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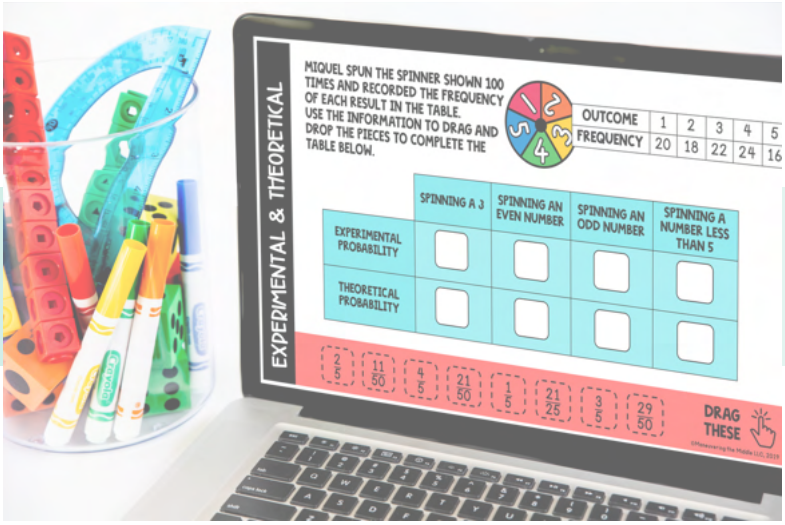

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MANEUVERING THE MIDDLE

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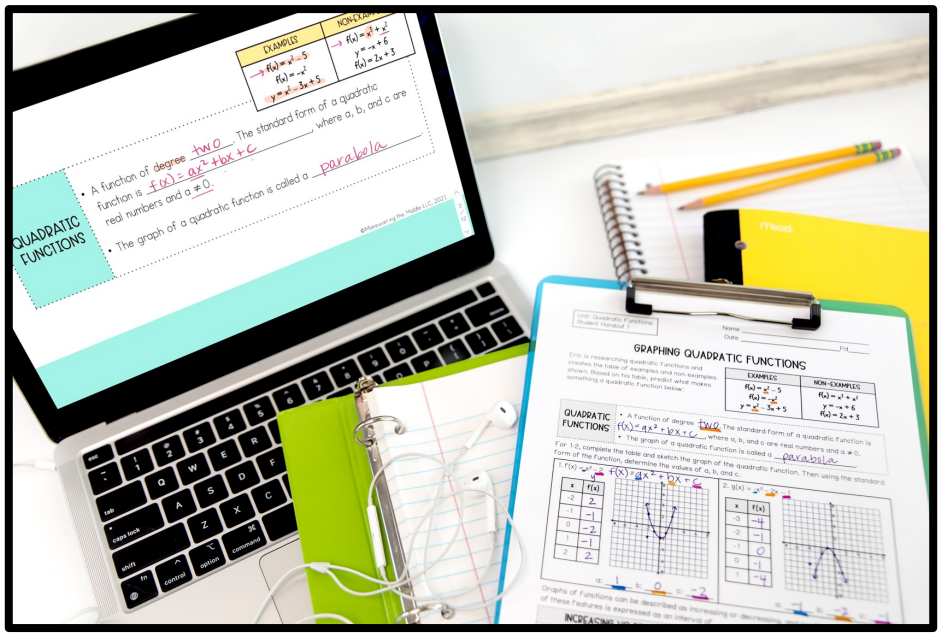
standards-based math curriculum for grades 6-algebra 1



Math curriculum designed to meet students' needs and empower teachers.

- ✓ Grade Level Curriculum: student-friendly guided notes, hands-on activities, teaching slides (coming August 2023), and teacher planning resources
- ✓ Supplemental Digital Components: digital activities, teaching slides, Google Form™ assessments
- ✓ Student Video Library: professional quality videos aligned to student handouts

6th teks planning guide

A MANEUVERING THE MIDDLE® RESOURCE

what is it?

This resource has been designed to model the process presented in the math training, "A Step-by-Step Plan for Unfinished Learning". Please use the information provided to jump start your planning for the school year.

how does it work?

