Broward County Public Schools

CARE

Curriculum Assessment Remediation Enrichment

Grade 6th Grade

Mathematics CARE Package # 2

Domain	The Number System		
Cluster	3: Apply and extend previous understanding of numbers to the system of rational numbers.		
Cluster	1: Apply and extend previous understanding of multiplication and division to divide fractions by fractions		
Standards	**MAFS.6.NS.3.6c** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	**MAFS.6.NS.3.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.	**MAFS.6.NS.1.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*

CURRICULUM

Student Problem-Solving

This links to the Student Problem-Solving 6th Grade Advanced site that provides interactive activities for students. This is wiki is a work in progress and will be updated regularly.

Implementation Suggestion

Students may work independently or in small groups of 2-3 to complete the task (ESE Strategy – Provide peer assistance; ESOL E4 – Peer Pair). Allow 15-20 minutes to complete this task. Students can meet with other groups to share their results. (ESOL (E6 – Think/Pair/Share). Then, review as a class-wide discussion.

Differentiation

Some students may benefit from working with a partner to complete the task. Encourage students who completed the performance task early to find the difference between their average scores and Tyra's average score. Ask them, in which quadrant of the coordinate plane would the second ball will be chipped in if it landed to the right of the hole and below the hole on the coordinate plane and have students to explain their reasoning. Students who complete the task early may also work with a blank coordinate plane to create another scenario. (e.g., pinpointing animal burrows in a field) in which locations can be indicated through the use of the coordinate pairs

Mathematical Practice 1

This task provides an opportunity for students to make sense of a problem and persevere in solving it. Students analyze the problem, formulate a plan, solve the problem, and justify the solution.

Mathematical Practice 3

This task provides an opportunity for students to construct viable arguments and critique the reasoning of others. Students share solutions among the group and justify via viable arguments giving students the opportunity to critique the reasoning of others.

Performance Task

Golfing with Number Line and Coordinate Plane

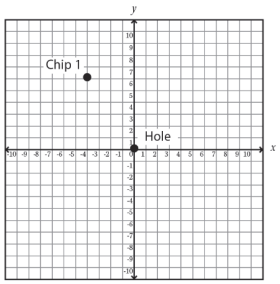
You are participating for a golf competition. Over the weekend, you play four rounds of golf with your coach, Tyra. The table below shows the scores after each round, and the average of the four scores.

	Your score	**Tyra's score**
Round 1	+8	-2
Round 2	+7	-1
Round 3	+9	+2
Round 4	+6	0
Average score	+7.5	-0.25

1. If the scores for Round 1 and Round 2 were plotted on a number line, would your average score be to the right or to the left of Tyra's average score? Explain your reasoning.

2. You want to know how your average compares with everyone else's, so you ask three of your friends for their average scores so far this season. Jean tells you his average score is $\frac{4}{15}$; Reggie tells you his average is $-\frac{3}{17}$; and Denise tells you her average is $-\frac{21}{8}$. Plot your average score along with the average score for each of your friends on the number line below. How your score does compares to your friends' score?

3. You are practicing chipping the golf ball onto the green (the area of grass around the hole). Chipping means using the golf club to pop the ball into the air a short distance so that it lands on the green. You draw a coordinate plane to represent the green. The point (0, 0) represent the hole, and each unit on the plane represents 1 foot. You measure how far each ball is from the hole. The location of the first ball you chip is plotted below.



a) What are the coordinates of the first ball you chip?

b) The second ball you chip lands at (3.5, 5.5). Plot this point on the coordinate plane.

c) The third ball you chip lands $\frac{13}{2}$ feet to the right of the hole and $-\frac{10}{4}$ feet below the hole on the coordinate plane. Plot this point on the coordinate plane.

Student worksheet, answer key, rubric and teacher's note can be found at the end of this document

ASSESSMENT

The Mini-MAF includes standards 6.NS.3.6, 6.NS.3.7, and 6.NS.1.1. Use the following table to assist in remediation efforts.

