EMDI Questions/Recording Sheet: Grade 5

Name _____ **Teacher** _____ **Date** _____

Green = grade level prompts; Yellow = prior grade level prompts

<table>
<tr><td colspan="2">1_G5. Compare Decimals</td><td colspan="2">Materials: Materials: screening cards; symbol cards; available: grid paper and base ten blocks</td></tr>
<tr><td colspan="4">Place a card in front of the student one at a time, along with the symbol cards, and say, "Choose the comparison symbol that shows the relationship between these two numbers." Once, they placed the symbol ask, "Can you read this for me?" Follow up: "How do you know?"

A. 0.165   0.2   B. 0.25   0.054   C.   0.43   0.430</td></tr>
<tr><td>Abilities</td><td colspan="2">Challenges/Strategies</td><td>Notes</td></tr>
<tr>
<td>
☐   0.165 < 0.2
☐   sound justification

☐   0.25 > 0.054
☐   sound justification

☐   0.43 = 0.430
☐   sound justification
</td>
<td colspan="2">
☐   Thinks more digits is greater
☐   Place value difficulty
☐   Incorrect comparison 0.165__ 0.2
☐   Incorrect comparison 0.25__ 0.054
☐   Incorrect comparison 0.43__ 0.430
☐   Unable to justify
☐   Does not read decimals using place value language (i.e. reads as "point two five or point twenty-five instead of twenty-five hundredths)
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<table>
<tr><td colspan="2">Compare Decimals (3_G4)</td><td colspan="2">Materials: screening cards; symbol cards >, <, and = available: grid paper, base ten blocks</td></tr>
<tr><td colspan="4">Place a card in front of the student, along with the symbol cards, and say:

"Choose the comparison symbol that shows the relationship between these two numbers."
Once they have placed the symbol ask, "Can you read this for me?"
Follow up: "How do you know?"

A. 0.16   0.2   B. 0.25   0.19   C. 0.4   0.40</td></tr>
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☐   0.16 < 0.2
☐   sound justification

☐   0.25 > 0.19
☐   sound justification

☐   0.4 = 0.40
☐   sound justification
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☐   Thinks more digits is greater
☐   Place value difficulty
☐   Incorrect comparison 0.16__ 0.2
☐   Incorrect comparison 0.25__ 0.19
☐   Incorrect comparison 0.4__ 0.40
☐   Does not read decimals using place value language (i.e. reads as "point two five" or "point twenty-five" instead of twenty-five hundredths)
☐   Unable to justify
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Decimal/Fraction Identification (2_G4)	**Materials**: screening cards; available: paper and pencil, symbol cards >, <, and =

A. Show card $\frac{6}{10}$ and ask the student to read the number. Then ask, "How would you write this number in decimal form?" Follow up: "How do you know?"

B. Show card $\frac{54}{100}$ and ask the student to read the number. Then ask, "How would you write this number in decimal form?" Follow up: "How do you know?"

C. Show card 0.07 and ask the student to read the number. Then ask, "How would you write this decimal number as a fraction?" Follow up: "How do you know?"

Abilities	Challenges/Strategies	Notes
Compares		
	☐ Unable to write any decimal	
☐ 0.6	☐ Incorrectly writes 0.6 as_____	
	☐ Incorrectly writes 0.54 as_____	
☐ 0.54	☐ Other	
☐ $\frac{7}{100}$	☐ Unable to write fraction	
	☐ Incorrectly writes fraction as_____	
	☐ Other	

2_G5. Rounding: Place Value	**Materials:** screening cards; available: paper and pencil

A. Place 21.543 card in front of student and ask the student to read the number. Then ask, "How would you round this number to the nearest **hundredths**?" Follow up: "How do you know?"

B. Place 96.064 card in front of student and ask the student to read the number. Then ask, "How would you round this number to the nearest **tenths**?" Follow up: "How do you know?"

Abilities	Challenges/Strategies	Notes
☐ Rounds to 21.54	☐ Rounds to an incorrect number _____	
☐ Rounds to 96.1	☐ Rounds to an incorrect number _____	
	☐ Trouble identifying place values	

Rounding: Place Value (1_G4)

Materials: screening cards; available: paper and pencil

A. Place 4,546 card in front of student and ask the student to read the number. Then ask, "How would you round this number to the nearest **hundred**?" Follow up: "How do you know?"

B. Place 48.67 card in front of student and ask the student to read the number. Then ask, "How would you round this number to the nearest **tenths**?" Follow up: "How do you know?"

