## A quantity is a measured amount.

A quantity can be measured with either positive or negative numbers.

- Positive or negative numbers are determined by comparing them to zero.

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


## 2 CFU

Which can be represented using a positive number? Explain.
Mt. George is 1200 feet ( 366 meters) above sea level.
(B) A large fish was seen about 10 feet ( 3 meters) below sea level.
(C) A boat floating on the sea.

Which can be represented using a negative number? Explain.
(A) Mt. George is 1200 feet ( 366 meters) above sea level.
(B) A large fish was seen about 10 feet ( 3 meters) below sea level.
(C) boat floating on the sea.

In your own words, what are positive and negative numbers?

1 Read the problem.
2 Identify the quantities. (underline)
3 Represent the quantities. (plot)
4 Interpret the quantities. (answer questions orally)

1. Last summer, the high temperature was

40 degrees Celsius. Today, the low temperature is 10 degrees below zero.

2. Today's high temperature will be

35 degrees Fahrenheit. At night, the temperature is expected to drop to 15 degrees below zero.


1 Read the problem.
2 Identify the quantities. (underline)
3 Represent the quantities. (plot)
4 Interpret the quantities. (answer questions orally)
3. New Orleans is 3 feet ( 1 meter) below sea level. Miami is about 6 feet ( 2 meters) above sea level.

4. New York is 33 feet ( 10 meters) above sea level. Lake Frome in Australia is 20 feet ( 6 meters) below sea level.


## Skill Closure

1 Read the problem.
2 Identify the quantities. (underline)
3 Represent the quantities. (plot)
4 Interpret the quantities. (answer questions orally)

1. A seagull is flying at an elevation of 15 feet above the sea. A fish swims 25 feet below sea level.

2. The temperature on a snowy mountain is 30 degrees Fahrenheit below zero. The temperature on the sandy beach is 60 degrees Fahrenheit.


## Concept Closure

The school's swimming pool is 12 feet deep and the diving board was 3 feet above the water.

Alexis said these quantities could be represented with positive and negative numbers as 12 and -3 . Do you agree? Explain.


Summary Closure
What did you learn today about representing quantities using positive and negative numbers?

Word Bank
quantity measured negative positive numbers zero

1 Read the problem.
2 Identify the quantities. (underline)
3 Represent the quantities. (plot)
4 Interpret the quantities. (answer questions orally)

1. The refrigerator keeps food at about 4 degrees Celsius.

The freezer keeps food about 18 degrees below zero Celsius.

A. On the number line, does zero represent no food in the refrigerator or zero degrees?
B. Which temperature is a negative number, the refrigerator's or the freezer's? Explain.
C. If the temperature of the freezer rises 3 degrees, what would be the new temperature? Explain.
2. To make tea, boil water to 100 degrees Celsius. To make ice cubes for iced tea, freeze water to -10 degrees Celsius.

A. Does zero represent the amount of water or water temperature?
B. Which temperature is a positive number, boiling water or freezing water? Explain.
C. If the temperature of the boiling water rises 10 degrees, what is the new temperature? Explain.

1 Read the problem.
2 Identify the quantities. (underline)
3 Represent the quantities. (plot)
4 Interpret the quantities. (answer questions orally)
3. In Field A, a grape farmer had a crop of 100 pounds more grapes than last year. Field $B$ had a crop of 60 pounds less than last year.

A. Does zero represent pounds or years?
B. Which field's yield is a negative number, Field A or B? Explain.
C. Which field's yield is a positive number, Field A or B? Explain.
4. A 30 -foot high oak tree was found to have 15 -foot deep roots, giving it strength and stability.

A. Does zero represent strength or ground level?
B. Which is a negative number, the height of the oak tree or the depth of its roots? Explain.
C. If they cut 10 feet from the top of the oak tree, how high is the tree now?

## 

Listen carefully to the problem.
Label the quantities and answer the questions.


Zero represents $\qquad$ .
-5 degrees is $\qquad$ because it's $\qquad$ 0.

55 degrees is $\qquad$ because it's $\qquad$ 0.


Zero represents $\qquad$ .
-10 feet is $\qquad$ because it's $\qquad$ 0 (sea level).

20 feet is $\qquad$ because it's $\qquad$ 0 (sea level).

## Reading

## Read the paragraph. Represent the quantities.

Contestants on the reality show Survivor had to participate in many challenges. They had to climb 30-foot trees and dive into 50 -foot deep lakes. They had to hike four miles one way and then hike four miles the opposite way. The temperature averaged 85 degrees above zero with

1 inch of rain per day. Each participant had to commit to a maximum of 44 days for the adventure, but if he or she got voted off, their time could be shortened by 7, 14, or 21 days. The winner will receive $\$ 1$ million dollars but had to spend $\$ 5000$ to go to the interviews. A total of 396 people have competed so far.

Last week, I played a fantasy adventure video game. I climbed a tower that was $\underline{200}$ feet tall. Then, I jumped off the tower and dove into a lake that was 82 feet deep. Then, I travelled through icy caverns where the temperature went as low as $\underline{60}$ degrees below zero, but I brought a magical torch whose fire was as hot as $\underline{210}$ degrees above zero. At the beginning of the game, I had a debt of 50,000 gold coins, and I had to run away from ogres that were also loan collectors. At the end of the game, I defeated a rich dragon, and gained 450,000 gold coins. It took me around 170 hours to get the best ending.

## Writing

Read the statements. Represent the quantities.

Represented as a
Positive or Negative Number

1. The hot air balloon went 200 feet high.
2. The scuba diver explored a 300-foot depth.
3. The aluminum melted at 1220 degrees ( ${ }^{\circ} \mathrm{F}$ ).
4. George missed 3 hours of work today.
5. Construction of the tall building started with a 20-foot deep foundation.
6. John got $\$ 1.00$ off for his movie tickets.
7. Mari slept past the alarm by 5 minutes.
8. José woke up 15 minutes before the sunrise.
9. The coldest winter was recorded at 60 degrees below $0\left({ }^{\circ} \mathrm{F}\right)$.
10. Bob got a raise of $\$ 691$ at work today.
11. Jane's rocket toy went up as high as 270 feet into the air.
12. The criminal spent 345 days in community service as punishment.
