Agenda:

1) Bell Ringer- exit ticket from lesson 1 (p.9)

2) Module 2- Rational Numbers
Lesson 2: From yesterday - what are additive inverses?
How do you add integers using a number line?

3) Homework: Lesson 2 (1-8)

4) PS #7 due Today

Sep 7-12:49 PM

Homework

For Questions 1–3, refer to the Integer Game.

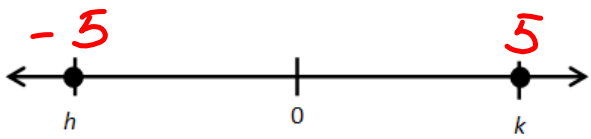
1. You have two cards with a sum of (-12) in your hand. What two cards could you have?

2. You add two more cards to your hand, but the total sum of the cards remains the same, (-12). Give some different examples of two cards you could choose.

3. Choose one card value and its additive inverse. Choose from the list below to write a real-world story problem that would model their sum.
   a. Elevation: above and below sea level
   b. Money: credits and debits, deposits and withdrawals
   c. Temperature: above and below **0** degrees
   d. Football: loss and gain of yards

Oct 24-10:55 AM

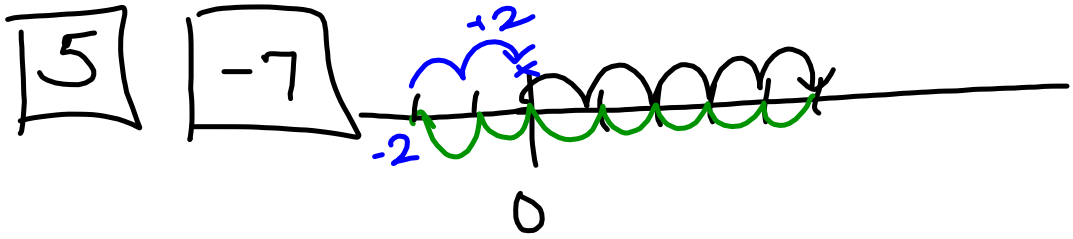
4. On the number line below, the numbers h and k are the same distance from 0. Write an equation to express the value of $h + k$.



$h + k = 0$

$-5 + 5 = 0$

5. During a football game, Kevin gained five yards on the first play. Then he lost seven yards on the second play. How many yards does Kevin need on the next play to get the team back to where they were when they started? Show your work.



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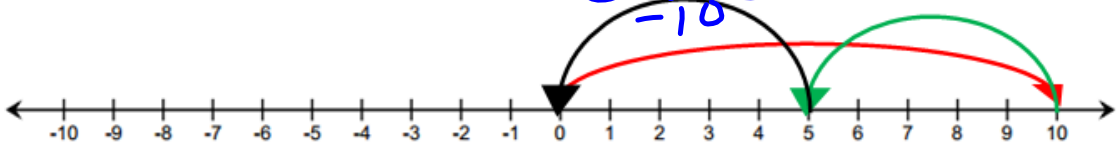
6. Write an addition number sentence that corresponds to the arrows below.

$10 + (-5) + (-5) = 0$



$+10$
-5
-5

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Lesson 2: Using the Number Line to Model the Addition of Integers

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Classwork

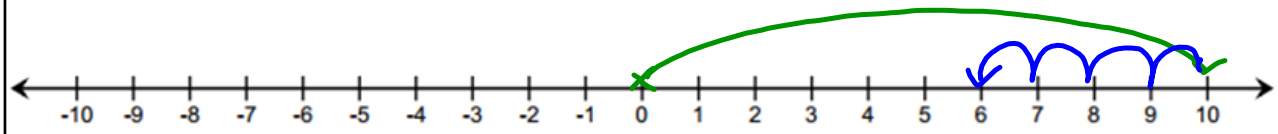
Exercise 1: Real-World Introduction to Integer Addition

Answer the questions below.

a. Suppose you received $10 from your grandmother for your birthday. You spent $4 on snacks. Using addition, how would you write a number sentence to represents this situation?

$10 + (-4) = 6$

b. How would you model your equation on a number line to show your answer?



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Example 1: Modeling Addition on the Number Line

Complete the steps to finding the sum of $-2 + 3$ by filling in the blanks. Model the number sentence using straight arrows called *vectors* on the number line below.

a. Place the tail of the arrow on 0.

