Name

Period_____ Wednesday, September 11, 2013

Learning Objective

We will represent[1] quantities using positive and negative numbers.

CFU

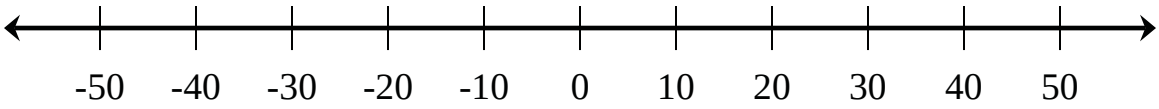
What are we going to do?

What does *represent* mean?
Represent means _____.

Activate Prior Knowledge

A **number line** shows the order of numbers based on their value.

Locate the number on the number line that represents **40 positive units** from zero.
Locate the number on the number line that represents **20 negative units** from zero.



Make Connection

Students, you already know how to work with positive and negative numbers on a number line. Now, we will use this knowledge to represent quantities using positive and negative numbers.

Vocabulary

[1] show

CCSS 6th Grade The Number System 5.0
Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of zero in each situation.
Lesson to be used by EDI-trained teachers only.

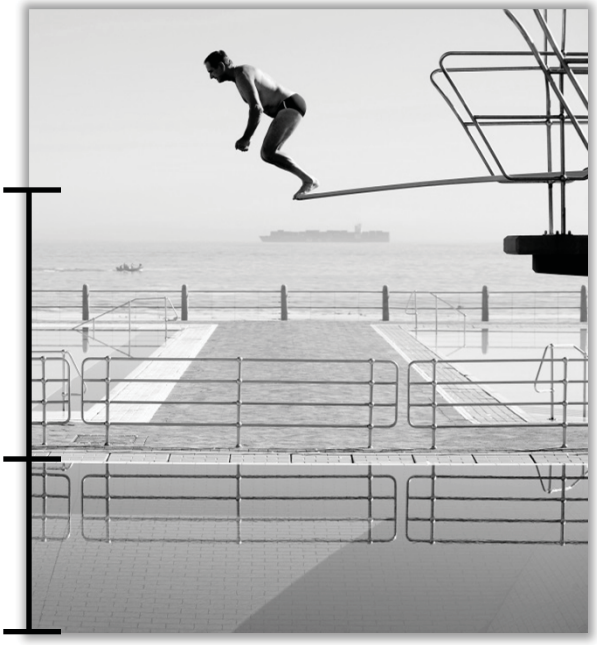
Concept Development

A **quantity** is a measured amount.
Quantities can be measured using **positive** or **negative numbers**.

- *Positive or negative value is determined by comparing the quantity to* ***zero****.*

Positive and Negative Numbers

Juan is practicing diving. He dives from the **10-meter** platform, and sinks to about **8 meters deep** in the pool.



Juan's position before the dive is **10 meters**.

Juan's position after the dive is **-8 meters.**

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Which example can be represented using a positive number? How do you know?

Which example can be represented using a negative number? How do you know?

What quantity is shown by the third example?

A Mt. George is 1200 feet above sea level.

B A large fish was seen about 10 feet below sea level.

C A boat is floating on the sea.

Skill Development/Guided Practice

Quantities can be measured using **positive** or **negative numbers**.

- *Positive or negative value is determined by comparing the quantity to* ***zero****.*

Represent quantities using positive or negative numbers.

1. Read the problem.
2. Identify[2] the quantities in the word problem. (underline)
3. Represent the quantity using positive or negative numbers.
   Hint: Compare the numbers to zero.
4. Explain what zero means in the problem. (draw sketch)

1. Last summer, the high temperature was 95 degrees Fahrenheit. Today in winter, the high temperature is 10 degrees below zero F.
   Summer's temperature: _____
   Winter's temperature: _____

2. The weatherman said today's high temperature would be only 45 degrees. Tomorrow the temperature is expected to drop to 5 degrees below zero.
   Today's temperature: _____
   Tomorrow's temperature: _____

3. Death Valley, Calif., is the lowest area in the U.S. at 282 feet below sea level. Mt. Whitney is the highest area in the U.S. at 14,505 feet above sea level.
   Death Valley's position: _____
   Mt. Whitney's position: _____

4. The pilot radioed that his airplane was at 10,000 feet. The submarine captain said his ship was at a depth of 2,000 feet.
   The airplane's position: _____
   The submarine's position: _____

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2. How did I/you identify the quantities in the problem?
3. How did I/you represent the quantity using positive or negative numbers?

