224	3.4	1
	11	1224	3.7	1	1226	3.2	1
	12	1225	3.5	1	1228	3.0	1
	13	1227	3.4	1	1229	2.9	1
	14	1228	3.4	1	1231	2.8	1
	15	1230	3.4	1	1233	2.7	1
	16	1231	3.4	1	1234	2.6	2
	17	1232	3.4	1	1236	2.6	2
	18	1234	3.5	2	1237	2.6	2
	19	1235	3.7	2	1239	2.7	2
	20	1237	3.8	2	1241	2.8	3
	21	1239	4.0	2	1243	2.9	3
	22	1241	4.3	3	1245	3.1	3
	23	1243	4.6	3	1247	3.4	3
	24	1245	5.0	3	1249	3.8	3
	25	1248	5.6	3	1252	4.5	3
	26	1251	6.3	3	1256	5.5	3
	27	1255	7.2	3	1261	7.3	4
	28	1259	8.6	4	1269	10.3	4
	29	1266	10.6	4	1280	15.2	4
	30	1275	14.3	4	1288	19.4	4

continued

Form	*Raw Score*	*2017*			*2016*		
		Scaled Score	*Standard Error*	*Performance Level*	*Scaled Score*	*Standard Error*	*Performance Level*
01	31	1288	20.7	4	1290	19.4	4
	32	1290	20.7	4	1290	19.4	4

Form	Raw Score	2017			2016		
		Scaled Score	*Standard Error*	*Performance Level*	*Scaled Score*	*Standard Error*	*Performance Level*
02	0	1200	23.2	1	1200	23.5	1
	1	1200	17.4	1	1200	18.4	1
	2	1200	12.0	1	1200	14.1	1
	3	1204	8.6	1	1200	10.0	1
	4	1209	6.9	1	1206	7.7	1
	5	1213	5.8	1	1211	6.3	1
	6	1216	5.1	1	1215	5.3	1
	7	1219	4.6	1	1218	4.6	1
	8	1221	4.3	1	1220	4.1	1
	9	1223	4.0	1	1222	3.7	1
	10	1224	3.8	1	1224	3.4	1
	11	1226	3.7	1	1226	3.2	1
	12	1227	3.6	1	1228	3.0	1
	13	1229	3.5	1	1229	2.9	1
	14	1230	3.5	1	1231	2.8	1
	15	1232	3.4	1	1233	2.7	1
	16	1233	3.5	1	1234	2.6	2
	17	1235	3.5	2	1236	2.6	2
	18	1236	3.6	2	1237	2.6	2
	19	1238	3.7	2	1239	2.7	2
	20	1239	3.8	2	1241	2.8	3
	21	1241	4.0	3	1243	2.9	3
	22	1243	4.2	3	1245	3.1	3
	23	1245	4.6	3	1247	3.4	3
	24	1247	5.0	3	1249	3.8	3
	25	1250	5.5	3	1252	4.5	3
	26	1253	6.2	3	1256	5.5	3
	27	1256	7.2	3	1261	7.3	4
	28	1261	8.5	4	1269	10.3	4
	29	1267	10.6	4	1280	15.2	4
	30	1277	14.2	4	1288	19.4	4
	31	1288	19.7	4	1290	19.4	4
	32	1290	19.7	4	1290	19.4	4

Form	*Raw Score*	*2017*			*2016*		
		Scaled Score	*Standard Error*	*Performance Level*	*Scaled Score*	*Standard Error*	*Performance Level*
03	0	1200	23.0	1	1200	23.5	1
	1	1200	17.6	1	1200	18.4	1
	2	1200	12.8	1	1200	14.1	1
	3	1203	9.3	1	1200	10.0	1
	4	1208	7.4	1	1206	7.7	1
	5	1212	6.3	1	1211	6.3	1
	6	1216	5.5	1	1215	5.3	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	7	1218	5.0	1	1218	4.6	1
	8	1221	4.6	1	1220	4.1	1
	9	1223	4.3	1	1222	3.7	1
	10	1225	4.1	1	1224	3.4	1
	11	1226	4.0	1	1226	3.2	1
	12	1228	3.9	1	1228	3.0	1
	13	1230	3.8	1	1229	2.9	1
	14	1231	3.8	1	1231	2.8	1
	15	1233	3.8	1	1233	2.7	1
	16	1234	3.8	2	1234	2.6	2
	17	1236	3.9	2	1236	2.6	2
	18	1237	3.9	2	1237	2.6	2
	19	1239	4.1	2	1239	2.7	2
	20	1241	4.2	3	1241	2.8	3
	21	1243	4.4	3	1243	2.9	3
	22	1245	4.7	3	1245	3.1	3
	23	1247	5.0	3	1247	3.4	3
	24	1249	5.4	3	1249	3.8	3
	25	1252	5.9	3	1252	4.5	3
	26	1255	6.7	3	1256	5.5	3
	27	1259	7.7	4	1261	7.3	4
	28	1264	9.1	4	1269	10.3	4
	29	1271	11.4	4	1280	15.2	4
	30	1281	15.4	4	1288	19.4	4
	31	1288	18.6	4	1290	19.4	4
	32	1290	18.6	4	1290	19.4	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-3. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 5

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	23.3	1	1200	26.5	1
	1	1200	15.6	1	1200	19.1	1
	2	1202	9.4	1	1200	12.6	1
	3	1208	7.0	1	1205	8.7	1
	4	1212	5.8	1	1210	6.8	1
	5	1215	5.0	1	1214	5.7	1
	6	1218	4.5	1	1217	5.0	1
	7	1220	4.1	1	1220	4.5	1
	8	1222	3.9	1	1222	4.1	1
	9	1224	3.7	1	1224	3.9	1
	10	1225	3.6	1	1226	3.8	1
	11	1227	3.5	1	1228	3.6	1

continued

Form	Raw Score	2017 Scaled Score	2017 Standard Error	2017 Performance Level	2016 Scaled Score	2016 Standard Error	2016 Performance Level
	12	1228	3.4	1	1230	3.6	1
	13	1229	3.4	1	1232	3.6	2
	14	1231	3.4	1	1233	3.6	2
	15	1232	3.4	2	1235	3.7	2
	16	1234	3.5	2	1236	3.8	2
	17	1235	3.6	2	1238	3.9	2
	18	1237	3.7	2	1240	4.1	3
	19	1238	3.8	2	1242	4.4	3
	20	1239	4.0	2	1244	4.7	3
	21	1242	4.3	3	1247	5.1	3
01	22	1244	4.5	3	1250	5.7	3
	23	1246	4.9	3	1253	6.4	3
	24	1248	5.3	3	1258	7.4	4
	25	1251	5.8	3	1263	8.9	4
	26	1254	6.5	3	1270	11.1	4
	27	1258	7.4	4	1280	14.9	4
	28	1263	8.7	4	1290	20.0	4
	29	1270	10.8	4	1290	20.0	4
	30	1280	14.8	4	1290	20.0	4
	31	1290	20.5	4	1290	20.0	4
	32	1290	20.5	4	1290	20.0	4
	0	1200	23.4	1	1200	26.5	1
	1	1200	16.1	1	1200	19.1	1
	2	1201	10.0	1	1200	12.6	1
	3	1208	7.5	1	1205	8.7	1
	4	1212	6.1	1	1210	6.8	1
	5	1216	5.3	1	1214	5.7	1
	6	1218	4.8	1	1217	5.0	1
	7	1220	4.4	1	1220	4.5	1
	8	1222	4.2	1	1222	4.1	1
	9	1224	4.0	1	1224	3.9	1
	10	1226	3.9	1	1226	3.8	1
	11	1228	3.8	1	1228	3.6	1
	12	1229	3.8	1	1230	3.6	1
02	13	1231	3.8	1	1232	3.6	2
	14	1232	3.8	2	1233	3.6	2
	15	1234	3.8	2	1235	3.7	2
	16	1235	3.9	2	1236	3.8	2
	17	1237	4.0	2	1238	3.9	2
	18	1239	4.1	2	1240	4.1	3
	19	1240	4.2	3	1242	4.4	3
	20	1242	4.4	3	1244	4.7	3
	21	1244	4.6	3	1247	5.1	3
	22	1246	4.9	3	1250	5.7	3
	23	1248	5.2	3	1253	6.4	3
	24	1251	5.5	3	1258	7.4	4
	25	1254	6.0	3	1263	8.9	4
	26	1257	6.7	4	1270	11.1	4

continued

Form	Raw Score	2017 Scaled Score	2017 Standard Error	2017 Performance Level	2016 Scaled Score	2016 Standard Error	2016 Performance Level
02	27	1261	7.5	4	1280	14.9	4
	28	1266	8.8	4	1290	20.0	4
	29	1272	10.9	4	1290	20.0	4
	30	1282	14.7	4	1290	20.0	4
	31	1290	19.1	4	1290	20.0	4
	32	1290	19.1	4	1290	20.0	4
03	0	1200	24.7	1	1200	26.5	1
	1	1200	17.2	1	1200	19.1	1
	2	1200	10.8	1	1200	12.6	1
	3	1207	8.0	1	1205	8.7	1
	4	1212	6.5	1	1210	6.8	1
	5	1215	5.6	1	1214	5.7	1
	6	1218	5.1	1	1217	5.0	1
	7	1221	4.7	1	1220	4.5	1
	8	1223	4.4	1	1222	4.1	1
	9	1225	4.2	1	1224	3.9	1
	10	1226	4.1	1	1226	3.8	1
	11	1228	4.0	1	1228	3.6	1
	12	1230	3.9	1	1230	3.6	1
	13	1232	3.9	2	1232	3.6	2
	14	1233	3.9	2	1233	3.6	2
	15	1234	3.9	2	1235	3.7	2
	16	1236	4.0	2	1236	3.8	2
	17	1238	4.1	2	1238	3.9	2
	18	1239	4.2	2	1240	4.1	3
	19	1241	4.4	3	1242	4.4	3
	20	1243	4.5	3	1244	4.7	3
	21	1245	4.7	3	1247	5.1	3
	22	1247	5.0	3	1250	5.7	3
	23	1250	5.3	3	1253	6.4	3
	24	1252	5.8	3	1258	7.4	4
	25	1255	6.3	3	1263	8.9	4
	26	1259	7.0	4	1270	11.1	4
	27	1263	7.9	4	1280	14.9	4
	28	1268	9.4	4	1290	20.0	4
	29	1275	11.7	4	1290	20.0	4
	30	1286	16.2	4	1290	20.0	4
	31	1290	18.7	4	1290	20.0	4
	32	1290	18.7	4	1290	20.0	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-4. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 6

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	24.8	1	1200	22.8	1
	1	1200	11.4	1	1200	15.9	1
	2	1205	6.9	1	1200	10.0	1
	3	1209	5.2	1	1204	7.3	1
	4	1212	4.3	1	1209	5.8	1
	5	1214	3.8	1	1212	5.0	1
	6	1216	3.5	1	1214	4.4	1
	7	1218	3.2	1	1217	4.1	1
	8	1219	3.1	1	1219	3.8	1
	9	1221	2.9	1	1220	3.6	1
	10	1222	2.9	1	1222	3.5	1
	11	1223	2.8	1	1224	3.4	1
	12	1224	2.8	1	1225	3.4	1
	13	1225	2.8	1	1227	3.4	1
	14	1226	2.8	1	1228	3.4	1
	15	1228	2.8	1	1229	3.4	1
	16	1229	2.9	1	1231	3.5	2
	17	1230	2.9	1	1232	3.5	2
	18	1231	3.0	2	1234	3.7	2
	19	1232	3.2	2	1236	3.8	2
	20	1234	3.3	2	1238	4.0	2
	21	1235	3.5	2	1239	4.3	2
	22	1237	3.7	2	1242	4.6	3
	23	1239	4.0	2	1244	5.0	3
	24	1241	4.4	3	1247	5.5	3
	25	1243	4.8	3	1251	6.3	3
	26	1246	5.3	3	1255	7.4	4
	27	1249	6.0	3	1261	9.2	4
	28	1253	7.0	4	1271	12.7	4
	29	1258	8.4	4	1287	21.2	4
	30	1265	10.8	4	1290	21.2	4
	31	1277	16.3	4	1290	21.2	4
	32	1290	22.4	4	1290	21.2	4
02	0	1200	27.0	1	1200	22.8	1
	1	1200	17.2	1	1200	15.9	1
	2	1201	9.6	1	1200	10.0	1
	3	1207	6.7	1	1204	7.3	1
	4	1211	5.3	1	1209	5.8	1
	5	1214	4.5	1	1212	5.0	1
	6	1216	4.0	1	1214	4.4	1
	7	1218	3.6	1	1217	4.1	1
	8	1220	3.4	1	1219	3.8	1
	9	1222	3.3	1	1220	3.6	1
	10	1223	3.2	1	1222	3.5	1
	11	1224	3.1	1	1224	3.4	1
	12	1226	3.1	1	1225	3.4	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	13	1227	3.2	1	1227	3.4	1
	14	1228	3.2	1	1228	3.4	1
	15	1230	3.3	1	1229	3.4	1
	16	1231	3.4	2	1231	3.5	2
	17	1233	3.5	2	1232	3.5	2
	18	1234	3.7	2	1234	3.7	2
	19	1236	3.9	2	1236	3.8	2
	20	1238	4.1	2	1238	4.0	2
	21	1239	4.4	2	1239	4.3	2
	22	1242	4.7	3	1242	4.6	3
	23	1244	5.0	3	1244	5.0	3
	24	1246	5.5	3	1247	5.5	3
	25	1249	6.0	3	1251	6.3	3
	26	1253	6.7	4	1255	7.4	4
	27	1257	7.7	4	1261	9.2	4
	28	1262	9.0	4	1271	12.7	4
	29	1269	11.2	4	1287	21.2	4
	30	1279	15.1	4	1290	21.2	4
	31	1287	18.9	4	1290	21.2	4
	32	1290	18.9	4	1290	21.2	4
03	0	1200	27.6	1	1200	22.8	1
	1	1200	17.3	1	1200	15.9	1
	2	1201	9.6	1	1200	10.0	1
	3	1208	6.7	1	1204	7.3	1
	4	1212	5.2	1	1209	5.8	1
	5	1215	4.4	1	1212	5.0	1
	6	1217	3.9	1	1214	4.4	1
	7	1219	3.6	1	1217	4.1	1
	8	1220	3.4	1	1219	3.8	1
	9	1222	3.3	1	1220	3.6	1
	10	1223	3.2	1	1222	3.5	1
	11	1225	3.2	1	1224	3.4	1
	12	1226	3.2	1	1225	3.4	1
	13	1228	3.2	1	1227	3.4	1
	14	1229	3.3	1	1228	3.4	1
	15	1231	3.4	2	1229	3.4	1
	16	1232	3.5	2	1231	3.5	2
	17	1233	3.6	2	1232	3.5	2
	18	1235	3.8	2	1234	3.7	2
	19	1237	4.0	2	1236	3.8	2
	20	1239	4.3	2	1238	4.0	2
	21	1241	4.6	3	1239	4.3	2
	22	1243	4.9	3	1242	4.6	3
	23	1245	5.3	3	1244	5.0	3
	24	1248	5.8	3	1247	5.5	3
	25	1251	6.5	3	1251	6.3	3
	26	1255	7.2	4	1255	7.4	4
	27	1259	8.3	4	1261	9.2	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	28	1264	9.7	4	1271	12.7	4
	29	1272	11.9	4	1287	21.2	4
	30	1282	15.5	4	1290	21.2	4
	31	1287	17.6	4	1290	21.2	4
	32	1290	17.6	4	1290	21.2	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-5. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 7

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	23.9	1	1200	24.5	1
	1	1200	15.0	1	1200	17.2	1
	2	1205	8.7	1	1201	10.8	1
	3	1211	6.3	1	1209	7.6	1
	4	1215	5.0	1	1214	5.9	1
	5	1218	4.3	1	1217	4.8	1
	6	1220	3.8	1	1220	4.2	1
	7	1222	3.5	1	1222	3.7	1
	8	1223	3.3	1	1224	3.4	1
	9	1225	3.1	1	1226	3.2	1
	10	1226	3.0	1	1227	3.0	1
	11	1227	2.9	1	1229	2.9	1
	12	1228	2.8	1	1230	2.8	1
	13	1230	2.8	1	1231	2.8	1
	14	1231	2.8	1	1233	2.8	1
	15	1232	2.8	1	1234	2.9	1
	16	1233	2.9	1	1236	3.0	2
	17	1234	2.9	1	1237	3.2	2
	18	1236	3.0	2	1238	3.4	2
	19	1237	3.1	2	1240	3.6	3
	20	1238	3.3	2	1242	3.9	3
	21	1239	3.5	2	1245	4.3	3
	22	1242	3.7	3	1247	4.8	3
	23	1243	4.0	3	1250	5.5	3
	24	1245	4.4	3	1255	6.5	4
	25	1248	4.9	3	1259	7.9	4
	26	1251	5.5	3	1266	10.1	4
	27	1254	6.3	3	1277	13.9	4
	28	1258	7.5	4	1290	20.4	4
	29	1264	9.2	4	1290	20.4	4
	30	1272	12.1	4	1290	20.4	4
	31	1285	18.4	4	1290	20.4	4
	32	1290	21.8	4	1290	20.4	4
02	0	1200	23.2	1	1200	24.5	1
	1	1200	16.6	1	1200	17.2	1
	2	1202	10.9	1	1201	10.8	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	3	1209	8.0	1	1209	7.6	1
	4	1214	6.4	1	1214	5.9	1
	5	1217	5.4	1	1217	4.8	1
	6	1220	4.7	1	1220	4.2	1
	7	1222	4.3	1	1222	3.7	1
	8	1224	4.0	1	1224	3.4	1
	9	1226	3.7	1	1226	3.2	1
	10	1228	3.6	1	1227	3.0	1
	11	1229	3.5	1	1229	2.9	1
	12	1231	3.4	1	1230	2.8	1
	13	1232	3.4	1	1231	2.8	1
	14	1233	3.4	1	1233	2.8	1
	15	1235	3.4	1	1234	2.9	1
	16	1236	3.5	2	1236	3.0	2
	17	1238	3.6	2	1237	3.2	2
	18	1239	3.7	2	1238	3.4	2
	19	1241	3.9	3	1240	3.6	3
	20	1243	4.1	3	1242	3.9	3
	21	1245	4.4	3	1245	4.3	3
	22	1247	4.7	3	1247	4.8	3
	23	1249	5.0	3	1250	5.5	3
	24	1251	5.5	3	1255	6.5	4
	25	1255	6.0	4	1259	7.9	4
	26	1257	6.7	4	1266	10.1	4
	27	1261	7.5	4	1277	13.9	4
	28	1266	8.7	4	1290	20.4	4
	29	1272	10.3	4	1290	20.4	4
	30	1280	13.0	4	1290	20.4	4
	31	1290	17.9	4	1290	20.4	4
	32	1290	17.9	4	1290	20.4	4
03	0	1200	23.0	1	1200	24.5	1
	1	1200	17.1	1	1200	17.2	1
	2	1200	11.8	1	1201	10.8	1
	3	1208	8.8	1	1209	7.6	1
	4	1213	7.0	1	1214	5.9	1
	5	1216	5.9	1	1217	4.8	1
	6	1219	5.1	1	1220	4.2	1
	7	1222	4.5	1	1222	3.7	1
	8	1224	4.2	1	1224	3.4	1
	9	1226	3.9	1	1226	3.2	1
	10	1228	3.7	1	1227	3.0	1
	11	1229	3.6	1	1229	2.9	1
	12	1231	3.5	1	1230	2.8	1
	13	1232	3.5	1	1231	2.8	1
	14	1234	3.5	1	1233	2.8	1
	15	1236	3.5	2	1234	2.9	1
	16	1237	3.6	2	1236	3.0	2
	17	1238	3.7	2	1237	3.2	2

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	18	1239	3.9	2	1238	3.4	2
	19	1242	4.0	3	1240	3.6	3
	20	1243	4.3	3	1242	3.9	3
	21	1245	4.5	3	1245	4.3	3
	22	1247	4.8	3	1247	4.8	3
	23	1250	5.2	3	1250	5.5	3
	24	1252	5.7	3	1255	6.5	4
	25	1255	6.3	4	1259	7.9	4
	26	1259	7.0	4	1266	10.1	4
	27	1263	7.9	4	1277	13.9	4
	28	1267	9.2	4	1290	20.4	4
	29	1274	11.0	4	1290	20.4	4
	30	1283	14.0	4	1290	20.4	4
	31	1290	17.6	4	1290	20.4	4
	32	1290	17.6	4	1290	20.4	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-6. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 8

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	23.0	1	1200	20.6	1
	1	1200	15.4	1	1200	15.3	1
	2	1200	9.4	1	1200	10.3	1
	3	1206	6.9	1	1202	7.6	1
	4	1210	5.6	1	1207	6.1	1
	5	1213	4.7	1	1211	5.2	1
	6	1216	4.2	1	1213	4.6	1
	7	1218	3.8	1	1216	4.1	1
	8	1219	3.5	1	1218	3.8	1
	9	1221	3.3	1	1220	3.6	1
	10	1222	3.1	1	1221	3.5	1
	11	1224	3.0	1	1223	3.4	1
	12	1225	3.0	1	1224	3.3	1
	13	1226	3.0	1	1226	3.3	1
	14	1227	3.0	1	1227	3.3	1
	15	1229	3.0	1	1229	3.4	1
	16	1229	3.1	1	1230	3.4	2
	17	1231	3.1	2	1232	3.5	2
	18	1233	3.2	2	1234	3.7	2
	19	1234	3.4	2	1235	3.9	2
	20	1235	3.5	2	1237	4.1	2
	21	1237	3.7	2	1239	4.4	2
	22	1239	3.9	2	1241	4.7	3
	23	1241	4.2	3	1244	5.1	3
	24	1243	4.5	3	1247	5.6	3

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	25	1245	4.9	3	1250	6.2	4
	26	1247	5.4	3	1254	7.1	4
	27	1251	6.1	4	1259	8.2	4
	28	1255	7.1	4	1265	10.0	4
	29	1260	8.8	4	1274	12.9	4
	30	1268	11.7	4	1290	19.7	4
	31	1282	18.8	4	1290	19.7	4
	32	1290	23.9	4	1290	19.7	4
02	0	1200	22.8	1	1200	20.6	1
	1	1200	15.6	1	1200	15.3	1
	2	1200	9.8	1	1200	10.3	1
	3	1206	7.3	1	1202	7.6	1
	4	1210	5.9	1	1207	6.1	1
	5	1213	5.0	1	1211	5.2	1
	6	1216	4.4	1	1213	4.6	1
	7	1218	4.0	1	1216	4.1	1
	8	1220	3.7	1	1218	3.8	1
	9	1222	3.5	1	1220	3.6	1
	10	1223	3.4	1	1221	3.5	1
	11	1225	3.3	1	1223	3.4	1
	12	1226	3.3	1	1224	3.3	1
	13	1228	3.2	1	1226	3.3	1
	14	1229	3.3	1	1227	3.3	1
	15	1230	3.3	2	1229	3.4	1
	16	1232	3.4	2	1230	3.4	2
	17	1233	3.4	2	1232	3.5	2
	18	1234	3.6	2	1234	3.7	2
	19	1236	3.7	2	1235	3.9	2
	20	1238	3.8	2	1237	4.1	2
	21	1239	4.0	2	1239	4.4	2
	22	1241	4.2	3	1241	4.7	3
	23	1243	4.5	3	1244	5.1	3
	24	1245	4.8	3	1247	5.6	3
	25	1248	5.3	3	1250	6.2	4
	26	1251	5.8	4	1254	7.1	4
	27	1254	6.6	4	1259	8.2	4
	28	1258	7.7	4	1265	10.0	4
	29	1264	9.4	4	1274	12.9	4
	30	1272	12.3	4	1290	19.7	4
	31	1286	19.2	4	1290	19.7	4
	32	1290	21.4	4	1290	19.7	4
03	0	1200	23.0	1	1200	20.6	1
	1	1200	16.3	1	1200	15.3	1
	2	1200	10.7	1	1200	10.3	1
	3	1205	8.0	1	1202	7.6	1
	4	1210	6.4	1	1207	6.1	1
	5	1213	5.4	1	1211	5.2	1
	6	1216	4.7	1	1213	4.6	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	7	1218	4.2	1	1216	4.1	1
	8	1220	3.9	1	1218	3.8	1
	9	1222	3.7	1	1220	3.6	1
	10	1224	3.5	1	1221	3.5	1
	11	1225	3.4	1	1223	3.4	1
	12	1227	3.4	1	1224	3.3	1
	13	1228	3.4	1	1226	3.3	1
	14	1229	3.4	1	1227	3.3	1
	15	1231	3.4	2	1229	3.4	1
	16	1233	3.5	2	1230	3.4	2
	17	1234	3.6	2	1232	3.5	2
	18	1236	3.7	2	1234	3.7	2
	19	1237	3.9	2	1235	3.9	2
	20	1239	4.1	2	1237	4.1	2
	21	1241	4.3	3	1239	4.4	2
	22	1243	4.5	3	1241	4.7	3
	23	1245	4.9	3	1244	5.1	3
	24	1247	5.3	3	1247	5.6	3
	25	1250	5.7	4	1250	6.2	4
	26	1253	6.4	4	1254	7.1	4
	27	1257	7.3	4	1259	8.2	4
	28	1261	8.5	4	1265	10.0	4
	29	1267	10.4	4	1274	12.9	4
	30	1276	13.6	4	1290	19.7	4
	31	1290	19.8	4	1290	19.7	4
	32	1290	19.8	4	1290	19.7	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-7. 2016–17 MSAA: Raw to Scaled Score Look-up Table—ELA Grade 11

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	32.1	1	1200	27.7	1
	1	1200	20.8	1	1201	13.4	1
	2	1206	11.0	1	1212	6.8	1
	3	1214	6.9	1	1217	4.9	1
	4	1218	5.2	1	1220	3.9	1
	5	1221	4.3	1	1222	3.4	1
	6	1223	3.7	1	1224	3.0	1
	7	1225	3.3	1	1226	2.8	1
	8	1227	3.1	1	1227	2.6	1
	9	1228	2.9	1	1228	2.4	1
	10	1229	2.7	1	1229	2.3	1
	11	1231	2.6	1	1230	2.2	1
	12	1232	2.6	1	1231	2.2	1
	13	1233	2.6	1	1233	2.2	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	14	1234	2.6	1	1234	2.2	1
	15	1235	2.6	1	1235	2.2	1
	16	1236	2.6	2	1236	2.3	2
	17	1237	2.7	2	1237	2.3	2
	18	1238	2.8	2	1238	2.5	2
	19	1239	2.9	2	1239	2.7	2
	20	1241	3.0	3	1241	2.9	3
	21	1242	3.2	3	1243	3.2	3
	22	1244	3.4	3	1245	3.7	3
01	23	1245	3.7	3	1248	4.4	3
	24	1247	4.1	3	1252	5.5	3
	25	1250	4.6	3	1258	7.7	4
	26	1253	5.4	3	1270	14.3	4
	27	1257	6.7	4	1290	29.7	4
	28	1262	8.7	4	1290	29.7	4
	29	1270	12.4	4	1290	29.7	4
	30	1285	20.1	4	1290	29.7	4
	31	1290	22.7	4	1290	29.7	4
	32	1290	22.7	4	1290	29.7	4
	0	1200	32.1	1	1200	27.7	1
	1	1200	20.6	1	1201	13.4	1
	2	1206	10.8	1	1212	6.8	1
	3	1214	7.0	1	1217	4.9	1
	4	1218	5.4	1	1220	3.9	1
	5	1221	4.5	1	1222	3.4	1
	6	1223	4.0	1	1224	3.0	1
	7	1225	3.6	1	1226	2.8	1
	8	1227	3.4	1	1227	2.6	1
	9	1228	3.2	1	1228	2.4	1
	10	1230	3.1	1	1229	2.3	1
	11	1231	3.0	1	1230	2.2	1
	12	1232	2.9	1	1231	2.2	1
	13	1234	2.8	1	1233	2.2	1
02	14	1235	2.8	1	1234	2.2	1
	15	1236	2.8	2	1235	2.2	1
	16	1237	2.9	2	1236	2.3	2
	17	1238	2.9	2	1237	2.3	2
	18	1239	3.0	2	1238	2.5	2
	19	1241	3.1	3	1239	2.7	2
	20	1242	3.2	3	1241	2.9	3
	21	1243	3.4	3	1243	3.2	3
	22	1245	3.6	3	1245	3.7	3
	23	1247	3.9	3	1248	4.4	3
	24	1249	4.3	3	1252	5.5	3
	25	1251	4.9	3	1258	7.7	4
	26	1254	5.7	3	1270	14.3	4
	27	1258	6.8	4	1290	29.7	4
	28	1264	8.7	4	1290	29.7	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	29	1272	12.2	4	1290	29.7	4
	30	1286	19.5	4	1290	29.7	4
	31	1290	21.7	4	1290	29.7	4
	32	1290	21.7	4	1290	29.7	4
03	0	1200	33.9	1	1200	27.7	1
	1	1200	20.1	1	1201	13.4	1
	2	1208	10.0	1	1212	6.8	1
	3	1215	6.7	1	1217	4.9	1
	4	1219	5.3	1	1220	3.9	1
	5	1222	4.5	1	1222	3.4	1
	6	1224	4.0	1	1224	3.0	1
	7	1226	3.6	1	1226	2.8	1
	8	1228	3.4	1	1227	2.6	1
	9	1230	3.2	1	1228	2.4	1
	10	1231	3.1	1	1229	2.3	1
	11	1232	3.0	1	1230	2.2	1
	12	1234	3.0	1	1231	2.2	1
	13	1235	3.0	1	1233	2.2	1
	14	1236	3.0	2	1234	2.2	1
	15	1237	3.0	2	1235	2.2	1
	16	1239	3.0	2	1236	2.3	2
	17	1239	3.1	2	1237	2.3	2
	18	1241	3.2	3	1238	2.5	2
	19	1243	3.4	3	1239	2.7	2
	20	1244	3.6	3	1241	2.9	3
	21	1246	3.8	3	1243	3.2	3
	22	1248	4.1	3	1245	3.7	3
	23	1250	4.5	3	1248	4.4	3
	24	1252	5.0	3	1252	5.5	3
	25	1255	5.7	4	1258	7.7	4
	26	1259	6.6	4	1270	14.3	4
	27	1263	7.8	4	1290	29.7	4
	28	1269	9.7	4	1290	29.7	4
	29	1278	12.9	4	1290	29.7	4
	30	1290	18.5	4	1290	29.7	4
	31	1290	18.5	4	1290	29.7	4
	32	1290	18.5	4	1290	29.7	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-8. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 3

