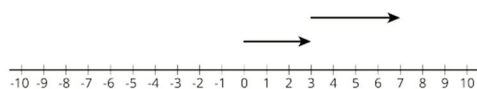


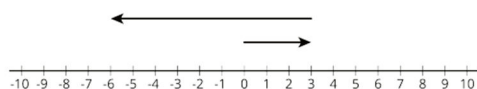
**Let's Do Some Math -
Which One Doesn't
Belong?**

Which pair of arrows doesn't belong?

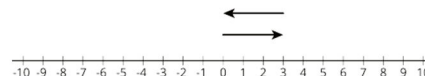
1.



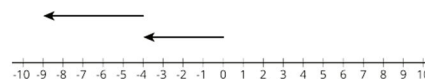
2.



3.



4.



Standards Unpacking

Key	Standard	Prerequisites/Vocabulary
Put a box around the conceptual component of the standard. Underline the procedural/fluency component of the standard. Put a cloud around the application component of the standard.	7.NS.1a- Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</i>	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.1b- Understand $p + q$ as the number located a distance $ q $ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.1c- Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in real-world contexts.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.1d- Apply properties of operations as strategies to add and subtract rational numbers.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?

Standards Unpacking		
Key	Standard	Prerequisites/Vocabulary
Put a box around the conceptual component of the standard. Underline the <u>procedural/fluency component</u> of the standard. Put a cloud around the  application component of the standard.	7.NS.2- Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.2a- Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.2b- Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.2c- Apply properties of operations as strategies to multiply and divide rational numbers.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?

Standards Unpacking		
Key	Standard	Prerequisites/Vocabulary
Put a box around the conceptual component of the standard. Underline the <u>procedural/fluency component</u> of the standard. Put a cloud around the  application component of the standard.	7.NS.2d - Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.NS.3 - Solve real-world and mathematical problems involving the four operations with rational numbers.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.EE.4 - Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities.	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?
	7.EE.4a - Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q , and r are specific rational numbers. Solve equations of these forms with accuracy and efficiency. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	What prior knowledge should my students have?
		What vocabulary/ notation should students know for this standard?

LESSON 11: Add Integers

Directions: : Complete the following SOLVE problem with your teacher. You will only complete the S step.

Jackie gets paid \$5.50 an hour for 40 hours of work per week. She deposited \$135.00 into her checking account. Her balance before the deposit was $-\$30.00$. What was the balance of Jackie's account after the deposit?

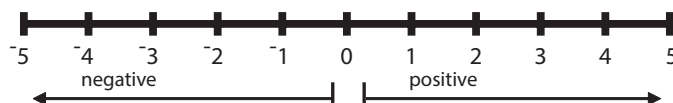
S Underline the question.

This problem is asking me to find _____.

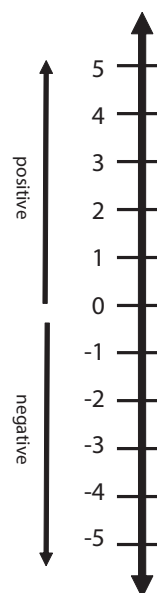
Directions: Complete this page with your teacher and partner.

1. Daniel earns \$4.00 walking his neighbor's dog. He pays his brother \$4.00 he owes him from last week.
 - a. Use unit tiles to represent the situation.

- b. Use a horizontal number line to represent the situation.



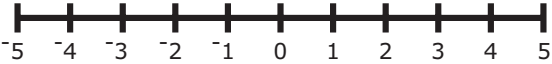
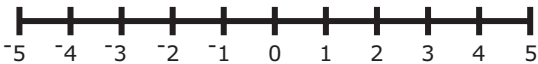
- c. Use a vertical number line to represent the situation.



Conclusion: When we add a number and its opposite, the sum is _____. This is known as the _____.

LESSON 11: Add Integers

Directions: Complete this page with your teacher and partner.

1. $3 + 2 =$	2. $-3 + -2 =$
	
	

What did you notice about Problem 1 and Problem 2?

In Problem 1 when you added two positive integers, what was the sum?