A planning guide has been included for each of the key topics in Unit 1: Numerical Representations. Each guide will help you prepare for formative assessment opportunities, common student misconceptions, instructional strategies you can use to reach your students and suggestions for utilizing activities to best support your students' needs.

learn more about All Access

The hands-on activities included are a brief sample of one element of our All Access membership. All Access is math curriculum designed to meet students' needs and empower teachers. You can find out more by clicking the link below.

maneuveringthemiddle.com/math-curriculum

opposites and absolute value

goal

Students should be able to identify a number, its opposite and its absolute value.

prior skills

In previous grades, students represented positive numbers as distances from zero on a number line.

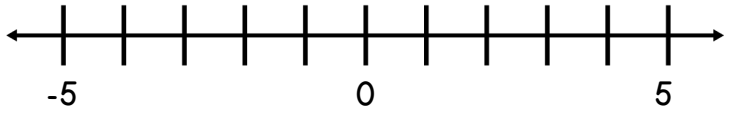
related materials

- Unit 1, Student Handout 1
- Unit 1, Student Handout 6

formative assessments

locating integers on the number line

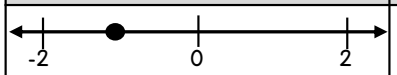
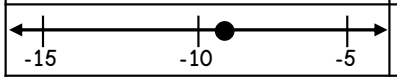
Georgie is asked to plot the number -3 on the number line below. Where should Georgie plot the number?



student handout 1

identify opposites and absolute value

Use your understanding of opposites and absolute value to complete the table below.

NUMBER LINE	NUMBER	ABSOLUTE VALUE	OPPOSITE
			
			

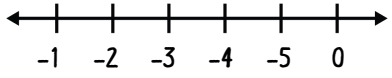
student handout 6

common misconceptions

locating integers on the number line

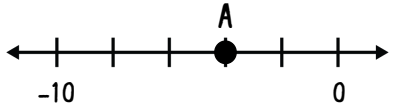
Students may not label values correctly if completing a blank number line (ex. 1) or may overlook the scale of a number line (ex. 2).

example 1



Students may label a number line starting with -1 at the left end of the number line.

example 2



Students may assume each tick mark represents 1 when placing point A at -2 on the number line above.

identify opposites and absolute value

Students may mistake the absolute value of a number for being the opposite of a number (ex. 1) or may overlook absolute value signs when comparing two values (ex. 2).

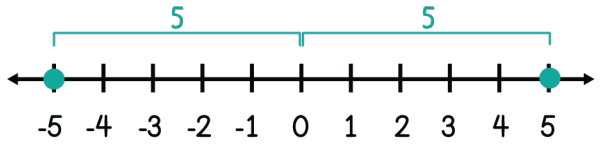
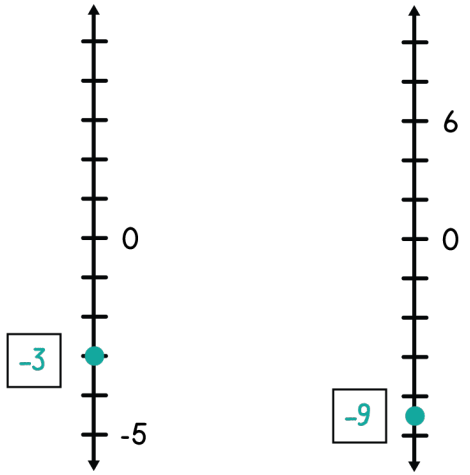
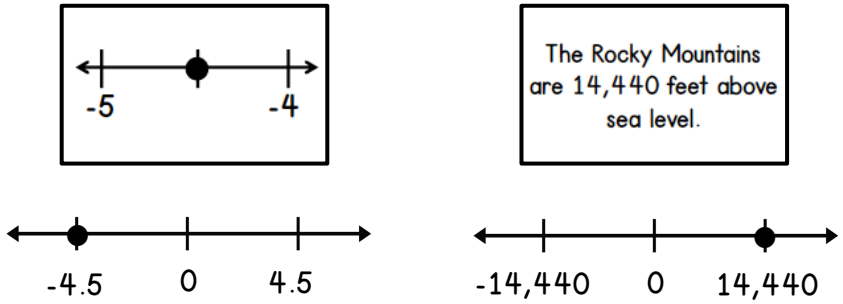
example 1

