

Represent Rational Numbers on the Number Line

FOCUS

Mathematics Objectives

- Plot rational numbers on a number line.
- Compare and order rational numbers.
- Use rational numbers to represent real-world quantities.

Language Objective Explain, orally and in writing, how to represent rational numbers using a number line and how to use rational numbers in real-world situations.

Essential Understanding Each rational number can be associated with a unique point on the number line. A number to the right of another on the number line is the greater number.

COHERENCE

Previously in this topic, students:

- focused on integers.

In this lesson, students:

- are introduced to rational numbers.
- plot, order, and compare rational numbers using a number line.
- use rational numbers in real-world situations.

Later in this topic, students will:

- learn about absolute value.
- plot rational numbers on a coordinate plane.

Additional Connections Representing rational numbers on the number line connects to work in Topic 8 when students draw polygons in the coordinate plane.

RIGOR

Conceptual Understanding Students use their understanding of plotting integers on a number line as they locate rational numbers on a number line and use the visual model to compare and order them.

Application Students apply understanding of rational numbers as they use them to represent real-world situations.

Vocabulary

- rational number

Materials

- number lines
- dry-erase number lines (optional)

Student Resources

 Family Engagement

Intervention System (IS)

L73 Comparing and Ordering Rational Numbers

M15 Fractions and Mixed Numbers on the Number Line

Teacher Resources

Available at
Savvas Realize®.

 Editable Lesson Plan

 Lesson Presentation Slides

 enVision on the Go: Planning Support



Notes

Language Support

Use this activity to introduce the term *rename* to support students' work in Example 1.

Prefixes Have students read the Try It! and write the word *rename*. Then have them underline the prefix *re-*. Remind students that this prefix means "to do again," so when they rename a number, they name it again in a different way.

- How does *renaming* a rational number as a mixed number help you plot it on a number line?

Encourage students to share their ideas and reasoning with a partner.

Additional activities are available online.

- Use the Think-Pair-Share activity with Example 2.
- Use the Mistakes as Opportunities activity with Practice and Problem Solving Items 23A-F.

Math Talk

Equation Detective

Analyze this work. Look for any mistakes.

Write each fraction or decimal as a mixed number.
Plot the points on the number line.

1.5 $\frac{4}{3}$ $\frac{12}{5}$

$1.5 = 1\frac{5}{10}$ $\frac{1}{3} R1 = 1\frac{1}{4}$ $\frac{2}{5} R2 = 2\frac{2}{5}$

$= 1\frac{1}{2}$ $3\frac{1}{4} = 1\frac{1}{4}$ $5\frac{2}{12} = 2\frac{2}{5}$



Number Fluency This Math Talk prepares students for representing negative rational numbers on a number line. Use this Math Talk at the start of the lesson to review writing fractions and decimals as mixed numbers and plotting them on the number line.

At this point in Grade 6, students may lose track of the denominator when writing a mixed number, as is done in the second conversion. Anticipate that some students will not notice the error.

As students analyze the work, ask:

- What steps did the student take to write each expression?
- Are the student's calculations correct? How do you know?
- Is the student's number line correct? Why or why not?

Encourage a discussion about the number line. Some students will think the number line is incorrect because one of the mixed numbers was calculated incorrectly. Other students will think that the plotting of the mixed numbers was done correctly. Both viewpoints are valid.

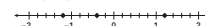
Exit Ticket



Name **Use this Exit Ticket anytime after Example 1.**

Exit Ticket
Lesson 2-2

1. What are the numbers positioned at each point on the number line?



- A) $-2\frac{4}{5}, -1\frac{3}{5}, 2\frac{4}{5}$
B) $1\frac{1}{5}, \frac{2}{5}, -\frac{6}{5}$
C) $-1\frac{2}{5}, -\frac{3}{5}, \frac{7}{5}$
D) $-1\frac{1}{5}, -\frac{2}{5}, \frac{6}{5}$

Self-Assessment

Select how well you understand what you learned in this lesson.