Form	*Raw Score*	*2017*			*2016*		
		Scaled Score	*Standard Error*	*Performance Level*	*Scaled Score*	*Standard Error*	*Performance Level*
01	0	1200	22.9	1	1200	24.3	1
	1	1200	16.7	1	1200	17.0	1
	2	1200	11.5	1	1201	11.3	1
	3	1207	8.9	1	1209	8.7	1
	4	1212	7.5	1	1213	7.3	1
	5	1216	6.6	1	1217	6.4	1
	6	1219	5.9	1	1220	5.7	1
	7	1222	5.5	1	1223	5.3	1
	8	1225	5.1	1	1225	4.9	1
	9	1227	4.8	1	1228	4.6	1
	10	1229	4.6	1	1229	4.4	1
	11	1231	4.4	1	1231	4.2	1
	12	1232	4.3	1	1233	4.1	1
	13	1234	4.1	1	1235	3.9	1
	14	1236	4.0	2	1236	3.8	2
	15	1237	4.0	2	1238	3.7	2
	16	1239	3.9	2	1239	3.7	2
	17	1240	3.9	3	1240	3.7	3
	18	1242	3.9	3	1242	3.7	3
	19	1243	4.0	3	1243	3.7	3
	20	1245	4.1	3	1245	3.7	3
	21	1247	4.2	3	1246	3.8	3
	22	1248	4.4	3	1248	3.9	3
	23	1250	4.6	3	1249	4.1	3
	24	1252	4.8	3	1251	4.3	3
	25	1254	5.1	4	1253	4.6	3
	26	1257	5.4	4	1255	4.9	4
	27	1259	5.8	4	1258	5.3	4
	28	1262	6.3	4	1260	5.8	4
	29	1265	6.9	4	1263	6.5	4
	30	1269	7.7	4	1267	7.3	4
	31	1274	8.8	4	1272	8.5	4
	32	1280	10.4	4	1278	10.4	4
	33	1288	13.1	4	1287	13.7	4
	34	1290	16.2	4	1290	17.8	4
	35	1290	16.2	4	1290	17.8	4
02	0	1200	25.4	1	1200	24.3	1
	1	1200	17.5	1	1200	17.0	1
	2	1203	11.4	1	1201	11.3	1
	3	1210	8.8	1	1209	8.7	1
	4	1215	7.4	1	1213	7.3	1
	5	1219	6.5	1	1217	6.4	1
	6	1222	5.8	1	1220	5.7	1
	7	1225	5.3	1	1223	5.3	1
	8	1227	4.9	1	1225	4.9	1
	9	1229	4.6	1	1228	4.6	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	10	1231	4.4	1	1229	4.4	1
	11	1233	4.2	1	1231	4.2	1
	12	1235	4.0	1	1233	4.1	1
	13	1237	3.8	2	1235	3.9	1
	14	1238	3.7	2	1236	3.8	2
	15	1239	3.6	2	1238	3.7	2
	16	1241	3.6	3	1239	3.7	2
	17	1242	3.6	3	1240	3.7	3
	18	1244	3.6	3	1242	3.7	3
	19	1245	3.7	3	1243	3.7	3
	20	1247	3.8	3	1245	3.7	3
	21	1248	3.9	3	1246	3.8	3
	22	1250	4.1	3	1248	3.9	3
	23	1252	4.3	3	1249	4.1	3
	24	1253	4.6	3	1251	4.3	3
	25	1256	4.9	4	1253	4.6	3
	26	1258	5.2	4	1255	4.9	4
	27	1260	5.6	4	1258	5.3	4
	28	1263	6.1	4	1260	5.8	4
	29	1266	6.6	4	1263	6.5	4
	30	1270	7.4	4	1267	7.3	4
	31	1274	8.4	4	1272	8.5	4
	32	1280	9.9	4	1278	10.4	4
	33	1288	12.7	4	1287	13.7	4
	34	1290	16.1	4	1290	17.8	4
	35	1290	16.1	4	1290	17.8	4
03	0	1200	25.6	1	1200	24.3	1
	1	1200	17.7	1	1200	17.0	1
	2	1203	11.6	1	1201	11.3	1
	3	1210	9.0	1	1209	8.7	1
	4	1215	7.6	1	1213	7.3	1
	5	1219	6.6	1	1217	6.4	1
	6	1222	5.9	1	1220	5.7	1
	7	1225	5.3	1	1223	5.3	1
	8	1228	4.8	1	1225	4.9	1
	9	1230	4.4	1	1228	4.6	1
	10	1232	4.1	1	1229	4.4	1
	11	1234	3.9	1	1231	4.2	1
	12	1236	3.7	2	1233	4.1	1
	13	1237	3.6	2	1235	3.9	1
	14	1238	3.6	2	1236	3.8	2
	15	1239	3.6	2	1238	3.7	2
	16	1241	3.6	3	1239	3.7	2
	17	1243	3.6	3	1240	3.7	3
	18	1244	3.7	3	1242	3.7	3
	19	1246	3.8	3	1243	3.7	3
	20	1247	3.9	3	1245	3.7	3
	21	1249	4.1	3	1246	3.8	3

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	22	1251	4.3	3	1248	3.9	3
	23	1253	4.6	3	1249	4.1	3
	24	1255	4.9	4	1251	4.3	3
	25	1257	5.3	4	1253	4.6	3
	26	1259	5.7	4	1255	4.9	4
	27	1262	6.1	4	1258	5.3	4
	28	1265	6.6	4	1260	5.8	4
	29	1268	7.2	4	1263	6.5	4
	30	1273	8.1	4	1267	7.3	4
	31	1277	9.2	4	1272	8.5	4
	32	1284	11.0	4	1278	10.4	4
	33	1290	14.2	4	1287	13.7	4
	34	1290	15.3	4	1290	17.8	4
	35	1290	15.3	4	1290	17.8	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-9. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 4

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	25.2	1	1200	24.7	1
	1	1200	19.9	1	1200	18.6	1
	2	1200	15.5	1	1200	13.3	1
	3	1200	11.7	1	1202	10.2	1
	4	1205	9.6	1	1208	8.6	1
	5	1210	8.2	1	1213	7.5	1
	6	1214	7.3	1	1217	6.8	1
	7	1218	6.6	1	1220	6.2	1
	8	1221	6.1	1	1223	5.8	1
	9	1224	5.6	1	1225	5.5	1
	10	1226	5.3	1	1228	5.2	1
	11	1228	5.0	1	1230	5.0	1
	12	1230	4.8	1	1232	4.9	1
	13	1232	4.6	1	1234	4.8	2
	14	1234	4.5	2	1236	4.7	2
	15	1236	4.4	2	1238	4.6	2
	16	1238	4.4	2	1239	4.6	2
	17	1239	4.3	2	1241	4.7	3
	18	1241	4.3	3	1243	4.7	3
	19	1243	4.4	3	1245	4.8	3
	20	1244	4.4	3	1247	4.9	3
	21	1246	4.5	3	1249	5.0	3

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	22	1248	4.6	3	1251	5.2	4
	23	1250	4.8	3	1254	5.5	4
	24	1252	5.0	4	1256	5.8	4
	25	1254	5.2	4	1259	6.2	4
	26	1257	5.6	4	1262	6.8	4
	27	1259	6.0	4	1266	7.5	4
	28	1262	6.6	4	1270	8.6	4
	29	1266	7.3	4	1276	10.1	4
	30	1270	8.4	4	1283	12.4	4
	31	1276	10.0	4	1290	15.6	4
	32	1283	12.4	4	1290	15.6	4
	33	1290	15.8	4	1290	15.6	4
	34	1290	15.8	4	1290	15.6	4
	35	1290	15.8	4	1290	15.6	4
02	0	1200	27.8	1	1200	24.7	1
	1	1200	19.7	1	1200	18.6	1
	2	1200	13.1	1	1200	13.3	1
	3	1205	10.0	1	1202	10.2	1
	4	1211	8.3	1	1208	8.6	1
	5	1215	7.2	1	1213	7.5	1
	6	1219	6.5	1	1217	6.8	1
	7	1222	5.9	1	1220	6.2	1
	8	1225	5.5	1	1223	5.8	1
	9	1227	5.1	1	1225	5.5	1
	10	1229	4.9	1	1228	5.2	1
	11	1232	4.7	1	1230	5.0	1
	12	1233	4.5	2	1232	4.9	1
	13	1235	4.4	2	1234	4.8	2
	14	1237	4.3	2	1236	4.7	2
	15	1239	4.2	2	1238	4.6	2
	16	1240	4.2	3	1239	4.6	2
	17	1242	4.1	3	1241	4.7	3
	18	1244	4.1	3	1243	4.7	3
	19	1245	4.2	3	1245	4.8	3
	20	1247	4.2	3	1247	4.9	3
	21	1249	4.3	3	1249	5.0	3
	22	1250	4.4	3	1251	5.2	4
	23	1252	4.5	4	1254	5.5	4
	24	1254	4.8	4	1256	5.8	4
	25	1256	5.1	4	1259	6.2	4
	26	1259	5.4	4	1262	6.8	4
	27	1262	5.9	4	1266	7.5	4
	28	1265	6.6	4	1270	8.6	4
	29	1268	7.5	4	1276	10.1	4
	30	1273	8.6	4	1283	12.4	4
	31	1279	10.3	4	1290	15.6	4
	32	1286	12.7	4	1290	15.6	4
	33	1290	14.9	4	1290	15.6	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	34	1290	14.9	4	1290	15.6	4
	35	1290	14.9	4	1290	15.6	4
03	0	1200	26.1	1	1200	24.7	1
	1	1200	19.5	1	1200	18.6	1
	2	1200	13.8	1	1200	13.3	1
	3	1204	10.7	1	1202	10.2	1
	4	1210	9.0	1	1208	8.6	1
	5	1215	7.9	1	1213	7.5	1
	6	1219	7.2	1	1217	6.8	1
	7	1222	6.6	1	1220	6.2	1
	8	1225	6.2	1	1223	5.8	1
	9	1228	5.9	1	1225	5.5	1
	10	1230	5.6	1	1228	5.2	1
	11	1232	5.4	1	1230	5.0	1
	12	1235	5.2	2	1232	4.9	1
	13	1237	5.0	2	1234	4.8	2
	14	1239	4.9	2	1236	4.7	2
	15	1241	4.8	3	1238	4.6	2
	16	1243	4.7	3	1239	4.6	2
	17	1244	4.7	3	1241	4.7	3
	18	1246	4.6	3	1243	4.7	3
	19	1248	4.7	3	1245	4.8	3
	20	1250	4.7	3	1247	4.9	3
	21	1252	4.9	4	1249	5.0	3
	22	1254	5.1	4	1251	5.2	4
	23	1256	5.3	4	1254	5.5	4
	24	1259	5.7	4	1256	5.8	4
	25	1261	6.1	4	1259	6.2	4
	26	1264	6.7	4	1262	6.8	4
	27	1268	7.4	4	1266	7.5	4
	28	1272	8.2	4	1270	8.6	4
	29	1276	9.1	4	1276	10.1	4
	30	1281	10.3	4	1283	12.4	4
	31	1287	11.8	4	1290	15.6	4
	32	1290	13.1	4	1290	15.6	4
	33	1290	13.1	4	1290	15.6	4
	34	1290	13.1	4	1290	15.6	4
	35	1290	13.1	4	1290	15.6	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-10. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 5

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	27.3	1	1200	26.9	1
	1	1200	19.7	1	1200	20.8	1
	2	1200	13.3	1	1200	15.4	1
	3	1206	9.9	1	1201	11.3	1
	4	1212	8.1	1	1208	9.1	1
	5	1217	6.9	1	1213	7.8	1
	6	1220	6.1	1	1217	6.9	1
	7	1223	5.6	1	1220	6.3	1
	8	1226	5.2	1	1223	5.8	1
	9	1228	4.9	1	1225	5.5	1
	10	1230	4.7	1	1228	5.3	1
	11	1232	4.6	2	1230	5.1	1
	12	1234	4.4	2	1232	5.0	2
	13	1236	4.4	2	1234	4.9	2
	14	1238	4.3	2	1236	4.8	2
	15	1239	4.3	2	1238	4.8	2
	16	1241	4.2	3	1240	4.8	3
	17	1243	4.3	3	1242	4.8	3
	18	1244	4.3	3	1244	4.8	3
	19	1246	4.3	3	1246	4.8	3
	20	1248	4.4	3	1248	4.9	3
	21	1250	4.5	3	1250	5.0	3
	22	1252	4.7	3	1252	5.1	3
	23	1254	4.9	3	1254	5.3	3
	24	1256	5.1	4	1256	5.5	4
	25	1258	5.4	4	1259	5.8	4
	26	1261	5.8	4	1262	6.2	4
	27	1264	6.3	4	1265	6.7	4
	28	1267	7.0	4	1268	7.4	4
	29	1271	7.8	4	1272	8.3	4
	30	1275	8.9	4	1277	9.6	4
	31	1281	10.3	4	1283	11.4	4
	32	1288	12.4	4	1290	14.1	4
	33	1290	14.2	4	1290	14.7	4
	34	1290	14.2	4	1290	14.7	4
	35	1290	14.2	4	1290	14.7	4
02	0	1200	29.3	1	1200	26.9	1
	1	1200	21.1	1	1200	20.8	1
	2	1200	14.2	1	1200	15.4	1
	3	1207	10.6	1	1201	11.3	1
	4	1213	8.5	1	1208	9.1	1
	5	1218	7.3	1	1213	7.8	1
	6	1221	6.4	1	1217	6.9	1
	7	1224	5.8	1	1220	6.3	1
	8	1227	5.4	1	1223	5.8	1
	9	1230	5.1	1	1225	5.5	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
02	10	1232	4.9	2	1228	5.3	1
	11	1234	4.7	2	1230	5.1	1
	12	1236	4.6	2	1232	5.0	2
	13	1238	4.5	2	1234	4.9	2
	14	1239	4.4	2	1236	4.8	2
	15	1241	4.4	3	1238	4.8	2
	16	1243	4.4	3	1240	4.8	3
	17	1245	4.4	3	1242	4.8	3
	18	1247	4.5	3	1244	4.8	3
	19	1248	4.5	3	1246	4.8	3
	20	1250	4.6	3	1248	4.9	3
	21	1252	4.8	3	1250	5.0	3
	22	1254	4.9	3	1252	5.1	3
	23	1256	5.2	4	1254	5.3	3
	24	1258	5.4	4	1256	5.5	4
	25	1261	5.8	4	1259	5.8	4
	26	1264	6.2	4	1262	6.2	4
	27	1267	6.8	4	1265	6.7	4
	28	1270	7.4	4	1268	7.4	4
	29	1274	8.3	4	1272	8.3	4
	30	1279	9.5	4	1277	9.6	4
	31	1285	11.1	4	1283	11.4	4
	32	1290	13.4	4	1290	14.1	4
	33	1290	13.6	4	1290	14.7	4
	34	1290	13.6	4	1290	14.7	4
	35	1290	13.6	4	1290	14.7	4
03	0	1200	28.7	1	1200	26.9	1
	1	1200	21.0	1	1200	20.8	1
	2	1200	14.5	1	1200	15.4	1
	3	1206	10.9	1	1201	11.3	1
	4	1212	8.9	1	1208	9.1	1
	5	1217	7.6	1	1213	7.8	1
	6	1221	6.7	1	1217	6.9	1
	7	1224	6.1	1	1220	6.3	1
	8	1227	5.7	1	1223	5.8	1
	9	1229	5.4	1	1225	5.5	1
	10	1232	5.2	2	1228	5.3	1
	11	1234	5.0	2	1230	5.1	1
	12	1236	4.9	2	1232	5.0	2
	13	1238	4.8	2	1234	4.9	2
	14	1240	4.8	3	1236	4.8	2
	15	1242	4.7	3	1238	4.8	2
	16	1244	4.7	3	1240	4.8	3
	17	1246	4.7	3	1242	4.8	3
	18	1248	4.7	3	1244	4.8	3
	19	1250	4.8	3	1246	4.8	3
	20	1252	4.9	3	1248	4.9	3
	21	1254	5.0	3	1250	5.0	3

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	22	1256	5.2	4	1252	5.1	3
	23	1258	5.4	4	1254	5.3	3
	24	1260	5.7	4	1256	5.5	4
	25	1263	6.1	4	1259	5.8	4
	26	1266	6.6	4	1262	6.2	4
	27	1269	7.2	4	1265	6.7	4
	28	1273	8.0	4	1268	7.4	4
	29	1277	9.1	4	1272	8.3	4
	30	1283	10.4	4	1277	9.6	4
	31	1289	12.1	4	1283	11.4	4
	32	1290	13.4	4	1290	14.1	4
	33	1290	13.4	4	1290	14.7	4
	34	1290	13.4	4	1290	14.7	4
	35	1290	13.4	4	1290	14.7	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-11. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 6

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	21.0	1	1200	23.1	1
	1	1200	14.2	1	1200	17.0	1
	2	1201	9.5	1	1200	11.8	1
	3	1207	7.5	1	1205	9.0	1
	4	1211	6.4	1	1210	7.5	1
	5	1215	5.7	1	1214	6.5	1
	6	1217	5.2	1	1217	5.8	1
	7	1220	4.8	1	1220	5.3	1
	8	1222	4.5	1	1222	4.9	1
	9	1224	4.3	1	1225	4.6	1
	10	1225	4.1	1	1226	4.4	1
	11	1227	4.0	1	1228	4.2	1
	12	1229	3.8	1	1230	4.1	1
	13	1230	3.8	1	1232	4.0	1
	14	1231	3.7	1	1233	4.0	1
	15	1233	3.7	1	1235	3.9	2
	16	1234	3.6	2	1236	3.9	2
	17	1235	3.6	2	1238	3.9	2
	18	1237	3.7	2	1239	4.0	2
	19	1238	3.7	2	1241	4.1	3
	20	1239	3.7	2	1242	4.2	3
	21	1241	3.8	3	1244	4.3	3
	22	1242	3.9	3	1246	4.5	3
	23	1244	4.1	3	1248	4.7	3
	24	1246	4.2	3	1250	4.9	4
	25	1247	4.4	3	1252	5.2	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	26	1249	4.7	4	1254	5.6	4
	27	1252	5.0	4	1257	6.0	4
	28	1254	5.4	4	1260	6.6	4
	29	1257	5.9	4	1264	7.4	4
	30	1260	6.5	4	1268	8.4	4
	31	1264	7.4	4	1274	9.9	4
	32	1269	8.9	4	1281	12.3	4
	33	1276	11.4	4	1290	16.5	4
	34	1290	17.7	4	1290	16.7	4
	35	1290	19.4	4	1290	16.7	4
02	0	1200	24.0	1	1200	23.1	1
	1	1200	13.2	1	1200	17.0	1
	2	1206	8.7	1	1200	11.8	1
	3	1211	6.9	1	1205	9.0	1
	4	1215	5.9	1	1210	7.5	1
	5	1218	5.3	1	1214	6.5	1
	6	1220	4.8	1	1217	5.8	1
	7	1223	4.5	1	1220	5.3	1
	8	1225	4.2	1	1222	4.9	1
	9	1226	4.0	1	1225	4.6	1
	10	1228	3.8	1	1226	4.4	1
	11	1229	3.7	1	1228	4.2	1
	12	1231	3.6	1	1230	4.1	1
	13	1232	3.6	1	1232	4.0	1
	14	1234	3.5	2	1233	4.0	1
	15	1235	3.5	2	1235	3.9	2
	16	1236	3.5	2	1236	3.9	2
	17	1237	3.5	2	1238	3.9	2
	18	1239	3.5	2	1239	4.0	2
	19	1239	3.5	2	1241	4.1	3
	20	1241	3.6	3	1242	4.2	3
	21	1243	3.7	3	1244	4.3	3
	22	1244	3.8	3	1246	4.5	3
	23	1246	3.9	3	1248	4.7	3
	24	1247	4.0	3	1250	4.9	4
	25	1249	4.2	4	1252	5.2	4
	26	1251	4.5	4	1254	5.6	4
	27	1253	4.8	4	1257	6.0	4
	28	1255	5.1	4	1260	6.6	4
	29	1258	5.6	4	1264	7.4	4
	30	1261	6.2	4	1268	8.4	4
	31	1264	7.1	4	1274	9.9	4
	32	1269	8.5	4	1281	12.3	4
	33	1276	10.9	4	1290	16.5	4
	34	1289	17.1	4	1290	16.7	4
	35	1290	19.1	4	1290	16.7	4
03	0	1200	24.7	1	1200	23.1	1
	1	1200	14.9	1	1200	17.0	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	2	1204	9.6	1	1200	11.8	1
	3	1210	7.5	1	1205	9.0	1
	4	1214	6.4	1	1210	7.5	1
	5	1217	5.6	1	1214	6.5	1
	6	1220	5.1	1	1217	5.8	1
	7	1222	4.8	1	1220	5.3	1
	8	1224	4.5	1	1222	4.9	1
	9	1226	4.3	1	1225	4.6	1
	10	1228	4.1	1	1226	4.4	1
	11	1230	4.0	1	1228	4.2	1
	12	1231	3.9	1	1230	4.1	1
	13	1233	3.8	1	1232	4.0	1
	14	1234	3.7	2	1233	4.0	1
	15	1236	3.7	2	1235	3.9	2
	16	1237	3.7	2	1236	3.9	2
	17	1238	3.7	2	1238	3.9	2
	18	1239	3.7	2	1239	4.0	2
	19	1241	3.7	3	1241	4.1	3
	20	1243	3.8	3	1242	4.2	3
	21	1244	3.9	3	1244	4.3	3
	22	1246	4.0	3	1246	4.5	3
	23	1247	4.2	3	1248	4.7	3
	24	1249	4.4	4	1250	4.9	4
	25	1251	4.6	4	1252	5.2	4
	26	1253	4.9	4	1254	5.6	4
	27	1255	5.2	4	1257	6.0	4
	28	1258	5.7	4	1260	6.6	4
	29	1261	6.2	4	1264	7.4	4
	30	1264	7.0	4	1268	8.4	4
	31	1268	8.0	4	1274	9.9	4
	32	1274	9.7	4	1281	12.3	4
	33	1283	12.8	4	1290	16.5	4
	34	1290	17.5	4	1290	16.7	4
	35	1290	17.5	4	1290	16.7	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-12. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 7

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	22.3	1	1200	20.8	1
	1	1200	15.8	1	1200	15.1	1
	2	1202	10.5	1	1201	10.4	1
	3	1209	8.1	1	1208	8.3	1
	4	1215	6.8	1	1212	7.1	1
	5	1219	6.0	1	1216	6.4	1
	6	1222	5.4	1	1219	5.8	1
	7	1224	5.0	1	1222	5.5	1
	8	1227	4.7	1	1224	5.2	1
	9	1229	4.5	1	1226	5.0	1
	10	1231	4.3	1	1228	4.8	1
	11	1233	4.2	2	1230	4.7	1
	12	1235	4.1	2	1232	4.6	2
	13	1236	4.0	2	1234	4.6	2
	14	1238	4.0	2	1236	4.5	2
	15	1239	3.9	2	1237	4.5	2
	16	1241	3.9	3	1239	4.5	2
	17	1243	3.9	3	1241	4.5	3
	18	1245	4.0	3	1243	4.6	3
	19	1247	4.0	3	1244	4.6	3
	20	1248	4.1	3	1246	4.7	3
	21	1250	4.2	3	1248	4.8	3
	22	1252	4.3	3	1250	4.9	3
	23	1254	4.4	4	1252	5.1	3
	24	1256	4.6	4	1254	5.2	4
	25	1259	4.8	4	1256	5.5	4
	26	1261	5.1	4	1258	5.7	4
	27	1264	5.4	4	1261	6.1	4
	28	1268	5.8	4	1264	6.5	4
	29	1272	6.4	4	1267	7.1	4
	30	1277	7.1	4	1271	8.0	4
	31	1284	8.1	4	1277	9.3	4
	32	1290	9.6	4	1284	11.5	4
	33	1290	12.4	4	1290	16.2	4
	34	1290	17.6	4	1290	16.2	4
02	0	1200	17.6	1	1200	20.8	1
	1	1200	24.5	1	1200	15.1	1
	2	1202	16.9	1	1201	10.4	1
	3	1210	11.0	1	1208	8.3	1
	4	1214	8.4	1	1212	7.1	1
	5	1218	7.1	1	1216	6.4	1
	6	1221	6.2	1	1219	5.8	1
	7	1224	5.6	1	1222	5.5	1
	8	1226	5.2	1	1224	5.2	1
	9	1228	4.8	1	1226	5.0	1
	10	1230	4.6	1	1228	4.8	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	11	1232	4.3	2	1230	4.7	1
	12	1233	4.2	2	1232	4.6	2
	13	1235	4.1	2	1234	4.6	2
	14	1236	4.0	2	1236	4.5	2
	15	1238	4.0	2	1237	4.5	2
	16	1239	4.0	2	1239	4.5	2
	17	1241	4.0	3	1241	4.5	3
	18	1243	4.1	3	1243	4.6	3
	19	1244	4.1	3	1244	4.6	3
	20	1246	4.2	3	1246	4.7	3
	21	1247	4.3	3	1248	4.8	3
	22	1249	4.4	3	1250	4.9	3
02	23	1251	4.6	3	1252	5.1	3
	24	1253	4.8	3	1254	5.2	4
	25	1255	5.0	4	1256	5.5	4
	26	1257	5.3	4	1258	5.7	4
	27	1259	5.6	4	1261	6.1	4
	28	1262	6.1	4	1264	6.5	4
	29	1265	6.6	4	1267	7.1	4
	30	1269	7.4	4	1271	8.0	4
	31	1273	8.5	4	1277	9.3	4
	32	1279	10.2	4	1284	11.5	4
	33	1288	13.3	4	1290	16.2	4
	34	1290	16.4	4	1290	16.2	4
	35	1290	16.4	4	1230	4.7	1
	0	1200	25.4	1	1200	20.8	1
	1	1200	17.8	1	1200	15.1	1
	2	1202	11.7	1	1201	10.4	1
	3	1209	8.9	1	1208	8.3	1
	4	1215	7.4	1	1212	7.1	1
	5	1219	6.5	1	1216	6.4	1
	6	1222	5.8	1	1219	5.8	1
	7	1224	5.4	1	1222	5.5	1
	8	1227	5.1	1	1224	5.2	1
	9	1229	4.8	1	1226	5.0	1
	10	1231	4.6	1	1228	4.8	1
03	11	1233	4.5	2	1230	4.7	1
	12	1235	4.4	2	1232	4.6	2
	13	1236	4.3	2	1234	4.6	2
	14	1238	4.3	2	1236	4.5	2
	15	1239	4.3	2	1237	4.5	2
	16	1241	4.3	3	1239	4.5	2
	17	1243	4.3	3	1241	4.5	3
	18	1245	4.4	3	1243	4.6	3
	19	1247	4.5	3	1244	4.6	3
	20	1248	4.6	3	1246	4.7	3
	21	1250	4.7	3	1248	4.8	3
	22	1252	4.9	3	1250	4.9	3