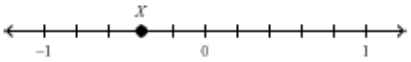
Questions	Standards	Lesson
1, 3, 7, 8	6.NS.3.6	Lesson 3.2 Identifying Opposites and Absolute Value of Rational Numbers
5, 6, 9	6.NS.3.7	Lesson 3.3 Comparing and Ordering Rational Numbers
2, 4, 10	6.NS1.1	Lesson 4.2 Dividing Fractions

Name: _____ **Class:** _____ **Date:** _____ **ID: A**

6th Grade Advanced Mini-MAFS 2 (To be given after Lesson 4.2)
MAFS.6.NS.1.1, MAFS.6.NS.3.6c, MAFS.6.NS.3.7a

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1 What value does the point X represent?



A −0.4 **B** −0.2 **C** 0.2 **D** 0.4

2 Which process do you use to find $\frac{4}{7} \div 5\frac{1}{6}$?

A Divide $\frac{4}{7} \div 5$ and divide $\frac{4}{7} \div \frac{1}{6}$, then find the sum of those quotients.

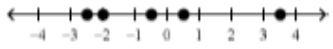
B Divide $\frac{4}{7} \div 5$ and divide $\frac{4}{7} \div \frac{1}{6}$, then find the product of those quotients.

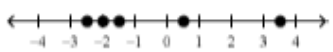
C Rewrite $5\frac{1}{6}$ as an improper fraction, find its reciprocal, and multiply it by $\frac{4}{7}$.

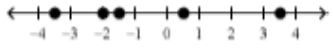
D Rewrite $5\frac{1}{6}$ as an improper fraction, and then multiply by the reciprocal of $\frac{4}{7}$.

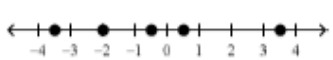
3 Which number line below shows the set of numbers graphed correctly?

$\left\{3.5, -\frac{7}{2}, \frac{1}{2}, -2, -1\frac{1}{2}\right\}$

A


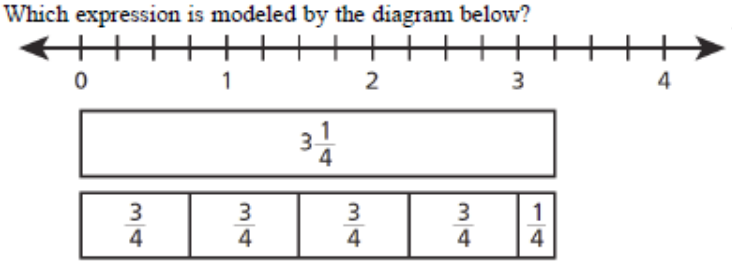
B


C


D


Name: _____ ID: A

4 Which expression is modeled by the diagram below?



A $3\frac{1}{4} \div \frac{3}{4}$ **B** $\frac{3}{4} \div 3\frac{1}{4}$ **C** $3\frac{1}{4} \div 4$ **D** $\frac{1}{4} \div 3$

5 Which number is to the left of $-5\frac{3}{5}$ on a number line?

A $-7\frac{1}{5}$ **B** -5 **C** 0 **D** -3.4

6 Raul has a checkbook balance of -$23.25. Shaylyn has a checkbook balance of −$25. Which statement correctly relates the two values?

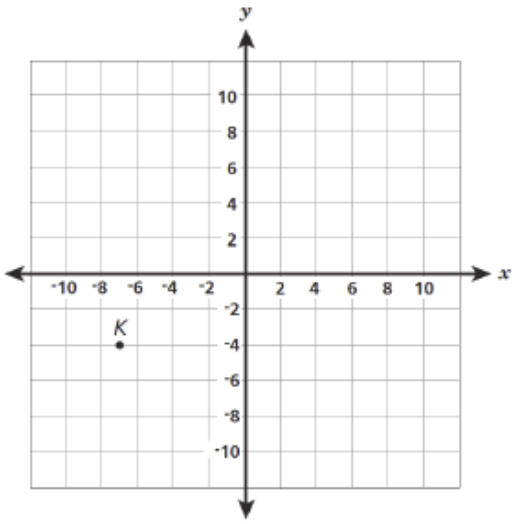
A −25 is less than -23.25, so −25 is located to the left of -23.25 on a number line.
B −25 is less than -23.25, so −25 is located to the right of -23.25 on a number line.
C −25 is greater than -23.25, so −25 is located to the left of -23.25 on a number line.
D −25 is greater than -23.25, so −25 is located to the right of -23.25 on a number line.