Math Goal

I can represent rational numbers using a number line.



Got it



Need help



Working on it

Language Goal

I can explain, orally and in writing, how to represent rational numbers using a number line and how to use rational numbers in real-world situations.



Got it



Need help



Working on it

Teacher Answer Key

1 of 1

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You can use the Assessment Sourcebook version or the auto-scored version on Savvas Realize®.

Prevent Misconceptions

If students chose answer choices A or B, review graphing negative numbers.

- Find the opposite of the negative number and its distance from 0; then find that number's opposite.

If students chose answer choice C, demonstrate how accurately counting the increments between the integers is essential when graphing points. Remind students to rename fractions and decimals as mixed numbers.

English Language Development

ELL English Language Learners (Example 2)

MLR3 Critique, Correct, and Clarify (Example 3)

Language Support (Example 1)

Step 1 Explore and Share



15-20 min

Explore and Share Scout Observational Assessment

Represent Rational Numbers on the Number Line

I can ... represent rational numbers using a number line.

Let's Build

Lesson 2-2

Explore and Share

Seagull $\frac{3}{4}$ yard

Dolphin $-\frac{1}{4}$ yard

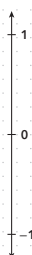
Sea Turtle -1 yard

Shark -0.5 yard

The locations of four animals relative to sea level are shown.

A. What can you say about the animals and their positions relative to sea level?

B. How can you use a number line to represent the locations of the animals?



Generalize How is representing the locations of negative fractions and decimals like representing the locations of positive fractions and decimals? How is it different?

Sample answer: You divide units into equal parts to represent the locations of either negative or positive fractions and decimals. Negative and positive fractions and decimals are located on opposite sides of 0.

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Sample Student Work

I can plot the locations of the animals on the number line. The negative numbers go below 0 and the positive numbers go above 0.

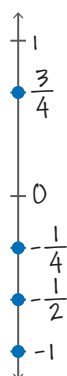
Izzy's Work

Izzy describes how the locations can be shown on a number line.

Cho's Work

Cho renames the decimal as a fraction and plots each animal's location on the number line.

I can write -0.5 as $-\frac{1}{2}$. Then I can plot the points for each animal's location.



ETP Explore and Share

Formative Assessment

Purpose Students plot benchmark rational numbers on a vertical number line to prepare for plotting additional rational numbers on a horizontal number line in the Visual Learning Bridge.

Introduce WHOLE CLASS

Ask: What other animals could you locate above sea level? Below sea level?

Monitor, Select, and Sequence SMALL GROUP

Observe students at work.

- **What strategies do students use to represent each elevation on a number line?** Students should recognize that the positive elevation is above sea level and negative elevations are below sea level. Students may convert the decimal to a fraction, or all fractions to decimals. If needed, ask: What other animals could have a positive elevation?

Early Finishers

Ask: A jellyfish swims below the shark and above the sea turtle. What rational number could be used to represent the elevation of the jellyfish relative to sea level? [$-\frac{3}{4}$]

Connect WHOLE CLASS

Connect Solution Strategies Have students share how they decided whether to plot a given rational number above 0 or below 0. Have students who plotted the points using fractions share together, followed by students who plotted points using decimals. Have students discuss why they chose fractions or decimals and how both representations are equivalent.

Have students discuss how they decided where to place each point on the number line; how is plotting negative numbers similar or different to plotting positive numbers? Plotting negative numbers is similar to plotting positive numbers in that their values continue to decrease as you move to the left.

When presenting Example 1, remind students of how they converted a decimal to a fraction or fractions to decimals in order to plot the location of all of the animals in the Explore and Share. Discuss with students how some numbers are easier to plot as fractions (such as $\frac{1}{3}$), while other numbers are equally easy to plot in either form.

Step 2 Visual Learning



40-45 min

Visual Learning Animation

Essential Question How can you plot, compare, and order rational numbers using a number line?

