MDI Questions/Recording Sheet: Grade 7

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

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

1_G7. Compare **Materials:** screening cards, symbols cards

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. $-\frac{3}{4}$ $-\frac{1}{2}$ B. -2 $-\frac{13}{6}$ C. -4.6 $-4\frac{2}{3}$

Abilities	Challenges/Strategies	Notes
□ $-\frac{3}{4} < -\frac{1}{2}$ □ Sound justification □ $-2 > -\frac{13}{6}$ □ Sound justification □ $-4.6 > -4\frac{2}{3}$ □ Sound justification	□ Incorrect comparison $-\frac{3}{4}$ ____ $-\frac{1}{2}$ □ Incorrect comparison -2 __ $-\frac{13}{6}$ □ Incorrect comparison -4.6 ___ $-4\frac{2}{3}$ □ Compares numeric value, ignores (-) □ Unable to justify	

Compare (1_G6) **Materials:** screening cards; symbol cards

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 -3 B. -7 -5 C. -4 -4.5 D. $-\frac{1}{2}$ $-\frac{1}{16}$

Abilities	Challenges/Strategies	Notes
□ $0 > -3$ □ Sound justification □ $-7 < -5$ □ Sound justification □ $-4 > -4.5$ □ Sound justification □ $-\frac{1}{2} < -\frac{1}{16}$ □ Sound justification	□ Incorrect comparison 0__ -3 □ Incorrect comparison -7 _ -5 □ Incorrect comparison $-4 > -4.5$ □ Incorrect comparison $-\frac{1}{2}$ __ $-\frac{1}{16}$ □ Compares numeric value, ignores (-) □ Unable to justify	

2_G7. Operations with Rational Numbers

Materials: screening cards available: two-color chips, number line

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

A. -3 + 7

B. $-5 - 1\frac{2}{3}$

C. $-\frac{1}{2} - -1\frac{3}{4}$

Abilities	Challenges/Strategies	Notes
Identifies □ 4 □ $-6\frac{2}{3}$ □ $1\frac{1}{4}$ □ Understands interaction of negative and positive values □ Correctly works with fractions and/or mixed numbers □ Explains approach / justifies thinking	Unable to identify: □ 4 □ $-6\frac{2}{3}$ □ $1\frac{1}{4}$ □ Computes with positive values, but doesn't take into account negative value □ Challenged with fraction operations	

Fraction Addition & Subtraction Strategies (6_G5)

Materials: screening cards available: fraction circle/ bars, # lines, grid paper

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

Abilities	Challenges/Strategies	Notes
Identifies: □ $\frac{5}{8} + \frac{3}{12} = \frac{21}{24}$ *or* $\frac{7}{8}$ □ $1\frac{4}{5} + 4\frac{1}{4} = 5\frac{21}{20}$ *or* $6\frac{1}{20}$ □ $4\frac{1}{2} - 2\frac{1}{3} = 2\frac{1}{6}$ □ Understands need for common denominator □ Explains approach	Unable to identify: □ $\frac{4}{16}$ (four-sixteenths or equiv) □ $-\frac{4}{5}$ (negative four-fifths)	

3_G7. Rational Numbers Multiplication/Division	**Materials:** screening cards available: paper and pencil

Show each card and ask students to use what they know about fraction operations to determine whether the product/quotient is less than or greater than the benchmark, rather than work out an exact answer. If needed, follow up: "How do you know?"

A. $\frac{4}{7} \times -\frac{1}{2}$

"Using what you know about fraction operations, is the product less than $-\frac{1}{2}$ or greater than $-\frac{1}{2}$?"

B. $-\frac{2}{3} \div -\frac{1}{2}$

"Using what you know about fraction operations, is the quotient less than $-\frac{2}{3}$ or greater than $-\frac{2}{3}$?"

Abilities	Challenges/Strategies	Notes
□ $\frac{4}{7} \times -\frac{1}{2} > -\frac{1}{2}$ □ Sound justification □ $-\frac{2}{3} \div -\frac{1}{2} > -\frac{2}{3}$ □ Sound justification	□ $\frac{4}{7} \times -\frac{1}{2} < -\frac{1}{2}$ □ $-\frac{2}{3} \div -\frac{1}{2} < -\frac{2}{3}$ □ Unable to justify □ Challenged by negative values □ Challenged by fractional values □ Misconception: multiplication makes it larger, which is why it's greater □ Misconception: Division makes it smaller □ Only computes, rather than reasons	

Estimating Fraction Quotients (6_G6)	**Materials:** screening cards available: paper and pencil

Show each card and ask students to use what they know about fraction operations to determine whether the quotient is less than or greater than the benchmark, rather than work out an exact answer. If needed, follow up: "How do you know?"

A. $\frac{5}{11} \div \frac{3}{4}$

"Using what you know about fraction operations, is the quotient less than 1 or greater than 1?"