$|17| = -17$

example 2

$|42| \_\_\_\_ |-63|$ (>)

opposites and absolute value

	locating integers on the number line	identify opposites and absolute value
instructional strategies	**picture it:** consider introducing both horizontal and vertical number lines; the comparison may help students make connections and oftentimes vertical number lines are more intuitive as they relate to contexts such as temperature, altitude, etc. **model it:** using masking tape, yarn or folding a piece of cardstock in half, allow students to build a number line in order to locate and discuss important features of the number line in a tangible way	**model it:** while opposites tend to be more intuitive, students may struggle with absolute value; have students place opposite values on a number line and then ask them what the values have in common to highlight that they share the same distance from 0 (the absolute value) 
extra practice and resources	Create and display a few number lines on the board with different intervals and a few values labeled. Then, challenge students to identify the value of a given interval. Examples shown below. 	**Absolute Value Cut and Paste*** As students utilize the cut and paste, consider the following: • For values on a number line where 0 is not shown, have students sketch a number line including 0 to help identify the opposite and absolute value • For descriptions, have students sketch a number line including 0 and the opposite of the value described For each activity card below, an example of a number line that a student may benefit from sketching is shown. 

*Absolute Value Cut and Paste is included in this PDF on pages 11-16.

comparing and ordering rational numbers

goal

Students should be able to locate, compare, and order rational numbers on a number line.

prior skills

In previous grades, students compared and ordered two decimals.

related materials

- Unit 1, Student Handout 2
- Unit 1, Student Handout 3
- Unit 1, Student Handout 4

	comparing and ordering decimals	comparing and ordering fractions	comparing and ordering rationals
formative assessments	Use the symbols <, >, or = to make each statement true. a. -5.05 _____ -5 b. 3.58 _____ 3.2 c. -1.75 _____ -0.75 d. -24 _____ -24.0 student handout 2	Order the following fractions from greatest to least. $\frac{11}{12}, \frac{2}{3}, \frac{5}{6}, \frac{1}{4}$ student handout 3 $3\frac{1}{5}, 3\frac{1}{4}, 3\frac{3}{20}, \frac{17}{5}$ student handout 3	Order the following numbers from least to greatest. $\frac{3}{8}$ $\frac{5}{4}$ 85% 2.5 0.15 $\frac{2}{3}$ 1.8 50% student handout 4
common misconceptions	Students may confuse inequality symbols (ex. 1) or assume a number must be greater if it has more digits after the decimal (ex. 2). example 1: -7.2 > 15.1; 20.5 < 20.2 example 2: 2.1, 2.05, 2.75, 3.4 *If ordering the list above from least to greatest, a student may start with 2.1 since there is only one digit after the decimal.*	Students may compare numerators before finding a common denominator (ex. 1) or may assume mixed numbers are greater than improper fractions (ex. 2). example 1: $\frac{3}{4} < \frac{5}{8}$ example 2: $1\frac{2}{9} > \frac{11}{8}$	Students may incorrectly convert numbers to the same form (ex. 1) or may may struggle to order integers correctly (ex. 2). example 1: $1\frac{1}{10} < 1.02$ because 1.01 is less than 1.02 example 2: $-4, -\frac{15}{2}, -8.5, -4.8$ *If ordering the list above from least to greatest, a student might start with -4, the "smallest" negative rather than -8.5, the value that is the furthest from zero.*