Visual Learning

Example 1 Understand Rational Numbers

Any number that can be written as the quotient of two integers is called a **rational number**. A rational number can be written in the form $\frac{a}{b}$ or $-\frac{a}{b}$, where a and b are integers and $b \neq 0$. A rational number can be a whole number, fraction, or decimal.

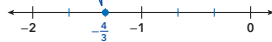
How can you find and position $-\frac{4}{3}$ and -1.5 on a number line?

Generalize You can plot numbers on horizontal or vertical number lines.

ONE WAY Use a horizontal number line to plot $-\frac{4}{3}$. You can write $-\frac{4}{3}$ as a mixed number.

$$-\frac{4}{3} = -1\frac{1}{3}$$

Divide the units on the number line into thirds and find one and one-third to the left of 0.



ANOTHER WAY Use a vertical number line to plot -1.5 . You can write -1.5 as a mixed number.

$$-1.5 = -1\frac{5}{10} \text{ or } -1\frac{1}{2}$$

Divide the units on the number line into halves and find one and one-half below 0.



Try It! Find and position $-\frac{5}{4}$ and -1.75 on the number lines.

a. Write $-\frac{5}{4}$ and -1.75 as mixed numbers.

$$-1\frac{1}{4}, -1\frac{3}{4}$$

b. Plot the points on the number lines.



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ETP Essential Question

Engage students in a discussion about the **Essential Question**. Make sure that students understand how to plot and order positive rational numbers before applying what they know to negative rational numbers.

ETP Example 1 Understand Rational Numbers

- What is an example of a number that has the form $\frac{a}{b}$ or $-\frac{a}{b}$? [$\frac{3}{5}$ or $-\frac{8}{9}$]
- For a rational number $\frac{a}{b}$, why is b not equal to 0? [The denominator in a fraction $\frac{a}{b}$ tells the number of equal parts; It does not make sense to have 0 equal parts.]
- Why is a whole number also a rational number? [Any number that can be written as a fraction is a rational number. A whole number can be written as a fraction with a denominator of 1.]
- To plot $-\frac{4}{3}$, why is it helpful to divide the units into thirds? [The denominator is 3.]
- Why can you use either fractions or decimals when plotting points on a number line? [Each rational number can be written as a fraction or as a decimal.]

ETP Try It!

- Why should you divide the units on the number line into fourths? [Both mixed numbers have a fraction part with a denominator of 4.]
- How can you determine the number of parts to divide the units of a number line into if the denominators of the rational numbers are not the same? [Use a common denominator.]

Support Student Understanding

Example 1 Some students may need additional practice plotting fractions on a number line.

- Have students divide number lines into equal parts.
 - How would you divide each unit on a number line that is labeled 1, 2, 3, etc. to plot $\frac{1}{3}$? [Divide each unit into thirds.]
 - Where would you plot $\frac{2}{3}$ on a number line? [Two out of 3 equal parts to the right of 0.]
 - Where would you plot $-\frac{2}{3}$ on a number line? [Two out of 3 equal parts to the left of 0.]

Extend Student Thinking

Example 1 Try It! Challenge advanced students to apply their knowledge to another problem. State the following problem or write it on the board.

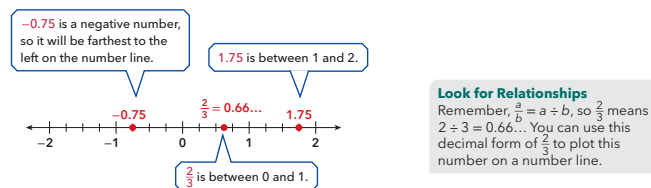
Plot the rational numbers $-\frac{14}{5}$ and -0.8 on the same number line.

- Into how many equal parts should you divide each unit? [5 or 10]
- Between which two integers should you plot each rational number? [$-\frac{14}{5}$ should be between -2 and -3 ; -0.8 should be between 0 and -1 .]