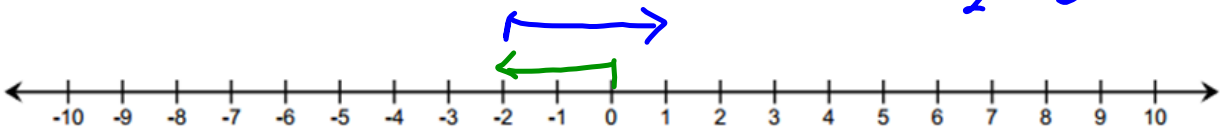
b. Draw the arrow 2 units to the left of 0, and stop at -2. The direction of the arrow is to the left since you are counting down from 0.

c. Start the next arrow at the end of the first arrow, or at -2.

d. Draw the second arrow 3 units to the right since you are counting up from -2.

e. Stop at 1.

$-2+3=1$



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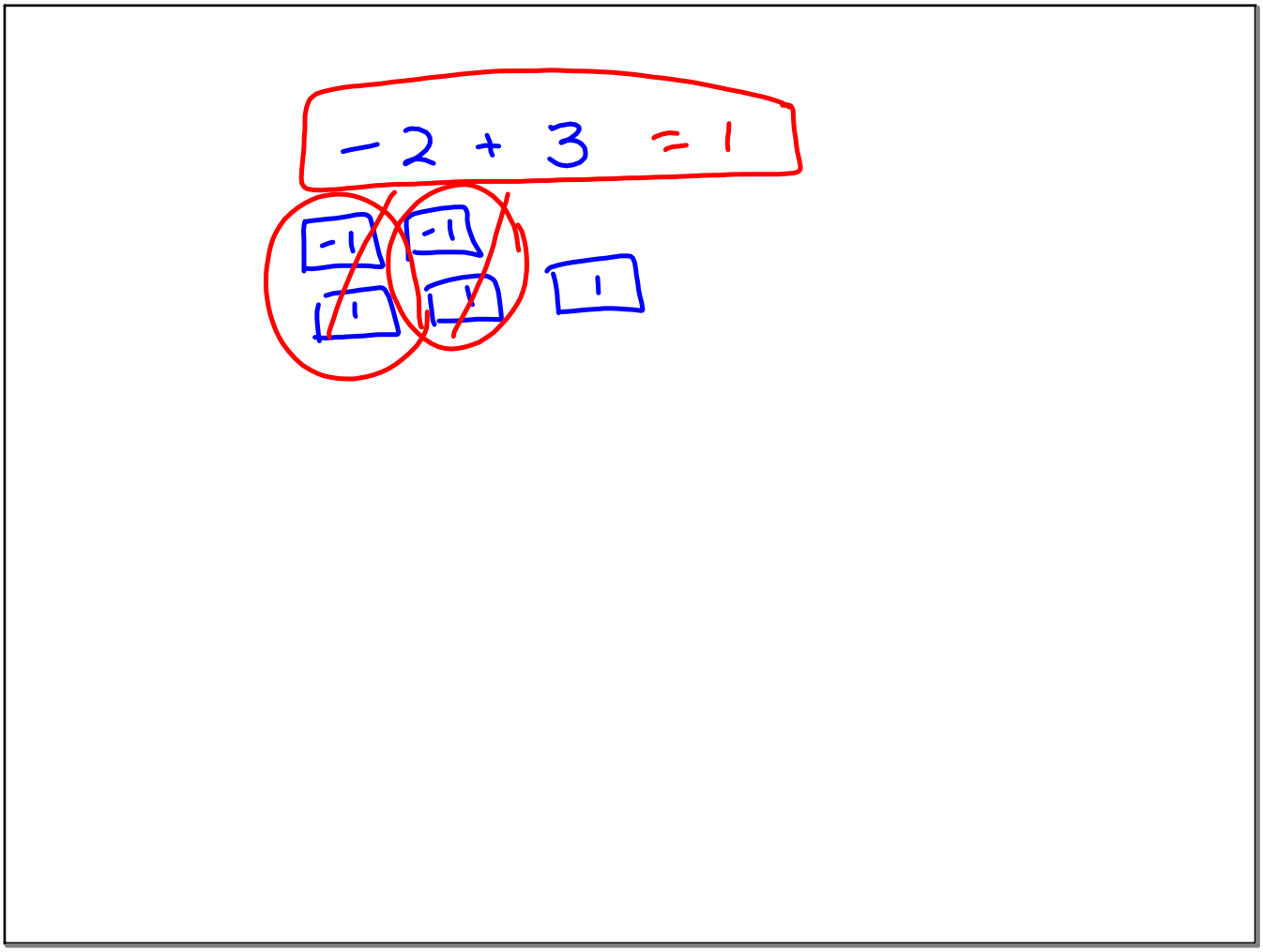