comparing and ordering rational numbers

comparing and ordering rational numbers

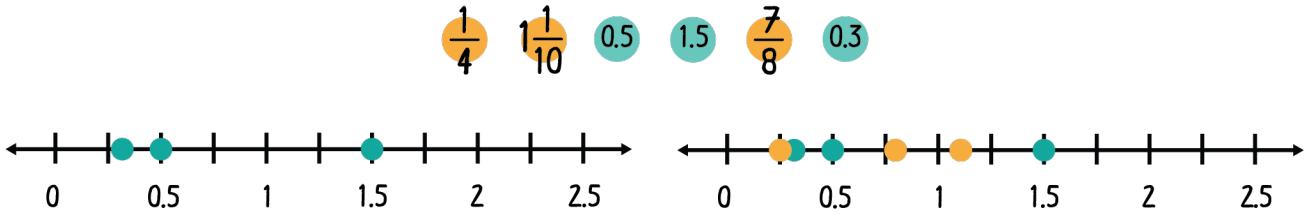
instructional strategies

simplify it: before students begin finding common denominators or converting values to the same forms, encourage students to utilize reasonableness and benchmark values to check their thinking and avoid unnecessary work (example thinking shown below)

"I know $\frac{7}{12}$ is greater than $\frac{9}{20}$ because $\frac{7}{12}$ is more than half, $\frac{6}{12}$, and $\frac{9}{20}$ is less than half, or $\frac{10}{20}$."

"I know 0.25 is less than $\frac{5}{16}$ because $0.25 = \frac{1}{4}$ and $\frac{1}{4} = \frac{4}{16}$."

model it: encourage students to always sketch a number line to organize their thinking; when given a list of values to order, have students first place any whole numbers and decimals before moving on to fractions



extra practice and resources

Comparing Rational Numbers Task Cards*

The task cards included in this activity cover many skills and assess students' understanding by posing questions in various formats. Consider working through one example from each of the following types of cards before allowing students to continue:

- Translating an inequality statement into words (Cards 1-4)
- Writing an inequality statement from a number line (Cards 5-8)
- Using an inequality symbol to compare rational values (Cards 9-12)
- Determining which rational value is closer to 0 (Cards 13-16)
- Plotting rational values on a number line (Cards 17-20)
- Determining a missing value on a number line (Cards 21-24)
- Determining a mystery value based on clues (Cards 25-28)

*Comparing Rational Numbers Task Cards is included in this PDF on pages 17-28.

classifying rational numbers

goal

Students should be able to classify whole numbers, integers, and rational numbers.

prior skills

Students have not previously classified numbers or relationships between number sets.

related materials

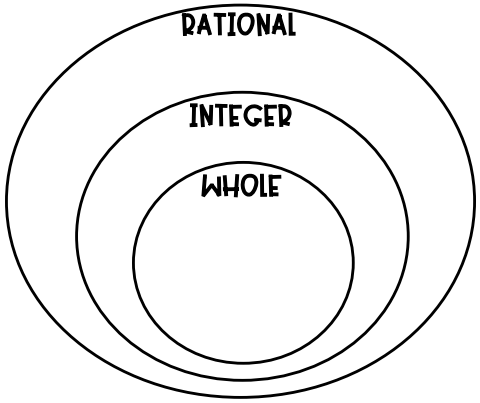
- Unit 1, Student Handout 5

classifying whole, integer and rational numbers in a visual representation

formative assessments

Use the graphic organizer below to correctly place each of the following values.

$-9,\ 0,\ \frac{1}{8},\ -\frac{1}{2},\ 15,\ 126,\ -37,\ \frac{2}{3}$



student handout 5

common misconceptions

Students may make incorrect generalizations such as all values with a decimal point are rational numbers and/or all values with a negative sign are integers (ex. 1). Students may also classify a number before simplifying it (ex. 2).

example 1	example 2
$7.0 \rightarrow$ rational	$-\frac{10}{2} \rightarrow$ rational
$-5.2 \rightarrow$ integer	$\frac{12}{3} \rightarrow$ rational

classifying rational numbers

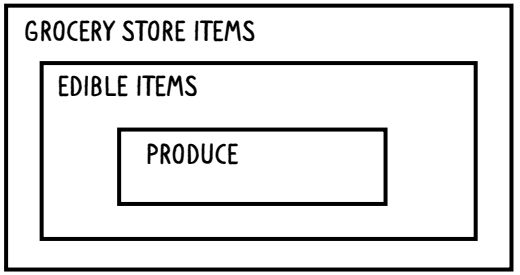
classifying whole, integer and rational numbers in a visual representation

instructional strategies

model it: allow students to explore concepts of sets and subsets by placing more familiar concepts on a graphic organizer first (example shown below)

Place each of the following where it belongs.