Step 2 Visual Learning *continued*

Example 2 Compare and Order Rational Numbers

Haru was asked to compare and order three rational numbers. Show how he can use $<$, $>$, or $=$ to compare $\frac{2}{3}$, 1.75, and -0.75 . Then order these numbers from least to greatest.



So, $-0.75 < \frac{2}{3} < 1.75$, and their order from least to greatest is $-0.75, \frac{2}{3}, 1.75$.

Try It! If $\frac{1}{4}$ is ordered within the list of numbers in the example, between which two numbers would it be placed? **Between -0.75 and $\frac{2}{3}$**

Example 3 Interpret Rational Numbers in Real-World Contexts

Sam and Rashida are scuba diving. Their locations are shown relative to sea level. Use $<$, $>$, or $=$ to compare the two depths and explain their relationship.



$-40 < -25$. Rashida is at a greater depth than Sam.

Try It! At 10:00 P.M. one winter night, the temperature was -3°C . At midnight, the temperature was -7°C . Use $<$, $>$, or $=$ to compare the two temperatures and explain their relationship.

On a thermometer, -7°C is below -3°C , so $-7^\circ\text{C} < -3^\circ\text{C}$. The symbol, $<$, tells us that -7°C is colder than -3°C .

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ETP Try It!

- Which temperatures are colder than -7°C ?
[All temperatures that are below -7°C .]
- Which temperatures are warmer than -3°C ?
[All temperatures that are above -3°C .]

ELL English Language Learners SPEAKING

Emerging As students work through Example 2, draw a number line with several rational numbers plotted on it, such as -2.5 , -0.75 , and 1.25 . Provide these sentence stems for students to verbally respond to a partner.

The _____ number is 1.25 . [greatest]

The _____ number is -2.5 . [least]

-0.75 is _____ than -2.5 . [greater]

-0.75 is _____ than 1.25 . [less]

Expanding As students work through Example 2, draw a number line with several rational numbers plotted on it, such as -2.5 , -0.75 , and 1.25 .

Have students work in pairs to compare the numbers aloud in different ways using the terms *least*, *greatest*, *greater than*, *less than*, and *between*.

Bridging As students work through Example 2, draw a number line with several rational numbers plotted on it, such as -2.5 , -0.75 , and 1.25 .

Have students work in pairs to compare the numbers in different ways by writing comparison statements using correct math symbols. Then have each student pair verbally share their statements with the class.

ETP Example 2 Compare and Order Rational Numbers

- How can you use a horizontal number line to compare two rational numbers? [Values of numbers increase going to the right and decrease going to the left.]
- What is another way to write -0.75 and 1.75 ? [$-\frac{3}{4}$ and $1\frac{3}{4}$]

ETP Try It!

- How can you use the symbols $<$, $>$, or $=$ to compare $\frac{1}{4}$ to -0.75 and $\frac{2}{3}$? [$-0.75 < \frac{1}{4} < \frac{2}{3}$ or $\frac{2}{3} > \frac{1}{4} > -0.75$]
- Is a positive rational number always greater than a negative rational number? Explain. [Yes; A positive number is always to the right of a negative number on a number line.]
- Would the opposite of $\frac{1}{4}$ also be between -0.75 and $\frac{2}{3}$? [Yes]

ETP Example 3 Interpret Rational Numbers in Real-World Contexts

- If Sam dives farther and is now deeper than Rashida, what numbers could be used to describe his depth? [Any number that is less than -40]

MLR3 Critique, Correct, and Clarify

Example 3 Try It! Have students work individually to respond to the following problem situation.

The temperature at sunrise was -4°C and the temperature at sunset was -9°C . It was colder/warmer at sunrise than at sunset.

Then have students share with a classmate their responses and justifications, and revise based on feedback.

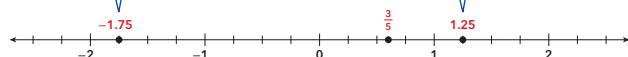
Step 2 Visual Learning *continued*

Key Concept

A **rational number** can be expressed as a fraction in the form $\frac{a}{b}$ or $-\frac{a}{b}$, where a and b are integers and b is not 0.