B. $2\frac{1}{8} \div \frac{1}{4}$

"Using what you know about fraction operations, is the quotient less than 4 or greater than 4?"

Abilities	Challenges/Strategies	Notes
☐ $\frac{5}{11} \div \frac{3}{4} < 1$ ☐ Sound justification ☐ $2\frac{1}{8} \div \frac{1}{4} > 4$ ☐ Sound justification	☐ $\frac{5}{11} \div \frac{3}{4} > 1$ ☐ $2\frac{1}{8} \div \frac{1}{4} < 4$ ☐ Unable to justify	

Estimating Fraction Products & Quotients (7_G5)	**Materials:** screening cards, available paper and pencil

Show each card and ask students to use what they know about fraction operations to determine whether the quotient is less than or greater than the benchmark, rather than work out an exact answer. If needed, follow up: "How do you know?"

A. $2 \times \frac{4}{5}$

"Using what you know about fraction operations, is the product less than $\frac{4}{5}$ or greater than $\frac{4}{5}$?"

B. $\frac{2}{3} \times \frac{9}{10}$

"Using what you know about fraction operations, is the product less than $\frac{9}{10}$ or greater than $\frac{9}{10}$?"

C. $3 \div \frac{1}{8}$

"Using what you know about fraction operations, is the quotient less than 3 or greater than 3?"

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

4_G7. Percent Problems

Materials: screening cards
available: paper and pencil

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

A. What is the total cost? Item $20, Tax Rate 5%
B. What is the sale price? Item $40, Sale 20% off

Abilities	Challenges/Strategies	Notes
☐ Total cost: $21 ☐ Sound justification ☐ Sale price: $32 ☐ Sound justification	☐ Total cost:_____ ☐ Sale price:____ ☐ Unable to justify ☐ Calculates percentage, but not final price ☐ Circle Strategy: Benchmark percentages; Proportion/equation; Other	

Percent of a Quantity (3_G6)

Materials: screening cards;
available: paper and pencil

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

B. What is 5% of 30? B. 6 is what % of 24? C. 30% of what is 6?

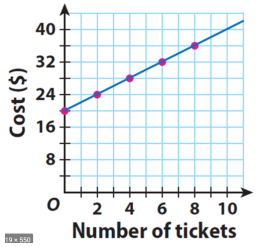
Abilities	Challenges/Strategies	Notes
☐ 5% of 30 is 1.5 ☐ Sound justification ☐ 6 is **25%** is 24 ☐ Sound justification ☐ 30% of **20** is 6 ☐ Sound justification	☐ 5% of 30 is ___ ☐ 6 is ___**%** is 24 ☐ 30% of ___ is 6 ☐ Unable to justify	

5_G7. Proportional Relationships	**Materials:** screening cards; available: paper and pencil

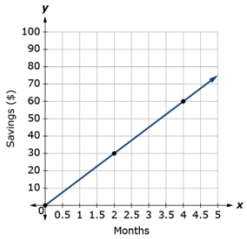
Spread the 6 cards in the set out in front of the student and ask, “Which of these relationships show a proportional relationship between 2 quantities?”

A. $3x = y$

B.



C.

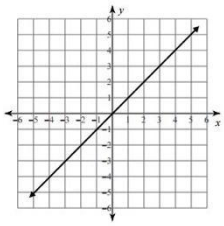


D.

x	y
0	0
4	8
7	14

E. $y = 2x + 5$

F.



Abilities	**Challenges/Strategies**	**Notes**
☐ Proportional Relationships: A, C, D, F ☐ Sound justification	☐ Unable to explain proportional relationships for: ☐ equation ☐ graph ☐ table	

Equivalent Ratios (4_G6)	**Materials:** screening cards; available: paper and pencil

Place a screening card in front of the student one at a time, and ask, “What missing amount will make the ratios equivalent?” If needed, follow up: “How did you figure out your answer?”

A. 4 : 7 = _ : 21

B. 12 : _ = 4 : 3

Abilities	**Challenges/Strategies**	**Notes**
☐ 4 : 7 = **12** : 21 ☐ Sound justification ☐ 12 : **9** = 4 : 3 ☐ **S**ound justification	☐ 4 : 7 = __ : 21 ☐ 12 : __ = 4 : 3 ☐ Unable to justify	

6_G7. Unit Rates	**Materials:** screening cards

Place the problem cards in front of the student one at a time, and say, “What is the answer to this problem?” Once, the student responds, ask, “How do you know?”

A. Ana earns $50 in 4 hours. How much does she earn per hour?
B. Jayden earns $36 in 3 hours. Does Ana or Jayden earn more per hour?
C. $56 for 8 pounds of almonds, $77 for 10 pounds of walnuts. Which costs less per pound?