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	23	1254	5.1	4	1252	5.1	3
	24	1256	5.3	4	1254	5.2	4
	25	1259	5.7	4	1256	5.5	4
	26	1261	6.1	4	1258	5.7	4
	27	1264	6.6	4	1261	6.1	4
	28	1268	7.3	4	1264	6.5	4
	29	1272	8.3	4	1267	7.1	4
	30	1277	9.7	4	1271	8.0	4
	31	1284	11.9	4	1277	9.3	4
	32	1290	15.7	4	1284	11.5	4
	33	1290	15.7	4	1290	16.2	4
	34	1290	15.7	4	1290	16.2	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-13. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 8

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	24.1	1	1200	24.1	1
	1	1200	16.9	1	1200	16.9	1
	2	1200	11.2	1	1200	11.2	1
	3	1207	8.6	1	1207	8.6	1
	4	1212	7.1	1	1212	7.1	1
	5	1216	6.2	1	1216	6.2	1
	6	1219	5.5	1	1219	5.5	1
	7	1222	5.1	1	1222	5.1	1
	8	1224	4.7	1	1224	4.7	1
	9	1226	4.5	1	1226	4.5	1
	10	1228	4.3	1	1228	4.3	1
	11	1229	4.2	1	1229	4.2	1
	12	1231	4.1	1	1231	4.1	1
	13	1233	4.0	1	1233	4.0	1
	14	1234	4.0	2	1234	4.0	2
	15	1236	4.0	2	1236	4.0	2
	16	1237	4.0	2	1237	4.0	2
	17	1239	4.0	2	1239	4.0	2
	18	1240	4.0	3	1240	4.0	3
	19	1242	4.0	3	1242	4.0	3
	20	1243	4.1	3	1243	4.1	3
	21	1245	4.2	3	1245	4.2	3
	22	1246	4.3	3	1246	4.3	3
	23	1248	4.4	3	1248	4.4	3
	24	1250	4.5	4	1250	4.5	4
	25	1252	4.7	4	1252	4.7	4
	26	1254	4.9	4	1254	4.9	4
	27	1256	5.2	4	1256	5.2	4
	28	1258	5.6	4	1258	5.6	4
	29	1261	6.1	4	1261	6.1	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	30	1264	6.7	4	1264	6.7	4
	31	1268	7.6	4	1268	7.6	4
	32	1274	9.1	4	1274	9.1	4
	33	1281	11.7	4	1281	9.0	4
	34	1290	18.1	4	1290	0.0	4
	35	1290	18.1	4	1290	0.0	4
02	0	1200	26.4	1	1200	24.1	1
	1	1200	15.9	1	1200	16.9	1
	2	1204	10.1	1	1200	11.2	1
	3	1211	7.9	1	1207	8.6	1
	4	1215	6.7	1	1212	7.1	1
	5	1219	6.0	1	1216	6.2	1
	6	1221	5.4	1	1219	5.5	1
	7	1224	5.1	1	1222	5.1	1
	8	1226	4.8	1	1224	4.7	1
	9	1228	4.6	1	1226	4.5	1
	10	1230	4.4	1	1228	4.3	1
	11	1232	4.3	1	1229	4.2	1
	12	1233	4.2	1	1231	4.1	1
	13	1235	4.1	2	1233	4.0	1
	14	1236	4.0	2	1234	4.0	2
	15	1238	4.0	2	1236	4.0	2
	16	1239	4.0	2	1237	4.0	2
	17	1241	4.0	3	1239	4.0	2
	18	1242	4.0	3	1240	4.0	3
	19	1244	4.0	3	1242	4.0	3
	20	1245	4.1	3	1243	4.1	3
	21	1247	4.2	3	1245	4.2	3
	22	1249	4.2	4	1246	4.3	3
	23	1250	4.4	4	1248	4.4	3
	24	1252	4.5	4	1250	4.5	4
	25	1253	4.7	4	1252	4.7	4
	26	1255	4.9	4	1254	4.9	4
	27	1258	5.2	4	1256	5.2	4
	28	1260	5.5	4	1258	5.6	4
	29	1263	6.0	4	1261	6.1	4
	30	1266	6.6	4	1264	6.7	4
	31	1270	7.5	4	1268	7.6	4
	32	1275	8.9	4	1274	9.1	4
	33	1282	11.4	4	1281	9.0	4
	34	1290	17.3	4	1290	0.0	4
	35	1290	17.3	4	1290	0.0	4
03	0	1200	27.0	1	1200	24.1	1
	1	1200	17.8	1	1200	16.9	1
	2	1202	11.2	1	1200	11.2	1
	3	1209	8.6	1	1207	8.6	1
	4	1214	7.2	1	1212	7.1	1
	5	1218	6.3	1	1216	6.2	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
03	6	1221	5.7	1	1219	5.5	1
	7	1223	5.3	1	1222	5.1	1
	8	1226	5.0	1	1224	4.7	1
	9	1228	4.8	1	1226	4.5	1
	10	1230	4.6	1	1228	4.3	1
	11	1232	4.4	1	1229	4.2	1
	12	1233	4.3	1	1231	4.1	1
	13	1235	4.2	2	1233	4.0	1
	14	1237	4.2	2	1234	4.0	2
	15	1238	4.2	2	1236	4.0	2
	16	1239	4.1	2	1237	4.0	2
	17	1241	4.2	3	1239	4.0	2
	18	1243	4.2	3	1240	4.0	3
	19	1244	4.2	3	1242	4.0	3
	20	1246	4.3	3	1243	4.1	3
	21	1248	4.4	3	1245	4.2	3
	22	1249	4.5	4	1246	4.3	3
	23	1251	4.6	4	1248	4.4	3
	24	1253	4.8	4	1250	4.5	4
	25	1255	5.0	4	1252	4.7	4
	26	1257	5.3	4	1254	4.9	4
	27	1260	5.7	4	1256	5.2	4
	28	1262	6.1	4	1258	5.6	4
	29	1266	6.7	4	1261	6.1	4
	30	1269	7.6	4	1264	6.7	4
	31	1274	8.8	4	1268	7.6	4
	32	1281	10.8	4	1274	9.1	4
	33	1290	14.5	4	1281	9.0	4
	34	1290	16.4	4	1290	0.0	4
	35	1290	16.4	4	1290	0.0	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

Table K-14. 2016–17 MSAA: Raw to Scaled Score Look-up Table—Mathematics Grade 11

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
01	0	1200	25.2	1	1200	24.0	1
	1	1200	13.6	1	1200	16.5	1
	2	1207	9.0	1	1202	11.1	1
	3	1213	7.1	1	1209	8.9	1
	4	1217	6.1	1	1214	7.6	1
	5	1220	5.4	1	1218	6.8	1
	6	1222	5.0	1	1221	6.2	1
	7	1225	4.6	1	1224	5.7	1
	8	1227	4.4	1	1227	5.3	1
	9	1228	4.2	1	1229	5.1	1
	10	1230	4.0	1	1231	4.8	1

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	11	1232	3.9	1	1233	4.7	1
	12	1233	3.8	1	1235	4.5	2
	13	1235	3.8	2	1237	4.4	2
	14	1236	3.8	2	1238	4.3	2
	15	1237	3.7	2	1239	4.3	2
	16	1239	3.7	2	1242	4.2	3
	17	1240	3.7	3	1243	4.2	3
	18	1242	3.8	3	1245	4.2	3
	19	1243	3.8	3	1246	4.3	3
	20	1244	3.8	3	1248	4.3	3
	21	1246	3.9	3	1250	4.4	4
	22	1247	4.0	3	1251	4.5	4
	23	1249	4.1	4	1253	4.7	4
	24	1251	4.3	4	1255	4.9	4
	25	1252	4.4	4	1257	5.1	4
	26	1254	4.6	4	1260	5.4	4
	27	1256	4.9	4	1262	5.8	4
	28	1259	5.2	4	1265	6.4	4
	29	1261	5.6	4	1269	7.1	4
	30	1264	6.2	4	1273	8.2	4
	31	1268	7.0	4	1279	9.9	4
	32	1272	8.2	4	1288	13.1	4
	33	1279	10.3	4	1290	16.3	4
	34	1290	15.6	4	1290	16.3	4
	35	1290	17.9	4	1290	16.3	4
02	0	1200	28.9	1	1200	24.0	1
	1	1200	14.6	1	1200	16.5	1
	2	1208	9.4	1	1202	11.1	1
	3	1214	7.3	1	1209	8.9	1
	4	1218	6.2	1	1214	7.6	1
	5	1222	5.6	1	1218	6.8	1
	6	1224	5.1	1	1221	6.2	1
	7	1226	4.7	1	1224	5.7	1
	8	1228	4.5	1	1227	5.3	1
	9	1230	4.3	1	1229	5.1	1
	10	1232	4.1	1	1231	4.8	1
	11	1234	4.0	2	1233	4.7	1
	12	1235	3.9	2	1235	4.5	2
	13	1237	3.9	2	1237	4.4	2
	14	1238	3.8	2	1238	4.3	2
	15	1239	3.8	2	1239	4.3	2
	16	1241	3.8	3	1242	4.2	3
	17	1242	3.8	3	1243	4.2	3
	18	1244	3.8	3	1245	4.2	3
	19	1245	3.9	3	1246	4.3	3
	20	1247	4.0	3	1248	4.3	3
	21	1248	4.0	3	1250	4.4	4
	22	1250	4.1	4	1251	4.5	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	23	1251	4.3	4	1253	4.7	4
	24	1253	4.4	4	1255	4.9	4
	25	1255	4.6	4	1257	5.1	4
	26	1257	4.8	4	1260	5.4	4
	27	1259	5.1	4	1262	5.8	4
	28	1261	5.4	4	1265	6.4	4
	29	1264	5.9	4	1269	7.1	4
	30	1267	6.5	4	1273	8.2	4
	31	1271	7.4	4	1279	9.9	4
	32	1276	8.7	4	1288	13.1	4
	33	1283	11.2	4	1290	16.3	4
	34	1290	16.5	4	1290	16.3	4
	35	1290	16.5	4	1290	16.3	4
03	0	1200	29.3	1	1200	24.0	1
	1	1200	14.9	1	1200	16.5	1
	2	1208	9.5	1	1202	11.1	1
	3	1214	7.5	1	1209	8.9	1
	4	1219	6.4	1	1214	7.6	1
	5	1222	5.7	1	1218	6.8	1
	6	1225	5.2	1	1221	6.2	1
	7	1227	4.9	1	1224	5.7	1
	8	1229	4.6	1	1227	5.3	1
	9	1231	4.4	1	1229	5.1	1
	10	1233	4.3	1	1231	4.8	1
	11	1234	4.2	2	1233	4.7	1
	12	1236	4.1	2	1235	4.5	2
	13	1237	4.0	2	1237	4.4	2
	14	1239	4.0	2	1238	4.3	2
	15	1240	3.9	3	1239	4.3	2
	16	1242	3.9	3	1242	4.2	3
	17	1243	3.9	3	1243	4.2	3
	18	1245	4.0	3	1245	4.2	3
	19	1246	4.0	3	1246	4.3	3
	20	1248	4.1	3	1248	4.3	3
	21	1249	4.2	4	1250	4.4	4
	22	1251	4.3	4	1251	4.5	4
	23	1253	4.4	4	1253	4.7	4
	24	1254	4.6	4	1255	4.9	4
	25	1256	4.8	4	1257	5.1	4
	26	1258	5.1	4	1260	5.4	4
	27	1261	5.4	4	1262	5.8	4
	28	1263	5.8	4	1265	6.4	4
	29	1266	6.4	4	1269	7.1	4
	30	1270	7.1	4	1273	8.2	4
	31	1274	8.1	4	1279	9.9	4
	32	1280	9.7	4	1288	13.1	4
	33	1288	12.5	4	1290	16.3	4

continued

Form	Raw Score	2017			2016		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	34	1290	15.5	4	1290	16.3	4
	35	1290	15.5	4	1290	16.3	4

Note: Because MSAA had one operational form for each test in 2016, the raw to scaled score look-up for 2016 is repeated three times in the table.

APPENDIX L—SCORE DISTRIBUTIONS

Figure L-1. **2016–17 MSAA: Performance Level Distributions Graph—ELA**

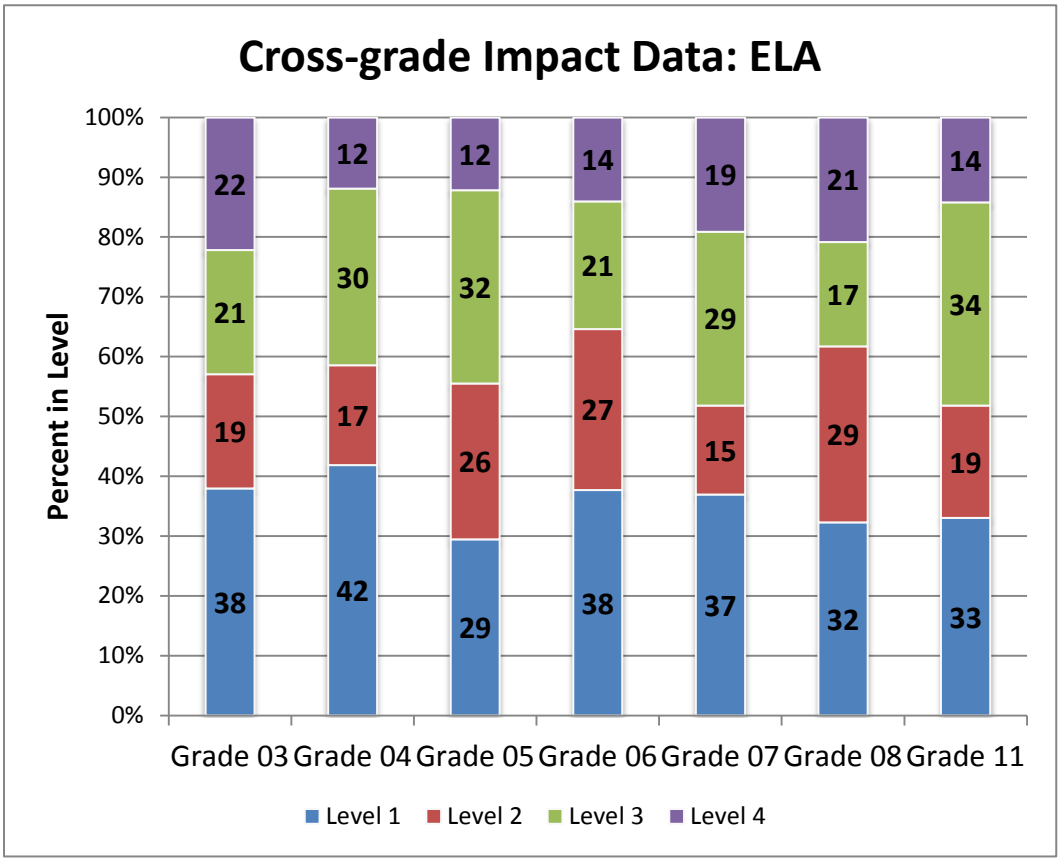


Figure L-2. . **2016–17 MSAA: Performance Level Distributions Graph—Mathematics**

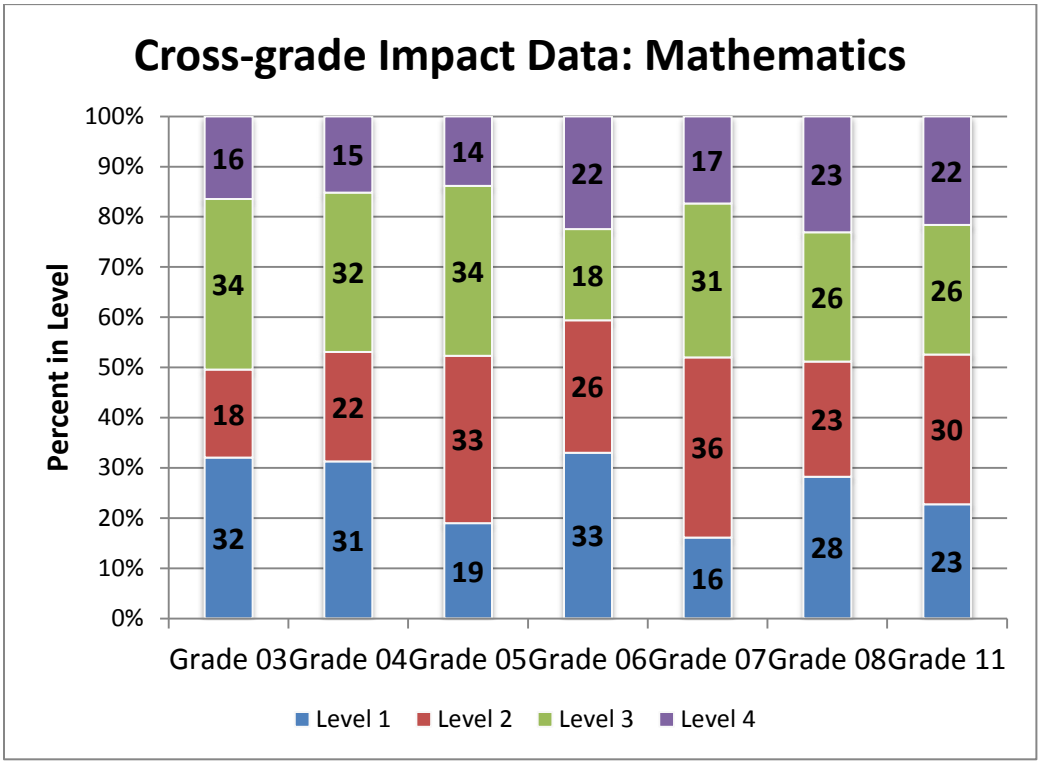
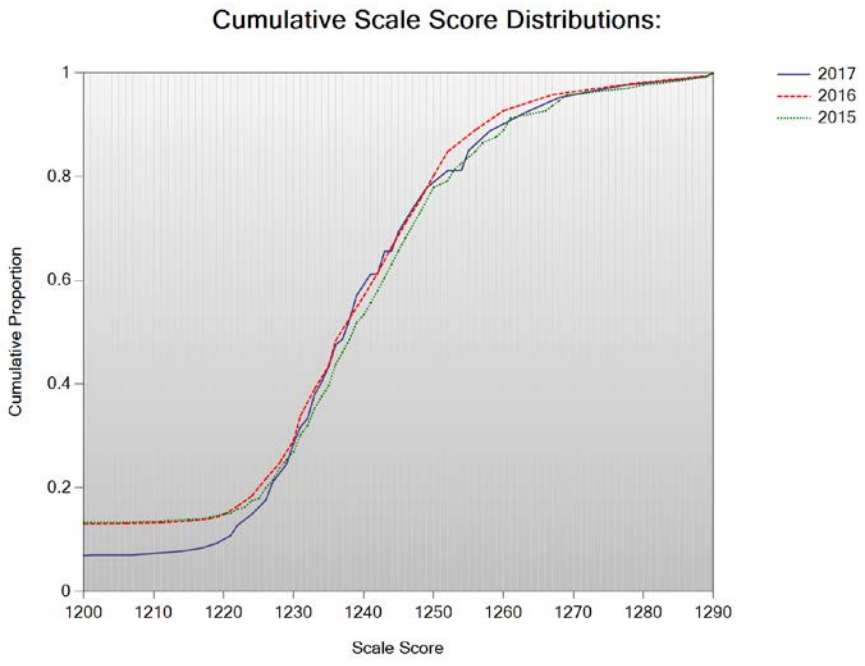


Figure L-3. **2016–17 MSAA: Cumulative Score Distribution—**
Top: ELA Grade 3 Bottom: ELA Grade 4



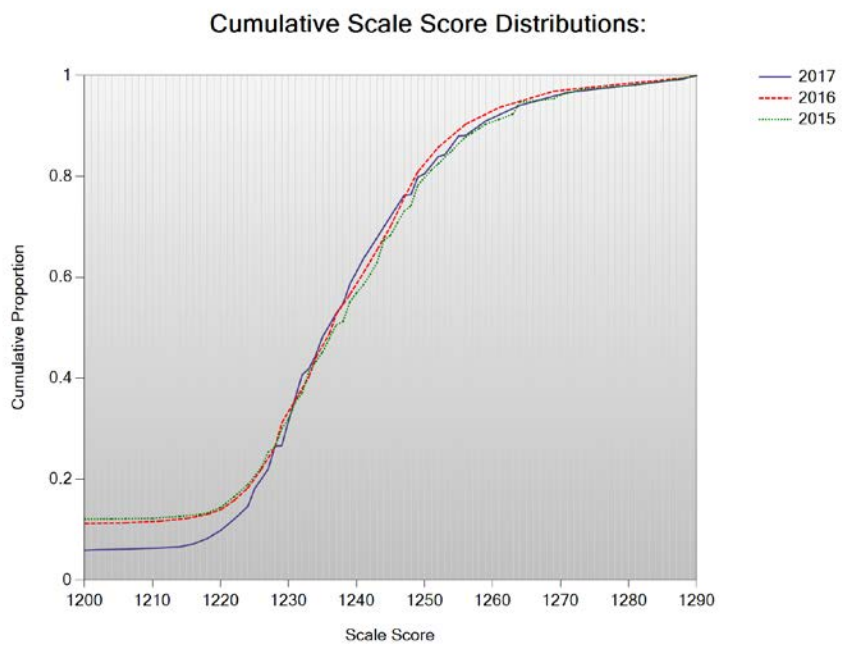
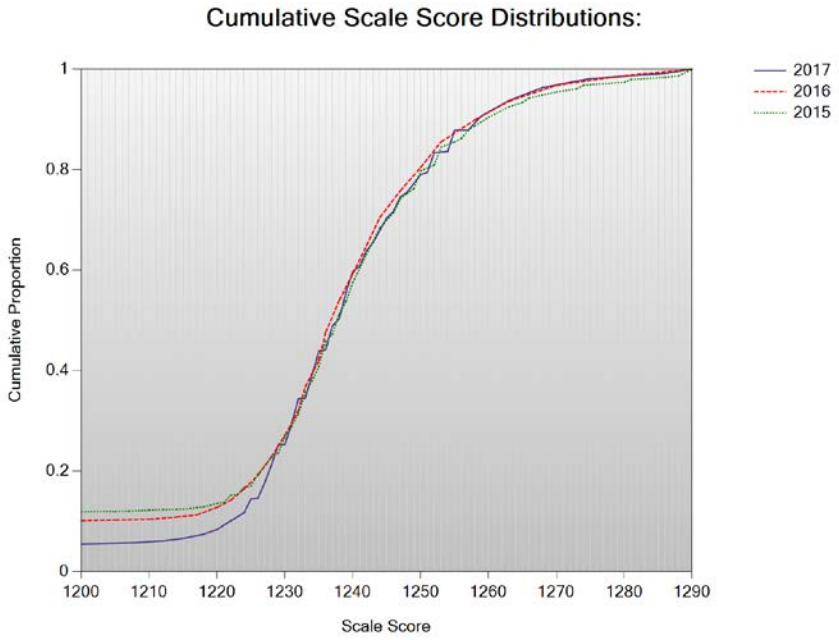


Figure L-4. **2016–17 MSAA: Cumulative Score Distribution**
Top: ELA Grade 5 Bottom: ELA Grade 6



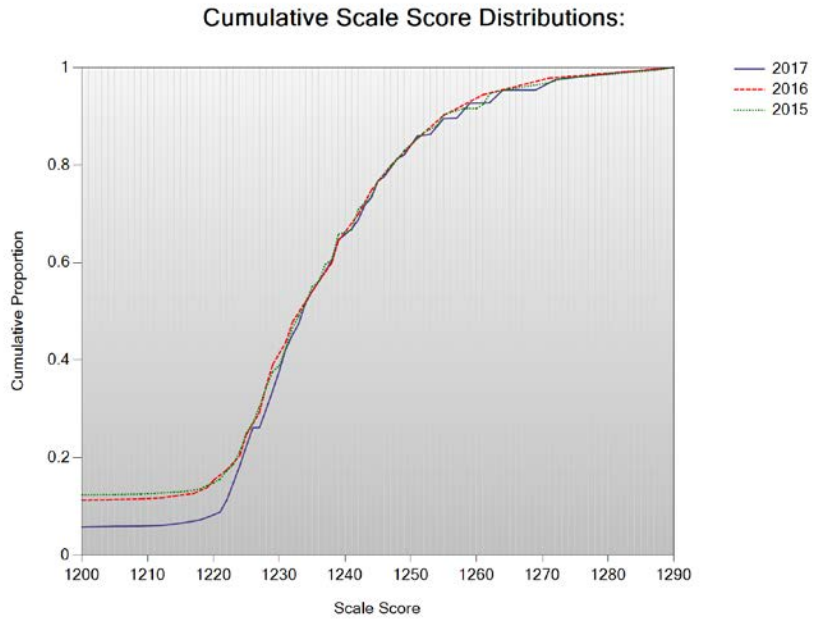
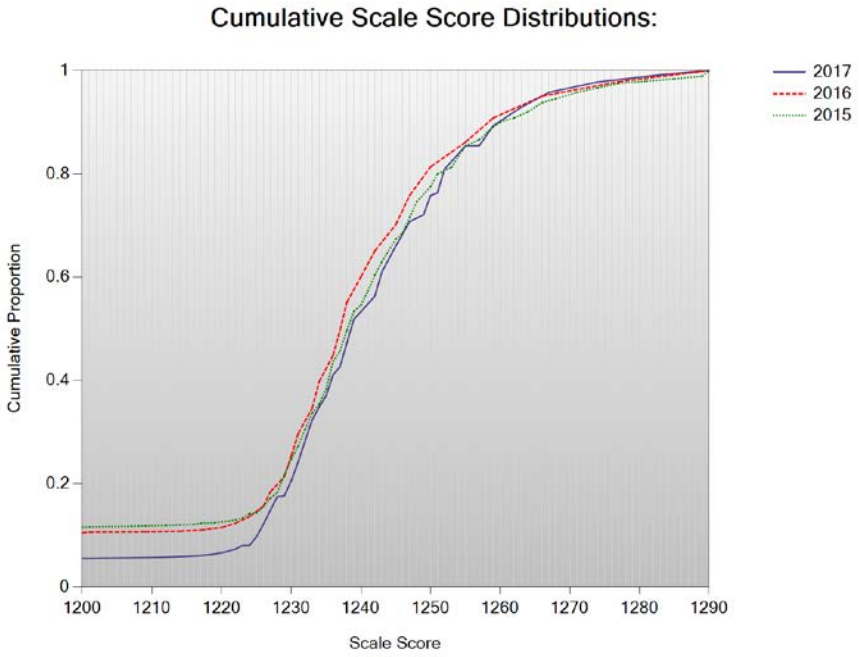


Figure L-5. **2016–17 MSAA: Cumulative Score Distribution**
Top: ELA Grade 7 Bottom: ELA Grade 8