The number farthest to the left is the least number.

The number farthest to the right is the greatest number.



The numbers, in order from least to greatest, are: $-1.75, \frac{3}{5}, 1.25$.

Talk About Math Ideas

If n is a rational number, how do you represent the opposite of n ?

Do You Understand?

- Essential Question** How can you plot, compare, and order rational numbers using a number line?

A number line helps you see where numbers are in relation to each other and to 0. The number farthest to the left is the least, and the number farthest to the right is the greatest.

- Generalize** Why are whole numbers rational numbers? Use 15 as an example.

Sample answer: Whole numbers are rational numbers because they can be written as fractions. $15 = \frac{15}{1}$

- Vocabulary** Why are integers rational numbers? Give an example.

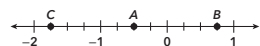
Sample answer: Integers are rational numbers because they can be written as fractions with a denominator of 1. $3 = \frac{3}{1}$

- Reasoning** Explain how the inequality $-4^\circ\text{C} > -9^\circ\text{C}$ describes how the temperatures are related.

-4°C is warmer than -9°C .

Do You Know How?

In 5–7, write the number positioned at each point.



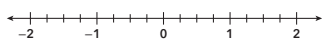
- A $-\frac{1}{2}$ or -0.5
- B $\frac{3}{4}$ or 0.75
- C $-1\frac{3}{4}$ or -1.75

In 8–11, plot the points on the number line.



- P at $-1\frac{1}{4}$
- Q at 0.25
- R at -0.75
- S at $-\frac{1}{4}$

In 12 and 13, use the number line to help order the numbers from least to greatest.



- $1.25, -\frac{3}{2}, -1.25, 1\frac{1}{2}, -\frac{3}{2}, -1.25, 1.25, 1\frac{1}{2}$
- $-1.5, -0.75, -1, 2, -1.5, -1, -0.75, 2$
- If p is a negative number, order $p, -p$, and 0 from least to greatest.
 $p, 0, -p$

ETP Key Concept



- How can you write -1.75 and 1.25 in the form $\frac{a}{b}$ or $-\frac{a}{b}$?
[Rename each decimal as a fraction: $-\frac{7}{4}, \frac{5}{4}$]
- Why are positive numbers always greater than negative numbers? [Positive numbers are always to the right of negative numbers on a number line.]

ETP Talk About Math Ideas

Have students discuss the response to the question in small groups. Listen for students explaining that the opposite of any rational number n can be represented on a number line as a point the same distance from 0 as n but in the opposite direction. So, the opposite of rational number n is $-n$.

ETP Do You Understand/Do You Know How?



Essential Question

Students should know that rational numbers include integers, fractions, decimals, and mixed numbers. When plotting and ordering rational numbers using the number line, it may be helpful to rename the numbers. Make sure students know that the order of rational numbers is not determined by their distances from 0, but rather that they increase in value as you move from left to right or from bottom to top on a number line.

Prevent Misconceptions

Item 8 Because negative numbers increase in magnitude from right to left, students may place mixed numbers to the right of the whole number rather than the left.

- Between which two integers is $-1\frac{1}{4}$? [-1 and -2]
- Should you place $-1\frac{1}{4}$ to the right or left of -1 ? [To the left]

Item 12

- How could you rename all the numbers as mixed numbers?
[$1\frac{1}{4}, -1\frac{1}{2}, -1\frac{1}{4}, 1\frac{1}{2}$]
- Why is the number line divided into fourths? Explain.
[The numbers with denominators of 2 can be renamed as equivalent fractions with denominators of 4.]

Step 3 Practice and Problem Solving

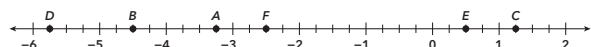


15-20 min

Interactive Practice Adaptive Practice

Practice and Problem Solving

In 15-20, write the number positioned at each point.