Abilities	**Challenges/Strategies**	**Notes**
☐ $12.50 per hour ☐ Sound justification ☐ Sound justification that Ana earns more per hour, with Jayden earning $12/hour. ☐ Almonds: $7/lb; Walnuts: $7.70/lb. ☐ Sound justification that almonds cost less per pound.	☐ Unable to find unit rates ☐ Reasons based on total earned or costs, rather than unit rates. ☐ Unable to justify ☐ Incorrect choices: _____	

Ratio Word problems (5_G6)	**Materials:** screening cards

Place the problem cards in front of the student one at a time, and say, “Which is a better deal.” Once, the student chooses, ask, “How do you know?”

A. $23 for 2 pounds fish, $11 for a pound of fish
B. $7 for 9 pounds of flour, $8 for 10 pounds of flour

Abilities	**Challenges/Strategies**	**Notes**
☐ Chooses $11 for a lb. ☐ Sound justification ☐ Chooses $7 for 9 ☐ Sound justification	☐ Incorrect choice _____ ☐ Incorrect choice _____ ☐ Unable to justify	

7_G7. Algebraic Expressions **Materials:** screening cards

Place the pair of expression cards in front of the student one at a time, and say, “Are these expressions equivalent?” Follow up with, “How do you know?”

A. 3x + 5 + 7x 10x + 5
B. 4(x - 8) 4x - 8
C. -5(x - 8) + 2 -5x – 38

Abilities	Challenges/Strategies	Notes
☐ 3x + 5 + 7x equivalent to 10x + 5 ☐ Sound justification ☐ 4(x - 8) not equivalent to 4x – 8 ☐ Sound justification ☐ -5(x - 8) + 2 not equivalent to -5x – 38 ☐ Sound justification	☐ Not Equivalent ☐ Equivalent ☐ Equivalent ☐ Unable to justify	

Algebraic Expressions (8_G6) **Materials:** screening cards
Available: paper and pencil

Place the pair of expression cards in front of the student one at a time, and say, “Are these expressions equivalent?” Follow up with, “How do you know?”

A. 3 + 4n + 1 8n B. 2(m + 3) 2m + 3

Abilities	Challenges/Strategies	Notes
☐ 3+ 4n + 1 Not Equivalent to 8n ☐ Sound justification ☐ 2(m+3) Not Equivalent to 2m+3 ☐ Sound justification	☐ Equivalent ☐ Equivalent ☐ Unable to justify	

8_G7. Word Problems	**Materials:** screening cards; available: paper and pencil

Place the word problem card in front of the student and say, “Read the problem on this card.” Next spread the remaining cards in the set out in front of the student and ask,

A. The length of a box is 3 more than twice its width. Let l represent the length of the box and w represent the width of the box. “Choose all of the equations that could represent the given situation.” Follow up: How do you know?

$l - 3 = 2w$ $l + 3 = 2w$ $l = 2w + 3$ $l - \frac{3}{2} = 2$ $\frac{1}{2} - 3 = w$ $l = 2(w + 3)$

B. A puppy weighed 14 ounces at birth. It gains 2 ounces each week. Let x represent the number of weeks. How much does it weigh after x weeks? “Which of these cards is an equation that could represent the given situation?” Follow up: “How do you know?”

y = 14x + 2 y = 2x + 14 x = 2y + 14 y −14 = 2x y-14/2 = x y/2 + 7 = x

Abilities	**Challenges/Strategies**	**Notes**
Represents situation: ☐ $l - 3 = 2w$ ☐ Sound justification ☐ $l = 2w + 3$ ☐ Sound justification Does not represent situation: $l + 3 = 2w$; $l - 3/2 = 2$ ½ - 3 = w; $l = 2(w + 3)$	☐ Incorrect choices: ☐ Unable to justify	
Represents situation: ☐ y = 2x + 14 ☐ Sound justification ☐ y −14 = 2x ☐ Sound justification Does not represent situation: y = 14x + 2; x = 2y + 14 y-14/2 = x; y/2 + 7 = x	☐ Incorrect Choices: ☐ Unable to justify	

Word Problems (9_G6)	**Materials:** screening cards; available: paper and pencil

Place the word problem card in front of the student and say, “Read the problem on this card.” Next, spread the remaining cards in the set out in front of the student and ask,

A school group is preparing for a field trip to a science center. There will be 7 times as many students as teachers on the trip.

A. “Which card is an equation that represents the relationship in the problem?”

B. “Are there other cards that also represent this problem? If so which one/one? If not, why not?”

7s = t t = $\frac{1}{7}$ s 7t = s 7 = $\frac{s}{t}$ $\frac{t}{s}$ = 7

Abilities	**Challenges/Strategies**	**Notes**
Represents Relationship ☐ t = $\frac{1}{7}$ s ☐ Sound justification ☐ 7t = s ☐ Sound justification ☐ 7 = $\frac{s}{t}$ ☐ Sound justification Does Not Represent Relationship ☐ 7s = t ☐ Sound justification ☐ 7 = $\frac{t}{s}$ ☐ Sound justification	Incorrect Choices: ☐ 7s = t ☐ 7 = $\frac{t}{s}$ ☐ Unable to justify	