APPLES	SOAP	MILK	CARROTS	BREAD	PAPER TOWELS



Consider asking the following:

- Is it possible for something to be placed in "edible items" that isn't produce?
- Is it possible for something to be placed in "produce" that isn't an edible item?

extra practice and resources

Sets and Subsets Intro Activity*

Consider using this activity as an introduction to explore relationships between sets and subsets and make meaningful discoveries before applying to whole, integer and rational numbers.

Classifying Rational Numbers Mystery Picture**

As students classify types of numbers, consider guiding their thinking with the following sentence stem:

"This value is _____ because _____"

Students can also use a graphic organizer alongside the mystery picture, or small groups of students could classify the values using small sticky notes and a large graphic organizer.

*Sets and Subsets Intro Activity is included as a part of 6th Grade All Access Membership.
**Classifying Real Numbers Mystery Picture is included as a part of 6th Grade All Access Membership.

ABSOLUTE VALUE

CUT AND PASTE

Students will be able to determine the absolute value, its opposite and interpret it in a real-world situation.

6.NS.7(c) Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

6.2B Identify a number, its opposite, and its absolute value.

Ideas for Implementation: Math is always more fun with a hands on activity! Students can work individually or in a partners to practice determining absolute value. Students will be given multiple answers, so some cards will not be used. Perfect for a center, tutoring, or to practice the concept. Glue and scissors required.

Directions: Each student will need a copy of the recording sheet (can be copied double sided) and a copy of the answers (copy one sided). Students will read each problem and match the corresponding opposite value, as well as the find the absolute value.

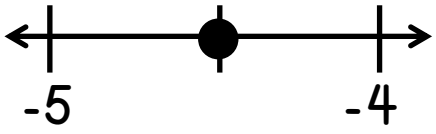
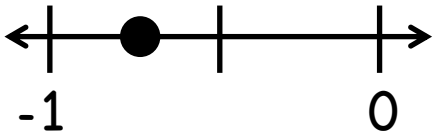
Unit: Number System
Cut and Paste

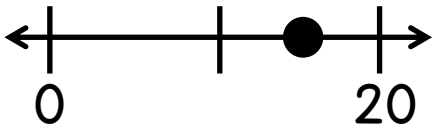
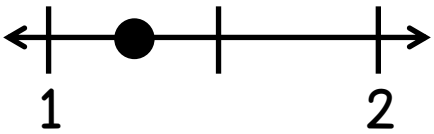
Name _____

Date _____Pd_____

ABSOLUTE VALUE

Cut and paste the opposite and absolute value for each problem in the appropriate boxes.

PROBLEM	OPPOSITE	ABSOLUTE VALUE
		
The Rocky Mountains are 14,440 feet above sea level.		
Your gas gauge shows you have 29 miles to empty.		
		
A board game card states to move backwards 12 spaces.		

PROBLEM	OPPOSITE	ABSOLUTE VALUE
		
The temperature on the thermometer reads -18°F.		
Your sister deposits $86.00 into your savings account.		
		