15. A $-3\frac{1}{4}$ or -3.25 16. B $-4\frac{1}{2}$ or -4.5 17. C $1\frac{1}{4}$ or 1.25
18. D $-5\frac{3}{4}$ or -5.75 19. E $\frac{1}{2}$ or 0.5 20. F $-2\frac{1}{2}$ or -2.5

21. Plot the numbers on the number line.



- A. $-5\frac{1}{2}$ B. -6.3 C. -5.8
D. $-6\frac{7}{10}$ E. -4.9 F. $-6\frac{9}{10}$

22. Use $<$, $>$, or $=$ to compare.

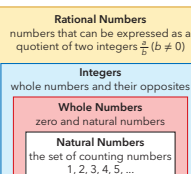
- A. $\frac{1}{10} > 0.09$ B. $-1.44 < -1\frac{1}{4}$ C. $-\frac{2}{3} > -0.8$
D. $0.5 = \frac{2}{4}$ E. $-2\frac{3}{4} < -2.25$ F. $-\frac{3}{5} < -0.35$

23. Order the numbers from least to greatest.

- A. $-6, 8, -9, 13$ B. $-\frac{4}{5}, -\frac{1}{2}, 0.25, -0.2$ C. $4.75, -2\frac{1}{2}, \frac{8}{9}, \frac{9}{2}$
D. $4, -3, -8, -1$ E. $\frac{1}{4}, 0.5, \frac{3}{4}, \frac{1}{2}$ F. $-\frac{4}{5}, -\frac{5}{4}, -\frac{3}{2}, 1.5$
-9, -6, 8, 13
 $-\frac{4}{5}, -\frac{1}{2}, 0.25, -0.2$
 $-\frac{8}{3}, -2\frac{1}{2}, \frac{9}{2}, 4.75$
 $-8, -3, -1, 4$
 $-\frac{1}{2}, -\frac{1}{4}, 0.5, \frac{3}{4}$
 $-\frac{3}{2}, -\frac{5}{4}, -\frac{4}{5}, 1.5$

24. **Make Sense and Persevere** What is the least number of points you must plot to have examples of all four sets of numbers, including at least one positive integer and one negative integer? Explain.

Two points: One positive integer and one negative integer; Integers are rational numbers, and the positive integer is also a whole number and a natural number.



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You may opt to have students complete automatically scored practice items online.

25. **Reasoning** Suppose you plot the locations of the animals on a number line. Which animal would be represented by the point farthest from 0 on the number line? Explain.

Fanfin anglerfish; Sample answer: $-2\frac{1}{4}$ is to the left of or below each of the other numbers and farthest from 0 on a number line.

26. Which animal is closest to a depth of -0.7 km?
Deep sea anglerfish

Animal	Locations Relative to Surface
Bloodbelly comb jelly	-0.8 km
Deep sea anglerfish	$-\frac{2}{3}$ km
Fanfin anglerfish	$-2\frac{1}{4}$ km
Gulper eel	-1.1 km
Pacific blackdragon	$-\frac{3}{10}$ km
Slender snipe eel	-0.6 km

27. Diya collected data on changes in sea levels. Her study concluded that as sea levels rise, the migration of coastal birds is impacted due to changes to their feeding areas. Describe in words what each sea level measurement represents.

Sample answer: 56.7 means that the coastal water is 56.7 mm above sea level; 34 means that the coastal water is 34 mm above sea level; -22.8 means that the coastal water is 22.8 mm below sea level; -54.5 means that the coastal water is 54.5 mm below sea level.

Year	Sea Level
1	56.7 mm
2	34 mm
3	-22.8 mm
4	-54.5 mm

28. **Construct Arguments** A classmate ordered these numbers from greatest to least. Is he correct? Construct an argument to justify your answer.

4.4, 4.2, -4.42 , -4.24

No; Sample answer: -4.42 is farther to the left of 0 on a number line than -4.24 . He should have switched the last two numbers.