Abilities	Challenges/Strategies	Notes
☐ Rounds to 4,500	☐ Rounds to 5000	
	☐ Rounds to 4400 or 4600	
	☐ Other	
☐ Rounds to 48.7	☐ Rounds to 50.	
	☐ Rounds to 48.6	
	☐ Other	

3_G5. Multiplication and Division by 10

Materials: screening cards; available: paper and pencil

Place a screening card in front of the student, and ask the question shown.
If needed, follow up: "How did you figure out your answer?"

A. 427×10^2 "What is this number in standard form?"

B. $347.8 \div 10$ "What is this number in standard form?"

C. "How many times greater is the value of the 4 in 604,000 than the value of the 4 in 513,400?"

Abilities	Challenges/Strategies	Notes
☐ 42,700	☐ Difficulties with result of multiplying by powers of 10	
☐ Knows results of multiplying by powers of 10	☐ Difficulties with result of dividing by power of 10	
☐ 34.78	☐ Difficulties with simplifying expanded form	
☐ Knows result of dividing by power of 10	☐ Difficulty with place value relationships	
☐ 10 times greater		

4_G5. Operations with Decimals

Materials: screening cards; available: paper and pencil

Place a screening card in front of the student, and ask, "What is the answer to this problem?"
If needed, follow up: "How did you figure out your answer?"

    A. 48.34 + 16.07

    B. 57.9 – 12.78

    C. 16 x 2.75

    D. 40 ÷ 0.25

Abilities	Challenges/Strategies	Notes
☐ 48.34 + 16.07=64.41 Model- partial sum – standard – compensation-other	☐ **48.34 + 16.07 =_____** Strategy attempted:	
☐ 57.9 – 12.78=45.12	☐ **57.9-12.78 =_____** Strategy attempted:	
☐ 16 x 2.75 = 44	☐ **16 x 2.75 =_____** Strategy attempted:	
☐ 40 ÷ 0.25 =160	☐ **40 ÷ 0.25 = _____** Strategy attempted:	

Operations with Whole Numbers (5_G4)

Materials screening cards; available: paper and pencil

Place a screening card in front of the student, and ask, "What is the answer to this problem?"
If needed, follow up: "How did you figure out your answer?"

    A. 765 + 218   B. 5,600 ÷ 7   C. 43 x 21

Abilities	Challenges/Strategies	Notes
☐ **765+218= (983)** Model- partial sum – standard – compensation-other	☐ **765+218 =_____** Strategy attempted:	
☐ **5,600 ÷ 7= (800)** strategy:	☐ **5,600 ÷ 7 =_____** Strategy attempted:	
☐ **43 x 21= (903)** Model- partial products – standard – compensation-other	☐ **43 x 21 =_____** Strategy attempted:	

5_G5. Estimate Fraction Sums and Differences	Materials screening cards

Show each card and ask students to estimate rather than work out an exact answer.

A. $\frac{9}{10} + \frac{3}{5}$ "Using estimation, is the sum less than 1 or greater than 1?"

B. $\frac{1}{5} + \frac{2}{9}$ "Using estimation, is the sum less than $\frac{1}{2}$ or greater than $\frac{1}{2}$?"

C. $\frac{3}{4} - \frac{1}{3}$ "Using estimation, Is the difference less than $\frac{1}{2}$ or greater than $\frac{1}{2}$?"

Abilities	Challenges/Strategies	Notes
☐ Uses benchmark fractions to estimate ☐ Rounds and compensates ☐ Reasons about the effect of adding or subtracting	☐ Computes rather than estimates ☐ Difficulty using benchmarks to estimate ☐ Other	

Compare Fractions (4_G4)	Materials: screening cards; symbol cards >, <, =

Place a card in front of the student, along with the symbol cards, and say, "Choose the comparison symbol that shows the relationship between these two fractions." Once they have placed the symbol ask, "Can you read this for me?" Then follow up: "How do you know?"

A. $\frac{5}{9}$ $\frac{5}{12}$ B. $\frac{6}{8}$ $\frac{3}{4}$ C. $\frac{4}{5}$ $\frac{6}{7}$

Abilities	Challenges/Strategies	Notes
☐ $\frac{5}{9} > \frac{5}{12}$ ☐ $\frac{6}{8} = \frac{3}{4}$ ☐ $\frac{4}{5} < \frac{6}{7}$ ☐ Compares to benchmarks ½ or 1	☐ Whole number overgeneralization (looks for largest or smallest number) ☐ Thinks if numbers are not the same fractions must not be equivalent ☐ No use of benchmarking (comparing to common fractions like ½) ☐ Creates visual representation of fractions ☐ Reasons about number of pieces and piece size ☐ Other difficulties	

6_G5. Fraction Addition & Subtraction Strategies	**Materials:** paper and pencil; available: fraction circles, bars, number lines, grid paper

Place one card in front of the student at a time and ask, "What is the answer to this problem?" If needed, follow up with "How did you figure out your answer?"