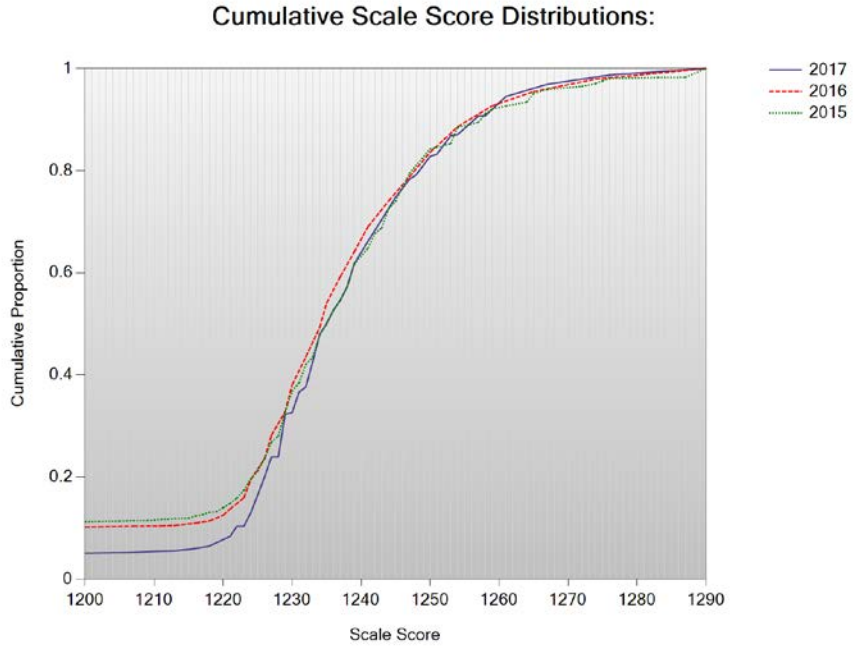


Figure L-6. **2016–17 MSAA: Cumulative Score Distribution**
ELA Grade 11

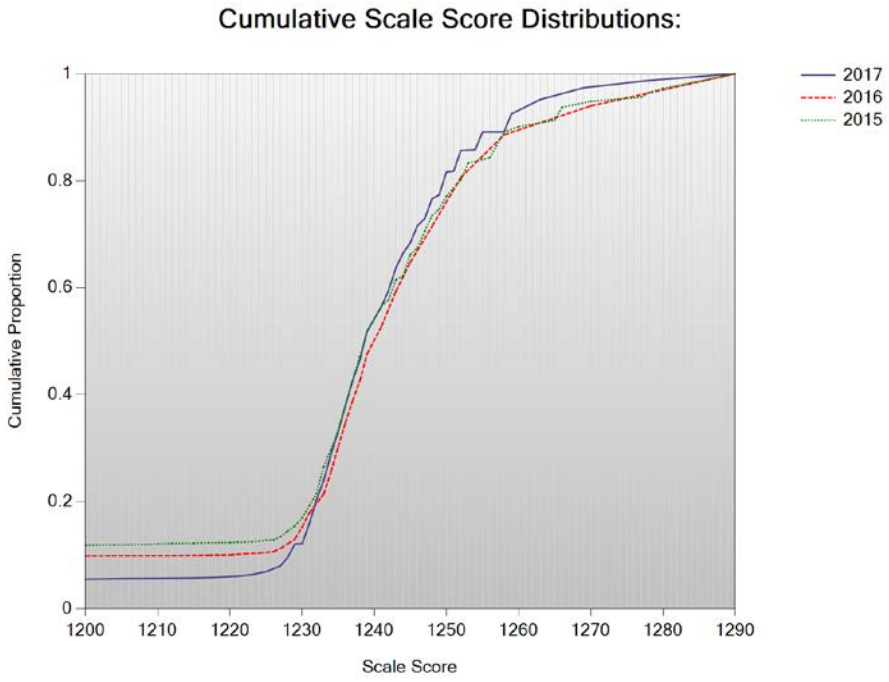
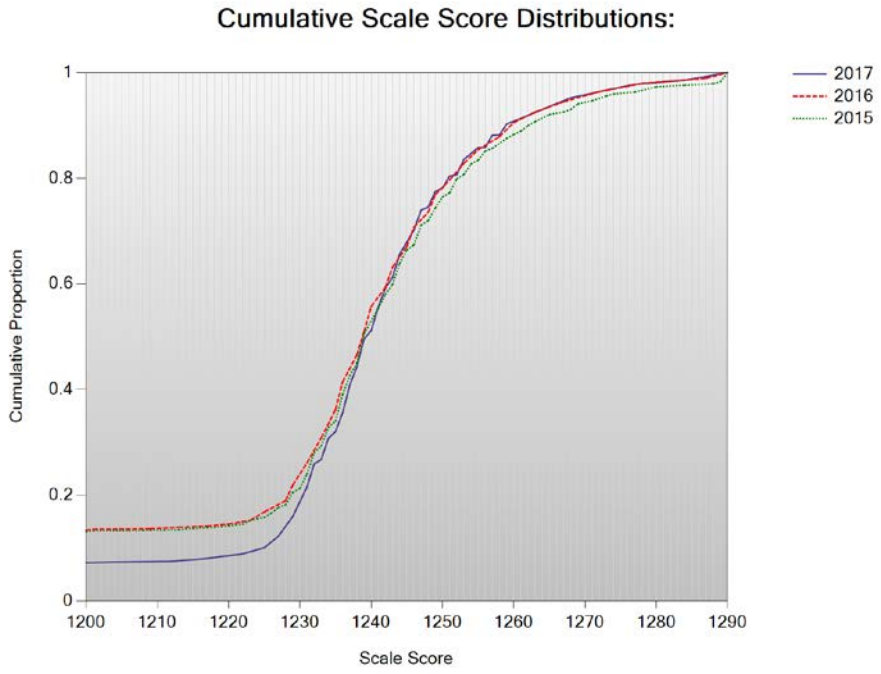


Figure L-7. **2016–17 MSAA: Cumulative Score Distribution**
Top: Mathematics Grade 3 Bottom: Mathematics Grade 4



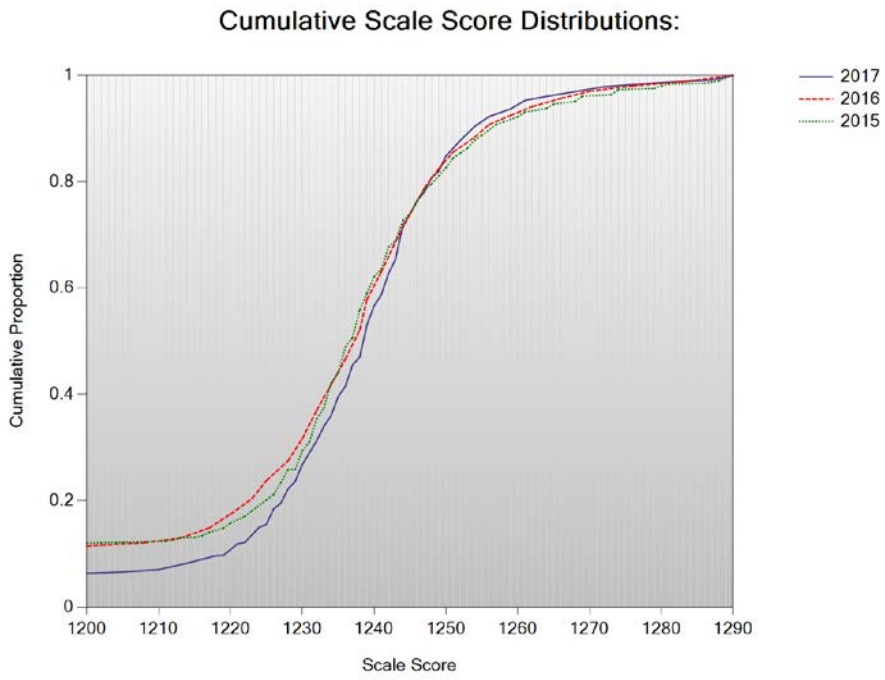
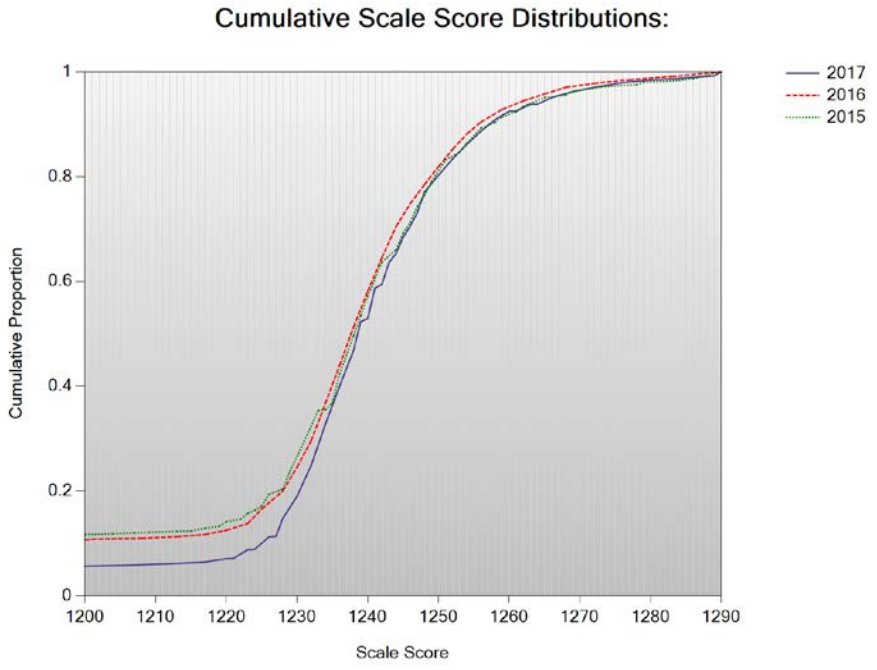


Figure L-8. **2016–17 MSAA: Cumulative Score Distribution**
Top: Mathematics Grade 5 Bottom: Mathematics Grade 6



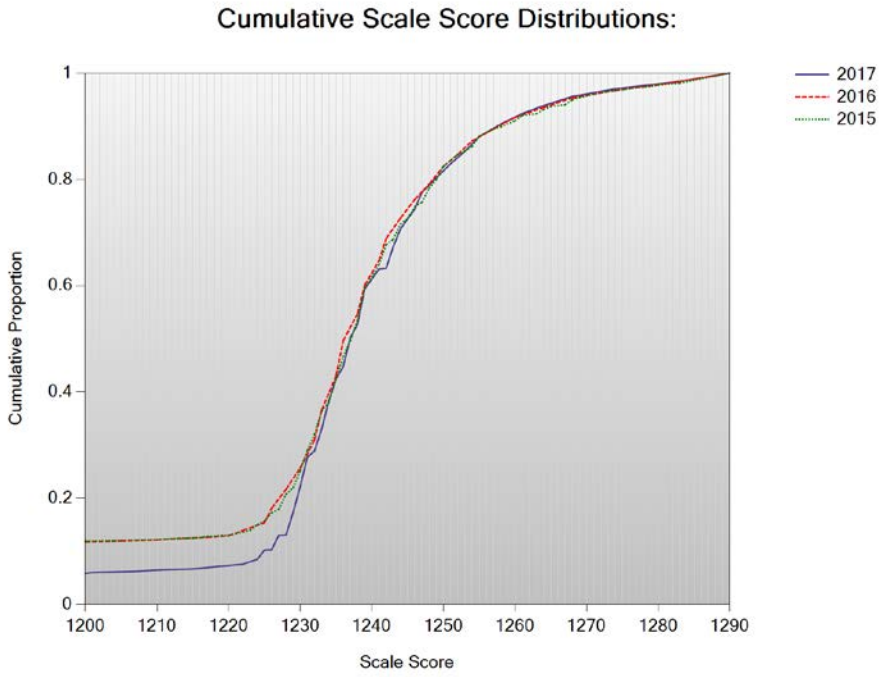
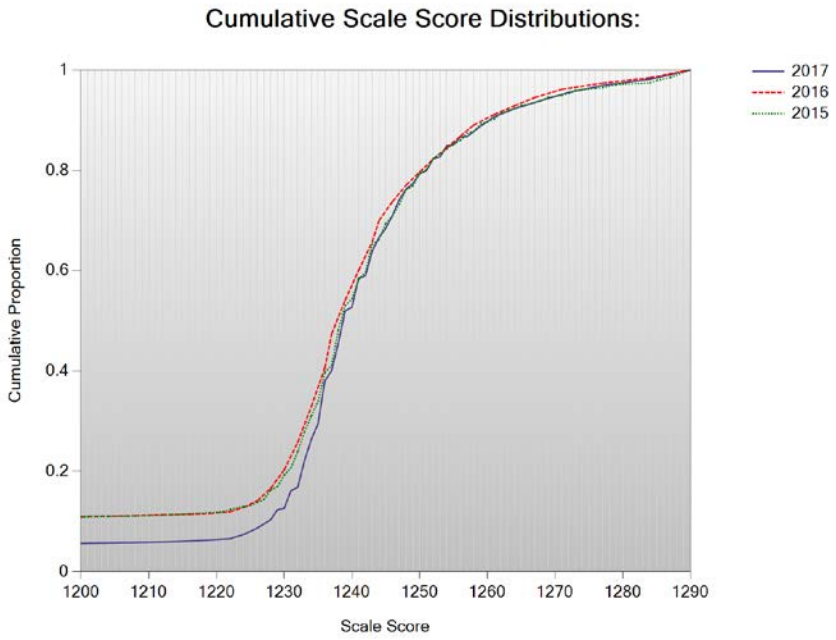


Figure L-9. **2016–17 MSAA: Cumulative Score Distribution**
Top: Mathematics Grade 7 Bottom: Mathematics Grade 8



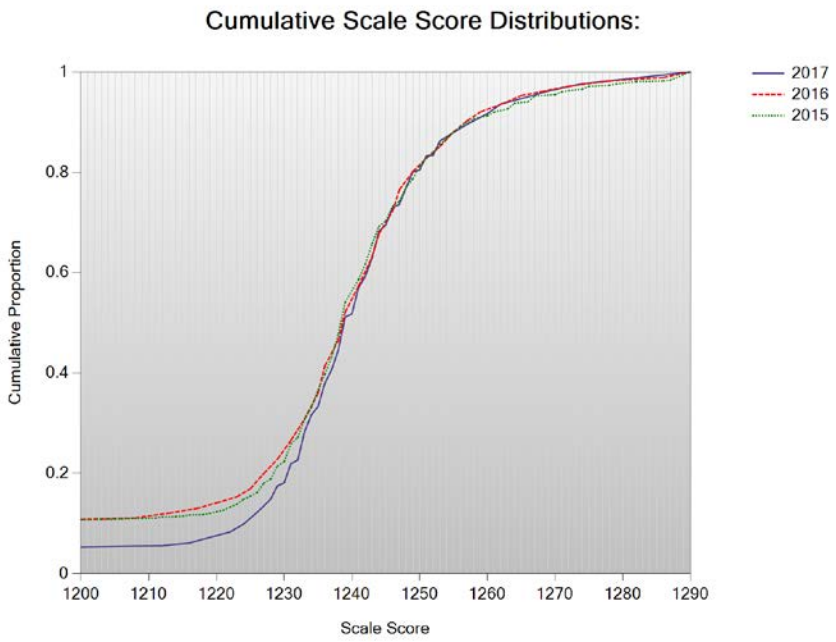
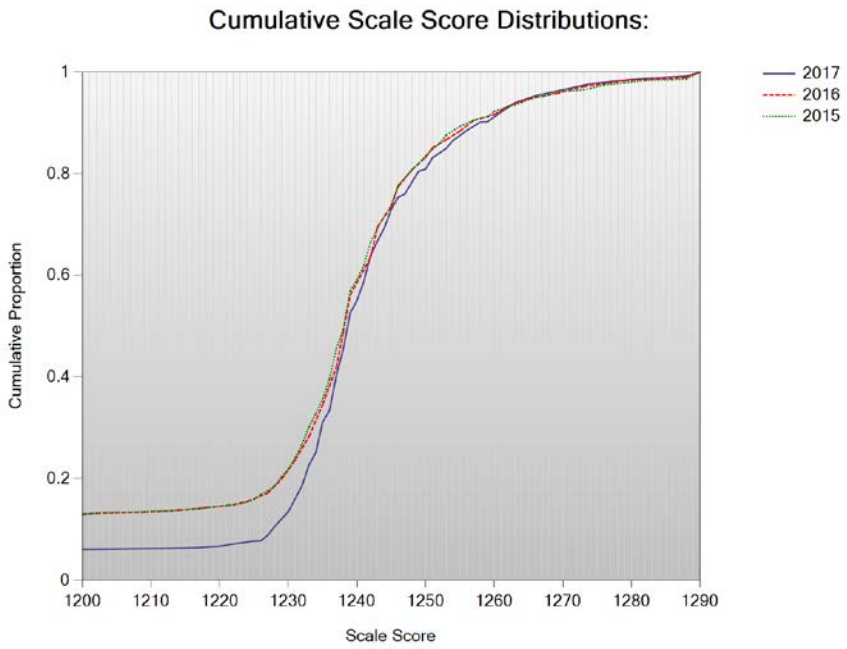


Figure L-10. **2016–17 MSAA: Cumulative Score Distribution—Mathematics Grade 11**



APPENDIX M—CLASSICAL RELIABILITY

Table M-1. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 3 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,160	32	12.75	3.99	0.57	2.61
Female	249	32	12.98	3.98	0.56	2.62
Male	419	32	12.88	4.03	0.58	2.60
Gender Undefined	492	32	12.52	3.96	0.57	2.61
Hispanic or Latino	219	32	12.31	3.90	0.55	2.62
American Indian or Alaska Native	18	32				
Asian	19	32				
Black or African American	153	32	12.86	3.96	0.56	2.62
Native Hawaiian or Pacific Islander	8	32				
White (non-Hispanic)	346	32	13.17	3.83	0.54	2.61
Two or More Races (non-Hispanic)	20	32				
No Primary race/Ethnicity Undefined	377	32	12.70	4.00	0.58	2.61
Currently receiving LEP services	37	32	11.76	3.71	0.51	2.60
Not receiving LEP services	500	32	12.98	3.86	0.54	2.62
LEP: All Other Students	623	32	12.62	4.10	0.60	2.60
Economically Disadvantaged Students	237	32	12.96	3.84	0.53	2.62
Non-economically Disadvantaged Students	300	32	12.84	3.88	0.54	2.62
SES: All Other Students	623	32	12.62	4.10	0.60	2.60
Migrant	0	32				
Non-migrant	529	32	12.90	3.86	0.54	2.62
Undefined Migrant Status	631	32	12.62	4.09	0.60	2.60
Augmentative Communication	318	32	12.20	4.33	0.64	2.60
No Augmentative Communication	839	32	12.95	3.83	0.53	2.61
Undefined Augmentative Communications	3	32				
Hearing Loss	54	32	11.22	4.11	0.61	2.56
Within Normal Limits	1,102	32	12.83	3.97	0.57	2.61
Undefined Hearing Loss	4	32				
Visual Impairment	66	32	11.21	4.37	0.65	2.58
Within Normal Limits	1,087	32	12.85	3.94	0.56	2.61
Undefined Visual Impairment	7	32				
Sensory Stimuli Response	210	32	10.55	4.63	0.71	2.51

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Follow Directions	949	32	13.23	3.66	0.48	2.63
Undefined Receptive Language	1	32				
Special School	141	32	12.05	4.51	0.67	2.60
Regular School Self-contained	836	32	12.82	3.88	0.54	2.62
Regular School Resource Room	122	32	12.75	4.14	0.61	2.58
Regular School Primarily Self-contained	37	32	13.19	3.99	0.58	2.59
Regular School General Education	23	32				
Undefined Classroom Setting	1	32				
Student Communicates Primarily Through Cries	147	32	10.04	4.57	0.70	2.50
Uses Intentional Communication	437	32	12.62	3.75	0.51	2.63
Uses Symbolic Language	575	32	13.53	3.69	0.50	2.61
Undefined Expressive Communication	1	32				

Table M-2. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 3 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	983	32	18.25	3.12	0.30	2.61
Female	209	32	18.37	3.09	0.30	2.60
Male	422	32	18.46	3.07	0.28	2.61
Gender Undefined	352	32	17.92	3.17	0.31	2.63
Hispanic or Latino	168	32	18.12	3.30	0.39	2.59
American Indian or Alaska Native	12	32				
Asian	12	32				
Black or African American	122	32	17.93	2.90	0.17	2.63
Native Hawaiian or Pacific Islander	9	32				
White (non-Hispanic)	330	32	18.70	3.06	0.28	2.59
Two or More Races (non-Hispanic)	44	32	18.34	3.32	0.40	2.56
No Primary race/Ethnicity Undefined	286	32	17.93	3.13	0.29	2.64
Currently receiving LEP services	31	32	18.45	2.96	0.24	2.58
Not receiving LEP services	453	32	18.43	3.07	0.29	2.60
LEP: All Other Students	499	32	18.07	3.16	0.31	2.63

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Economically Disadvantaged Students	242	32	18.48	3.01	0.26	2.59
Non-economically Disadvantaged Students	242	32	18.39	3.12	0.31	2.60
SES: All Other Students	499	32	18.07	3.16	0.31	2.63
Migrant	1	32				
Non-migrant	472	32	18.44	3.07	0.29	2.59
Undefined Migrant Status	510	32	18.07	3.16	0.30	2.63
Augmentative Communication	173	32	17.23	3.06	0.23	2.69
No Augmentative Communication	802	32	18.46	3.09	0.30	2.59
Undefined Augmentative Communications	8	32				
Hearing Loss	25	32	17.16	3.74	0.48	2.69
Within Normal Limits	953	32	18.29	3.09	0.28	2.61
Undefined Hearing Loss	5	32				
Visual Impairment	29	32	17.62	3.29	0.35	2.64
Within Normal Limits	948	32	18.27	3.11	0.29	2.61
Undefined Visual Impairment	6	32				
Sensory Stimuli Response	59	32	17.47	3.22	0.30	2.71
Follow Directions	923	32	18.30	3.11	0.30	2.61
Undefined Receptive Language	1	32				
Special School	65	32	17.92	2.91	0.14	2.69
Regular School Self-contained	659	32	18.14	3.11	0.29	2.62
Regular School Resource Room	160	32	18.39	3.04	0.28	2.58
Regular School Primarily Self-contained	71	32	18.92	3.05	0.29	2.58
Regular School General Education	27	32	18.89	4.12	0.63	2.50
Undefined Classroom Setting	1	32				
Student Communicates Primarily Through Cries	32	32	16.13	2.09	-0.73	2.75
Uses Intentional Communication	223	32	17.74	3.14	0.27	2.68
Uses Symbolic Language	727	32	18.50	3.10	0.31	2.58
Undefined Expressive Communication	1	32				

Table M-3. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 3 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,303	32	25.43	3.66	0.68	2.07
Female	324	32	25.61	3.53	0.66	2.05
Male	632	32	25.80	3.62	0.69	2.02
Gender Undefined	347	32	24.61	3.75	0.67	2.16
Hispanic or Latino	216	32	24.70	3.48	0.62	2.14
American Indian or Alaska Native	21	32				
Asian	12	32				
Black or African American	188	32	25.54	3.28	0.60	2.07
Native Hawaiian or Pacific Islander	6	32				
White (non-Hispanic)	579	32	26.02	3.55	0.68	2.00
Two or More Races (non-Hispanic)	37	32	26.08	4.15	0.78	1.95
No Primary race/Ethnicity Undefined	244	32	24.61	4.04	0.72	2.15
Currently receiving LEP services	44	32	24.82	3.10	0.53	2.12
Not receiving LEP services	741	32	25.92	3.52	0.67	2.01
LEP: All Other Students	518	32	24.80	3.80	0.68	2.14
Economically Disadvantaged Students	438	32	26.22	3.52	0.69	1.97
Non-economically Disadvantaged Students	347	32	25.39	3.45	0.63	2.09
SES: All Other Students	518	32	24.80	3.80	0.68	2.14
Migrant	0	32				
Non-migrant	780	32	25.87	3.50	0.67	2.02
Undefined Migrant Status	523	32	24.78	3.80	0.68	2.14
Augmentative Communication	89	32	23.63	3.96	0.67	2.26
No Augmentative Communication	1,207	32	25.58	3.59	0.67	2.05
Undefined Augmentative Communications	7	32				
Hearing Loss	16	32				
Within Normal Limits	1,285	32	25.43	3.66	0.68	2.07
Undefined Hearing Loss	2	32				
Visual Impairment	26	32	24.27	4.14	0.73	2.15
Within Normal Limits	1,268	32	25.45	3.65	0.68	2.07
Undefined Visual Impairment	9	32				
Sensory Stimuli Response	23	32				
Follow Directions	1,279	32	25.49	3.63	0.68	2.06
Undefined Receptive Language	1	32				

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Special School	42	32	24.14	4.69	0.78	2.18
Regular School Self-contained	784	32	25.19	3.61	0.66	2.10
Regular School Resource Room	252	32	25.92	3.56	0.68	2.00
Regular School Primarily Self-contained	168	32	26.08	3.55	0.69	1.98
Regular School General Education	56	32	25.63	3.87	0.72	2.06
Undefined Classroom Setting	1	32				
Student Communicates Primarily Through Cries	13	32				
Uses Intentional Communication	149	32	24.05	4.02	0.69	2.25
Uses Symbolic Language	1,140	32	25.65	3.56	0.67	2.04
Undefined Expressive Communication	1	32				

Table M-4. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 4 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,671	32	14.36	4.08	0.57	2.67
Female	331	32	14.10	4.18	0.59	2.66
Male	625	32	14.78	4.24	0.61	2.66
Gender Undefined	715	32	14.12	3.85	0.52	2.67
Hispanic or Latino	299	32	14.27	4.03	0.56	2.67
American Indian or Alaska Native	20	32				
Asian	18	32				
Black or African American	222	32	14.51	4.27	0.61	2.66
Native Hawaiian or Pacific Islander	13	32				
White (non-Hispanic)	526	32	14.49	4.28	0.62	2.65
Two or More Races (non-Hispanic)	36	32	14.31	4.27	0.61	2.67
No Primary race/Ethnicity Undefined	537	32	14.14	3.84	0.51	2.68
Currently receiving LEP services	55	32	15.22	4.10	0.57	2.69
Not receiving LEP services	721	32	14.52	4.20	0.60	2.66
LEP: All Other Students	895	32	14.18	3.97	0.55	2.67
Economically Disadvantaged Students	336	32	14.58	4.43	0.64	2.65
Non-economically Disadvantaged Students	440	32	14.56	4.01	0.56	2.66

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	895	32	14.18	3.97	0.55	2.67
Migrant	1	32				
Non-migrant	762	32	14.56	4.18	0.59	2.66
Undefined Migrant Status	908	32	14.19	3.98	0.55	2.67
Augmentative Communication	432	32	13.77	3.87	0.52	2.68
No Augmentative Communication	1,221	32	14.60	4.13	0.59	2.66
Undefined Augmentative Communications	18	32				
Hearing Loss	57	32	13.42	5.18	0.75	2.61
Within Normal Limits	1,610	32	14.39	4.03	0.56	2.67
Undefined Hearing Loss	4	32				
Visual Impairment	96	32	13.19	5.05	0.73	2.62
Within Normal Limits	1,563	32	14.44	4.00	0.56	2.67
Undefined Visual Impairment	12	32				
Sensory Stimuli Response	211	32	12.00	4.76	0.70	2.61
Follow Directions	1,458	32	14.71	3.85	0.52	2.67
Undefined Receptive Language	2	32				
Special School	215	32	13.43	4.49	0.65	2.65
Regular School Self-contained	1,173	32	14.26	3.93	0.54	2.67
Regular School Resource Room	172	32	15.42	4.22	0.61	2.64
Regular School Primarily Self-contained	61	32	15.34	3.78	0.50	2.67
Regular School General Education	48	32	16.04	4.05	0.58	2.63
Undefined Classroom Setting	2	32				
Student Communicates Primarily Through Cries	160	32	11.70	5.09	0.74	2.58
Uses Intentional Communication	563	32	14.01	3.86	0.52	2.68
Uses Symbolic Language	946	32	15.03	3.79	0.50	2.67
Undefined Expressive Communication	2	32				