The deepest part of the Indian Ocean is 8,047 meters below sea level.		
create your own		

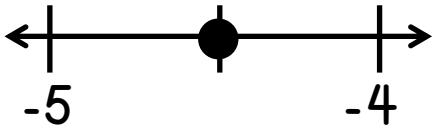
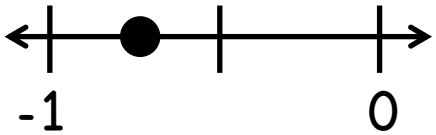
$4\frac{1}{2}$	$4\frac{1}{2}$	$-4\frac{1}{2}$	$\frac{2}{3}$	$\frac{5}{4}$
18	18	-18	$\frac{2}{3}$	$\frac{5}{4}$
-86	86	-86	$-\frac{2}{3}$	$-\frac{5}{4}$
-15	15	-15	-14,440	29
-8,047	8,047	8,047	-14,440	-29
12	12	-12	14,440	-29

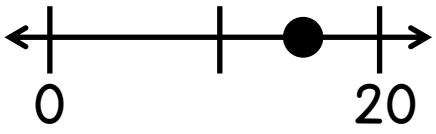
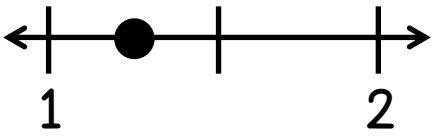
Unit: Number System
Cut and Paste

Name KEY
Date _____ Pd_____

ABSOLUTE VALUE

Cut and paste the opposite and absolute value for each problem in the appropriate boxes.

PROBLEM	OPPOSITE	ABSOLUTE VALUE
	$4\frac{1}{2}$	$4\frac{1}{2}$
The Rocky Mountains are 14,440 feet above sea level.	-14,440	14,440
Your gas gauge shows you have 29 miles to empty.	-29	29
	$\frac{2}{3}$	$\frac{2}{3}$
A board game card states to move backwards 12 spaces.	12	12

PROBLEM	OPPOSITE	ABSOLUTE VALUE
	-15	15
The temperature on the thermometer reads -18°F.	18	18
Your sister deposits $86.00 into your savings account.	-86	86
	$-\frac{5}{4}$	$\frac{5}{4}$
The deepest part of the Indian Ocean is 8,047 meters below sea level.	8,047	8,047
create your own		

COMPARING RATIONAL NUMBERS

TASK CARDS

Students will be able to compare rational numbers.

6.NS.7(a) Interpret statements of inequality as statements about the relative position of two numbers on the number line diagram.

6.2C Locate, compare, and order integers and rational numbers using the number line.

Ideas for Implementation: Task cards are excellent for classroom practice. Students get hands-on practice and there are many activities to play with these cards.

Read this blog post for ideas on how to use task cards.

Teacher Tips: Print on cardstock or laminate to keep cards lasting. You can store them in plastic baggies or on binder rings.

Translate the inequality statement below to words. Write it two different ways.

$-9 < -6$

1

Translate the inequality statement below to words. Write it two different ways.

$6\frac{1}{2} < 6.75$

2

Translate the inequality statement below to words. Write it two different ways.

$-1.9 > -3$

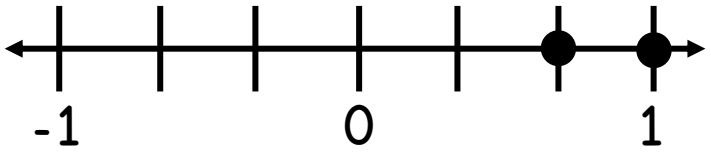
3

Translate the inequality statement below to words. Write it two different ways.

$0 > -\frac{1}{4}$

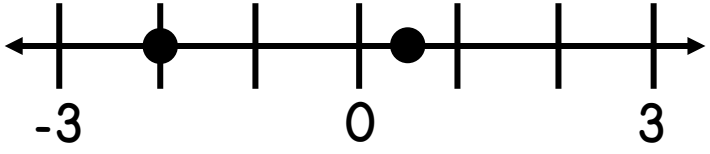
4

Read the number line below. Write an inequality comparing the two points.



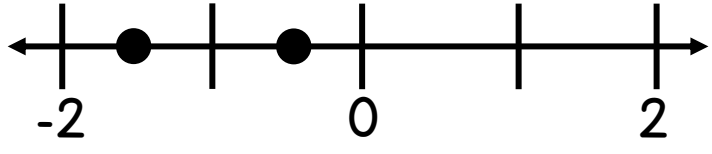
5

Read the number line below. Write an inequality comparing the two points.