A. $\frac{5}{8} + \frac{3}{12}$ B. $1\frac{4}{5} + 4\frac{1}{4}$ C. $4\frac{1}{2} - 2\frac{1}{3}$

Abilities	Challenges/Strategies	Notes
☐ $\frac{5}{8} + \frac{3}{12} = \frac{21}{24}$ $or \frac{7}{8}$	☐ $\frac{5}{8} + \frac{3}{12} =$ Strategy attempted:	
☐ $1\frac{4}{5} + 4\frac{1}{4} = 5\frac{21}{20}$ $or\ 6\frac{1}{20}$	☐ $1\frac{4}{5} + 4\frac{1}{4} =$ Strategy attempted:	
☐ $4\frac{1}{2} - 2\frac{1}{3} = 2\frac{1}{6}$	☐ $4\frac{1}{2} - 2\frac{1}{3} =$ Strategy attempted:	
☐ Understands need for common denominator	☐ Adds/subtracts numerators	
☐ Explains approach	☐ Adds/subtracts denominators	
	☐ Adds/subtracts both	
	☐ Other	

Addition & Subtraction Strategies-Fractions (6_G4_)	**Materials:** screening cards available: fraction circles, bars, number lines, grid paper

Place one card in front of the student at a time, and ask, "What is the answer to this problem?" If needed, follow up: "How did you figure out your answer?"

A. $\frac{2}{7} + \frac{4}{7}$ B. $1\frac{3}{10} + 4\frac{7}{10}$ C. $8\frac{5}{8} - 2\frac{3}{8}$

Abilities	Challenges/Strategies	Notes
☐ $\frac{2}{7} + \frac{4}{7} = \frac{6}{7}$	☐ $\frac{2}{7} + \frac{4}{7}$ Strategy attempted:	
☐ $1\frac{3}{10} + 4\frac{7}{10} = 5\frac{10}{10}$ or 6	☐ $1\frac{3}{10} + 4\frac{7}{10}$ Strategy attempted:	
☐ $8\frac{5}{8} - 2\frac{3}{8} = 6\frac{2}{8}$ or 6 $\frac{1}{4}$	☐ $8\frac{5}{8} - 2\frac{3}{8}$ Strategy attempted:	
☐ Explains approach	☐ Adds/subtracts numerators	
	☐ Adds/subtracts denominators	
	☐ Other	

7_G5. Estimating Fraction Products and Quotients   Materials: screening cards,

Show each card and ask students to estimate rather than work out an exact answer. If needed, follow up: "How do you know?"

A. $2 \times \frac{4}{5}$ "Using estimation, is the product less than $\frac{4}{5}$ or greater than $\frac{4}{5}$?"

B. $\frac{2}{3} \times \frac{9}{10}$ "Using estimation, is the product less than $\frac{9}{10}$ or greater than $\frac{9}{10}$?"

C. $3 \div \frac{1}{8}$ "Using estimation, is the quotient less than 3 or greater than 3?"

Abilities	Challenges/Strategies	Notes
☐ greater than $\frac{4}{5}$	☐ Misconception: multiplication always makes bigger	
☐ less than $\frac{9}{10}$		
☐ greater than 3	☐ Misconception: division always makes smaller	
☐ Reasons about fractions and multiplication (2 times is doubling; 2/3 of a number less is less than that number)	☐ Computes rather than estimates	
☐ Reasons about fraction division (3 has how many 1/8)	☐ Other	

8_G5. Fraction Multiplication and Division

Materials: screening cards
available: paper and pencil, fraction circles or bars, number lines, grid paper

Show each card and ask, "What is the answer to this problem?

If needed, follow up: "How did you figure out your answer?"

