

Comparison of the MLR and NECAP Expectations

Grade 7 Mathematics

Maine Learning Results	NECAP	Differences/Comments
A. Number	Number and Operations	
1. Students use negative and positive rational numbers expressed as integers, fractions, and decimals.	M(N&O)–7–2 Demonstrates understanding of the relative magnitude of numbers by ordering, comparing, or identifying equivalent rational numbers <u>across number formats</u> , numbers with whole number bases and whole number exponents (e.g., 3^3 , 4^3), integers, <u>absolute values</u> , or <u>numbers represented in scientific notation</u> using number lines or equality and inequality symbols.	Ordering integers appears in NECAP GLE N&O -6-2 (grade3 6). Identifying rational numbers across number formats appears in MLR A2 at grade 6. Exponents are introduced in MLR A1 at grade 6. Scientific notation is introduced in MLR A1 at grade 8.
2. Students compute with signed rational numbers.		Computing with integers is introduced in NECAP GLEs at grade 6 (N&O-6-4).
3. Students <i>understand</i> that when the ratio of two varying quantities is constant, the two quantities are in direct proportion.	M(N&O)–7–4 Accurately solves problems involving <u>proportional reasoning</u> ; <u>percents involving discounts, tax, or tips</u> ; and <u>rates</u> . (IMPORTANT: <i>Applies the conventions of order of operations including parentheses, brackets, or exponents.</i>)	
4. Students <i>interpret</i> and use percents to <i>solve</i> problems.	M(N&O)–7–1 Demonstrates conceptual understanding of rational numbers with respect to <u>percents as a means of comparing the same or different parts of the whole when the wholes vary in magnitude</u> (e.g., 8 girls in a classroom of 16 students compared to 8 girls in a classroom of 20 students, or 20% of 400 compared to 50% of 100); and <u>percents as a way of expressing multiples of a number</u> (e.g., 200% of 50) using models, explanations, or other representations.	

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B. Data	Data, Statistics, and Probability/Geometry & Measurement	
1. Students use graphs and charts to represent, organize, <i>interpret</i> , and draw inferences from data.	<p>M(DSP)–7–1 Interprets a given representation (circle graphs, <u>scatter plots that represent discrete linear relationships</u>, or <u>histograms</u>) to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: <i>Analyzes data consistent with concepts and skills in M(DSP)–7–2.</i>)</p> <p>M(DSP)–7–2 Analyzes patterns, trends, or distributions in data in a variety of contexts <u>by solving problems</u> using measures of central tendency (mean, median, or mode), dispersion (range or variation), or <u>outliers</u> to analyze situations to <u>determine their effect on mean, median, or mode</u>; and <u>evaluates the sample from which the statistics were developed (bias)</u>.</p> <p>M(DSP)–7–3 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in <u>M(DSP)–7–1</u>.</p>	<p>Scatter plots are introduced in MLR B2 at grade 9.</p> <p>Use of outliers and detecting bias in a sample are not explicitly mentioned in the MLRs.</p>
2. Students <i>understand</i> and apply concepts of probability to simple events.	M(DSP)–7–5 For a probability event in which the sample space may or may not contain equally likely outcomes, determines the experimental or theoretical probability of an event in a problem-solving situation.	

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C. Geometry	Geometry and Measurement	
1. Students <i>understand</i> angle properties of lines in the plane.	<p>M(G&M)–7–1 <u>Uses properties of angle relationships resulting from two or three intersecting lines (adjacent angles, vertical angles, straight angles, or angle relationships formed by two non-parallel lines cut by a transversal), or two parallel lines cut by a transversal to solve problems.</u></p> <p>M(G&M)–7–2 Applies theorems or relationships (triangle inequality or sum of the measures of interior angles of regular polygons) to solve problems.</p>	<p>Some of the content in NECAP GLE G&M-7-1 appears in MLR C2 at grade 8.</p> <p>Some of the content in NECAP GLE G&M-7-2 appears in MLR C1 at grade 8.</p>
2. Students <i>solve</i> problems involving perimeter and area.	M(G&M)–7–6 Demonstrates conceptual understanding of the area of <u>circles or the area or perimeter of composite figures (quadrilaterals, triangles, or parts of circles)</u> , and the <u>surface area of rectangular prisms, or volume of rectangular prisms, triangular prisms, or cylinders</u> using models, formulas, or by solving related problems. Expresses all measures using appropriate units.	
3. Students <i>understand</i> and use the concept of scale drawings to enlarge or reduce two-dimensional plane figures.	M(G&M)–7–5 <u>Applies concepts of similarity by solving problems involving scaling up or down and their impact on angle measures, linear dimensions and areas of polygons, and circles when the linear dimensions are multiplied by a constant factor.</u> Describes effects using models or explanations.	
No corresponding MLR at this grade.	M(G&M)–7–4 <u>Applies the concepts of congruency by solving problems on a coordinate plane involving reflections, translations, or rotations.</u>	Addressed in MLR C4 at grade 6.

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D. Algebra	Functions and Algebra	
1. Students <i>create</i> and <i>evaluate</i> simple expressions.	<p>M(F&A)–7–3 Demonstrates conceptual understanding of algebraic expressions by using letters to represent unknown quantities to write <u>algebraic expressions (including those with whole number exponents or more than one variable)</u>; or by evaluating <u>algebraic expressions (including those with whole number exponents or more than one variable)</u>; or by evaluating an expression within an equation (e.g., determine the value of y when $x = 4$ given $y = 5x^2 - 2$).</p> <p>M(F&A)–7–1 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, graphs, or in problem situations; and <u>generalizes a linear relationship using words and symbols</u>; <u>generalizes a linear relationship to find a specific case</u>; or <u>writes an expression or equation using words or symbols to express the generalization of a nonlinear relationship</u>.</p>	NECAP GLE F&A-7-1 goes beyond the expectations in this MLR.
2. Students <i>understand</i> and <i>solve</i> problems involving linear equations and know that a linear equation can be written in the form $0 = ax + b$.	<p>M(F&A)–7–4 Demonstrates conceptual understanding of equality by showing equivalence between two expressions (<u>expressions consistent with the parameters of the left- and right-hand sides of the equations being solved at this grade level</u>) using models or different representations of the expressions, solving multi-step linear equations of the form $ax \pm b = c$ with $a \neq 0$, $ax \pm b = cx \pm d$ with $a, c \neq 0$, and $(x/a) \pm b = c$ with $a \neq 0$, where a, b, c and d are whole numbers; or by <u>translating a problem-solving situation into an equation consistent with the parameters of the type of equations being solved for this grade level</u>.</p>	

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Students <i>understand</i> and use directly proportional relationships, $y = kx$.	M(F&A)–7–2 Demonstrates conceptual understanding of linear relationships ($y = kx$, $y = mx + b$) as a constant rate of change by <u>solving problems involving the relationship between slope and rate of change</u> , by <u>describing the meaning of slope in concrete situations</u> , or <u>informally determining the slope of a line from a table or graph</u> ; and <u>distinguishes between constant and varying rates of change in concrete situations represented in tables or graphs</u> ; or describes how change in the value of one variable relates to change in the value of a second variable in problem situations with constant rates of change.	Some of the content in the NECAP GLE is introduced at grade 8 in the MLRs.