29. **Make Sense and Persevere** Order -3.25 , $-3\frac{3}{8}$, $-3\frac{1}{4}$, and -3.1 from least to greatest. Explain.

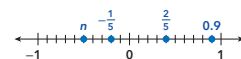
$-3\frac{3}{8}$, -3.25 , $-3\frac{1}{4}$, -3.1 ; Sample answer: I wrote the decimals as fractions and used number sense to compare and order.

30. **Higher Order Thinking** Suppose $\frac{a}{b}$, $\frac{c}{d}$, and $\frac{e}{f}$ represent three rational numbers. If $\frac{a}{b}$ is less than $\frac{c}{d}$, and $\frac{c}{d}$ is less than $\frac{e}{f}$, compare $\frac{a}{b}$ and $\frac{e}{f}$. Explain.

$\frac{a}{b} < \frac{e}{f}$; Sample answer: On a number line, $\frac{a}{b}$ is to the left of $\frac{c}{d}$, and $\frac{c}{d}$ is to the left of $\frac{e}{f}$. So, $\frac{a}{b}$ is also to the left of $\frac{e}{f}$.

Assessment Practice

31. Which could be a value for n ?



- A. $-\frac{1}{2}$ B. $-\frac{1}{3}$ C. $-\frac{1}{4}$ D. $-\frac{1}{6}$

32. Which inequality does **NOT** represent the correct position of two numbers on a number line?

- A. $\frac{4}{2} > \frac{25}{4}$ B. $-6 < -5$
C. $-4\frac{1}{2} > -\frac{25}{5}$ D. $-\frac{1}{2} < \frac{1}{2}$

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Practice and Problem Solving

Error Intervention

Item 23C Students may not understand how to rename $-\frac{8}{3}$ as a decimal, or they may not understand how to interpret a repeating decimal.

- What do you notice about the quotient of 8 divided by 3? [The quotient does not end; It repeats 6 indefinitely.]
- Between which two tenths would you place $-2.\overline{6}$ on the number line? [-2.6 and -2.7]

ELL English Language Learners

Item 30 Higher Order Thinking Students may have trouble understanding the problem. Have students replace the variables with numbers.

- Use $\frac{a}{b}$ to represent one number and $\frac{c}{d}$ to represent another number. If $\frac{a}{b}$ is less than $\frac{c}{d}$, where would the two numbers be on a number line? [$\frac{a}{b}$ would be to the left of $\frac{c}{d}$.]

Engage Through Student Choice

Go online for an assignment strategy.

Item Analysis: Practice and Problem Solving

Example	Items	DOK
1	15-21	1
	24	3
2	22-23	1
	29, 32	2
	28, 30, 31	3
3	25-26	2
	27	3

Step 4 Assess and Differentiate



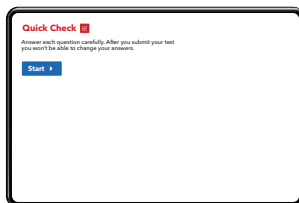
15-30 min

ETP Quick Check



Assess lesson content with the Quick Check.

- The online Quick Check is **automatically scored** and **remediation, practice, or enrichment** will be assigned based on student performance.
- You can use the Assessment Sourcebook version to prescribe targeted remediation or enrichment.



0-3 points: Reteach to Build Understanding and Additional Vocabulary Support Activities

4-5 points: Enrichment Activity

In addition, **English Language Learners** may benefit from the Build Mathematical Literacy Activity.

Differentiation Library DL

- Additional Differentiation Library resources are described at the start of this topic.
- Differentiation resources that support diverse learning styles are online and in the Differentiation Library Teacher's Guide.

Video Tutorials

Students can access instructional tutorials online.

- What's a Rational Number?
- How Do You Order Fractions and Decimals from Greatest to Least?