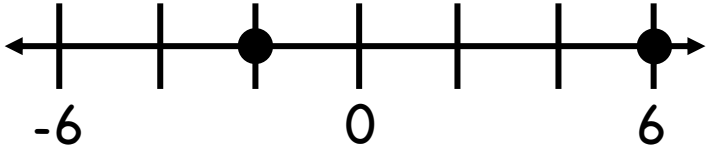
6

Read the number line below. Write an inequality comparing the two points.



7

Read the number line below. Write an inequality comparing the two points.



8

Use <, >, = to compare the rational numbers below.

-150% ◯ -15.0

9

Use <, >, = to compare the rational numbers below.

6.71 ◯ $6\frac{3}{4}$

10

Use <, >, = to compare the rational numbers below.

$-\frac{11}{3}$ ◯ -3.1

11

Use <, >, = to compare the rational numbers below.

1.8 ◯ 18%

12

Which of the following numbers is closer to zero?

-0.8 or $\frac{2}{3}$

13

Which of the following numbers is closer to zero?

-16.5 or -16.05

14

Which of the following numbers is closer to zero?

72% or -60

15

Which of the following numbers is closer to zero?

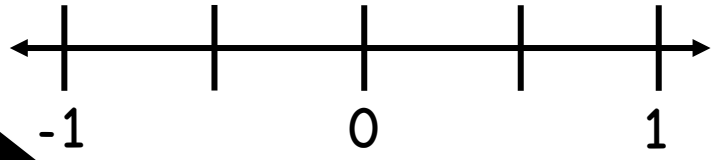
15% or $\frac{1}{6}$

16

Place the points below on the number line.

pt A: -25%

pt B: $\frac{2}{3}$

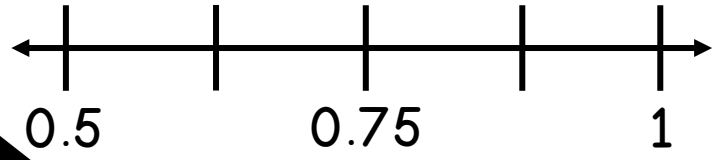


17

Place the points below on the number line.

pt A: 60%

pt B: $\frac{7}{8}$

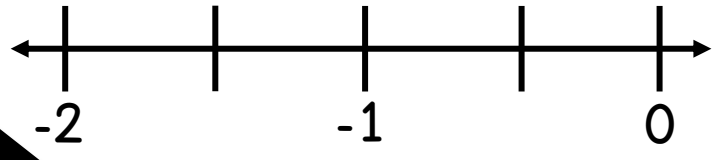


18

Place the points below on the number line.

pt A: -1.4

pt B: -1.8

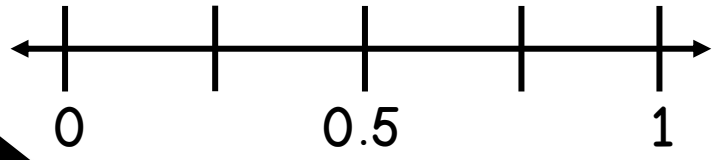


19

Place the points below on the number line.

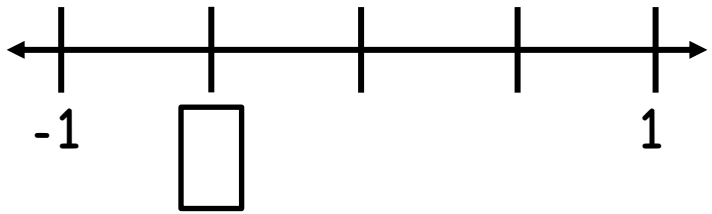
pt A: $\frac{5}{6}$

pt B: 0.75



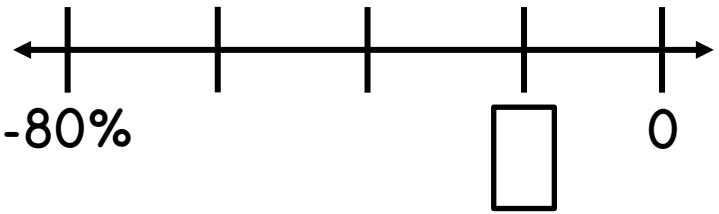
20

What rational number is missing from the number line below?