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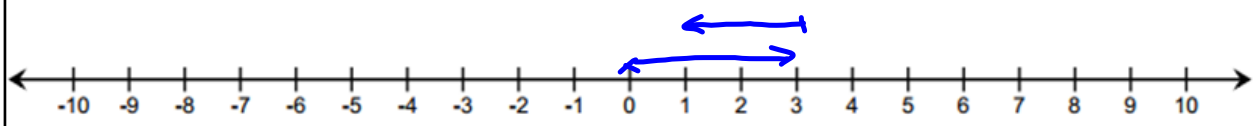
f. Repeat the process from part (a) for the expression $3 + (-2)$. $= 1$



$-2 + 3 = 1$

$3 + (-2) = 1$

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g. What can you say about the sum of $-2 + 3$ and $3 + (-2)$? Does order matter when adding numbers? Why or why not?

- Same
- order does not matter
- commutative property

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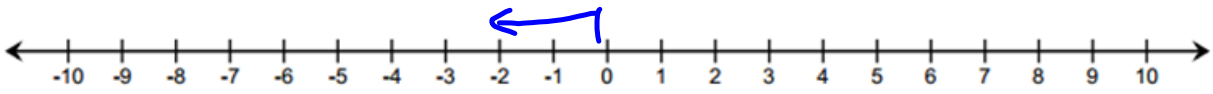
Example 2: Expressing Absolute Value as the Length of an Arrow on the Number Line

a. How does absolute value determine the arrow length for -2 ?

2 units long

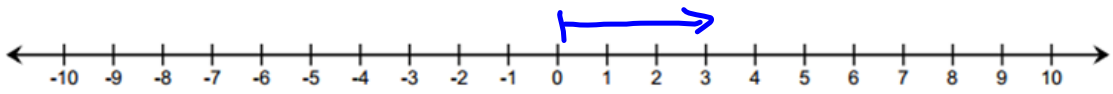


absolute value is arrow length

b. How does the absolute value determine the arrow length for 3 ?

$|3| = 3$

arrow length = 3



c. How does absolute value help you to represent -10 on a number line?

arrow 10 long to the left

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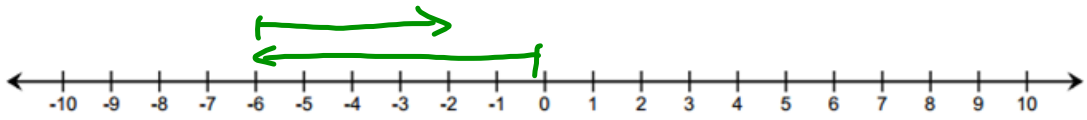
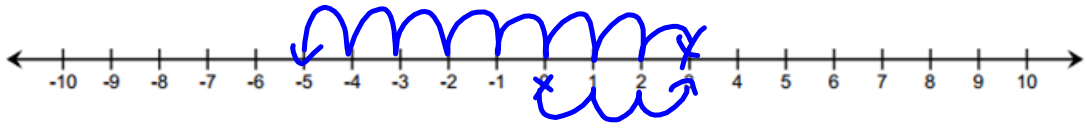
Exercise 2

Create a number line model to represent each of the expressions below.

a. $-6 + 4 = -2$



b. $3 + (-8) = -5$



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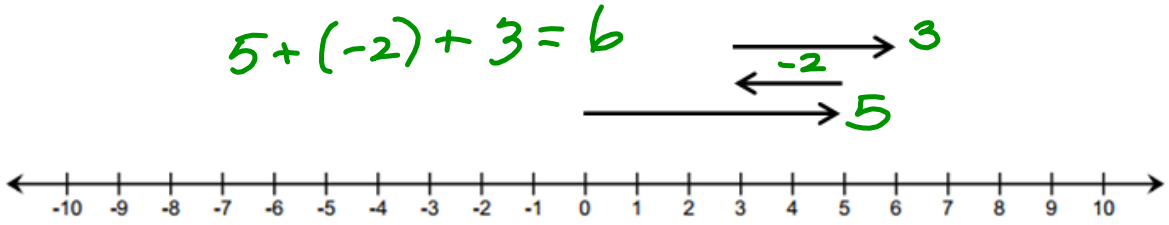
Example 3: Finding Sums on a Real Number Line Model

Find the sum of the integers represented in the diagram below. Write an equation to express the sum.

$5 + (-2) + 3 = 6$



a. What three cards are represented in this model? How did you know?