Table M-5. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 4 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	647	32	19.97	2.96	0.25	2.57
Female	126	32	19.66	2.98	0.27	2.56
Male	265	32	20.17	2.99	0.27	2.56
Gender Undefined	256	32	19.92	2.91	0.21	2.60
Hispanic or Latino	120	32	19.89	2.80	0.16	2.57
American Indian or Alaska Native	7	32				
Asian	12	32				
Black or African American	116	32	20.26	2.82	0.18	2.55
Native Hawaiian or Pacific Islander	5	32				
White (non-Hispanic)	189	32	20.07	3.06	0.31	2.53
Two or More Races (non-Hispanic)	11	32				
No Primary race/Ethnicity Undefined	187	32	19.71	3.00	0.24	2.61
Currently receiving LEP services	18	32				
Not receiving LEP services	300	32	20.10	2.99	0.27	2.55
LEP: All Other Students	329	32	19.88	2.93	0.22	2.59
Economically Disadvantaged Students	167	32	20.35	2.97	0.27	2.54
Non-economically Disadvantaged Students	151	32	19.76	3.00	0.27	2.57
SES: All Other Students	329	32	19.88	2.93	0.22	2.59
Migrant	0	32				
Non-migrant	312	32	20.07	2.98	0.27	2.55
Undefined Migrant Status	335	32	19.88	2.94	0.23	2.59
Augmentative Communication	83	32	19.43	2.67	0.00	2.66
No Augmentative Communication	559	32	20.05	3.00	0.28	2.55
Undefined Augmentative Communications	5	32				
Hearing Loss	14	32				
Within Normal Limits	626	32	20.01	2.96	0.25	2.57
Undefined Hearing Loss	7	32				
Visual Impairment	21	32				
Within Normal Limits	621	32	19.99	2.98	0.26	2.57
Undefined Visual Impairment	5	32				
Sensory Stimuli Response	23	32				
Follow Directions	622	32	19.99	2.96	0.25	2.57

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	2	32				
Special School	39	32	19.59	2.64	0.01	2.62
Regular School Self-contained	414	32	19.87	2.91	0.21	2.58
Regular School Resource Room	108	32	20.24	3.28	0.41	2.52
Regular School Primarily Self-contained	64	32	20.56	3.01	0.29	2.54
Regular School General Education	20	32				
Undefined Classroom Setting	2	32				
Student Communicates Primarily Through Cries	11	32				
Uses Intentional Communication	115	32	19.40	2.67	0.02	2.64
Uses Symbolic Language	519	32	20.11	2.98	0.27	2.55
Undefined Expressive Communication	2	32				

Table M-6. MSAA: Reliability: Subgroup-ELA Grade 4 Form 3

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,359	32	24.84	3.57	0.64	2.15
Female	341	32	24.94	3.51	0.63	2.13
Male	672	32	25.12	3.56	0.64	2.12
Gender Undefined	346	32	24.21	3.59	0.62	2.23
Hispanic or Latino	233	32	24.57	3.63	0.64	2.18
American Indian or Alaska Native	20	32				
Asian	9	32				
Black or African American	211	32	24.37	3.50	0.60	2.20
Native Hawaiian or Pacific Islander	4	32				
White (non-Hispanic)	617	32	25.29	3.57	0.66	2.09
Two or More Races (non-Hispanic)	30	32	25.37	3.48	0.62	2.15
No Primary race/Ethnicity Undefined	235	32	24.27	3.52	0.60	2.22
Currently receiving LEP services	45	32	24.02	3.80	0.66	2.21
Not receiving LEP services	789	32	25.14	3.58	0.65	2.11
LEP: All Other Students	525	32	24.46	3.49	0.60	2.20
Economically Disadvantaged Students	485	32	25.22	3.66	0.67	2.09
Non-economically Disadvantaged Students	349	32	24.88	3.50	0.62	2.15

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	525	32	24.46	3.49	0.60	2.20
Migrant	1	32				
Non-migrant	829	32	25.09	3.61	0.66	2.11
Undefined Migrant Status	529	32	24.45	3.48	0.60	2.20
Augmentative Communication	70	32	23.87	3.47	0.56	2.30
No Augmentative Communication	1,276	32	24.89	3.57	0.64	2.14
Undefined Augmentative Communications	13	32				
Hearing Loss	19	32				
Within Normal Limits	1,336	32	24.84	3.57	0.64	2.15
Undefined Hearing Loss	4	32				
Visual Impairment	23	32				
Within Normal Limits	1,329	32	24.85	3.58	0.64	2.15
Undefined Visual Impairment	7	32				
Sensory Stimuli Response	11	32				
Follow Directions	1,347	32	24.85	3.57	0.64	2.15
Undefined Receptive Language	1	32				
Special School	46	32	24.72	3.64	0.63	2.21
Regular School Self-contained	837	32	24.74	3.62	0.64	2.16
Regular School Resource Room	270	32	25.01	3.43	0.61	2.14
Regular School Primarily Self-contained	153	32	25.19	3.56	0.66	2.08
Regular School General Education	52	32	24.67	3.52	0.62	2.16
Undefined Classroom Setting	1	32				
Student Communicates Primarily Through Cries	5	32				
Uses Intentional Communication	102	32	23.92	3.50	0.58	2.27
Uses Symbolic Language	1,251	32	24.92	3.56	0.64	2.14
Undefined Expressive Communication	1	32				

Table M-7. MSAA: Reliability: Subgroup-ELA Grade 5 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,234	32	12.22	3.91	0.56	2.60
Female	211	32	12.26	3.85	0.54	2.60
Male	462	32	12.52	3.98	0.57	2.60
Gender Undefined	561	32	11.95	3.87	0.55	2.59
Hispanic or Latino	254	32	12.42	3.91	0.56	2.61
American Indian or Alaska Native	11	32				
Asian	22	32				
Black or African American	167	32	12.44	3.99	0.58	2.59
Native Hawaiian or Pacific Islander	10	32				
White (non-Hispanic)	341	32	12.39	3.92	0.56	2.61
Two or More Races (non-Hispanic)	25	32	13.04	4.20	0.61	2.61
No Primary race/Ethnicity Undefined	404	32	11.77	3.88	0.56	2.59
Currently receiving LEP services	42	32	12.33	4.15	0.61	2.57
Not receiving LEP services	494	32	12.46	3.92	0.56	2.60
LEP: All Other Students	698	32	12.04	3.89	0.55	2.60
Economically Disadvantaged Students	204	32	12.55	3.96	0.57	2.59
Non-economically Disadvantaged Students	332	32	12.38	3.91	0.56	2.60
SES: All Other Students	698	32	12.04	3.89	0.55	2.60
Migrant	3	32				
Non-migrant	527	32	12.45	3.95	0.57	2.60
Undefined Migrant Status	704	32	12.04	3.89	0.55	2.60
Augmentative Communication	330	32	11.42	3.86	0.55	2.59
No Augmentative Communication	900	32	12.52	3.89	0.55	2.60
Undefined Augmentative Communications	4	32				
Hearing Loss	51	32	12.75	3.72	0.50	2.63
Within Normal Limits	1,180	32	12.19	3.92	0.56	2.60
Undefined Hearing Loss	3	32				
Visual Impairment	54	32	11.19	4.59	0.70	2.53
Within Normal Limits	1,172	32	12.27	3.87	0.55	2.60
Undefined Visual Impairment	8	32				
Sensory Stimuli Response	173	32	10.00	4.39	0.68	2.49

continued

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
Follow Directions	1,061	32	12.58	3.71	0.50	2.61
Undefined Receptive Language	0	32				
Special School	186	32	10.81	4.36	0.66	2.54
Regular School Self-contained	824	32	12.18	3.78	0.52	2.60
Regular School Resource Room	129	32	13.28	3.81	0.53	2.61
Regular School Primarily Self-contained	66	32	13.76	3.57	0.47	2.60
Regular School General Education	29	32	14.07	2.52	-0.14	2.70
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	138	32	9.59	4.44	0.69	2.47
Uses Intentional Communication	387	32	11.52	3.63	0.49	2.60
Uses Symbolic Language	709	32	13.11	3.64	0.49	2.61
Undefined Expressive Communication	0	32				

Table M-8. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 5 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,174	32	17.79	2.94	0.20	2.63
Female	238	32	18.05	2.91	0.20	2.61
Male	462	32	17.74	3.05	0.26	2.62
Gender Undefined	474	32	17.70	2.84	0.13	2.65
Hispanic or Latino	203	32	18.06	2.83	0.14	2.62
American Indian or Alaska Native	18	32				
Asian	18	32				
Black or African American	160	32	17.39	2.87	0.15	2.64
Native Hawaiian or Pacific Islander	7	32				
White (non-Hispanic)	394	32	17.96	3.02	0.25	2.62
Two or More Races (non-Hispanic)	18	32				
No Primary race/Ethnicity Undefined	356	32	17.54	2.88	0.16	2.65
Currently receiving LEP services	34	32	18.71	2.54	-0.07	2.63
Not receiving LEP services	537	32	17.80	3.05	0.26	2.62

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	*Mean*	*Standard Deviation*		
LEP: All Other Students	603	32	17.72	2.86	0.15	2.64
Economically Disadvantaged Students	259	32	18.02	2.97	0.23	2.61
Non-economically Disadvantaged Students	312	32	17.71	3.06	0.26	2.63
SES: All Other Students	603	32	17.72	2.86	0.15	2.64
Migrant	1	32				
Non-migrant	566	32	17.85	3.03	0.25	2.62
Undefined Migrant Status	607	32	17.73	2.86	0.15	2.64
Augmentative Communication	198	32	17.06	2.70	0.03	2.66
No Augmentative Communication	970	32	17.92	2.96	0.22	2.61
Undefined Augmentative Communications	6	32				
Hearing Loss	14	32				
Within Normal Limits	1,158	32	17.78	2.94	0.20	2.63
Undefined Hearing Loss	2	32				
Visual Impairment	36	32	17.08	3.68	0.48	2.65
Within Normal Limits	1,134	32	17.81	2.91	0.18	2.63
Undefined Visual Impairment	4	32				
Sensory Stimuli Response	57	32	16.44	3.09	0.27	2.65
Follow Directions	1,117	32	17.85	2.92	0.19	2.62
Undefined Receptive Language	0	32				
Special School	87	32	16.79	2.79	0.08	2.67
Regular School Self-contained	768	32	17.78	2.99	0.22	2.63
Regular School Resource Room	204	32	18.16	2.61	0.00	2.61
Regular School Primarily Self-contained	86	32	17.97	3.02	0.28	2.56
Regular School General Education	29	32	17.69	3.57	0.46	2.62
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	42	32	16.10	2.90	0.14	2.69
Uses Intentional Communication	245	32	17.23	3.04	0.23	2.67
Uses Symbolic Language	887	32	18.02	2.87	0.18	2.60
Undefined Expressive Communication	0	32				

Table M-9. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 5 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,339	32	24.21	3.48	0.60	2.20
Female	324	32	24.35	3.18	0.53	2.19
Male	644	32	24.48	3.59	0.63	2.17
Gender Undefined	371	32	23.61	3.47	0.57	2.28
Hispanic or Latino	204	32	24.04	3.37	0.56	2.22
American Indian or Alaska Native	18	32				
Asian	15	32				
Black or African American	202	32	24.43	3.70	0.65	2.18
Native Hawaiian or Pacific Islander	3	32				
White (non-Hispanic)	606	32	24.53	3.35	0.58	2.17
Two or More Races (non-Hispanic)	30	32	24.27	3.66	0.63	2.21
No Primary race/Ethnicity Undefined	261	32	23.52	3.60	0.60	2.29
Currently receiving LEP services	43	32	24.05	3.45	0.59	2.20
Not receiving LEP services	767	32	24.47	3.48	0.61	2.17
LEP: All Other Students	529	32	23.84	3.45	0.58	2.25
Economically Disadvantaged Students	425	32	24.88	3.30	0.59	2.12
Non-economically Disadvantaged Students	385	32	23.97	3.60	0.61	2.24
SES: All Other Students	529	32	23.84	3.45	0.58	2.25
Migrant	1	32				
Non-migrant	807	32	24.46	3.48	0.61	2.17
Undefined Migrant Status	531	32	23.83	3.45	0.58	2.25
Augmentative Communication	59	32	22.42	3.91	0.63	2.37
No Augmentative Communication	1,274	32	24.28	3.44	0.59	2.19
Undefined Augmentative Communications	6	32				
Hearing Loss	14	32				
Within Normal Limits	1,324	32	24.23	3.48	0.60	2.20
Undefined Hearing Loss	1	32				
Visual Impairment	36	32	23.56	3.07	0.43	2.32
Within Normal Limits	1,297	32	24.23	3.49	0.60	2.20
Undefined Visual Impairment	6	32				

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Sensory Stimuli Response	13	32				
Follow Directions	1,326	32	24.23	3.45	0.59	2.20
Undefined Receptive Language	0	32				
Special School	45	32	22.02	4.20	0.67	2.41
Regular School Self-contained	790	32	24.18	3.58	0.62	2.21
Regular School Resource Room	283	32	24.49	3.22	0.54	2.18
Regular School Primarily Self-contained	150	32	24.37	3.11	0.52	2.16
Regular School General Education	71	32	24.45	3.08	0.49	2.19
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	10	32				
Uses Intentional Communication	117	32	23.37	4.18	0.70	2.29
Uses Symbolic Language	1,212	32	24.31	3.38	0.58	2.19
Undefined Expressive Communication	0	32				

Table M-10. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 6 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,826	32	14.85	4.43	0.65	2.63
Female	359	32	15.02	4.63	0.68	2.63
Male	673	32	14.98	4.30	0.62	2.64
Gender Undefined	794	32	14.67	4.44	0.65	2.63
Hispanic or Latino	332	32	14.63	4.61	0.68	2.62
American Indian or Alaska Native	20	32				
Asian	24	32				
Black or African American	222	32	14.93	4.44	0.65	2.63
Native Hawaiian or Pacific Islander	16	32				
White (non-Hispanic)	555	32	15.13	4.22	0.61	2.64
Two or More Races (non-Hispanic)	35	32	15.14	4.99	0.72	2.64
No Primary race/Ethnicity Undefined	622	32	14.67	4.43	0.65	2.63
Currently receiving LEP services	46	32	14.46	4.12	0.59	2.63
Not receiving LEP services	765	32	15.10	4.30	0.62	2.64

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
LEP: All Other Students	1,015	32	14.69	4.53	0.66	2.63
Economically Disadvantaged Students	356	32	15.56	4.34	0.63	2.63
Non-economically Disadvantaged Students	455	32	14.67	4.21	0.61	2.64
SES: All Other Students	1,015	32	14.69	4.53	0.66	2.63
Migrant	0	32				
Non-migrant	798	32	15.05	4.31	0.63	2.64
Undefined Migrant Status	1,028	32	14.70	4.51	0.66	2.63
Augmentative Communication	455	32	13.93	4.11	0.58	2.67
No Augmentative Communication	1,361	32	15.16	4.48	0.66	2.62
Undefined Augmentative Communications	10	32				
Hearing Loss	58	32	15.12	4.22	0.60	2.68
Within Normal Limits	1,757	32	14.84	4.44	0.65	2.63
Undefined Hearing Loss	11	32				
Visual Impairment	100	32	13.25	5.32	0.76	2.60
Within Normal Limits	1,715	32	14.95	4.35	0.63	2.64
Undefined Visual Impairment	11	32				
Sensory Stimuli Response	233	32	12.59	5.13	0.75	2.59
Follow Directions	1,593	32	15.19	4.22	0.61	2.64
Undefined Receptive Language	0	32				
Special School	270	32	13.56	4.65	0.68	2.63
Regular School Self-contained	1,268	32	14.79	4.32	0.63	2.64
Regular School Resource Room	192	32	16.20	4.35	0.64	2.59
Regular School Primarily Self-contained	66	32	17.00	4.06	0.60	2.57
Regular School General Education	30	32	15.77	3.87	0.53	2.65
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	192	32	12.13	5.23	0.76	2.58
Uses Intentional Communication	548	32	13.91	4.15	0.59	2.65
Uses Symbolic Language	1,086	32	15.81	4.10	0.59	2.62
Undefined Expressive Communication	0	32				

Table M-11. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 6 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	687	32	20.07	2.94	0.29	2.47
Female	133	32	20.11	2.93	0.30	2.45
Male	256	32	20.11	3.03	0.34	2.46
Gender Undefined	298	32	20.00	2.88	0.25	2.49
Hispanic or Latino	140	32	20.08	2.86	0.25	2.47
American Indian or Alaska Native	9	32				
Asian	4	32				
Black or African American	83	32	19.96	3.11	0.36	2.48
Native Hawaiian or Pacific Islander	1	32				
White (non-Hispanic)	207	32	20.17	2.97	0.32	2.45
Two or More Races (non-Hispanic)	17	32				
No Primary race/Ethnicity Undefined	226	32	20.08	2.96	0.29	2.49
Currently receiving LEP services	21	32				
Not receiving LEP services	281	32	20.16	3.08	0.36	2.46
LEP: All Other Students	385	32	20.00	2.84	0.24	2.48
Economically Disadvantaged Students	155	32	20.40	3.18	0.40	2.46
Non-economically Disadvantaged Students	147	32	19.88	2.93	0.29	2.46
SES: All Other Students	385	32	20.00	2.84	0.24	2.48
Migrant	1	32				
Non-migrant	299	32	20.17	3.07	0.36	2.46
Undefined Migrant Status	387	32	19.99	2.83	0.23	2.48
Augmentative Communication	59	32	19.39	3.10	0.32	2.56
No Augmentative Communication	624	32	20.14	2.93	0.29	2.46
Undefined Augmentative Communications	4	32				
Hearing Loss	9	32				
Within Normal Limits	676	32	20.07	2.93	0.29	2.47
Undefined Hearing Loss	2	32				
Visual Impairment	7	32				
Within Normal Limits	678	32	20.08	2.94	0.30	2.47
Undefined Visual Impairment	2	32				
Sensory Stimuli Response	19	32				
Follow Directions	668	32	20.09	2.91	0.28	2.47

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	32				
Special School	40	32	19.08	3.65	0.53	2.50
Regular School Self-contained	464	32	19.98	2.93	0.28	2.48
Regular School Resource Room	122	32	20.40	2.82	0.25	2.44
Regular School Primarily Self-contained	47	32	20.66	2.60	0.13	2.43
Regular School General Education	14	32				
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	9	32				
Uses Intentional Communication	96	32	19.45	2.73	0.13	2.55
Uses Symbolic Language	582	32	20.22	2.93	0.30	2.45
Undefined Expressive Communication	0	32				

Table M-12. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 6 Form 3

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,361	32	24.64	3.37	0.62	2.08
Female	334	32	24.68	3.36	0.62	2.06
Male	611	32	24.89	3.46	0.64	2.06
Gender Undefined	416	32	24.23	3.20	0.56	2.11
Hispanic or Latino	205	32	24.11	3.29	0.59	2.11
American Indian or Alaska Native	31	32	24.77	3.95	0.75	1.98
Asian	5	32				
Black or African American	205	32	24.80	3.48	0.64	2.09
Native Hawaiian or Pacific Islander	6	32				
White (non-Hispanic)	571	32	24.93	3.45	0.65	2.04
Two or More Races (non-Hispanic)	24	32				
No Primary race/Ethnicity Undefined	314	32	24.30	3.11	0.54	2.11
Currently receiving LEP services	36	32	23.81	3.44	0.61	2.14
Not receiving LEP services	755	32	24.96	3.46	0.65	2.05
LEP: All Other Students	570	32	24.26	3.19	0.56	2.10
Economically Disadvantaged Students	438	32	25.24	3.48	0.66	2.02
Non-economically Disadvantaged Students	353	32	24.50	3.41	0.62	2.10

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	570	32	24.26	3.19	0.56	2.10
Migrant	2	32				
Non-migrant	787	32	24.91	3.47	0.65	2.06
Undefined Migrant Status	572	32	24.26	3.19	0.56	2.11
Augmentative Communication	45	32	25.33	3.46	0.64	2.07
No Augmentative Communication	1,310	32	24.62	3.36	0.62	2.08
Undefined Augmentative Communications	6	32				
Hearing Loss	29	32	24.41	3.10	0.52	2.14
Within Normal Limits	1,330	32	24.65	3.37	0.62	2.08
Undefined Hearing Loss	2	32				
Visual Impairment	30	32	24.63	3.06	0.52	2.11
Within Normal Limits	1,327	32	24.63	3.38	0.62	2.08
Undefined Visual Impairment	4	32				
Sensory Stimuli Response	10	32				
Follow Directions	1,351	32	24.64	3.37	0.62	2.08
Undefined Receptive Language	0	32				
Special School	46	32	24.54	3.36	0.59	2.15
Regular School Self-contained	863	32	24.47	3.42	0.63	2.09
Regular School Resource Room	271	32	25.08	3.13	0.58	2.04
Regular School Primarily Self-contained	135	32	24.84	3.34	0.63	2.02
Regular School General Education	46	32	24.67	3.61	0.67	2.06
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	7	32				
Uses Intentional Communication	91	32	23.95	3.16	0.54	2.15
Uses Symbolic Language	1,263	32	24.68	3.37	0.62	2.07
Undefined Expressive Communication	0	32				

Table M-13. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 7 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,253	32	13.31	4.08	0.59	2.63
Female	214	32	13.05	4.11	0.59	2.63
Male	447	32	13.82	4.12	0.60	2.62
Gender Undefined	592	32	13.03	4.02	0.57	2.63
Hispanic or Latino	224	32	13.01	4.30	0.64	2.58
American Indian or Alaska Native	14	32				
Asian	21	32				
Black or African American	156	32	13.27	4.30	0.63	2.61
Native Hawaiian or Pacific Islander	14	32				
White (non-Hispanic)	346	32	13.84	4.05	0.58	2.64
Two or More Races (non-Hispanic)	18	32				
No Primary race/Ethnicity Undefined	460	32	13.09	3.92	0.55	2.64
Currently receiving LEP services	32	32	13.34	4.37	0.66	2.55
Not receiving LEP services	495	32	13.55	4.16	0.60	2.63
LEP: All Other Students	726	32	13.15	4.02	0.57	2.62
Economically Disadvantaged Students	230	32	13.48	4.57	0.68	2.59
Non-economically Disadvantaged Students	297	32	13.59	3.83	0.52	2.66
SES: All Other Students	726	32	13.15	4.02	0.57	2.62
Migrant	0	32				
Non-migrant	509	32	13.58	4.20	0.61	2.63
Undefined Migrant Status	744	32	13.13	4.00	0.57	2.62
Augmentative Communication	351	32	12.30	3.90	0.55	2.62
No Augmentative Communication	898	32	13.70	4.07	0.59	2.62
Undefined Augmentative Communications	4	32				
Hearing Loss	48	32	11.81	4.10	0.60	2.58
Within Normal Limits	1,196	32	13.38	4.08	0.58	2.63
Undefined Hearing Loss	9	32				
Visual Impairment	70	32	10.87	4.69	0.71	2.53
Within Normal Limits	1,174	32	13.46	4.00	0.57	2.63
Undefined Visual Impairment	9	32				
Sensory Stimuli Response	150	32	10.44	4.42	0.67	2.52
Follow Directions	1,102	32	13.70	3.87	0.54	2.64

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	1	32				
Special School	195	32	12.11	4.31	0.64	2.60
Regular School Self-contained	898	32	13.34	3.99	0.57	2.63
Regular School Resource Room	103	32	14.43	4.04	0.57	2.64
Regular School Primarily Self-contained	36	32	15.22	3.83	0.55	2.56
Regular School General Education	20	32				
Undefined Classroom Setting	1	32				
Student Communicates Primarily Through Cries	140	32	10.16	4.46	0.69	2.50
Uses Intentional Communication	391	32	12.79	3.82	0.52	2.65
Uses Symbolic Language	721	32	14.20	3.79	0.52	2.62
Undefined Expressive Communication	1	32				

Table M-14. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 7 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,047	32	18.14	3.07	0.25	2.67
Female	223	32	18.42	2.80	0.11	2.65
Male	410	32	18.32	3.11	0.27	2.65
Gender Undefined	414	32	17.82	3.15	0.27	2.69
Hispanic or Latino	177	32	17.92	2.94	0.17	2.69
American Indian or Alaska Native	21	32				
Asian	11	32				
Black or African American	141	32	18.60	2.94	0.19	2.65
Native Hawaiian or Pacific Islander	3	32				
White (non-Hispanic)	361	32	18.42	3.06	0.25	2.65
Two or More Races (non-Hispanic)	14	32				
No Primary race/Ethnicity Undefined	319	32	17.78	3.22	0.30	2.68
Currently receiving LEP services	28	32	18.43	3.10	0.28	2.62
Not receiving LEP services	472	32	18.33	2.97	0.20	2.66
LEP: All Other Students	547	32	17.97	3.15	0.28	2.67

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Economically Disadvantaged Students	244	32	18.49	3.02	0.24	2.63
Non-economically Disadvantaged Students	256	32	18.20	2.93	0.16	2.68
SES: All Other Students	547	32	17.97	3.15	0.28	2.67
Migrant	0	32				
Non-migrant	499	32	18.35	2.97	0.20	2.66
Undefined Migrant Status	548	32	17.96	3.16	0.28	2.67
Augmentative Communication	128	32	17.13	3.19	0.26	2.74
No Augmentative Communication	911	32	18.27	3.03	0.24	2.65
Undefined Augmentative Communications	8	32				
Hearing Loss	28	32	17.68	2.79	0.04	2.74
Within Normal Limits	1,014	32	18.16	3.08	0.25	2.66
Undefined Hearing Loss	5	32				
Visual Impairment	54	32	18.20	2.92	0.13	2.72
Within Normal Limits	985	32	18.13	3.08	0.25	2.66
Undefined Visual Impairment	8	32				
Sensory Stimuli Response	37	32	15.89	2.70	-0.05	2.76
Follow Directions	1,008	32	18.22	3.05	0.24	2.66
Undefined Receptive Language	2	32				
Special School	103	32	17.31	3.47	0.39	2.71
Regular School Self-contained	708	32	18.08	2.98	0.20	2.67
Regular School Resource Room	136	32	18.49	3.21	0.33	2.63
Regular School Primarily Self-contained	67	32	18.90	2.80	0.13	2.62
Regular School General Education	31	32	19.06	3.03	0.26	2.60
Undefined Classroom Setting	2	32				
Student Communicates Primarily Through Cries	30	32	15.90	3.14	0.24	2.74
Uses Intentional Communication	193	32	17.39	2.88	0.10	2.73
Uses Symbolic Language	822	32	18.40	3.05	0.26	2.64
Undefined Expressive Communication	2	32				

Table M-15. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 7 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,545	32	24.31	3.44	0.58	2.22
Female	396	32	24.31	3.37	0.57	2.20
Male	662	32	24.53	3.46	0.59	2.20
Gender Undefined	487	32	24.01	3.46	0.57	2.26
Hispanic or Latino	215	32	24.31	3.33	0.54	2.25
American Indian or Alaska Native	24	32				
Asian	7	32				
Black or African American	244	32	24.23	3.36	0.56	2.22
Native Hawaiian or Pacific Islander	4	32				
White (non-Hispanic)	632	32	24.57	3.47	0.60	2.18
Two or More Races (non-Hispanic)	26	32	23.54	3.65	0.62	2.24
No Primary race/Ethnicity Undefined	393	32	24.04	3.53	0.59	2.25
Currently receiving LEP services	36	32	24.75	2.93	0.44	2.19
Not receiving LEP services	841	32	24.53	3.51	0.61	2.19
LEP: All Other Students	668	32	24.01	3.35	0.55	2.25
Economically Disadvantaged Students	483	32	24.71	3.35	0.58	2.18
Non-economically Disadvantaged Students	394	32	24.33	3.65	0.63	2.21
SES: All Other Students	668	32	24.01	3.35	0.55	2.25
Migrant	3	32				
Non-migrant	872	32	24.53	3.50	0.61	2.19
Undefined Migrant Status	670	32	24.02	3.35	0.55	2.25
Augmentative Communication	59	32	22.88	3.69	0.59	2.35
No Augmentative Communication	1,477	32	24.37	3.42	0.58	2.21
Undefined Augmentative Communications	9	32				
Hearing Loss	13	32				
Within Normal Limits	1,527	32	24.29	3.44	0.58	2.22
Undefined Hearing Loss	5	32				
Visual Impairment	30	32	23.60	3.27	0.54	2.23
Within Normal Limits	1,500	32	24.34	3.43	0.58	2.22
Undefined Visual Impairment	15	32				
Sensory Stimuli Response	16	32				
Follow Directions	1,529	32	24.34	3.42	0.58	2.22

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	32				
Special School	56	32	22.73	3.76	0.61	2.36
Regular School Self-contained	983	32	24.25	3.47	0.59	2.23
Regular School Resource Room	281	32	24.68	3.18	0.53	2.18
Regular School Primarily Self-contained	167	32	24.51	3.44	0.60	2.19
Regular School General Education	58	32	24.52	3.52	0.62	2.17
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	14	32				
Uses Intentional Communication	113	32	23.51	3.64	0.59	2.32
Uses Symbolic Language	1,418	32	24.39	3.40	0.58	2.21
Undefined Expressive Communication	0	32				