Item Analysis: Additional Practice

Example	Items	DOK
1	1-17	1
	18	2
	33	3
2	19-26	1
	35	2
	32, 34	3
3	27	1
	29, 30	2
	28, 31	3

Additional Practice

Printable or autoscored on Savvas Realize®

Name _____

2-2 Additional Practice

In 1-8, write the number positioned at each point on the number line at the right.

1. A $\frac{3}{4}$ or 0.75 2. B $1\frac{1}{2}$ or 1.5 3. C $-2\frac{3}{4}$ or -2.75 4. D $-1\frac{1}{4}$ or -1.25

5. E $2\frac{1}{2}$ or 2.5 6. F $-\frac{1}{4}$ or -0.25 7. G $-2\frac{1}{4}$ or -2.25 8. H $\frac{1}{2}$ or 0.5

In 9-16, plot each point on the number line at the right.

9. S(2.75) 10. T($\frac{1}{4}$) 11. U($-2\frac{1}{2}$) 12. V(2.25)

13. W($1\frac{3}{4}$) 14. X(-0.75) 15. Y(-1.75) 16. Z($-\frac{3}{4}$)

17. Plot -8.7 on the number line below.

18. Draw a number line and plot $-\frac{5}{3}$.

In 19-26, use <, >, or = to compare.

19. -12 < -15 20. $-\frac{1}{3} < -1$ 21. -2 < -2.1 22. $\frac{1}{5} < \frac{1}{4}$

23. $\frac{7}{10} < -0.85$ 24. $-0.66 < -\frac{3}{4}$ 25. $-4\frac{1}{2} < -3.9$ 26. $7\frac{1}{2} < 7.75$

In 27 and 28, use the map at the right.

27. The map shows how deep archaeologists have dug at several excavation sites. Order the archaeological excavation sites from the least depth to the greatest depth.
Site C, Site B, Site A, Site D

28. Archaeologists are excavating a new Site E. On a number line, the depth of Site E is between the depths of Site A and Site B. What is a possible depth of Site E?
Sample answer: -2.5 m

Excavation Map

19 2-2 Represent Rational Numbers on the Number Line

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In 29-31, use the table at the right.

29. **Reasoning** Suppose you plot the lengths in the table on a number line. Which track member's long jump length would be represented by the point closest to, but not equal to, 0 on the number line? Explain.

Ann; Sample answer: The other lengths are farther than +2 units from 0.

Track Members	Long Jump Length Relative to State Qualifying Distance
Theresa	-5.625 in.
Ann	2 in.
Shirley	-3 in.
Delia	0 in.

30. Delia's relative long jump length was recorded as 0. What does this mean?

Sample answer: This means that there was no difference in the lengths of Delia's long jump and the state qualifying distance.

31. **Construct Arguments** Which track members did NOT qualify for the state championship? Construct an argument to explain how you know.
Theresa and Shirley; Their relative jump lengths were negative, which means that they were shorter than the qualifying distance.

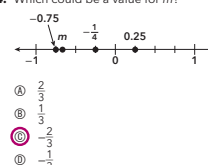
32. **Make Sense and Persevere** Order $-6\frac{1}{4}$, -6.35, $-\frac{1}{5}$, and -6.1 from greatest to least. Explain.

-6.1, $-\frac{1}{5}$, $-6\frac{1}{4}$, -6.35; Sample answer: I wrote the fractions as decimals and used place value to compare and order.

33. **Higher Order Thinking** Tyler says there are infinitely many rational numbers between 0 and 1. Do you agree? Explain.
Yes; Sample answer: You can use the unit fractions as an example: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, and so on. You can keep increasing the denominator by 1 forever.

Assessment Practice

34. Which could be a value for m?



35. Which inequality represents the correct position of two numbers on a number line?

- Ⓐ $6.5 > \frac{25}{4}$
Ⓑ $-6.5 > -\frac{25}{4}$
Ⓒ $-6 > -5$
Ⓓ $5 > \frac{25}{4}$

20 2-2 Represent Rational Numbers on the Number Line

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