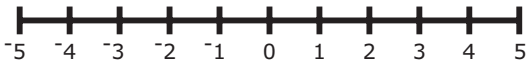
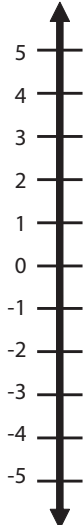
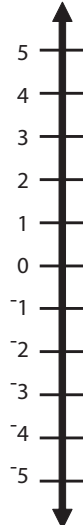
In Problem 2 when you added two negative integers, what was the sum?

What is your conclusion?

Justify your thinking using one of the number line models.

LESSON 11: Add Integers

Directions: Complete this page with your teacher and partner.

3. $3 + ^{-}2 =$	4. $^{-}3 + 2 =$
	
	

What did you notice about Problem 3 and Problem 4?

In Problem 3, when you added the two integers, what was the sum?

In Problem 4, when you added the two integers, what was the sum?

LESSON 11: Add Integers

Directions: Complete this page with your teacher and partner.

RULES FOR OPERATIONS WITH INTEGERS
ADDITION: Two integers with same signs: Two integers with different signs:
SUBTRACTION: Subtraction is the same as Make two changes to the problem: After these two steps:
MULTIPLICATION: Two integers with same signs: Two integers with different signs:
DIVISION: Two integers with same signs: Two integers with different signs:

LESSON 12: Subtract Integers

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

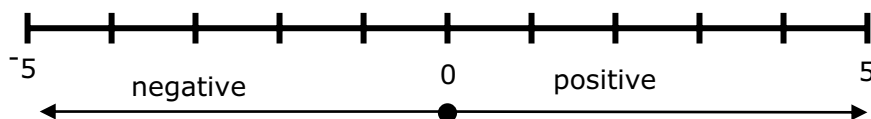
The highest elevation in North America is Mt. McKinley, which has an elevation of 20,320 feet above sea level. The lowest elevation in North America is Death Valley, which has an elevation of 282 feet below sea level. What is the difference between these two elevations?

S Underline the question.

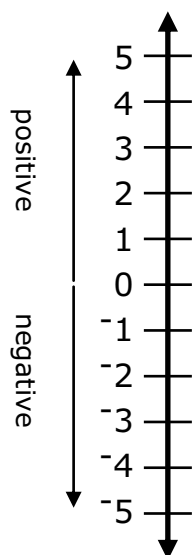
This problem is asking me to find _____.

Directions: Complete this page with your teacher and partner.

1. What is the absolute value of 3? _____ What is the absolute value of -3 ? _____



2.



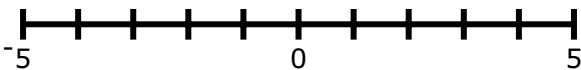
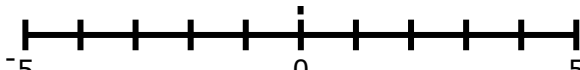
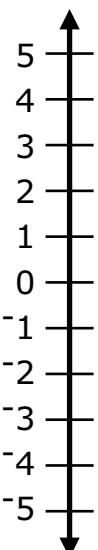
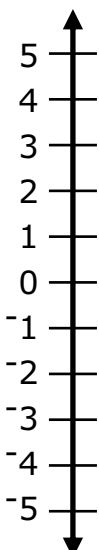
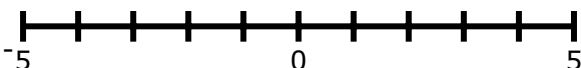
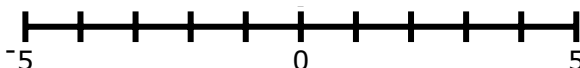
What is the value of $|-4|$? _____

What is the value of $|4|$? _____

Conclusion: The absolute value of a number is always a _____ value because the absolute value represents the distance from _____ on the number line and a distance cannot be a _____ value.