Table M-16. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 8 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,848	32	14.79	4.22	0.60	2.66
Female	354	32	14.63	4.45	0.64	2.67
Male	653	32	14.91	4.08	0.57	2.66
Gender Undefined	841	32	14.76	4.22	0.60	2.66
Hispanic or Latino	332	32	14.89	4.10	0.58	2.67
American Indian or Alaska Native	24	32				
Asian	24	32				
Black or African American	268	32	14.93	4.25	0.61	2.67
Native Hawaiian or Pacific Islander	13	32				
White (non-Hispanic)	527	32	14.78	4.29	0.62	2.66
Two or More Races (non-Hispanic)	31	32	14.06	4.76	0.68	2.67
No Primary race/Ethnicity Undefined	629	32	14.75	4.22	0.60	2.66
Currently receiving LEP services	34	32	15.12	4.73	0.69	2.65
Not receiving LEP services	789	32	14.76	4.24	0.60	2.66
LEP: All Other Students	1,025	32	14.80	4.19	0.60	2.66

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Economically Disadvantaged Students	295	32	15.04	4.34	0.62	2.67
Non-economically Disadvantaged Students	528	32	14.62	4.21	0.60	2.66
SES: All Other Students	1,025	32	14.80	4.19	0.60	2.66
Migrant	1	32				
Non-migrant	809	32	14.79	4.27	0.61	2.66
Undefined Migrant Status	1,038	32	14.78	4.18	0.59	2.66
Augmentative Communication	430	32	13.14	3.98	0.55	2.66
No Augmentative Communication	1,401	32	15.30	4.17	0.59	2.66
Undefined Augmentative Communications	17	32				
Hearing Loss	75	32	13.88	4.25	0.60	2.67
Within Normal Limits	1,758	32	14.84	4.20	0.60	2.66
Undefined Hearing Loss	15	32				
Visual Impairment	100	32	14.23	4.01	0.55	2.70
Within Normal Limits	1,734	32	14.83	4.23	0.60	2.66
Undefined Visual Impairment	14	32				
Sensory Stimuli Response	189	32	11.92	4.70	0.69	2.60
Follow Directions	1,657	32	15.12	4.03	0.56	2.67
Undefined Receptive Language	2	32				
Special School	258	32	13.13	4.31	0.62	2.65
Regular School Self-contained	1,283	32	14.82	4.16	0.59	2.67
Regular School Resource Room	202	32	16.21	3.89	0.54	2.64
Regular School Primarily Self-contained	70	32	16.04	3.69	0.50	2.62
Regular School General Education	33	32	15.48	4.24	0.61	2.64
Undefined Classroom Setting	2	32				
Student Communicates Primarily Through Cries	184	32	11.82	4.65	0.69	2.60
Uses Intentional Communication	534	32	13.50	4.04	0.56	2.67
Uses Symbolic Language	1,128	32	15.89	3.80	0.51	2.65
Undefined Expressive Communication	2	32				

Table M-17. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 8 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	827	32	20.40	2.79	0.19	2.51
Female	175	32	20.65	2.75	0.17	2.50
Male	341	32	20.47	2.79	0.19	2.51
Gender Undefined	311	32	20.17	2.81	0.20	2.52
Hispanic or Latino	129	32	20.53	2.95	0.30	2.47
American Indian or Alaska Native	13	32				
Asian	7	32				
Black or African American	134	32	20.49	2.91	0.26	2.50
Native Hawaiian or Pacific Islander	7	32				
White (non-Hispanic)	284	32	20.46	2.70	0.14	2.51
Two or More Races (non-Hispanic)	14	32				
No Primary race/Ethnicity Undefined	239	32	20.13	2.81	0.19	2.53
Currently receiving LEP services	21	32				
Not receiving LEP services	402	32	20.41	2.80	0.19	2.51
LEP: All Other Students	404	32	20.36	2.78	0.18	2.51
Economically Disadvantaged Students	203	32	20.48	2.93	0.28	2.49
Non-economically Disadvantaged Students	220	32	20.38	2.70	0.13	2.53
SES: All Other Students	404	32	20.36	2.78	0.18	2.51
Migrant	0	32				
Non-migrant	418	32	20.41	2.82	0.21	2.51
Undefined Migrant Status	409	32	20.38	2.77	0.17	2.51
Augmentative Communication	72	32	19.75	2.97	0.24	2.59
No Augmentative Communication	749	32	20.47	2.77	0.19	2.50
Undefined Augmentative Communications	6	32				
Hearing Loss	12	32				
Within Normal Limits	810	32	20.40	2.81	0.20	2.51
Undefined Hearing Loss	5	32				
Visual Impairment	28	32	20.89	3.11	0.30	2.59
Within Normal Limits	796	32	20.38	2.78	0.19	2.51
Undefined Visual Impairment	3	32				
Sensory Stimuli Response	17	32				
Follow Directions	810	32	20.41	2.79	0.19	2.51

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	32				
Special School	58	32	19.83	2.74	0.10	2.60
Regular School Self-contained	531	32	20.36	2.81	0.20	2.51
Regular School Resource Room	145	32	20.42	2.67	0.13	2.49
Regular School Primarily Self-contained	70	32	21.04	3.01	0.34	2.44
Regular School General Education	23	32				
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	16	32				
Uses Intentional Communication	104	32	19.75	2.44	-0.14	2.60
Uses Symbolic Language	707	32	20.50	2.83	0.23	2.49
Undefined Expressive Communication	0	32				

Table M-18. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 8 Form 3

Table M-19.

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,426	32	25.30	3.23	0.58	2.10
Female	347	32	25.47	3.09	0.54	2.08
Male	620	32	25.52	3.24	0.59	2.08
Gender Undefined	459	32	24.88	3.27	0.57	2.14
Hispanic or Latino	216	32	24.72	3.40	0.61	2.14
American Indian or Alaska Native	20	32				
Asian	14	32				
Black or African American	187	32	25.13	3.16	0.56	2.11
Native Hawaiian or Pacific Islander	7	32				
White (non-Hispanic)	619	32	25.75	3.21	0.59	2.06
Two or More Races (non-Hispanic)	29	32	24.86	2.72	0.35	2.20
No Primary race/Ethnicity Undefined	334	32	25.02	3.16	0.54	2.14
Currently receiving LEP services	30	32	24.37	3.25	0.57	2.14
Not receiving LEP services	791	32	25.60	3.21	0.58	2.07
LEP: All Other Students	605	32	24.96	3.21	0.56	2.13
Economically Disadvantaged Students	434	32	25.91	3.13	0.58	2.03

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Non-economically Disadvantaged Students	387	32	25.15	3.27	0.58	2.13
SES: All Other Students	605	32	24.96	3.21	0.56	2.13
Migrant	2	32				
Non-migrant	816	32	25.57	3.22	0.58	2.08
Undefined Migrant Status	608	32	24.95	3.21	0.56	2.13
Augmentative Communication	42	32	24.05	3.79	0.66	2.22
No Augmentative Communication	1,375	32	25.34	3.21	0.57	2.10
Undefined Augmentative Communications	9	32				
Hearing Loss	19	32				
Within Normal Limits	1,401	32	25.30	3.23	0.58	2.10
Undefined Hearing Loss	6	32				
Visual Impairment	40	32	25.13	3.63	0.65	2.15
Within Normal Limits	1,381	32	25.30	3.22	0.57	2.10
Undefined Visual Impairment	5	32				
Sensory Stimuli Response	13	32				
Follow Directions	1,413	32	25.31	3.22	0.58	2.10
Undefined Receptive Language	0	32				
Special School	57	32	24.32	3.63	0.64	2.18
Regular School Self-contained	864	32	25.15	3.26	0.58	2.12
Regular School Resource Room	340	32	25.83	3.00	0.53	2.05
Regular School Primarily Self-contained	127	32	25.24	3.37	0.61	2.10
Regular School General Education	38	32	25.66	2.58	0.37	2.05
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	7	32				
Uses Intentional Communication	97	32	24.16	3.34	0.55	2.23
Uses Symbolic Language	1,322	32	25.40	3.20	0.57	2.09
Undefined Expressive Communication	0	32				

Table M-20. 2016–17 MSAA: Reliability: Subgroup-ELA Grade 11 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,126	32	12.45	3.83	0.52	2.64
Female	216	32	12.76	3.92	0.55	2.64
Male	394	32	12.23	4.08	0.59	2.62
Gender Undefined	516	32	12.49	3.57	0.45	2.66
Hispanic or Latino	150	32	11.85	4.05	0.59	2.60
American Indian or Alaska Native	13	32				
Asian	17	32				
Black or African American	175	32	12.09	4.60	0.68	2.59
Native Hawaiian or Pacific Islander	14	32				
White (non-Hispanic)	323	32	12.93	3.55	0.44	2.66
Two or More Races (non-Hispanic)	12	32				
No Primary race/Ethnicity Undefined	422	32	12.67	3.43	0.40	2.67
Currently receiving LEP services	16	32				
Not receiving LEP services	443	32	12.67	3.94	0.55	2.63
LEP: All Other Students	667	32	12.34	3.71	0.49	2.65
Economically Disadvantaged Students	193	32	12.91	3.90	0.54	2.64
Non-economically Disadvantaged Students	266	32	12.40	4.04	0.58	2.62
SES: All Other Students	667	32	12.34	3.71	0.49	2.65
Migrant	1	32				
Non-migrant	443	32	12.70	3.93	0.55	2.63
Undefined Migrant Status	682	32	12.28	3.75	0.50	2.64
Augmentative Communication	278	32	11.88	3.53	0.44	2.64
No Augmentative Communication	843	32	12.64	3.91	0.54	2.64
Undefined Augmentative Communications	5	32				
Hearing Loss	58	32	12.16	4.06	0.60	2.58
Within Normal Limits	1,064	32	12.47	3.82	0.52	2.64
Undefined Hearing Loss	4	32				
Visual Impairment	59	32	11.90	4.09	0.59	2.63
Within Normal Limits	1,062	32	12.48	3.82	0.52	2.64
Undefined Visual Impairment	5	32				

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Sensory Stimuli Response	139	32	9.94	4.98	0.76	2.45
Follow Directions	987	32	12.80	3.50	0.42	2.66
Undefined Receptive Language	0	32				
Special School	257	32	11.93	3.87	0.54	2.62
Regular School Self-contained	729	32	12.55	3.79	0.51	2.64
Regular School Resource Room	100	32	12.76	3.89	0.53	2.66
Regular School Primarily Self-contained	36	32	13.08	4.06	0.59	2.60
Regular School General Education	4	32				
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	125	32	9.42	5.21	0.79	2.41
Uses Intentional Communication	327	32	11.98	3.48	0.42	2.65
Uses Symbolic Language	674	32	13.24	3.34	0.37	2.66
Undefined Expressive Communication	0	32				

Table M-21. MSAA: Reliability: Subgroup- ELA Grade 11 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	994	32	18.13	3.24	0.32	2.66
Female	188	32	18.62	3.12	0.28	2.65
Male	369	32	18.18	3.24	0.32	2.66
Gender Undefined	437	32	17.88	3.27	0.33	2.67
Hispanic or Latino	140	32	17.71	3.51	0.42	2.67
American Indian or Alaska Native	10	32				
Asian	6	32				
Black or African American	145	32	18.28	3.13	0.29	2.64
Native Hawaiian or Pacific Islander	8	32				
White (non-Hispanic)	321	32	18.40	3.22	0.32	2.66
Two or More Races (non-Hispanic)	6	32				
No Primary race/Ethnicity Undefined	358	32	17.98	3.14	0.28	2.67
Currently receiving LEP services	18	32				
Not receiving LEP services	426	32	18.47	3.16	0.30	2.64
LEP: All Other Students	550	32	17.85	3.26	0.33	2.68

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Economically Disadvantaged Students	197	32	18.91	3.08	0.29	2.60
Non-economically Disadvantaged Students	247	32	18.13	3.22	0.31	2.67
SES: All Other Students	550	32	17.85	3.26	0.33	2.68
Migrant	1	32				
Non-migrant	440	32	18.49	3.18	0.31	2.64
Undefined Migrant Status	553	32	17.84	3.26	0.33	2.68
Augmentative Communication	115	32	17.21	3.14	0.24	2.73
No Augmentative Communication	875	32	18.24	3.24	0.33	2.65
Undefined Augmentative Communications	4	32				
Hearing Loss	29	32	17.48	3.28	0.31	2.72
Within Normal Limits	963	32	18.15	3.23	0.32	2.66
Undefined Hearing Loss	2	32				
Visual Impairment	30	32	18.17	3.78	0.49	2.69
Within Normal Limits	958	32	18.15	3.21	0.31	2.66
Undefined Visual Impairment	6	32				
Sensory Stimuli Response	27	32	15.96	3.03	0.16	2.78
Follow Directions	967	32	18.19	3.22	0.32	2.66
Undefined Receptive Language	0	32				
Special School	127	32	17.03	3.31	0.32	2.74
Regular School Self-contained	653	32	18.17	3.19	0.31	2.66
Regular School Resource Room	136	32	18.69	3.21	0.35	2.60
Regular School Primarily Self-contained	61	32	18.75	3.20	0.34	2.60
Regular School General Education	17	32				
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	24	32				
Uses Intentional Communication	135	32	16.92	3.15	0.25	2.74
Uses Symbolic Language	835	32	18.37	3.21	0.32	2.64
Undefined Expressive Communication	0	32				

Table M-22. MSAA: Reliability: Subgroup- ELA Grade 11 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,361	32	23.33	3.57	0.62	2.19
Female	275	32	23.55	3.36	0.59	2.15
Male	584	32	23.68	3.77	0.67	2.16
Gender Undefined	502	32	22.80	3.37	0.56	2.24
Hispanic or Latino	165	32	22.50	3.52	0.59	2.25
American Indian or Alaska Native	13	32				
Asian	5	32				
Black or African American	201	32	23.53	3.82	0.67	2.19
Native Hawaiian or Pacific Islander	2	32				
White (non-Hispanic)	531	32	23.69	3.57	0.64	2.14
Two or More Races (non-Hispanic)	18	32				
No Primary race/Ethnicity Undefined	426	32	23.00	3.37	0.57	2.22
Currently receiving LEP services	25	32	22.72	3.57	0.61	2.23
Not receiving LEP services	689	32	23.67	3.70	0.66	2.16
LEP: All Other Students	647	32	22.99	3.39	0.57	2.22
Economically Disadvantaged Students	371	32	23.99	3.59	0.65	2.13
Non-economically Disadvantaged Students	343	32	23.25	3.78	0.66	2.19
SES: All Other Students	647	32	22.99	3.39	0.57	2.22
Migrant	2	32				
Non-migrant	711	32	23.63	3.70	0.66	2.16
Undefined Migrant Status	648	32	22.99	3.39	0.57	2.22
Augmentative Communication	55	32	21.04	3.72	0.58	2.40
No Augmentative Communication	1,299	32	23.42	3.53	0.62	2.18
Undefined Augmentative Communications	7	32				
Hearing Loss	24	32				
Within Normal Limits	1,334	32	23.35	3.56	0.62	2.18
Undefined Hearing Loss	3	32				
Visual Impairment	30	32	22.77	4.17	0.71	2.24
Within Normal Limits	1,325	32	23.35	3.56	0.62	2.18
Undefined Visual Impairment	6	32				
Sensory Stimuli Response	5	32				
Follow Directions	1,356	32	23.33	3.57	0.62	2.19

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	32				
Special School	76	32	22.49	3.93	0.66	2.29
Regular School Self-contained	862	32	23.24	3.54	0.61	2.20
Regular School Resource Room	267	32	23.25	3.68	0.65	2.18
Regular School Primarily Self-contained	133	32	24.52	3.24	0.60	2.05
Regular School General Education	23	32				
Undefined Classroom Setting	0	32				
Student Communicates Primarily Through Cries	4	32				
Uses Intentional Communication	84	32	22.62	3.90	0.64	2.35
Uses Symbolic Language	1,273	32	23.37	3.54	0.62	2.17
Undefined Expressive Communication	0	32				

Table M-23. MSAA: Reliability: Subgroup-Mathematics Grade 3 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,272	35	12.21	3.70	0.48	2.68
Female	279	35	12.40	3.78	0.49	2.69
Male	477	35	12.36	3.59	0.44	2.69
Gender Undefined	516	35	11.97	3.75	0.50	2.66
Hispanic or Latino	231	35	12.17	3.66	0.47	2.67
American Indian or Alaska Native	20	35				
Asian	19	35				
Black or African American	156	35	12.19	3.62	0.45	2.68
Native Hawaiian or Pacific Islander	8	35				
White (non-Hispanic)	400	35	12.61	3.55	0.42	2.70
Two or More Races (non-Hispanic)	27	35	13.11	5.29	0.76	2.60
No Primary race/Ethnicity Undefined	411	35	11.91	3.73	0.49	2.66
Currently receiving LEP services	43	35	11.53	3.30	0.36	2.65
Not receiving LEP services	556	35	12.46	3.74	0.48	2.69
LEP: All Other Students	673	35	12.04	3.68	0.47	2.67
Economically Disadvantaged Students	266	35	12.34	4.00	0.55	2.69
Non-economically Disadvantaged Students	333	35	12.44	3.49	0.40	2.69

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	673	35	12.04	3.68	0.47	2.67
Migrant	0	35				
Non-migrant	588	35	12.40	3.74	0.48	2.69
Undefined Migrant Status	684	35	12.05	3.66	0.47	2.67
Augmentative Communication	315	35	11.30	3.94	0.55	2.64
No Augmentative Communication	951	35	12.50	3.57	0.43	2.69
Undefined Augmentative Communications	6	35				
Hearing Loss	56	35	10.27	4.31	0.65	2.56
Within Normal Limits	1,208	35	12.30	3.64	0.46	2.68
Undefined Hearing Loss	8	35				
Visual Impairment	76	35	10.26	4.10	0.60	2.59
Within Normal Limits	1,189	35	12.32	3.64	0.46	2.68
Undefined Visual Impairment	7	35				
Sensory Stimuli Response	204	35	10.12	4.18	0.63	2.55
Follow Directions	1,066	35	12.60	3.46	0.39	2.70
Undefined Receptive Language	2	35				
Special School	146	35	10.76	3.93	0.56	2.60
Regular School Self-contained	902	35	12.27	3.56	0.43	2.68
Regular School Resource Room	144	35	12.70	3.54	0.42	2.71
Regular School Primarily Self-contained	50	35	13.30	4.55	0.65	2.70
Regular School General Education	28	35	13.21	4.07	0.57	2.68
Undefined Classroom Setting	2	35				
Student Communicates Primarily Through Cries	138	35	9.73	4.38	0.67	2.53
Uses Intentional Communication	433	35	11.70	3.29	0.34	2.67
Uses Symbolic Language	699	35	13.00	3.53	0.41	2.70
Undefined Expressive Communication	2	35				

Table M-24. MSAA: Reliability: Subgroup-Mathematics Grade 3 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	856	35	15.78	3.04	0.15	2.80
Female	198	35	15.79	3.18	0.24	2.77
Male	357	35	16.11	3.15	0.21	2.80
Gender Undefined	301	35	15.37	2.77	-0.04	2.82
Hispanic or Latino	155	35	15.92	3.02	0.15	2.79
American Indian or Alaska Native	11	35				
Asian	11	35				
Black or African American	114	35	15.82	3.18	0.22	2.80
Native Hawaiian or Pacific Islander	8	35				
White (non-Hispanic)	301	35	16.03	3.15	0.21	2.79
Two or More Races (non-Hispanic)	32	35	16.34	3.02	0.15	2.79
No Primary race/Ethnicity Undefined	224	35	15.21	2.77	-0.04	2.82
Currently receiving LEP services	29	35	16.21	2.51	-0.20	2.75
Not receiving LEP services	417	35	15.99	3.20	0.24	2.79
LEP: All Other Students	410	35	15.54	2.89	0.05	2.82
Economically Disadvantaged Students	220	35	15.76	3.13	0.21	2.77
Non-economically Disadvantaged Students	226	35	16.24	3.18	0.23	2.80
SES: All Other Students	410	35	15.54	2.89	0.05	2.82
Migrant	0	35				
Non-migrant	437	35	15.97	3.17	0.23	2.79
Undefined Migrant Status	419	35	15.58	2.89	0.05	2.82
Augmentative Communication	139	35	14.94	3.29	0.27	2.81
No Augmentative Communication	709	35	15.95	2.96	0.11	2.79
Undefined Augmentative Communications	8	35				
Hearing Loss	20	35				
Within Normal Limits	834	35	15.79	3.01	0.13	2.80
Undefined Hearing Loss	2	35				
Visual Impairment	24	35				
Within Normal Limits	826	35	15.78	3.05	0.16	2.80
Undefined Visual Impairment	6	35				
Sensory Stimuli Response	54	35	14.19	2.47	-0.31	2.82
Follow Directions	801	35	15.88	3.05	0.16	2.80

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	1	35				
Special School	60	35	15.33	3.06	0.12	2.87
Regular School Self-contained	597	35	15.63	3.07	0.18	2.78
Regular School Resource Room	113	35	16.20	3.04	0.13	2.83
Regular School Primarily Self-contained	67	35	16.69	2.75	-0.03	2.79
Regular School General Education	18	35				
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	40	35	14.25	2.80	-0.03	2.84
Uses Intentional Communication	202	35	15.31	3.07	0.15	2.83
Uses Symbolic Language	613	35	16.03	3.00	0.14	2.78
Undefined Expressive Communication	1	35				

Table M-25. MSAA: Reliability: Subgroup-Mathematics Grade 3 Form 3

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,340	35	23.24	5.07	0.75	2.52
Female	307	35	23.24	4.87	0.74	2.50
Male	657	35	23.44	5.18	0.77	2.50
Gender Undefined	376	35	22.89	5.05	0.74	2.57
Hispanic or Latino	219	35	23.16	5.07	0.75	2.52
American Indian or Alaska Native	21	35				
Asian	13	35				
Black or African American	195	35	22.50	5.04	0.74	2.56
Native Hawaiian or Pacific Islander	7	35				
White (non-Hispanic)	570	35	23.91	5.11	0.77	2.46
Two or More Races (non-Hispanic)	42	35	23.02	4.61	0.69	2.59
No Primary race/Ethnicity Undefined	273	35	22.62	5.04	0.73	2.60
Currently receiving LEP services	40	35	22.60	4.99	0.74	2.52
Not receiving LEP services	740	35	23.45	5.11	0.76	2.49
LEP: All Other Students	560	35	23.00	5.03	0.74	2.55
Economically Disadvantaged Students	448	35	23.63	5.18	0.77	2.47
Non-economically Disadvantaged Students	332	35	23.11	4.98	0.74	2.54

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	560	35	23.00	5.03	0.74	2.55
Migrant	1	35				
Non-migrant	775	35	23.43	5.10	0.76	2.49
Undefined Migrant Status	564	35	22.97	5.03	0.74	2.56
Augmentative Communication	128	35	20.92	5.22	0.74	2.68
No Augmentative Communication	1,208	35	23.47	5.00	0.75	2.50
Undefined Augmentative Communications	4	35				
Hearing Loss	21	35				
Within Normal Limits	1,317	35	23.27	5.04	0.75	2.52
Undefined Hearing Loss	2	35				
Visual Impairment	22	35				
Within Normal Limits	1,309	35	23.27	5.06	0.75	2.52
Undefined Visual Impairment	9	35				
Sensory Stimuli Response	39	35	18.15	4.42	0.62	2.74
Follow Directions	1,301	35	23.39	5.01	0.75	2.51
Undefined Receptive Language	0	35				
Special School	45	35	21.98	5.51	0.78	2.60
Regular School Self-contained	800	35	22.81	5.10	0.75	2.54
Regular School Resource Room	276	35	23.68	5.14	0.77	2.47
Regular School Primarily Self-contained	159	35	24.96	4.53	0.71	2.42
Regular School General Education	60	35	23.27	4.36	0.65	2.59
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	21	35				
Uses Intentional Communication	178	35	21.56	5.47	0.77	2.65
Uses Symbolic Language	1,141	35	23.58	4.92	0.74	2.49
Undefined Expressive Communication	0	35				

Table M-26. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 4 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,137	35	11.32	4.04	0.58	2.60
Female	219	35	11.57	4.00	0.57	2.63
Male	415	35	11.42	4.16	0.61	2.59
Gender Undefined	503	35	11.13	3.94	0.57	2.59
Hispanic or Latino	211	35	11.50	3.96	0.57	2.59
American Indian or Alaska Native	15	35				
Asian	12	35				
Black or African American	165	35	11.03	4.04	0.60	2.56
Native Hawaiian or Pacific Islander	8	35				
White (non-Hispanic)	333	35	11.65	4.17	0.61	2.62
Two or More Races (non-Hispanic)	26	35	9.96	4.46	0.69	2.47
No Primary race/Ethnicity Undefined	367	35	11.13	3.95	0.56	2.61
Currently receiving LEP services	32	35	12.16	3.56	0.42	2.70
Not receiving LEP services	477	35	11.40	4.19	0.62	2.60
LEP: All Other Students	628	35	11.22	3.94	0.57	2.60
Economically Disadvantaged Students	245	35	11.42	4.33	0.64	2.59
Non-economically Disadvantaged Students	264	35	11.47	3.99	0.57	2.61
SES: All Other Students	628	35	11.22	3.94	0.57	2.60
Migrant	0	35				
Non-migrant	501	35	11.45	4.12	0.60	2.60
Undefined Migrant Status	636	35	11.22	3.97	0.57	2.60
Augmentative Communication	287	35	10.62	4.12	0.61	2.57
No Augmentative Communication	840	35	11.57	3.97	0.57	2.61
Undefined Augmentative Communications	10	35				
Hearing Loss	34	35	9.18	4.98	0.76	2.44
Within Normal Limits	1,099	35	11.37	3.99	0.57	2.61
Undefined Hearing Loss	4	35				
Visual Impairment	61	35	9.48	4.41	0.68	2.49
Within Normal Limits	1,067	35	11.41	3.99	0.57	2.61
Undefined Visual Impairment	9	35				
Sensory Stimuli Response	136	35	8.42	4.66	0.74	2.37
Follow Directions	1,000	35	11.71	3.77	0.52	2.63

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	1	35				
Special School	118	35	9.77	4.43	0.68	2.51
Regular School Self-contained	813	35	11.30	3.98	0.57	2.60
Regular School Resource Room	130	35	11.79	3.71	0.50	2.63
Regular School Primarily Self-contained	47	35	13.43	3.63	0.47	2.64
Regular School General Education	28	35	12.39	3.64	0.44	2.72
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	115	35	8.17	5.01	0.78	2.34
Uses Intentional Communication	351	35	11.13	4.06	0.59	2.61
Uses Symbolic Language	670	35	11.95	3.54	0.45	2.63
Undefined Expressive Communication	1	35				

Table M-27. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 4 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,414	35	15.26	3.42	0.34	2.79
Female	302	35	15.41	3.39	0.32	2.79
Male	583	35	15.47	3.42	0.34	2.78
Gender Undefined	529	35	14.95	3.42	0.33	2.79
Hispanic or Latino	253	35	15.40	3.32	0.29	2.79
American Indian or Alaska Native	12	35				
Asian	17	35				
Black or African American	203	35	14.90	3.30	0.29	2.79
Native Hawaiian or Pacific Islander	5	35				
White (non-Hispanic)	512	35	15.59	3.46	0.36	2.77
Two or More Races (non-Hispanic)	23	35				
No Primary race/Ethnicity Undefined	389	35	14.92	3.50	0.36	2.79
Currently receiving LEP services	52	35	15.87	3.28	0.26	2.83