7 Which of the following rational numbers is the same as 0.7, in the form $\frac{a}{b}$, where a and b are integers?

A $\frac{1}{7}$ **C** $\frac{3}{7}$
B $\frac{3}{4}$ **D** $\frac{7}{10}$

Name: _____ ID: A

8 What coordinate best represent the location of point K on the coordinate plane below?



A $(-7,-4)$ **B** $(-7,4)$ **C** $(-4,-7)$ **D** $(-4,7)$

9 In which are **both** statements true?

A $-12 > -18$ and $|-12| > |-18|$
B $-7 > -22$ and $|-22| < |-7|$
C $-21 > -29$ and $|-29| > |-21|$
D $-9 > -15$ and $|-15| < |-9|$

10 The area of a rectangular city park is $\frac{25}{54}$ square miles. The length of the park is $\frac{5}{9}$ mile. What is the width, in miles, of the park?

A $\frac{4}{9}$ miles
B $\frac{5}{6}$ miles
C $1\frac{1}{54}$ miles
D $1\frac{1}{5}$ ribbons

ID: A

6th Grade Advanced Mini-MAFS 2 (To be given after Lesson 4.2)
MAFS.6.NS.1.1, MAFS.6.NS.3.6c, MAFS.6.NS.3.7a
Answer Section

MULTIPLE CHOICE

1	ANS: A	PTS: 1	STA: MAFS.6.NS.3.6c	
	MSC: DOK 1			
2	ANS: C	PTS: 1	STA: MAFS.6.NS.1.1	
	MSC: DOK 3			
3	ANS: C	PTS: 1	STA: MAFS.6.NS.3.6c	
	MSC: DOK 2			
4	ANS: A	PTS: 1	STA: MAFS.6.NS.1.1	
	MSC: DOK 2			
5	ANS: A	PTS: 1	STA: MAFS.6.NS.3.7a	
	MSC: DOK 1			
6	ANS: A	PTS: 1	STA: MAFS.6.NS.3.7a	
	MSC: DOK 2			
7	ANS: D	PTS: 1	STA: MAFS.6.NS.3.6c	
	MSC: DOK 1			
8	ANS: A	PTS: 1	STA: MAFS.6.NS.3.6c	
	MSC: DOK 2			
9	ANS: C	PTS: 1	STA: MAFS.6.NS.3.7a	
	MSC: DOK 2			
10	ANS: B	PTS: 1	STA: MAFS.6.NS.1.1	
	MSC: DOK 2			

REMEDIATION / RETEACH

Key Vocabulary

Activate prior knowledge (ESE Strategy – Pre-teach Vocabulary; ESOL G1 Activating Prior Knowledge) by reviewing key terms and concepts.

Rational Number – any number than can written in the form $\frac{a}{b}$ where **a** and **b** are integers and $\mathbf{b} \neq 0$.
Positive Number – Value greater than zero.
Negative Number – Value less than zero.
Decimal – Value less than one.
Equivalent Fraction and Decimal - Fractions and decimals that represent the same number.
Quadrant- Any of the 4 equal areas made by dividing a plane by an x and y axis
Cartesian Coordinates – can be use to pinpoint a location on a map or graph.
Coordinate Plane- The plane containing the "x" axis and "y" axis

Common Errors

Students may demonstrate some difficulty in accurately…

- The student does not demonstrate an understanding of rational numbers as points on the number line. For example students gives all coordinates as integers.
- Students may graph fractions incorrectly on a number line.
- The student is unable to effectively work with rational coordinates in the coordinate plane. For example the student reverses coordinates and makes similar errors with a number of other points.
- Student may neglect negative coordinates and treat them as if they are positive.
- Students may believe that 0.43 is greater than 0.5 because 43 > 5.