Vocabulary

[2] find (synonym)

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5. Maria made two bank transactions$_3$ today – a deposit of $25 and a withdrawal of $10.
   First transaction: _____
   Second transaction: _____

6. Magda made a deposit of $120 in her bank account. Then she wrote a check to pay $110 for her cell phone bill.
   First transaction: _____
   Second transaction: _____

7. Blaine's car battery needs 4 more volts of electricity to be fully charged. The battery won't work if the voltage drops by 3 volts.
   Voltage needed: _____
   Voltage drop: _____

8. Adam's toy car needs a total of 3 volts of charge from its 2 batteries. Battery A has 1.7 volts, but Battery B has lost one volt.
   Battery A voltage: _____
   Battery B voltage: _____

CFU

2. How did I/you identify the quantities in the problem?
3. How did I/you represent the quantity using positive or negative numbers?

Relevance

Quantities can be measured using **positive** or **negative numbers**.

- *Positive or negative value is determined by comparing the quantity to **zero**.*

1. *Representing quantities using positive and negative numbers will help you manage your world better.*

You will be able to adjust your clothing for temperature, adjust your direction up or down, balance your bank account, and understand how electricity works.

2. *Representing quantities using positive and negative numbers will help you do well on tests.*

Sample Test Question:

32. The Cake Factory bakes cakes for a grocery chain. All cakes must be within 3 ounces of the target weight of 30 ounces. Cakes were assigned a negative number if they were below 30 ounces and a positive number if above 30 ounces.

Which cake weights below would be accepted?

A A cake with a reading of -1.2 oz.
B A cake with a reading of 2.7 oz.
C A cake with a reading of -5.3 oz.
D A cake with a reading of 3.1 oz.

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Does anyone else have another reason why it is relevant to represent quantities using positive and negative numbers? (Pair-Share) Why is it relevant to represent quantities using positive and negative numbers? You may give one of my reasons or one of your own. Which reason is more relevant to you? Why?

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Skill Closure

Represent quantities using positive or negative numbers.

1. Read the problem.
2. Identify the quantities in the word problem. (underline)
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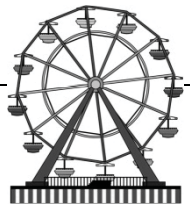
   Hint: Compare the numbers to zero.
4. Explain what zero means in the problem. (draw sketch)

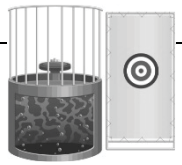
Word Bank

quantity
measured
positive
negative
numbers
zero

1. The temperature in the grocery store was 70 degrees. But the temperature in the walk-in freezer was 15 degrees below zero.
   Store's temperature: _____
   Freezer's temperature: _____

2. At the carnival, the Ferris wheel was 30 feet high. The water in the dunk tank, however, was 4 feet below the ground.
   Ferris wheel: _____
   Dunk tank: _____





Access Common Core

The school's swimming pool was 14 feet deep and the diving board was 3 feet above the water. Charles said these quantities could be represented with positive and negative numbers as 14 and -3. Do you agree? Explain.

_____

_____

Summary Closure

What did you learn today about representing quantities using positive or negative numbers? (Pair-Share) Use words from the word bank.

Day 1 _____

_____

Day 2 _____

_____

Independent Practice

Name _____

Quantities can be measured using **positive** or **negative numbers**.

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1. The refrigerator keeps food at about 4 degrees Celsius, while the freezer keeps them at about 18 degrees below zero Celsius.
   Refrigerator temperature: _____
   Freezer temperature: _____

2. To make iced tea, you need to boil water at 104 degrees Celsius, and freeze ice cubes at 4 degrees below zero Celsius.
   Boiling water: _____
   Freezing ice cubes: _____

3. The latest poll showed the presidential candidate was up 12 points in the East, but down 15 points in the West.
   Poll rating in East: _____
   Poll rating in West: _____

4. Polls showed that the number of people favoring the new immigration law went up 12% this month, and the number against the law went down 10%.
   Number of people in favor: _____
   Number of people against: _____

Periodic Review 2

Name _____

1. When building a house, the plumbing pipes are set 3 feet deep in the ground, and allowed to rise up in the air about 2 feet.
   Above ground: _____
   Below ground: _____

2. A 30-foot high oak tree was found to have 15-foot deep roots, giving it strength and stability.
   Tree: _____
   Roots: _____

DIRECTIONS:

Use an integer to describe each situation above.

Access Common Core

Determine whether these statements correctly represent quantities as positive or negative numbers.

Statement	Represented as a Pos. or Neg. Number	Yes or No
1. The hot air balloon went 200 feet high.	- 200 feet	O Yes O No
2. The scuba diver explored a 300-foot depth.	- 300 feet	O Yes O No
3. The aluminum melted at 1220 degrees F.	-1220 degrees	O Yes O No
4. George missed 3 hours of work today.	3 hours	O Yes O No
5. Construction of the tall building started with a 20-foot deep foundation.	- 20 feet	O Yes O No
6. John got $1.00 off on his tickets for the movie.	$1.00	O Yes O No