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Not receiving LEP services	685	35	15.47	3.38	0.32	2.78
LEP: All Other Students	677	35	14.99	3.46	0.35	2.79
Economically Disadvantaged Students	351	35	15.49	3.44	0.35	2.77
Non-economically Disadvantaged Students	386	35	15.52	3.31	0.29	2.79
SES: All Other Students	677	35	14.99	3.46	0.35	2.79
Migrant	1	35				
Non-migrant	728	35	15.50	3.38	0.32	2.79
Undefined Migrant Status	685	35	15.00	3.44	0.34	2.79
Augmentative Communication	218	35	14.95	3.51	0.37	2.79
No Augmentative Communication	1,183	35	15.31	3.40	0.33	2.78
Undefined Augmentative Communications	13	35				
Hearing Loss	37	35	14.89	3.49	0.34	2.83
Within Normal Limits	1,370	35	15.26	3.42	0.34	2.79
Undefined Hearing Loss	7	35				
Visual Impairment	52	35	15.31	3.22	0.23	2.82
Within Normal Limits	1,353	35	15.26	3.43	0.34	2.79
Undefined Visual Impairment	9	35				
Sensory Stimuli Response	86	35	14.19	3.49	0.36	2.80
Follow Directions	1,325	35	15.32	3.40	0.33	2.79
Undefined Receptive Language	3	35				
Special School	133	35	14.49	3.56	0.38	2.81
Regular School Self-contained	935	35	15.15	3.38	0.32	2.78
Regular School Resource Room	199	35	15.73	3.40	0.34	2.78
Regular School Primarily Self-contained	102	35	16.02	3.28	0.27	2.81
Regular School General Education	42	35	15.93	3.76	0.45	2.79
Undefined Classroom Setting	3	35				
Student Communicates Primarily Through Cries	51	35	14.22	3.71	0.43	2.80
Uses Intentional Communication	318	35	14.78	3.38	0.31	2.81
Uses Symbolic Language	1,042	35	15.45	3.40	0.33	2.77
Undefined Expressive Communication	3	35				

Table M-28. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 4 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,139	35	21.02	4.71	0.69	2.63
Female	279	35	20.99	4.86	0.71	2.61
Male	566	35	21.14	4.77	0.70	2.62
Gender Undefined	294	35	20.84	4.43	0.64	2.67
Hispanic or Latino	191	35	20.85	4.46	0.65	2.65
American Indian or Alaska Native	21	35				
Asian	10	35				
Black or African American	181	35	20.51	4.50	0.65	2.66
Native Hawaiian or Pacific Islander	9	35				
White (non-Hispanic)	490	35	21.28	4.85	0.71	2.60
Two or More Races (non-Hispanic)	28	35	19.54	5.46	0.78	2.58
No Primary race/Ethnicity Undefined	209	35	21.32	4.64	0.67	2.66
Currently receiving LEP services	35	35	20.46	4.95	0.71	2.66
Not receiving LEP services	650	35	21.03	4.80	0.70	2.62
LEP: All Other Students	454	35	21.06	4.57	0.66	2.65
Economically Disadvantaged Students	393	35	21.18	4.95	0.72	2.60
Non-economically Disadvantaged Students	292	35	20.76	4.60	0.67	2.64
SES: All Other Students	454	35	21.06	4.57	0.66	2.65
Migrant	1	35				
Non-migrant	677	35	21.03	4.80	0.70	2.62
Undefined Migrant Status	461	35	21.02	4.58	0.66	2.65
Augmentative Communication	86	35	20.07	4.29	0.60	2.72
No Augmentative Communication	1,040	35	21.10	4.72	0.69	2.62
Undefined Augmentative Communications	13	35				
Hearing Loss	19	35				
Within Normal Limits	1,116	35	21.02	4.71	0.69	2.63
Undefined Hearing Loss	4	35				
Visual Impairment	28	35	19.86	3.78	0.52	2.62
Within Normal Limits	1,105	35	21.06	4.72	0.69	2.63
Undefined Visual Impairment	6	35				
Sensory Stimuli Response	25	35	19.52	4.32	0.59	2.76
Follow Directions	1,113	35	21.05	4.71	0.69	2.63

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	1	35				
Special School	50	35	20.68	4.68	0.67	2.68
Regular School Self-contained	685	35	21.06	4.87	0.71	2.63
Regular School Resource Room	222	35	20.73	4.24	0.61	2.65
Regular School Primarily Self-contained	131	35	21.37	4.77	0.71	2.58
Regular School General Education	50	35	21.26	4.31	0.63	2.62
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	13	35				
Uses Intentional Communication	116	35	20.08	4.31	0.60	2.72
Uses Symbolic Language	1,009	35	21.14	4.74	0.69	2.62
Undefined Expressive Communication	1	35				

Table M-29. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 5 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,137	35	10.52	3.13	0.32	2.57
Female	197	35	10.74	3.10	0.30	2.60
Male	437	35	10.54	3.07	0.30	2.56
Gender Undefined	503	35	10.42	3.19	0.35	2.57
Hispanic or Latino	209	35	10.63	3.24	0.36	2.59
American Indian or Alaska Native	12	35				
Asian	18	35				
Black or African American	132	35	10.37	3.51	0.47	2.55
Native Hawaiian or Pacific Islander	6	35				
White (non-Hispanic)	370	35	10.73	2.96	0.25	2.57
Two or More Races (non-Hispanic)	16	35				
No Primary race/Ethnicity Undefined	374	35	10.37	3.14	0.33	2.57
Currently receiving LEP services	27	35	10.52	2.29	-0.28	2.60
Not receiving LEP services	493	35	10.50	3.11	0.32	2.57
LEP: All Other Students	617	35	10.54	3.18	0.35	2.57
Economically Disadvantaged Students	210	35	10.65	3.27	0.39	2.56
Non-economically Disadvantaged Students	310	35	10.40	2.92	0.23	2.57

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	617	35	10.54	3.18	0.35	2.57
Migrant	1	35				
Non-migrant	514	35	10.50	3.08	0.30	2.57
Undefined Migrant Status	622	35	10.54	3.18	0.34	2.57
Augmentative Communication	294	35	10.10	3.37	0.43	2.55
No Augmentative Communication	839	35	10.66	3.03	0.28	2.58
Undefined Augmentative Communications	4	35				
Hearing Loss	30	35	9.33	4.23	0.65	2.49
Within Normal Limits	1,105	35	10.56	3.09	0.31	2.57
Undefined Hearing Loss	2	35				
Visual Impairment	61	35	8.82	4.09	0.66	2.38
Within Normal Limits	1,073	35	10.63	3.04	0.28	2.58
Undefined Visual Impairment	3	35				
Sensory Stimuli Response	139	35	8.91	4.46	0.70	2.43
Follow Directions	998	35	10.75	2.83	0.16	2.59
Undefined Receptive Language	0	35				
Special School	145	35	9.66	3.70	0.53	2.53
Regular School Self-contained	792	35	10.53	3.01	0.27	2.57
Regular School Resource Room	132	35	10.86	3.01	0.27	2.58
Regular School Primarily Self-contained	46	35	11.85	2.16	-0.56	2.69
Regular School General Education	22	35				
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	109	35	8.49	4.59	0.73	2.39
Uses Intentional Communication	345	35	10.14	2.99	0.26	2.56
Uses Symbolic Language	683	35	11.04	2.74	0.10	2.60
Undefined Expressive Communication	0	35				

Table M-30. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 5 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,489	35	14.56	3.01	0.15	2.78
Female	302	35	14.72	3.07	0.18	2.78
Male	636	35	14.65	3.08	0.20	2.76
Gender Undefined	551	35	14.36	2.88	0.06	2.79
Hispanic or Latino	266	35	14.66	2.90	0.08	2.78
American Indian or Alaska Native	17	35				
Asian	29	35	14.41	3.05	0.15	2.81
Black or African American	237	35	14.57	3.00	0.14	2.79
Native Hawaiian or Pacific Islander	9	35				
White (non-Hispanic)	497	35	14.74	3.13	0.23	2.75
Two or More Races (non-Hispanic)	32	35	15.44	2.96	0.11	2.79
No Primary race/Ethnicity Undefined	402	35	14.19	2.89	0.07	2.78
Currently receiving LEP services	54	35	14.11	2.74	-0.01	2.76
Not receiving LEP services	708	35	14.71	3.11	0.21	2.76
LEP: All Other Students	727	35	14.45	2.91	0.09	2.79
Economically Disadvantaged Students	345	35	14.98	2.98	0.14	2.75
Non-economically Disadvantaged Students	417	35	14.41	3.16	0.23	2.77
SES: All Other Students	727	35	14.45	2.91	0.09	2.79
Migrant	3	35				
Non-migrant	756	35	14.68	3.09	0.20	2.76
Undefined Migrant Status	730	35	14.44	2.91	0.08	2.79
Augmentative Communication	241	35	13.48	2.62	-0.13	2.78
No Augmentative Communication	1,243	35	14.77	3.04	0.17	2.77
Undefined Augmentative Communications	5	35				
Hearing Loss	35	35	14.00	2.26	-0.56	2.82
Within Normal Limits	1,450	35	14.57	3.02	0.16	2.77
Undefined Hearing Loss	4	35				
Visual Impairment	42	35	13.62	2.60	-0.11	2.75
Within Normal Limits	1,436	35	14.59	3.02	0.16	2.77
Undefined Visual Impairment	11	35				
Sensory Stimuli Response	86	35	13.27	2.32	-0.48	2.82
Follow Directions	1,403	35	14.64	3.03	0.16	2.77

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	35				
Special School	134	35	13.93	2.90	0.07	2.80
Regular School Self-contained	929	35	14.48	2.98	0.13	2.78
Regular School Resource Room	247	35	14.86	3.06	0.20	2.73
Regular School Primarily Self-contained	126	35	15.04	2.99	0.16	2.74
Regular School General Education	53	35	14.92	3.28	0.29	2.76
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	71	35	13.10	2.89	0.07	2.78
Uses Intentional Communication	297	35	14.02	2.86	0.04	2.81
Uses Symbolic Language	1,121	35	14.79	3.01	0.16	2.75
Undefined Expressive Communication	0	35				

Table M-31. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 5 Form 3

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,140	35	21.67	4.67	0.68	2.62
Female	273	35	21.74	4.38	0.64	2.62
Male	508	35	22.04	4.72	0.69	2.61
Gender Undefined	359	35	21.09	4.75	0.69	2.64
Hispanic or Latino	194	35	21.10	4.12	0.58	2.66
American Indian or Alaska Native	19	35				
Asian	8	35				
Black or African American	167	35	21.71	5.09	0.73	2.63
Native Hawaiian or Pacific Islander	5	35				
White (non-Hispanic)	476	35	22.09	4.55	0.68	2.59
Two or More Races (non-Hispanic)	25	35	22.00	4.52	0.65	2.66
No Primary race/Ethnicity Undefined	246	35	21.26	5.03	0.73	2.63
Currently receiving LEP services	37	35	21.81	4.56	0.67	2.64
Not receiving LEP services	607	35	22.02	4.62	0.68	2.60
LEP: All Other Students	496	35	21.23	4.70	0.68	2.64
Economically Disadvantaged Students	338	35	22.07	4.74	0.70	2.58
Non-economically Disadvantaged Students	306	35	21.93	4.48	0.66	2.63

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	496	35	21.23	4.70	0.68	2.64
Migrant	1	35				
Non-migrant	639	35	22.01	4.61	0.68	2.60
Undefined Migrant Status	500	35	21.21	4.69	0.68	2.65
Augmentative Communication	60	35	19.10	4.13	0.55	2.77
No Augmentative Communication	1,072	35	21.79	4.66	0.69	2.61
Undefined Augmentative Communications	8	35				
Hearing Loss	14	35				
Within Normal Limits	1,125	35	21.69	4.67	0.69	2.62
Undefined Hearing Loss	1	35				
Visual Impairment	24	35				
Within Normal Limits	1,111	35	21.72	4.66	0.68	2.62
Undefined Visual Impairment	5	35				
Sensory Stimuli Response	21	35				
Follow Directions	1,119	35	21.72	4.66	0.68	2.62
Undefined Receptive Language	0	35				
Special School	37	35	18.46	4.60	0.65	2.72
Regular School Self-contained	678	35	21.68	4.66	0.68	2.62
Regular School Resource Room	239	35	21.70	4.78	0.70	2.60
Regular School Primarily Self-contained	131	35	21.77	4.04	0.57	2.65
Regular School General Education	55	35	23.29	4.83	0.72	2.56
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	15	35				
Uses Intentional Communication	113	35	20.83	4.66	0.67	2.69
Uses Symbolic Language	1,012	35	21.83	4.64	0.68	2.61
Undefined Expressive Communication	0	35				

Table M-32. 2016–17 MSAA: Reliability: Subgroup-Mathematics Grade 6 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,441	35	13.54	3.83	0.47	2.78
Female	291	35	13.83	3.77	0.45	2.79
Male	509	35	13.55	3.79	0.46	2.78
Gender Undefined	641	35	13.41	3.88	0.49	2.77
Hispanic or Latino	268	35	13.58	3.69	0.43	2.78
American Indian or Alaska Native	25	35	12.28	5.94	0.80	2.64
Asian	16	35				
Black or African American	163	35	13.61	3.50	0.37	2.78
Native Hawaiian or Pacific Islander	12	35				
White (non-Hispanic)	436	35	13.76	3.71	0.43	2.79
Two or More Races (non-Hispanic)	22	35				
No Primary race/Ethnicity Undefined	499	35	13.39	3.91	0.50	2.78
Currently receiving LEP services	36	35	14.56	3.63	0.39	2.83
Not receiving LEP services	595	35	13.76	3.68	0.42	2.79
LEP: All Other Students	810	35	13.34	3.93	0.51	2.77
Economically Disadvantaged Students	285	35	14.04	3.74	0.45	2.78
Non-economically Disadvantaged Students	346	35	13.61	3.61	0.40	2.80
SES: All Other Students	810	35	13.34	3.93	0.51	2.77
Migrant	0	35				
Non-migrant	618	35	13.81	3.68	0.42	2.79
Undefined Migrant Status	823	35	13.35	3.93	0.50	2.77
Augmentative Communication	355	35	13.05	3.96	0.51	2.78
No Augmentative Communication	1,079	35	13.71	3.78	0.46	2.77
Undefined Augmentative Communications	7	35				
Hearing Loss	35	35	12.43	3.11	0.20	2.79
Within Normal Limits	1,398	35	13.57	3.85	0.48	2.78
Undefined Hearing Loss	8	35				
Visual Impairment	78	35	12.09	4.82	0.69	2.70
Within Normal Limits	1,357	35	13.63	3.75	0.45	2.78
Undefined Visual Impairment	6	35				
Sensory Stimuli Response	191	35	11.40	4.79	0.69	2.65
Follow Directions	1,250	35	13.87	3.55	0.38	2.79

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	35				
Special School	217	35	12.29	4.75	0.68	2.70
Regular School Self-contained	1,011	35	13.73	3.53	0.37	2.79
Regular School Resource Room	144	35	13.45	3.88	0.49	2.78
Regular School Primarily Self-contained	50	35	15.00	3.89	0.50	2.76
Regular School General Education	19	35				
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	162	35	11.12	4.89	0.71	2.63
Uses Intentional Communication	427	35	12.95	3.89	0.49	2.77
Uses Symbolic Language	852	35	14.30	3.29	0.28	2.80
Undefined Expressive Communication	0	35				

Table M-33. 2016–17 MSAA: Reliability: Subgroup-Mathematics Grade 6 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	769	35	17.17	3.37	0.30	2.82
Female	161	35	16.98	3.57	0.38	2.81
Male	296	35	17.12	3.46	0.34	2.82
Gender Undefined	312	35	17.31	3.16	0.20	2.83
Hispanic or Latino	143	35	17.31	3.54	0.37	2.82
American Indian or Alaska Native	9	35				
Asian	9	35				
Black or African American	96	35	16.95	3.51	0.35	2.82
Native Hawaiian or Pacific Islander	3	35				
White (non-Hispanic)	264	35	17.15	3.52	0.36	2.81
Two or More Races (non-Hispanic)	6	35				
No Primary race/Ethnicity Undefined	239	35	17.21	3.02	0.12	2.83
Currently receiving LEP services	16	35				
Not receiving LEP services	328	35	17.01	3.52	0.36	2.82
LEP: All Other Students	425	35	17.30	3.26	0.25	2.83
Economically Disadvantaged Students	140	35	17.16	3.47	0.35	2.81
Non-economically Disadvantaged Students	204	35	16.89	3.51	0.35	2.83

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	425	35	17.30	3.26	0.25	2.83
Migrant	0	35				
Non-migrant	341	35	17.02	3.50	0.35	2.82
Undefined Migrant Status	428	35	17.28	3.26	0.24	2.83
Augmentative Communication	108	35	15.96	3.19	0.19	2.86
No Augmentative Communication	655	35	17.36	3.36	0.30	2.81
Undefined Augmentative Communications	6	35				
Hearing Loss	20	35				
Within Normal Limits	745	35	17.16	3.39	0.31	2.82
Undefined Hearing Loss	4	35				
Visual Impairment	28	35	17.11	3.76	0.42	2.86
Within Normal Limits	738	35	17.17	3.36	0.30	2.82
Undefined Visual Impairment	3	35				
Sensory Stimuli Response	47	35	15.47	2.68	-0.14	2.85
Follow Directions	722	35	17.28	3.38	0.31	2.81
Undefined Receptive Language	0	35				
Special School	63	35	15.46	3.13	0.18	2.83
Regular School Self-contained	529	35	17.21	3.39	0.30	2.83
Regular School Resource Room	116	35	17.69	3.32	0.30	2.77
Regular School Primarily Self-contained	44	35	17.86	2.66	-0.14	2.85
Regular School General Education	17	35				
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	34	35	15.00	3.12	0.20	2.79
Uses Intentional Communication	148	35	16.42	3.59	0.37	2.85
Uses Symbolic Language	587	35	17.48	3.25	0.26	2.80
Undefined Expressive Communication	0	35				

Table M-34. 2016–17 MSAA: Reliability: Subgroup-Mathematics Grade 6 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,682	35	24.43	5.10	0.77	2.42
Female	377	35	23.92	5.12	0.78	2.43
Male	747	35	25.02	5.21	0.79	2.37
Gender Undefined	558	35	23.98	4.85	0.74	2.47
Hispanic or Latino	267	35	24.29	4.83	0.75	2.44
American Indian or Alaska Native	29	35	25.34	4.94	0.78	2.33
Asian	8	35				
Black or African American	254	35	24.67	5.31	0.80	2.37
Native Hawaiian or Pacific Islander	8	35				
White (non-Hispanic)	643	35	24.80	5.21	0.79	2.38
Two or More Races (non-Hispanic)	48	35	23.60	4.70	0.71	2.51
No Primary race/Ethnicity Undefined	425	35	23.88	4.99	0.75	2.47
Currently receiving LEP services	51	35	24.65	5.49	0.81	2.41
Not receiving LEP services	892	35	24.74	5.25	0.79	2.38
LEP: All Other Students	739	35	24.04	4.86	0.74	2.46
Economically Disadvantaged Students	528	35	24.98	5.24	0.80	2.37
Non-economically Disadvantaged Students	415	35	24.42	5.28	0.79	2.41
SES: All Other Students	739	35	24.04	4.86	0.74	2.46
Migrant	3	35				
Non-migrant	939	35	24.73	5.26	0.79	2.39
Undefined Migrant Status	740	35	24.04	4.86	0.74	2.46
Augmentative Communication	101	35	22.79	5.13	0.75	2.58
No Augmentative Communication	1,574	35	24.53	5.09	0.78	2.41
Undefined Augmentative Communications	7	35				
Hearing Loss	43	35	25.56	4.71	0.75	2.34
Within Normal Limits	1,636	35	24.40	5.10	0.77	2.42
Undefined Hearing Loss	3	35				
Visual Impairment	33	35	22.67	6.08	0.84	2.47
Within Normal Limits	1,641	35	24.46	5.08	0.77	2.42
Undefined Visual Impairment	8	35				
Sensory Stimuli Response	28	35	21.71	5.23	0.74	2.65
Follow Directions	1,654	35	24.48	5.08	0.77	2.41

continue

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	35				
Special School	80	35	23.15	5.15	0.75	2.56
Regular School Self-contained	1,065	35	24.14	5.14	0.78	2.43
Regular School Resource Room	327	35	25.02	4.94	0.77	2.38
Regular School Primarily Self-contained	155	35	25.17	4.85	0.76	2.37
Regular School General Education	55	35	26.18	4.91	0.79	2.26
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	16	35				
Uses Intentional Communication	167	35	23.02	4.99	0.74	2.56
Uses Symbolic Language	1,499	35	24.62	5.07	0.78	2.40
Undefined Expressive Communication	0	35				

Table M-35. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 7 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,091	35	12.88	3.63	0.43	2.74
Female	217	35	13.17	3.59	0.42	2.74
Male	405	35	12.95	3.69	0.45	2.74
Gender Undefined	469	35	12.70	3.58	0.41	2.75
Hispanic or Latino	192	35	12.95	3.97	0.52	2.74
American Indian or Alaska Native	15	35				
Asian	15	35				
Black or African American	152	35	13.09	3.33	0.32	2.75
Native Hawaiian or Pacific Islander	7	35				
White (non-Hispanic)	329	35	13.18	3.73	0.46	2.75
Two or More Races (non-Hispanic)	20	35				
No Primary race/Ethnicity Undefined	361	35	12.51	3.50	0.39	2.74
Currently receiving LEP services	32	35	13.13	4.25	0.61	2.66
Not receiving LEP services	482	35	13.04	3.64	0.43	2.75
LEP: All Other Students	577	35	12.74	3.58	0.41	2.75

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Economically Disadvantaged Students	236	35	13.11	3.86	0.50	2.73
Non-economically Disadvantaged Students	278	35	12.99	3.52	0.39	2.75
SES: All Other Students	577	35	12.74	3.58	0.41	2.75
Migrant	2	35				
Non-migrant	504	35	13.03	3.67	0.44	2.74
Undefined Migrant Status	585	35	12.74	3.57	0.41	2.75
Augmentative Communication	256	35	11.83	3.82	0.49	2.72
No Augmentative Communication	830	35	13.22	3.50	0.38	2.75
Undefined Augmentative Communications	5	35				
Hearing Loss	32	35	11.56	4.44	0.63	2.68
Within Normal Limits	1,051	35	12.93	3.61	0.42	2.75
Undefined Hearing Loss	8	35				
Visual Impairment	70	35	11.19	4.69	0.68	2.64
Within Normal Limits	1,013	35	13.01	3.53	0.39	2.75
Undefined Visual Impairment	8	35				
Sensory Stimuli Response	135	35	10.24	4.39	0.65	2.60
Follow Directions	955	35	13.26	3.35	0.32	2.76
Undefined Receptive Language	1	35				
Special School	165	35	11.35	4.01	0.55	2.68
Regular School Self-contained	769	35	12.99	3.53	0.39	2.75
Regular School Resource Room	97	35	13.65	3.25	0.28	2.76
Regular School Primarily Self-contained	44	35	14.55	3.09	0.21	2.75
Regular School General Education	15	35				
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	124	35	10.15	4.50	0.67	2.59
Uses Intentional Communication	303	35	12.44	3.44	0.36	2.75
Uses Symbolic Language	663	35	13.60	3.24	0.28	2.76
Undefined Expressive Communication	1	35				

Table M-36. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 7 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,535	35	16.34	3.02	0.12	2.84
Female	330	35	16.65	2.94	0.07	2.83
Male	570	35	16.43	3.18	0.21	2.83
Gender Undefined	635	35	16.10	2.90	0.03	2.85
Hispanic or Latino	243	35	16.39	2.93	0.05	2.85
American Indian or Alaska Native	30	35	16.73	3.27	0.28	2.78
Asian	16	35				
Black or African American	227	35	16.49	2.88	0.02	2.84
Native Hawaiian or Pacific Islander	7	35				
White (non-Hispanic)	495	35	16.50	3.17	0.21	2.82
Two or More Races (non-Hispanic)	18	35				
No Primary race/Ethnicity Undefined	499	35	16.03	2.93	0.06	2.84
Currently receiving LEP services	30	35	17.43	2.91	0.04	2.85
Not receiving LEP services	688	35	16.55	3.08	0.16	2.83
LEP: All Other Students	817	35	16.13	2.96	0.08	2.84
Economically Disadvantaged Students	338	35	16.99	3.03	0.13	2.82
Non-economically Disadvantaged Students	380	35	16.23	3.08	0.15	2.83
SES: All Other Students	817	35	16.13	2.96	0.08	2.84
Migrant	1	35				
Non-migrant	707	35	16.59	3.09	0.16	2.83
Undefined Migrant Status	827	35	16.13	2.95	0.07	2.85
Augmentative Communication	225	35	15.23	2.59	-0.21	2.85
No Augmentative Communication	1,299	35	16.54	3.06	0.14	2.83
Undefined Augmentative Communications	11	35				
Hearing Loss	41	35	15.90	3.06	0.13	2.85
Within Normal Limits	1,487	35	16.35	3.02	0.12	2.84
Undefined Hearing Loss	7	35				
Visual Impairment	64	35	16.09	2.92	0.03	2.88
Within Normal Limits	1,462	35	16.36	3.03	0.13	2.84
Undefined Visual Impairment	9	35				
Sensory Stimuli Response	56	35	15.16	2.93	0.05	2.86
Follow Directions	1,478	35	16.39	3.02	0.12	2.84

continued

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
Undefined Receptive Language	1	35				
Special School	144	35	15.51	2.51	-0.31	2.87
Regular School Self-contained	1,073	35	16.26	3.00	0.10	2.84
Regular School Resource Room	187	35	17.02	3.23	0.23	2.83
Regular School Primarily Self-contained	100	35	17.07	3.19	0.25	2.76
Regular School General Education	30	35	16.80	3.17	0.20	2.84
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	55	35	15.62	2.51	-0.30	2.86
Uses Intentional Communication	284	35	15.10	2.47	-0.33	2.85
Uses Symbolic Language	1,195	35	16.67	3.08	0.16	2.82
Undefined Expressive Communication	1	35				

Table M-37. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 7 Form 3

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,235	34	23.71	4.90	0.76	2.42
Female	288	34	23.53	4.98	0.76	2.43
Male	553	34	23.86	4.84	0.75	2.41
Gender Undefined	394	34	23.62	4.93	0.76	2.42
Hispanic or Latino	186	34	23.49	4.83	0.75	2.41
American Indian or Alaska Native	14	34				
Asian	8	34				
Black or African American	163	34	23.28	5.08	0.77	2.44
Native Hawaiian or Pacific Islander	7	34				
White (non-Hispanic)	524	34	23.93	4.81	0.75	2.42
Two or More Races (non-Hispanic)	20	34				
No Primary race/Ethnicity Undefined	313	34	23.73	4.99	0.76	2.42
Currently receiving LEP services	35	34	23.97	4.46	0.71	2.39
Not receiving LEP services	648	34	23.93	4.84	0.75	2.41
LEP: All Other Students	552	34	23.43	5.00	0.76	2.43
Economically Disadvantaged Students	389	34	23.84	4.81	0.75	2.41
Non-economically Disadvantaged Students	294	34	24.06	4.82	0.75	2.41

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	*Mean*	*Standard Deviation*		
SES: All Other Students	552	34	23.43	5.00	0.76	2.43
Migrant	0	34				
Non-migrant	680	34	23.92	4.81	0.75	2.41
Undefined Migrant Status	555	34	23.44	5.01	0.76	2.43
Augmentative Communication	58	34	21.05	4.74	0.70	2.62
No Augmentative Communication	1,171	34	23.85	4.87	0.76	2.41
Undefined Augmentative Communications	6	34				
Hearing Loss	15	34				
Within Normal Limits	1,215	34	23.71	4.89	0.75	2.42
Undefined Hearing Loss	5	34				
Visual Impairment	21	34				
Within Normal Limits	1,198	34	23.71	4.89	0.75	2.42
Undefined Visual Impairment	16	34				
Sensory Stimuli Response	14	34				
Follow Directions	1,219	34	23.75	4.89	0.76	2.42
Undefined Receptive Language	2	34				
Special School	47	34	21.40	4.59	0.68	2.59
Regular School Self-contained	759	34	23.62	4.90	0.75	2.43
Regular School Resource Room	237	34	23.98	5.01	0.77	2.39
Regular School Primarily Self-contained	126	34	24.31	4.63	0.74	2.36
Regular School General Education	64	34	24.30	4.81	0.76	2.36
Undefined Classroom Setting	2	34				
Student Communicates Primarily Through Cries	9	34				
Uses Intentional Communication	117	34	21.87	4.80	0.71	2.56
Uses Symbolic Language	1,107	34	23.94	4.87	0.76	2.40
Undefined Expressive Communication	2	34				