Resources	Description
Locating Points on the Cartesian Graph	In this interactive, students use clues and logic to plot the location of aquatic animals on a Cartesian graph that represents the four cardinal directions. The three riddles in the interactive, including one that requires students to understand rate, rational numbers and have randomized values, so that students can practice placing points at different locations on the graph. An included response sheet helps students work with the interactive.

Rational Numbers on the Number Line	In this interactive, use logic to solve riddles involving a wallaby jumping contest. Students will interpret information using inductive and deductive reasoning, convert fractions to decimals and decimals to fractions to order numbers in a number line using an understanding of equivalent values among units and with fractions and decimals between -5 and +5. Respond sheet included.
Fractions, Mixed Numbers, and Decimals on the Number Line	In this interactive, students use logic to solve three riddles involving a frog jumping contest and then place the contestants' jumps at the correct points on the number line. Numbers are randomized so that the frogs' placements on the number line are different each time one of the three riddles appears. The accompanying classroom activity provides a review of equivalent values of fractions and decimals and a response sheet to help students work with the interactive.
Lesson 3.2 Reteach* Practice & Problem-Solving D Reading Strategies*	These worksheets are HMH resources that could be used to review opposites and absolute value. (*ESE Strategy – Provide guided notes; ESOL G16 – Note-taking/Outline Notes)
Lesson 3.3 Reteach* Practice & Problem-Solving D Reading Strategies*	These worksheets are HMH resources that could be used to reteach writing fractions as decimals and vice versa. Students would need teacher-directed assistance, then can work in pairs. (*ESE Strategy – Provide guided notes; ESOL G16 – Note-taking/Outline Notes, E4 – Peer Pair)
Lesson 4.2 Reteach* Practice & Problem-Solving D Reading Strategies*	These worksheets are HMH resources that could be used to reteach the concept of dividing fractions using models. These students would need teacher-directed assistance, then can work in pairs. (*ESE Strategy – Provide guided notes; ESOL G16 – Note-taking/Outline Notes, E4 – Peer Pair)

ENRICHMENT

Enrichment Activity

Suggested Strategies:
Students can use the interactive individually if they have access to a computer or tablet. If your classroom has computer stations, students may work in small groups, perhaps competing to see which group can successfully solve the most problems in a given time.

Alternately, you could put the interactive up on a Smart Board and have students take turns doing the problems. This way, the whole class can help solve the riddles and place the wallabies at the correct points on the number line.

As students work through the riddles with peers, they have an opportunity to improve skills in mathematics communication and reasoning. This addresses the CCSS Standards for Mathematical Practice, especially "Construct viable arguments and critique the reasoning of others."

Get your Tech On:

Students will read the problems on the computer and then use the mouse to:

1. Select the tick divisions for the number line based on their understanding of the lowest common denominator among the number choices. The tick division choices are halves, thirds, fourths, fifths, sixths, eighths, ninths, tenths, and twelfths.
2. Drag the wallabies to the correct points on the number line.
3. Select "Check" to verify answers.
4. Receive feedback on the number of wallabies correctly placed on the line.
5. Select "Next Riddle" when they are ready to progress.

After three wrong answers, students can choose to see the correct answer and move on, therefore having group discussion is important to address any misconceptions.