A. $\frac{2}{3} \times \frac{5}{8}$ B. $\frac{1}{5} \div 2$

Abilities	Challenges/Strategies	Notes
☐ $\frac{2}{3} \times \frac{5}{8} = \frac{10}{24}$ or $\frac{5}{12}$	☐ $\frac{2}{3} \times \frac{5}{8} =$ Strategy attempted:	
☐ $\frac{1}{5} \div 2 = \frac{1}{10}$		
☐ Uses multiplication algorithm	☐ $\frac{1}{5} \div 2 =$ Strategy attempted:	
☐ Uses fraction division algorithm	☐ Difficulty with fraction multiplication algorithm	
☐ Uses other effective strategies:	☐ Difficulty with fraction division algorithm	
☐ Simplifies fractions		
☐ Explains approach		

Multiplication of Fractions (7_G4)   **Materials:** screening cards

Place the card $4 \times \frac{2}{3}$ in front of the student and say, "Take a look at this card." Next, spread the remaining cards in the set out in front of the student and ask,

A. "Which of these cards is another way to show or represent $4 \times \frac{2}{3}$?"

B. Point to the $4 \times \frac{2}{3}$ card and ask, "What is the answer to this problem?" If needed, follow up with "How did you figure out your answer?"

Abilities	Challenges/Strategies	Notes
☐ selects these three correct representations: $8 \times \frac{1}{3}$ $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3}$ ☐ $4 \times \frac{2}{3} = \frac{8}{3}$ or $2\frac{2}{3}$ ☐ sound justification	☐ Difficulty with groups of ☐ Difficulty with equivalent expression ☐ Difficulty with repeated addition ☐ Difficulty interpreting number line ☐ Other	

9_G5. Fraction Word Problems   **Materials:** screening cards; paper and pencil; available: fraction pieces or bars, number lines, grid paper

Place card in front of the student and ask the student to read the problem aloud and then solve it. If needed, follow up: "How did you figure out your answer?"

A. Penny is making snack bags of raisins. She wants each snack bag to contain $\frac{1}{4}$ cup of raisins. If she has 3 cups of raisins, how many snack bags can she make?

B. Jackie and Gina mow their neighbor's lawn. First, Jackie mowed $\frac{2}{3}$ of the lawn. Then, Gina mowed $\frac{3}{4}$ of what Jackie did not mow. What part of the whole lawn did Gina mow?

Abilities	Challenges/Strategies	Notes
☐ $3 \div \frac{1}{4} = 12$ ☐ Identifies correct unit (bags) ☐ Strategy: 3 has how many ¼; standard division; visual model ☐ $\frac{3}{4} \times \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$ ☐ Identifies correct unit (lawn) ☐ Strategy: cross-cancels; standard multiplication; visual model ☐ Represents situations correctly	☐ $3 \div \frac{1}{4} =$ _____ Strategy attempted: ☐ Incorrect unit ☐ $\frac{3}{4} \times \frac{1}{3} =$ _____ Strategy attempted: ☐ Incorrect unit	

8_G4. **Fraction Word Problems** **Word Problems**	**Materials** Screening cards; paper and pencil; available: fraction pieces or bars, number lines, grid paper

Place card in front of the student and ask the student to read the problem aloud and then solve it. If needed, follow up: "How did you figure out your answer?"

If the student does not express the answer as a mixed numeral, follow up: "Is there another way to express this answer?"

A. There are 2 containers of paint with $\frac{3}{5}$ of a gallon in each container. How many gallons of paint are there?

B. Trina's watering can has 2 gallons of water in it. After she waters her plants, there is $\frac{3}{4}$ of a gallon of water in the can. How much water did she use?

C. There are 7 children sitting at the table. Paulina gives ½ of an apple to each of them. How many apples does she give out?

Abilities	**Challenges/Strategies**	**Notes**
☐ $2 \times \frac{3}{5} = 1\frac{1}{5}$ or $\frac{6}{5}$	☐ $2 \times \frac{3}{5} = $ __ Strategy attempted:	
☐ Correct unit (gallons)		
☐ Strategy: visual model, additive; standard multiplication	☐ Incorrect unit	
☐ $2 - (1\frac{1}{4}$ or $\frac{5}{4}) = \frac{3}{4}$	☐ $2 - $ __ $= \frac{3}{4}$ Strategy attempted:	
☐ Correct unit (gallons)	☐ Incorrect unit	
☐ Strategy: regrouping, adding up, expressing as improper fractions & using algorithm.	☐ $7 \times \frac{1}{2} = $ __ Strategy attempted:	
☐ $7 \times \frac{1}{2} = 3\frac{1}{2}$ or $\frac{7}{2}$	☐ Incorrect unit	
☐ Correct unit (apples)		
☐ Strategy: ½ of 7; algorithm		