Table M-38. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 8 Form 1

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,355	35	11.86	3.85	0.52	2.66
Female	270	35	11.84	3.86	0.53	2.65
Male	464	35	12.01	3.86	0.53	2.66
Gender Undefined	621	35	11.77	3.84	0.52	2.65
Hispanic or Latino	243	35	12.12	3.55	0.43	2.69
American Indian or Alaska Native	15	35				
Asian	15	35				
Black or African American	175	35	12.05	3.48	0.40	2.69
Native Hawaiian or Pacific Islander	8	35				
White (non-Hispanic)	416	35	11.88	4.14	0.60	2.63
Two or More Races (non-Hispanic)	24	35				
No Primary race/Ethnicity Undefined	459	35	11.64	3.88	0.54	2.64
Currently receiving LEP services	22	35				
Not receiving LEP services	586	35	11.96	3.89	0.54	2.65
LEP: All Other Students	747	35	11.80	3.84	0.52	2.66
Economically Disadvantaged Students	236	35	12.08	3.74	0.49	2.67
Non-economically Disadvantaged Students	372	35	11.86	3.94	0.55	2.64
SES: All Other Students	747	35	11.80	3.84	0.52	2.66
Migrant	0	35				
Non-migrant	597	35	11.94	3.87	0.53	2.65
Undefined Migrant Status	758	35	11.80	3.83	0.52	2.66
Augmentative Communication	291	35	10.45	4.12	0.61	2.58
No Augmentative Communication	1,052	35	12.27	3.69	0.48	2.67
Undefined Augmentative Communications	12	35				
Hearing Loss	42	35	10.64	5.05	0.75	2.52
Within Normal Limits	1,304	35	11.91	3.79	0.51	2.66
Undefined Hearing Loss	9	35				
Visual Impairment	71	35	11.00	4.31	0.63	2.63
Within Normal Limits	1,277	35	11.91	3.83	0.52	2.66
Undefined Visual Impairment	7	35				
Sensory Stimuli Response	140	35	9.67	4.94	0.74	2.50
Follow Directions	1,214	35	12.12	3.62	0.46	2.67

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	1	35				
Special School	191	35	10.39	4.19	0.62	2.58
Regular School Self-contained	927	35	11.93	3.76	0.50	2.66
Regular School Resource Room	158	35	12.84	3.73	0.49	2.67
Regular School Primarily Self-contained	57	35	12.96	3.39	0.37	2.69
Regular School General Education	21	35				
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	138	35	9.27	4.75	0.73	2.47
Uses Intentional Communication	354	35	10.97	3.68	0.49	2.63
Uses Symbolic Language	862	35	12.65	3.48	0.41	2.68
Undefined Expressive Communication	1	35				

Table M-39. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 8 Form 2

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	920	35	16.08	3.12	0.15	2.87
Female	191	35	16.12	3.04	0.09	2.89
Male	356	35	15.97	3.31	0.25	2.86
Gender Undefined	373	35	16.16	2.97	0.06	2.88
Hispanic or Latino	154	35	15.94	3.08	0.13	2.87
American Indian or Alaska Native	15	35				
Asian	9	35				
Black or African American	138	35	15.96	3.09	0.13	2.88
Native Hawaiian or Pacific Islander	10	35				
White (non-Hispanic)	305	35	16.15	3.26	0.23	2.87
Two or More Races (non-Hispanic)	17	35				
No Primary race/Ethnicity Undefined	272	35	16.22	2.98	0.07	2.88
Currently receiving LEP services	16	35				
Not receiving LEP services	447	35	16.10	3.19	0.19	2.87
LEP: All Other Students	457	35	16.08	3.04	0.10	2.88
Economically Disadvantaged Students	182	35	16.33	3.34	0.27	2.86
Non-economically Disadvantaged Students	281	35	15.90	3.10	0.13	2.88

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	457	35	16.08	3.04	0.10	2.88
Migrant	2	35				
Non-migrant	454	35	16.12	3.19	0.19	2.87
Undefined Migrant Status	464	35	16.03	3.05	0.11	2.87
Augmentative Communication	116	35	15.62	2.82	-0.04	2.88
No Augmentative Communication	797	35	16.13	3.16	0.18	2.87
Undefined Augmentative Communications	7	35				
Hearing Loss	24	35				
Within Normal Limits	889	35	16.10	3.11	0.15	2.87
Undefined Hearing Loss	7	35				
Visual Impairment	38	35	15.55	2.53	-0.28	2.87
Within Normal Limits	877	35	16.10	3.14	0.17	2.87
Undefined Visual Impairment	5	35				
Sensory Stimuli Response	39	35	14.95	2.89	0.02	2.87
Follow Directions	880	35	16.12	3.12	0.15	2.87
Undefined Receptive Language	1	35				
Special School	80	35	15.70	3.07	0.12	2.88
Regular School Self-contained	619	35	15.99	3.10	0.14	2.87
Regular School Resource Room	150	35	16.43	3.10	0.15	2.86
Regular School Primarily Self-contained	57	35	16.32	3.36	0.27	2.88
Regular School General Education	13	35				
Undefined Classroom Setting	1	35				
Student Communicates Primarily Through Cries	39	35	15.79	2.80	-0.07	2.90
Uses Intentional Communication	181	35	15.32	2.86	0.00	2.86
Uses Symbolic Language	699	35	16.28	3.17	0.18	2.87
Undefined Expressive Communication	1	35				

Table M-40. 2016–17 MSAA: Reliability: Subgroup- Mathematics Grade 8 Form 3

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,830	35	22.52	5.11	0.74	2.61
Female	420	35	22.57	5.01	0.73	2.60
Male	792	35	22.78	5.20	0.75	2.59
Gender Undefined	618	35	22.14	5.04	0.73	2.63
Hispanic or Latino	282	35	22.27	4.95	0.72	2.63
American Indian or Alaska Native	27	35	21.56	4.45	0.63	2.69
Asian	21	35				
Black or African American	274	35	22.76	5.04	0.73	2.60
Native Hawaiian or Pacific Islander	9	35				
White (non-Hispanic)	716	35	22.82	5.27	0.76	2.58
Two or More Races (non-Hispanic)	34	35	22.59	4.70	0.69	2.62
No Primary race/Ethnicity Undefined	467	35	22.18	5.02	0.73	2.63
Currently receiving LEP services	48	35	22.63	4.17	0.58	2.69
Not receiving LEP services	952	35	22.84	5.23	0.76	2.58
LEP: All Other Students	830	35	22.14	5.00	0.72	2.63
Economically Disadvantaged Students	517	35	23.11	4.98	0.73	2.57
Non-economically Disadvantaged Students	483	35	22.52	5.37	0.77	2.60
SES: All Other Students	830	35	22.14	5.00	0.72	2.63
Migrant	1	35				
Non-migrant	996	35	22.83	5.18	0.75	2.58
Undefined Migrant Status	833	35	22.13	5.00	0.72	2.63
Augmentative Communication	138	35	19.89	4.37	0.63	2.66
No Augmentative Communication	1,680	35	22.75	5.10	0.74	2.60
Undefined Augmentative Communications	12	35				
Hearing Loss	40	35	21.63	5.14	0.74	2.63
Within Normal Limits	1,780	35	22.55	5.11	0.74	2.60
Undefined Hearing Loss	10	35				
Visual Impairment	58	35	21.22	4.42	0.64	2.64
Within Normal Limits	1,762	35	22.57	5.13	0.74	2.60
Undefined Visual Impairment	10	35				
Sensory Stimuli Response	45	35	18.91	3.18	0.28	2.70
Follow Directions	1,785	35	22.61	5.12	0.74	2.60

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	35				
Special School	100	35	19.91	4.23	0.60	2.66
Regular School Self-contained	1,141	35	22.23	5.05	0.73	2.62
Regular School Resource Room	377	35	23.42	5.13	0.75	2.56
Regular School Primarily Self-contained	152	35	23.64	5.07	0.75	2.56
Regular School General Education	60	35	23.75	5.39	0.79	2.49
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	35	35	18.31	3.11	0.32	2.56
Uses Intentional Communication	204	35	20.74	4.88	0.70	2.67
Uses Symbolic Language	1,591	35	22.84	5.09	0.74	2.59
Undefined Expressive Communication	0	35				

Table M-41. 2016–17 MSAA: Reliability: Subgroup-Mathematics Grade 11 Form 1

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	882	35	11.22	3.86	0.53	2.64
Female	152	35	11.28	3.78	0.51	2.64
Male	313	35	10.85	4.05	0.58	2.61
Gender Undefined	417	35	11.48	3.72	0.49	2.65
Hispanic or Latino	134	35	11.11	4.08	0.59	2.63
American Indian or Alaska Native	16	35				
Asian	10	35				
Black or African American	128	35	10.43	4.84	0.72	2.56
Native Hawaiian or Pacific Islander	14	35				
White (non-Hispanic)	230	35	11.52	2.98	0.20	2.67
Two or More Races (non-Hispanic)	10	35				
No Primary race/Ethnicity Undefined	340	35	11.63	3.57	0.44	2.67
Currently receiving LEP services	16	35				
Not receiving LEP services	321	35	11.14	3.88	0.54	2.63
LEP: All Other Students	545	35	11.31	3.78	0.51	2.64

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Economically Disadvantaged Students	159	35	10.92	4.24	0.62	2.61
Non-economically Disadvantaged Students	178	35	11.23	3.73	0.50	2.64
SES: All Other Students	545	35	11.31	3.78	0.51	2.64
Migrant	0	35				
Non-migrant	324	35	11.23	3.82	0.52	2.64
Undefined Migrant Status	558	35	11.22	3.88	0.54	2.64
Augmentative Communication	196	35	10.59	3.70	0.50	2.61
No Augmentative Communication	679	35	11.39	3.89	0.54	2.64
Undefined Augmentative Communications	7	35				
Hearing Loss	43	35	10.84	4.04	0.58	2.62
Within Normal Limits	836	35	11.24	3.85	0.53	2.64
Undefined Hearing Loss	3	35				
Visual Impairment	40	35	10.15	4.60	0.70	2.52
Within Normal Limits	839	35	11.28	3.82	0.52	2.64
Undefined Visual Impairment	3	35				
Sensory Stimuli Response	98	35	8.57	4.85	0.75	2.40
Follow Directions	784	35	11.55	3.58	0.45	2.66
Undefined Receptive Language	0	35				
Special School	190	35	10.59	3.51	0.44	2.62
Regular School Self-contained	557	35	11.34	3.95	0.55	2.64
Regular School Resource Room	99	35	11.25	3.73	0.50	2.64
Regular School Primarily Self-contained	27	35	12.04	4.29	0.63	2.59
Regular School General Education	9	35				
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	92	35	8.23	5.40	0.81	2.33
Uses Intentional Communication	238	35	10.52	3.73	0.52	2.59
Uses Symbolic Language	552	35	12.03	3.26	0.32	2.70
Undefined Expressive Communication	0	35				

Table M-42. 2016–17 MSAA: Reliability: Subgroup-Mathematics Grade 11 Form 2

Description	*Number of Students*	*Raw Score*			*Alpha*	*Standard Error*
		Maximum	*Mean*	*Standard Deviation*		
All Students	1,149	35	14.64	2.74	-0.08	2.85
Female	216	35	14.61	3.00	0.10	2.85
Male	398	35	14.64	2.74	-0.08	2.84
Gender Undefined	535	35	14.66	2.63	-0.18	2.86
Hispanic or Latino	159	35	14.15	2.56	-0.23	2.85
American Indian or Alaska Native	11	35				
Asian	12	35				
Black or African American	148	35	14.60	2.61	-0.20	2.86
Native Hawaiian or Pacific Islander	5	35				
White (non-Hispanic)	370	35	14.70	2.86	0.02	2.83
Two or More Races (non-Hispanic)	6	35				
No Primary race/Ethnicity Undefined	438	35	14.80	2.70	-0.13	2.86
Currently receiving LEP services	19	35				
Not receiving LEP services	458	35	14.60	2.77	-0.05	2.84
LEP: All Other Students	672	35	14.67	2.73	-0.09	2.85
Economically Disadvantaged Students	215	35	14.89	2.68	-0.11	2.83
Non-economically Disadvantaged Students	262	35	14.37	2.79	-0.04	2.84
SES: All Other Students	672	35	14.67	2.73	-0.09	2.85
Migrant	1	35				
Non-migrant	472	35	14.61	2.74	-0.08	2.84
Undefined Migrant Status	676	35	14.67	2.74	-0.08	2.85
Augmentative Communication	167	35	14.19	2.28	-0.57	2.86
No Augmentative Communication	978	35	14.73	2.80	-0.03	2.84
Undefined Augmentative Communications	4	35				
Hearing Loss	32	35	14.75	2.17	-0.74	2.86
Within Normal Limits	1,114	35	14.64	2.76	-0.07	2.85
Undefined Hearing Loss	3	35				
Visual Impairment	43	35	14.53	2.48	-0.33	2.86
Within Normal Limits	1,101	35	14.65	2.75	-0.07	2.85
Undefined Visual Impairment	5	35				
Sensory Stimuli Response	52	35	12.90	2.12	-0.73	2.79
Follow Directions	1,097	35	14.73	2.74	-0.08	2.85

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
Undefined Receptive Language	0	35				
Special School	165	35	14.08	2.53	-0.25	2.83
Regular School Self-contained	758	35	14.65	2.72	-0.10	2.85
Regular School Resource Room	153	35	14.74	2.59	-0.19	2.82
Regular School Primarily Self-contained	62	35	15.45	3.11	0.16	2.86
Regular School General Education	11	35				
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	49	35	13.33	2.57	-0.21	2.82
Uses Intentional Communication	197	35	14.13	2.44	-0.36	2.84
Uses Symbolic Language	903	35	14.83	2.78	-0.05	2.85
Undefined Expressive Communication	0	35				

Table M-43. 2016–17 MSAA: Reliability: Subgroup-Mathematics Grade 11 Form 3

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
All Students	1,262	35	22.40	5.57	0.79	2.58
Female	247	35	22.33	5.53	0.78	2.57
Male	507	35	23.02	5.61	0.79	2.55
Gender Undefined	508	35	21.82	5.49	0.77	2.61
Hispanic or Latino	154	35	22.03	5.75	0.79	2.60
American Indian or Alaska Native	11	35				
Asian	3	35				
Black or African American	170	35	23.44	5.44	0.78	2.55
Native Hawaiian or Pacific Islander	5	35				
White (non-Hispanic)	472	35	22.54	5.61	0.79	2.55
Two or More Races (non-Hispanic)	13	35				
No Primary race/Ethnicity Undefined	434	35	21.91	5.42	0.77	2.61
Currently receiving LEP services	22	35				
Not receiving LEP services	589	35	22.76	5.55	0.79	2.55
LEP: All Other Students	651	35	22.03	5.58	0.78	2.60
Economically Disadvantaged Students	347	35	23.34	5.53	0.79	2.53
Non-economically Disadvantaged Students	264	35	22.08	5.48	0.78	2.58

continued

Description	Number of Students	Raw Score			Alpha	Standard Error
		Maximum	Mean	Standard Deviation		
SES: All Other Students	651	35	22.03	5.58	0.78	2.60
Migrant	3	35				
Non-migrant	606	35	22.81	5.54	0.79	2.55
Undefined Migrant Status	653	35	22.01	5.58	0.78	2.60
Augmentative Communication	76	35	19.76	4.44	0.62	2.74
No Augmentative Communication	1,181	35	22.55	5.59	0.79	2.57
Undefined Augmentative Communications	5	35				
Hearing Loss	31	35	20.58	5.08	0.72	2.71
Within Normal Limits	1,229	35	22.44	5.56	0.79	2.58
Undefined Hearing Loss	2	35				
Visual Impairment	29	35	20.45	5.53	0.76	2.68
Within Normal Limits	1,224	35	22.45	5.57	0.79	2.57
Undefined Visual Impairment	9	35				
Sensory Stimuli Response	15	35				
Follow Directions	1,247	35	22.44	5.58	0.79	2.58
Undefined Receptive Language	0	35				
Special School	94	35	19.81	5.52	0.76	2.71
Regular School Self-contained	769	35	22.44	5.53	0.78	2.57
Regular School Resource Room	235	35	23.16	5.74	0.80	2.55
Regular School Primarily Self-contained	140	35	22.86	5.17	0.76	2.55
Regular School General Education	24	35				
Undefined Classroom Setting	0	35				
Student Communicates Primarily Through Cries	8	35				
Uses Intentional Communication	89	35	19.53	4.89	0.68	2.75
Uses Symbolic Language	1,165	35	22.63	5.57	0.79	2.56
Undefined Expressive Communication	0	35				

APPENDIX N—DECISION ACCURACY AND CONSISTENCY RESULTS

Table N-1. 2016–17 MSAA: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Performance Level – Form 1

Content Area	*Grade*	*Overall*	*Kappa*	*Conditional on Level*		
				Level 1	*Level 2*	*Level 3/4*
ELA	3	0.82 (0.76)	0.27	0.88 (0.87)	0.44 (0.30)	0.65 (0.29)
	4	0.80 (0.73)	0.28	0.87 (0.86)	0.44 (0.31)	0.65 (0.31)
	5	0.77 (0.69)	0.29	0.84 (0.82)	0.54 (0.41)	0.64 (0.29)
	6	0.81 (0.73)	0.38	0.86 (0.83)	0.65 (0.51)	0.66 (0.31)
	7	0.84 (0.78)	0.27	0.89 (0.89)	0.35 (0.24)	0.66 (0.33)
	8	0.75 (0.66)	0.34	0.81 (0.76)	0.66 (0.55)	0.65 (0.30)
	11	0.74 (0.67)	0.25	0.83 (0.82)	0.30 (0.23)	0.66 (0.37)
Mathematics	3	0.70 (0.62)	0.23	0.80 (0.77)	0.26 (0.20)	0.65 (0.39)
	4	0.75 (0.67)	0.29	0.84 (0.82)	0.39 (0.29)	0.67 (0.40)
	5	0.59 (0.50)	0.14	0.70 (0.61)	0.48 (0.41)	0.59 (0.25)
	6	0.72 (0.64)	0.22	0.81 (0.78)	0.41 (0.31)	0.63 (0.30)
	7	0.61 (0.51)	0.20	0.73 (0.63)	0.49 (0.42)	0.64 (0.35)
	8	0.72 (0.64)	0.25	0.82 (0.79)	0.39 (0.30)	0.66 (0.37)
	11	0.68 (0.60)	0.26	0.80 (0.76)	0.36 (0.28)	0.67 (0.42)

Note: Due to the small sample size, students in Levels 3 and 4 were collapsed for purposes of the decision accuracy and consistency analysis.

Table N-2. 2016–17 MSAA: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Performance Level – Form 2

Content Area	*Grade*	*Overall*	*Kappa*	*Conditional on Level*	
				Level 1/2	*Level 3/4*
ELA	3	0.74 (0.65)	0.18	0.76 (0.75)	0.63 (0.43)
	4	0.67 (0.58)	0.16	0.66 (0.56)	0.67 (0.60)
	5	0.66 (0.58)	0.13	0.68 (0.63)	0.62 (0.50)
	6	0.69 (0.60)	0.18	0.71 (0.65)	0.66 (0.54)
	7	0.67 (0.58)	0.16	0.66 (0.55)	0.68 (0.61)
	8	0.65 (0.57)	0.12	0.67 (0.62)	0.62 (0.51)
	11	0.70 (0.61)	0.21	0.69 (0.58)	0.70 (0.63)
Mathematics	3	0.64 (0.56)	0.09	0.60 (0.47)	0.66 (0.62)

continued

Mathematics	4	0.70 (0.61)	0.22	0.71 (0.64)	0.68 (0.58)
	5	0.64 (0.55)	0.09	0.61 (0.49)	0.65 (0.60)
	6	0.73 (0.64)	0.19	0.75 (0.73)	0.64 (0.46)
	7	0.61 (0.54)	0.07	0.60 (0.50)	0.62 (0.57)
	8	0.63 (0.55)	0.10	0.63 (0.56)	0.62 (0.54)
	11	0.96 (0.94)	0.89	0.96 (0.95)	0.96 (0.94)

Note: Due to the small sample size, students in Levels 1 and 2, and Levels 3 and 4 were collapsed for purposes of the decision accuracy and consistency analysis.

Table N-3. 2016–17 MSAA: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Performance Level – Form 3

Content Area	*Grade*	*Overall*	*Kappa*	*Conditional on Level*		
				Level 1/2	*Level 3*	*Level 4*
ELA	3	0.76 (0.69)	0.36	0.71 (0.47)	0.46 (0.36)	0.86 (0.83)
	4	0.71 (0.61)	0.35	0.70 (0.46)	0.64 (0.56)	0.79 (0.70)
	5	0.70 (0.60)	0.32	0.68 (0.39)	0.60 (0.51)	0.79 (0.72)
	6	0.68 (0.59)	0.32	0.70 (0.47)	0.52 (0.43)	0.80 (0.73)
	7	0.71 (0.61)	0.31	0.67 (0.37)	0.58 (0.49)	0.80 (0.73)
	8	0.71 (0.63)	0.29	0.68 (0.41)	0.43 (0.34)	0.82 (0.78)
	11	0.70 (0.60)	0.33	0.69 (0.42)	0.61 (0.53)	0.79 (0.70)
Mathematics	3	0.77 (0.69)	0.44	0.74 (0.53)	0.62 (0.52)	0.86 (0.81)
	4	0.74 (0.66)	0.37	0.72 (0.49)	0.52 (0.42)	0.84 (0.80)
	5	0.75 (0.67)	0.38	0.70 (0.44)	0.62 (0.51)	0.83 (0.78)
	6	0.77 (0.70)	0.44	0.77 (0.60)	0.46 (0.36)	0.87 (0.84)
	7	0.79 (0.72)	0.45	0.74 (0.53)	0.59 (0.48)	0.88 (0.85)
	8	0.76 (0.68)	0.41	0.75 (0.56)	0.47 (0.37)	0.86 (0.82)
	11	0.80 (0.73)	0.46	0.77 (0.59)	0.51 (0.40)	0.89 (0.86)

Note: Due to the small sample size, students in Levels 1 and 2 were collapsed for purposes of the decision accuracy and consistency analysis.

Table N-4. 2016–17 MSAA: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Conditional on Cutpoint – Form 1

Content Area	Grade	Level 1/Level 2			Level 2/Level 3			Level 3/Level 4		
		Accuracy (Consistency)	False		Accuracy (Consistency)	False		Accuracy (Consistency)	False	
			Positive	Negative		Positive	Negative		Positive	Negative
ELA	3	0.85 (0.79)	0.11	0.04	0.96 (0.93)	0.04	0.01	*	*	*
	4	0.84 (0.78)	0.11	0.05	0.95 (0.92)	0.05	0.01	*	*	*
	5	0.81 (0.74)	0.12	0.07	0.96 (0.93)	0.04	0.01	*	*	*
	6	0.83 (0.77)	0.10	0.07	0.97 (0.96)	0.02	0.00	*	*	*
	7	0.87 (0.82)	0.09	0.03	0.95 (0.92)	0.05	0.01	*	*	*
	8	0.79 (0.71)	0.12	0.09	0.96 (0.94)	0.03	0.00	*	*	*
	11	0.81 (0.73)	0.13	0.06	0.89 (0.84)	0.09	0.02	*	*	*
Mathematics	3	0.77 (0.69)	0.15	0.08	0.86 (0.79)	0.11	0.03	*	*	*
	4	0.81 (0.74)	0.12	0.07	0.91 (0.87)	0.07	0.02	*	*	*
	5	0.69 (0.60)	0.16	0.15	0.88 (0.82)	0.11	0.01	*	*	*
	6	0.78 (0.70)	0.15	0.07	0.91 (0.87)	0.08	0.01	*	*	*
	7	0.73 (0.64)	0.13	0.14	0.87 (0.80)	0.11	0.02	*	*	*
	8	0.79 (0.71)	0.13	0.08	0.90 (0.85)	0.08	0.02	*	*	*
	11	0.78 (0.70)	0.13	0.09	0.87 (0.81)	0.10	0.03	*	*	*

Note: Due to the small sample size, students in Levels 3 and 4 were collapsed for purposes of the decision accuracy and consistency analysis.

Table N-5. 2016–17 MSAA: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Conditional on Cutpoint – Form 2

Content Area	Grade	Level 1/Level 2			Level 2/Level 3			Level 3/Level 4		
		Accuracy (Consistency)	False		Accuracy (Consistency)	False		Accuracy (Consistency)	False	
			Positive	Negative		Positive	Negative		Positive	Negative
ELA	3	*	*	*	0.74 (0.65)	0.19	0.07	*	*	*
	4	*	*	*	0.67 (0.58)	0.16	0.18	*	*	*
	5	*	*	*	0.66 (0.58)	0.21	0.12	*	*	*
	6	*	*	*	0.69 (0.60)	0.18	0.13	*	*	*
	7	*	*	*	0.67 (0.58)	0.14	0.19	*	*	*
	8	*	*	*	0.65 (0.57)	0.21	0.14	*	*	*
	11	*	*	*	0.70 (0.61)	0.14	0.16	*	*	*

continued

Content Area	Grade	Level 1/Level 2			Level 2/Level 3			Level 3/Level 4		
		Accuracy (Consistency)	False		Accuracy (Consistency)	False		Accuracy (Consistency)	False	
			Positive	Negative		Positive	Negative		Positive	Negative
Mathematics	3	*	*	*	0.64 (0.56)	0.11	0.24	*	*	*
	4	*	*	*	0.70 (0.61)	0.16	0.14	*	*	*
	5	*	*	*	0.64 (0.55)	0.13	0.23	*	*	*
	6	*	*	*	0.73 (0.64)	0.19	0.08	*	*	*
	7	*	*	*	0.61 (0.54)	0.15	0.23	*	*	*
	8	*	*	*	0.63 (0.55)	0.19	0.18	*	*	*
	11	*	*	*	0.96 (0.94)	0.02	0.02	*	*	*

Note: Due to the small sample size, students in Levels 1 and 2, and Levels 3 and 4 were collapsed for purposes of the decision accuracy and consistency analysis.

Table N-6. 2016–17 MSAA: Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Conditional on Cutpoint – Form 3

Content Area	Grade	Level 1/Level 2			Level 2/Level 3			Level 3/Level 4		
		Accuracy (Consistency)	False		Accuracy (Consistency)	False		Accuracy (Consistency)	False	
			Positive	Negative		Positive	Negative		Positive	Negative
ELA	3	*	*	*	0.92 (0.88)	0.02	0.06	0.83 (0.77)	0.07	0.10
	4	*	*	*	0.90 (0.86)	0.02	0.07	0.80 (0.73)	0.11	0.09
	5	*	*	*	0.91 (0.87)	0.02	0.07	0.78 (0.71)	0.11	0.11
	6	*	*	*	0.88 (0.83)	0.03	0.09	0.79 (0.72)	0.10	0.11
	7	*	*	*	0.92 (0.88)	0.01	0.06	0.78 (0.70)	0.10	0.12
	8	*	*	*	0.90 (0.85)	0.02	0.08	0.80 (0.72)	0.08	0.12
	11	*	*	*	0.91 (0.87)	0.02	0.07	0.79 (0.71)	0.11	0.10
Mathematics	3	*	*	*	0.93 (0.90)	0.02	0.05	0.84 (0.78)	0.08	0.08
	4	*	*	*	0.91 (0.87)	0.02	0.07	0.82 (0.75)	0.08	0.10
	5	*	*	*	0.93 (0.90)	0.01	0.05	0.82 (0.75)	0.08	0.10
	6	*	*	*	0.91 (0.87)	0.03	0.06	0.85 (0.80)	0.07	0.08
	7	*	*	*	0.94 (0.91)	0.02	0.05	0.85 (0.80)	0.06	0.08
	8	*	*	*	0.90 (0.86)	0.03	0.07	0.84 (0.78)	0.07	0.09
	11	*	*	*	0.92 (0.89)	0.03	0.05	0.87 (0.81)	0.06	0.08

Note: Due to the small sample size, students in Levels 1 and 2 were collapsed for purposes of the decision accuracy and consistency analysis.

APPENDIX O—TECHNICAL ADVISORY COMMITTEE MEMBERS

Table O-1. 2016-17 MSAA: Technical Advisory Committee Members

Name	Organization	Expertise
Derek Briggs	University of Colorado	Assessment / Growth / Psychometrics
Joseph Martineau	The National Center for the Improvement of Educational Assessment	Psychometrics / Computer Adaptive Testing
Rachel Quenemoen	National Center on Educational Outcomes	Students With Significant Cognitive Disabilities / NCSC Awareness
Michael Russell	Boston College	Technology / Accessibility
Martha Thurlow	University of Minnesota/NCEO	Special Education / Accessibility