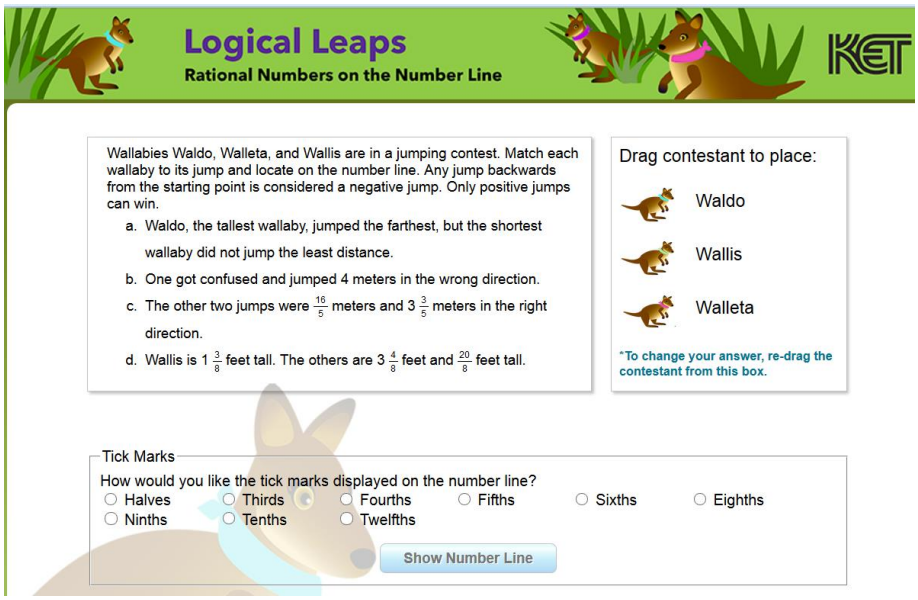
Direction: Pass out copies of the Response Sheet handout. As students work through the problems, they fill in the random numbers that come up in the riddles and record where each wallaby should be placed on the number line. (See at the end of the document)

Rational Numbers on the Number Line

In this interactive, use logic to solve riddles involving a wallaby jumping contest. Then, place each contestant's jump—a fraction, mixed number, or decimal between –5 and +5—at the correct point on the number line. Backward jumps are represented by negative numbers and forward jumps by positive numbers. Numbers are randomized so that riddles can be solved and wallabies placed on the number line multiple times. The accompanying classroom activity includes a fraction/decimal concept review and a response sheet to accompany the online work.

Solving Riddles and Placing Points on the Number Line (20 minutes, whole group, small groups, or individuals)

Hyperlink (interactive) http://tdcms.ket.org/cpbmath2/leapsthree/index.html
Hyperlink to Teachers Resources http://www.pbslearningmedia.org/resource/mket_int_logicleaps3/logicleaps3/



Student Response can be found at the end of this document

Performance task
(Student worksheet)

Name:_____ Date: _____ Class: _____

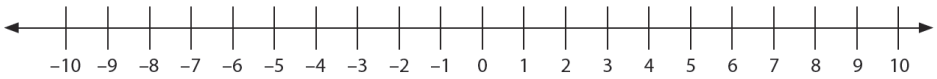
Golfing with Number Line and Coordinate Plane
MAFS.6.NS.3.6c

You are participating for a golf competition. Over the weekend, you play four rounds of golf with your coach, Tyra. The table below shows the scores after each round, and the average of the four scores.

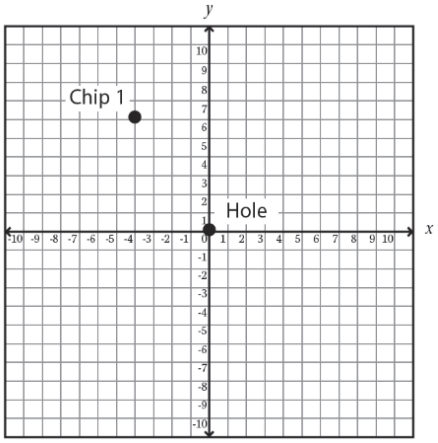
	Your score	Tyra's score
Round 1	+8	-2
Round 2	+7	-1
Round 3	+9	+2
Round 4	+6	0
Average score	+7.5	-0.25

1. If the score for Round 1 and Round 2 were plotted on a number line, would your average score be to the right or to the left of Tyra's average score? Explain your reasoning.