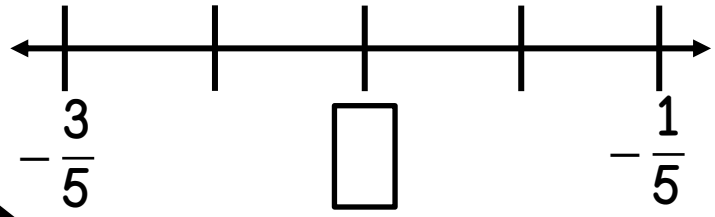
21

What rational number is missing from the number line below?



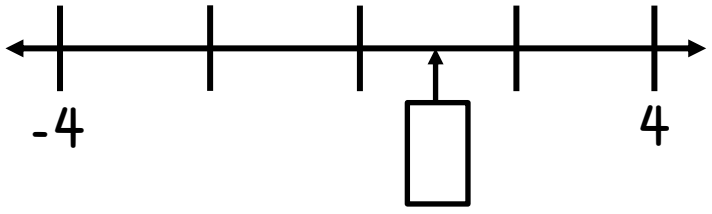
22

What rational number is missing from the number line below?



23

What rational number is missing from the number line below?



24

What number am I?

- I am an integer
- I am not positive
- I am less than -12

25

What number am I?

- I am a positive number
- I am not a whole number
- I am greater than 5

26

What number am I?

- I am not an integer
- I am greater than -2
- I am less than 0

27

What number am I?

- I am not negative
- I am not a whole number
- I am between 1 and 2

28

Unit: Numerical Representations
Comparing Rationals

Name_____
Date _____ Pd _____

Comparing Rational Numbers Task Card

Show your work for each problem in the correct box.

1	2	3	4
5	6	7	8
9	10	11	12

13	14	15	16
17 	18 	19 	20 
21	22	23	24
25	26	27	28

Unit: Numerical Representations
Comparing Rationals

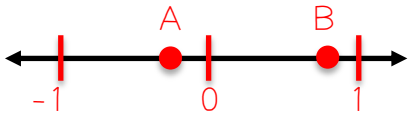
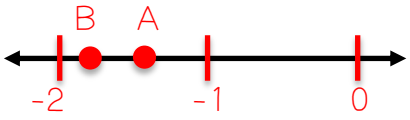
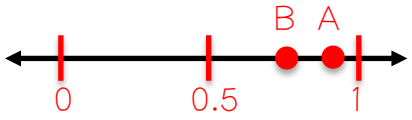
Name KEY

Date _____ Pd ____

Comparing Rational Numbers Task Card

Show your work for each problem in the correct box.

1 1. -9 is less than -6 2. -6 is greater than -9	**2** 1. $6\frac{1}{2}$ is less than 6.75 2. 6.75 is greater than $6\frac{1}{2}$	**3** 1. -1.9 is greater than -3 2. -3 is less than -1.9	**4** 1. 0 is greater than $-\frac{1}{4}$ 2. $-\frac{1}{4}$ is less than 0
5 $\frac{2}{3} < 1$ $1 > \frac{2}{3}$	**6** $-2 < \frac{1}{2}$ $\frac{1}{2} > -2$	**7** $-1\frac{1}{2} < -\frac{1}{2}$ $-\frac{1}{2} > -1\frac{1}{2}$	**8** $-2 < 6$ $6 > -2$
9 >	**10** <	**11** <	**12** >

13 $\frac{2}{3}$	**14** 16.05	**15** 72%	**16** 15%
17 	**18** 	**19** 	**20** 
21 $-\frac{1}{2}$, -0.5, -50%	**22** $-\frac{1}{5}$, -0.2, -20%	**23** $-\frac{2}{5}$, -0.4, -40%	**24** 1 or 1.0 or 100%
25 Answer varies	**26** Answer varies	**27** Answer varies	**28** Answer varies