5 -2 3

b. In what ways does this model differ from the ones we used in Lesson 1?

c. Can you make a connection between the sum of **6** and where the third arrow ends on the number line?

where 3rd arrow ends is the sum

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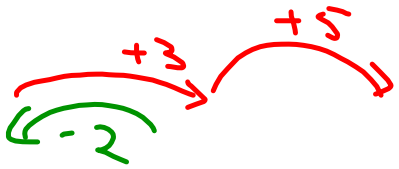
d. Would the sum change if we changed the order in which we add the numbers, for example, $(-2) + 3 + 5$?

no

$(-2) + 8 = 6$

e. Would the diagram change? If so, how?

arrows would move



Exercise 3

Play the Integer Game with your group. Use a number line to practice "counting on".

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Lesson Summary

- On a number line, arrows are used to represent integers; they show length and direction.
- The length of an arrow on the number line is the absolute value of the integer.
- Adding several arrows is the same as combing integers in the Integer Game.
- The sum of several arrows is the final position of the last arrow.

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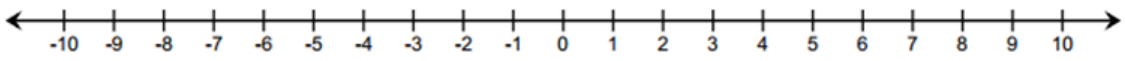
Problem Set

For Questions 1–4, represent each of the following problems using both a number line diagram and an equation.

1. David and Victoria are playing the Integer Card Game. David drew three cards, $-6, 12$, and -4 . What is the sum of the cards in his hand? Model your answer on the number line below.



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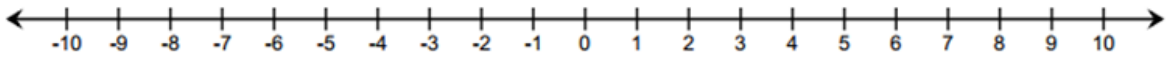
2. In the Integer Card Game, you drew the cards, $2, 8,$ and $-11.$ Your partner gave you a 7 from his hand. What is your new total? Model your answer on the number line below.



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3. What cards would you need to get your score back to zero? Explain. Use and explain the term "additive inverse" in your answer.

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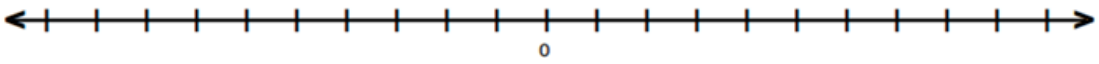
4. If a football player gains 40 yards on a play, but on the next play, he loses 10 yards, what would his total yards be for the game if he ran for another 60 yards? What did you count by to label the units on your number line?



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5. Find the sums.

a. $-2 + 9$

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b. $-8 + -8$
c. $-4 + (-6) + 10$
d. $5 + 7 + (-11)$

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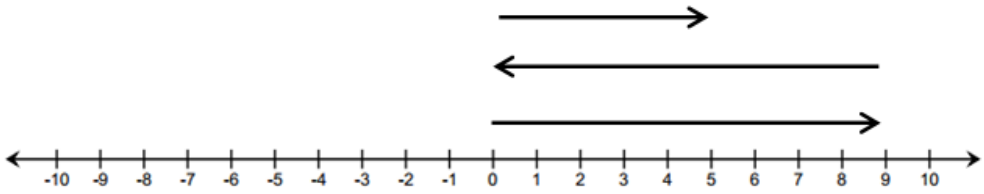
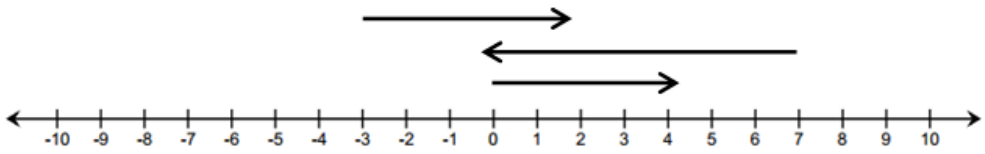
7. Write a story problem that would model the sum of the arrows in the number diagram below.



8. Do the arrows correctly represent the equation $4 + (-7) + 5 = 2$? If not, draw a correct model below.



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Integers Practice 1- Addition

Directions: Solve.

1. (-3) + (-2) = -5

2. -2 + (– 14) = -16

3. -7 + (-2) = -9

4. -5 + (-6) = -11

5. 10 + (-12) = -2

6. -3 + (-4) = -7

7. 4 + 5 = 9

8. 3 + (-14) = -11

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9. -3 + 8 = 5

10. -13 + 14 = 1

11. 9 + (-8) = 1

12. -6 + 10 = 4

13. 6 + (-10) = -4

14. -6 + 10 = 4

15. (-7) + (-6) = -13

16. 12 + 13 = 25

17. – 8 + 8 = 0

18. -5 + 6 = 1

19. -5 + 15 = 10

20. 9 + (-4) = 5