2. You want to know how your average compares with everyone else's, so you ask three of your friends for their average scores so far this season. Jean tells you his average score is $\frac{4}{15}$; Reggie's average is $-\frac{3}{17}$; and Denise's average is $-\frac{21}{8}$. Plot your average score along with the average score for each of your friends on the number line below. How your score does compares to your friends' score?



3. You are practicing chipping the golf ball onto the green (the area of grass around the hole). Chipping means using the golf club to pop the ball into the air a short distance so that it lands on the green. You draw a coordinate plane to represent the green. The point (0, 0) represent the hole, and each unit on the plane represents 1 foot. You measure how far each ball is from the hole. The location of the first ball you chip is plotted below.



a) What are the coordinates of the first ball you chip?

b) The second ball you chip lands at (3.5, 5.5). Plot this point on the coordinate plane.

c) The third ball you chip lands $\frac{13}{2}$ feet to the right of the hole and $-\frac{10}{4}$ feet below the hole on the coordinate plane. Plot this point on the coordinate plane.

Performance task
(Answer Key)

Name:_____ Date: _____ Class: _____

Golfing with Number Line and Coordinate Plane
MAFS.6.NS.3.6c

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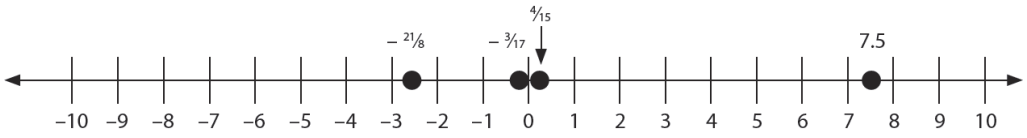
Round 1	+8	-2
Round 2	+7	-1
Round 3	+9	+2
Round 4	+6	0
Average score	+7.5	-0.25

1. If the score for Round 1 and Round 2 were plotted on a number line, would your average score be to the right or to the left of Tyra's average score? Explain your reasoning.
   It would be to the right of Tyra's score because it is a positive number and Tyra's score is a negative number.

2. You want to know how your average compares with everyone else's, so you ask three of your friends for their average scores so far this season. Jean tells you his average score is $\frac{4}{15}$; Reggie tells you his average is $-\frac{3}{17}$; and Denise tells you her average is $-\frac{21}{8}$. Plot your average score along with the average score for each of your friends on the number line below. How your score does compares to your friends' score?



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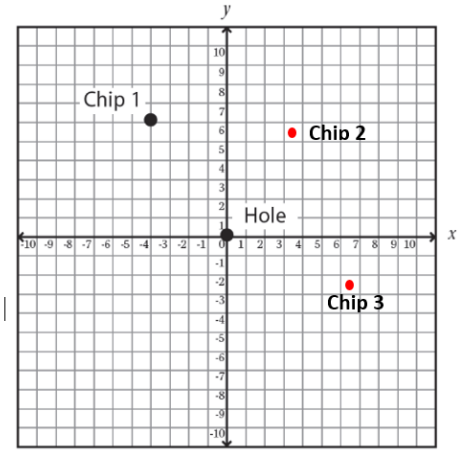

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b) The second ball you chip lands at (3.5, 5.5). Plot this point on the coordinate plane.

c) The third ball you chip lands $\frac{13}{2}$ feet to the right of the hole and $-\frac{10}{4}$ feet below the hole on the coordinate plane. Plot this point on the coordinate plane.

Performance Task 3 Point Rubric	
3 points	The response is accurate, complete, and fulfills all requirements of the task. The solution and accompanying work demonstrate a thorough understanding of the mathematical concepts and procedures of finding positions of rational numbers on a vertical or horizontal number line as well as on a coordinate plane.
2 points	The response is partially accurate and fulfills most requirements of the task. Some knowledge of the mathematical concepts and/ or procedures of finding positions of rational numbers on a vertical or horizontal number line as well as on a coordinate plan is demonstrated in the solution or accompanying work.
1 point	The response is mostly inaccurate and fulfills few requirements of the task. Very limited knowledge of the mathematical concepts and/or procedures of finding positions of rational numbers on a vertical or horizontal number line as well as on a coordinate plane is demonstrated in the solution or accompanying work.
0 points	The response contains an incorrect solution and work is incomplete or demonstrates flawed thinking.