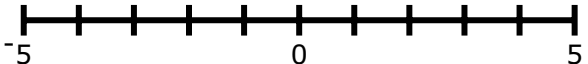
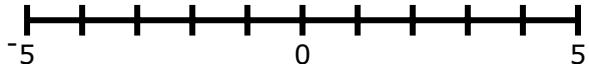
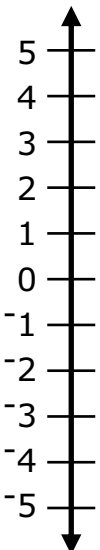
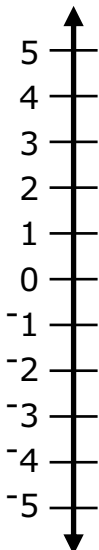
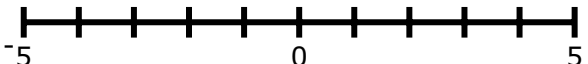
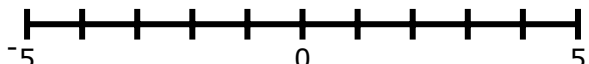
LESSON 12: Subtract Integers

Directions: Complete this page with your teacher and partner.

1. $4 - 1 =$	2. $-4 - (-1) =$
	
	
Describe the relationship between subtraction and addition.	
Compare the horizontal number line below and the number line for $4 + ^{-}1$.	Compare the horizontal number line below and the number line for $^{-}4 + 1$.
	
How can you represent the number line model above with addition?	How can you represent the number line model above with addition?
Conclusion: Subtraction is the same as adding the _____. _____ corresponds to _____	Conclusion: Subtraction is the same as adding the _____. _____ corresponds to _____

LESSON 12: Subtract Integers

Directions: Complete this page with your teacher and partner.

3. $4 - (-1) =$	4. $-4 - 1 =$
	
	
Describe the relationship between subtraction and addition.	
Compare the horizontal number line below and the number line for $4 + 1$.	Compare the horizontal number line below and the number line for $-4 + -1$.
	
How can you represent the number line model above with addition?	How can you represent the number line model above with addition?
Conclusion: Subtraction is the same as adding the _____. _____ has the same answer as _____.	Conclusion: Subtraction is the same as adding the _____. _____ has the same answer as _____.

LESSON 12: Subtract Integers

Directions: Complete this page with your teacher and partner.

Problem	Corresponding addition problem	How are they similar?	How are they different?
1. $4 - 1 =$			
2. $-4 - (-1) =$			
3. $4 - (-1) =$			
4. $-4 - 1 =$			
What conclusion can you make about the problems above?			
Subtraction Problem	Corresponding Addition Problem	Explanation	
5. $6 - 2 =$			
6. $4 - (-9) =$			
7. $-7 - (-5) =$			
8. $-10 - 3 =$			

LESSON 13: Multiply Integers

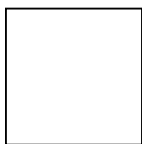
Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

The membership at the local fitness club has decreased an average of 16 people each month for the last 6 months. If this pattern continues for the next 6 months, what integer could be used to represent the loss of members over the next 6 - month period?

S Underline the question.

This problem is asking me to find _____.

Directions: Complete this page with your teacher and partner.



= _____



= _____

Wording for multiplication of integers:

Gain/Lose _____ groups of positive/negative _____ items

1. $2 \cdot 2 =$ _____

2. $2 \cdot ^{-}2 =$ _____

_____ two groups of _____ two items. _____ two groups of _____ two items.

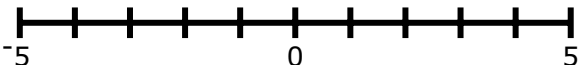
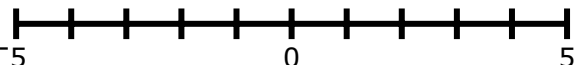
3. $^{-}2 \cdot 2 =$ _____

4. $^{-}2 \cdot ^{-}2 =$ _____

_____ two groups of _____ two items. _____ two groups of _____ two items.

LESSON 13: Multiply Integers

Directions: Complete this page with your teacher and partner.