Misconception/Error

- The student is unable to effectively work with rational coordinates in the coordinate plane. For example the student reverses coordinates and makes similar errors with a number of other points.
- Student may neglect negative coordinates and treat them as if they are positive.
- Students may believe that 0.43 is greater than 0.5 because $43 > 5$.
- Teacher Suggestions: This is the time to address this problem by emphasizing place value and place holders to compare decimals.
- The student does not demonstrate an understanding of rational numbers as points on the number line. For example students gives all coordinates as integers.

Suggestions to address misconceptions:

- Review the definition of rational numbers and provide numerous examples of rational numbers initially written as fractions and then written as decimals. Explain to the student that there is a point on the number line for every rational number.
- Remind the student that the values of numbers get greater as one moves from the left on the number line to the right and that this is true of the negative numbers as well.
- Point out that a number and its opposite are equidistant from zero (e.g., if 8.5 is midway between 8 and 9, then -8.5 is midway between -8 and -9).
- Ask the student to graph rational numbers, both positive and negative, given in the form of both fractions and decimals.
- Provide feedback.
- Introduce the concept of absolute value and explain the relationship between the graphs of numbers and their opposites in terms of this concept.
- Give the student additional opportunities to graph rational numbers and their opposites and guide the student to compare their distances from zero.

Monitoring/ Facilitating the Performance Task

Ask questions and prompt students thinking so that they:

- Represent and compare numbers on a number line. Make sure that students articulate how to compare positive and negative numbers on a number line.
- Place decimals correctly on a number line. Ensure students articulate how to plot a number that is between two whole numbers.
- Understand how points can be plotted on a coordinate plane. If students are having difficulty explaining their responses, ask them to explain verbally how they determined their answers. Be sure students understand how to properly write coordinates of a point.
- Prompt for and encourage the use of proper mathematic terms as well as justification of strategies and solutions.

Student Response Sheet

Rational Numbers on the Number Line Response Sheet

As you solve the riddles in the interactive, find the corresponding problem here. Write in the values that come up each time you do the riddle. Then, place the wallabies on the number line with the correct number of tick marks for the problem.

Wallabies Waldo, Walleta, and Wallis are in a jumping contest. Match each wallaby to its jump and locate it on the number line. Any jump backward from the starting point is considered a negative jump. Only positive jumps can win.

a. Waldo, the tallest wallaby, jumped the farthest, but the shortest wallaby did not jump the least distance.
b. One got confused and jumped _____ meters in the wrong direction.
c. The other two jumps were _____ meters and ____ meters in the right direction.
d. Wallis is _____ feet tall. The others are ____ feet and _____ feet tall.

Wallabies Springer, Leaping Lily, and Jumping Joey are in a jumping contest. Match each wallaby to its jump and locate it on the number line. Any jump backward from the starting point is considered a negative jump. Only positive jumps can win.

a. The three jumps were ____ meters, _____ meters, and ____ meters.
b. The second and third place jumps both went backward.
c. Leaping Lily had the shortest jump, but she was the winner.
d. Springer jumped the farthest.

Wallabies Waltzing Matilda, Skippy, and Boomer are in a jumping contest. Match each wallaby to its jump and locate it on the number line. Any jump backward from the starting point is considered a negative jump. Only positive jumps can win.

a. The wallaby with the longest tail had the shortest jump.
b. Waltzing Matilda's tail was _____, and Boomer's tail was _____ feet.
c. Skippy, whose tail was _____ inches, jumped ____ meters in the wrong direction.
d. The other two jumps were _____ and ____, both in the right direction.