1. $2 \cdot 2 =$	2. $2 \cdot -2 =$
	
Describe the process in Problem 1.	Describe the process in Problem 2.
In Problem 1 when you multiplied the two positive factors, what was the product?	In Problem 2 when you multiplied a positive factor and a negative factor, what was the product?
What conclusion can you draw about multiplying two positive integers?	What conclusion can you draw about multiplying one positive integer and one negative integer?
3. $-2 \cdot 2 =$	4. $-2 \cdot -2 =$
What did we have to do to “lose” groups of items?	What did we have to do to “lose” groups of items?
In Problem 3 when you multiplied a negative factor and a positive factor, what was the product?	In Problem 4 when you multiplied the two negative factors, what was the product?
What conclusion can you draw about multiplying one negative integer and one positive integer?	What conclusion can you draw about multiplying two negative integers?

LESSON 13: Multiply Integers

Directions: Complete this page with your teacher and partner.

	What do you notice about the signs of the factors?	What is the sign of the product?
Problem 1 $2 \bullet 2 =$		
Problem 2 $2 \bullet ^{-}2 =$		
Problem 3 $^{-}2 \bullet 2 =$		
Problem 4 $^{-}2 \bullet ^{-}2 =$		
Conclusions:		
When you multiply two integers that have like signs, the answer is _____.		
When you multiply two integers that have different signs, the answer is _____.		

For Problems 1 – 4, solve the following integer problems and create a context for the problems. For Problems 5 – 8 write the integer problems to match the context and find the solutions.

Equation	Context
1. $6 \bullet 20 =$	
2. $11 \bullet ^{-}5 =$	
3. $^{-}10 \bullet 9 =$	
4. $^{-}12 \bullet ^{-}12 =$	
5.	The art club sold 12 cases of oranges and made a profit of \$20 per case. What is the total profit?
6.	Justin owes \$5.00 to each of his four sisters. What is his financial standing?
7.	Mr. Johnson spent \$3.00 each on 12 packs of pencils. What is his financial standing?
8.	During the integer math game, Tanya draws a red 7 and a red 8. She has to multiply the two negative numbers. What is the product?

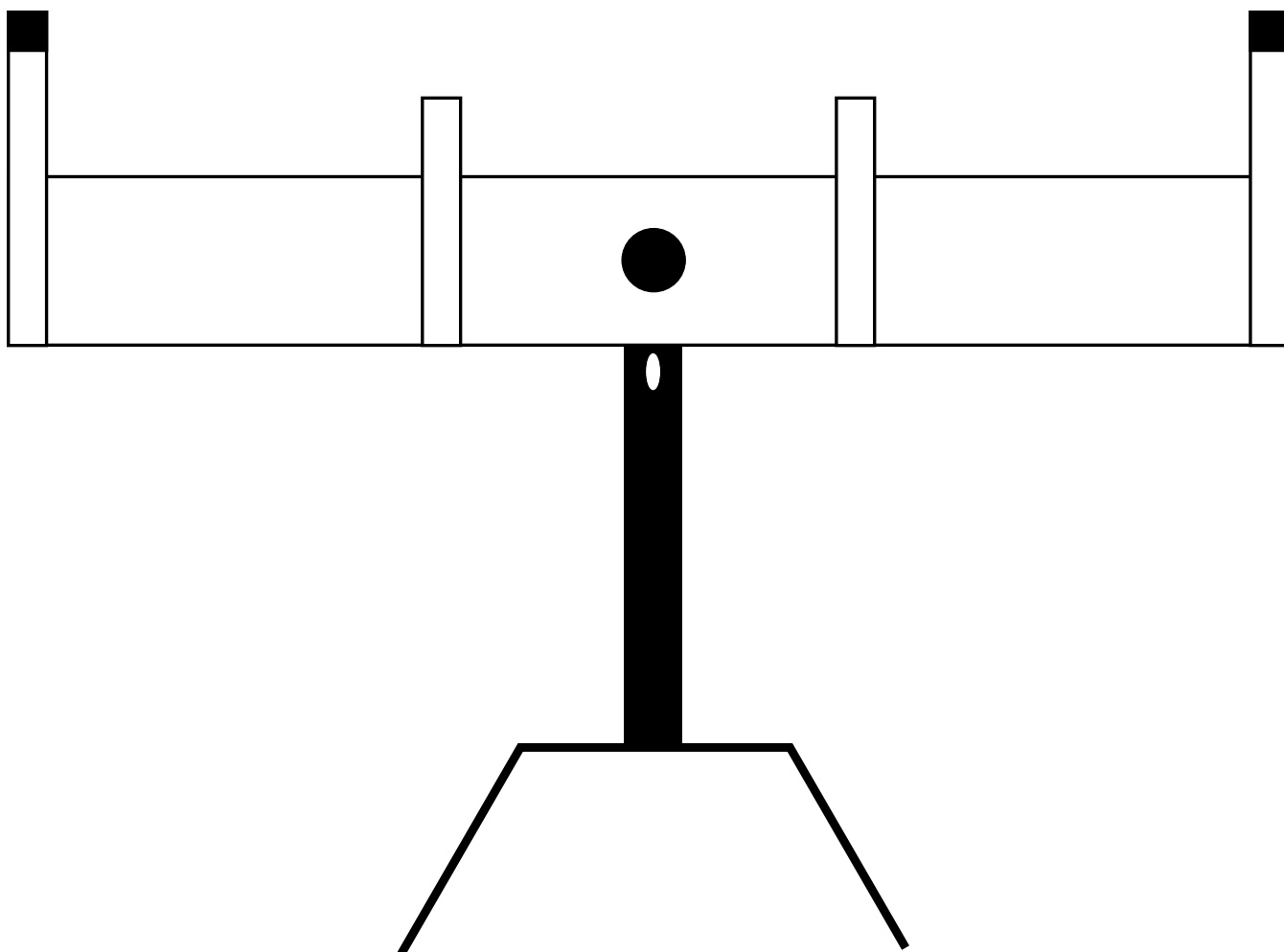
Lesson 15: Real-World Application with Rational Numbers

Directions: Complete this page with your teacher and partner.

Fraction	Decimal	Repeating or Terminating	Prime Factorization of the Denominator
$\frac{3}{4}$			
$\frac{1}{2}$			
$\frac{5}{8}$			
$\frac{2}{5}$			
$\frac{1}{6}$			
$\frac{7}{9}$			
$\frac{9}{10}$			
$\frac{3}{7}$			

1. What do you notice about all of the terminating decimals?
2. What do you notice about the repeating decimals?
3. What numbers are part of the prime factorization of the denominators of the values that have repeating decimals?
4. What generalizations can you make about fractions and whether their equivalent decimals will be terminating or repeating?
5. Any value that can be written as a fraction is called a _____. In decimal form, rational numbers will be either _____ or _____.

LESSON 19: Two-Step Equations with Integers



Directions: Complete this page with your teacher and partner.

3. $2c + 2 = -6$ Model	Check:
Pictorial Check:	Solve the equation Check:

LESSON 19: Two-Step Equations with Integers

Directions: Complete this page with your teacher and partner.

4. $2c + -2 = 6$

Model

Check:

Pictorial

Solve the equation

Check:

Check:

Understanding Modeling Questions Use this sheet as a reflection tool to support the understanding of the evidence statement around the modeling questions. After you engage/learn about the questions, use the tool to make notes around your take aways and implementation ideas.	
Current Unit Topics:	
	Evidence Statement for Modeling
What Content Standards Are Addressed in This Evidence Statement from the Current Unit?	
Takeaways About the Statement – What Do Students Need to Be Able to Do	
What Should Be Evident in a Student Response	

Think Quantities!	Think Structure!	Think Repetition!
What can I count? What can I measure? How are the quantities related? How can I represent the quantities so I can see relationships?	How is this situation behaving? What kind of problem is this? Does the problem remind me of another I've solved? Will changing the form help? How can I chunk this expressions/number/visual?	Is there a process that keeps repeating? Am I counting /building/drawing in the same way each time? Do I keep repeating the same calculations? How can I use repetition to write a rule?

Modeling Question – 7.D.1

Used from: NJ Released Questions – D.1 – Expressions and Equations – VF643084

A family purchased tickets to a museum and spent a total of \$38.00. The family purchased 4 tickets. There was a \$1.50 processing fee for each ticket. Write and solve an equation that can be used to find x , the cost of one ticket to the museum. Show your work or explain your answer.