LESSON MAKER PRO

Which Side of Zero?

Use signed numbers to describe changes and positions.

GRADE 6 · 6.NOS.C.5

6.NOS.C.5 "Use understanding of rational numbers as positive and negative numbers to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits..."

NAME _____ DATE _____

CHOOSE A REFERENCE POINT

Choose 0 as a reference point, such as the water's surface or a tied score. Use positive numbers for one direction and negative numbers for the opposite direction. Add signed changes to find a final value.

WORKED EXAMPLE

A diver is 9 feet below the water's surface and rises 4 feet. What is the diver's final position? What does 0 feet mean?

1. Below the surface is negative, so the starting position is -9 feet.
2. Rising 4 feet is a positive change: -9 + 4 = -5.
3. 0 feet is the water's surface.

Answer: -5 feet; 0 feet is the water's surface.

PRACTICE 6 problems

1 At sunrise, the temperature is 8°C below 0°C. Write the temperature as a signed number.

ANSWER _____

2 A hilltop is 16 meters above sea level. Write its elevation as a signed number.

ANSWER _____

3 Your game points start at 0. You gain 12 points, then lose 15 points. Write your final points as a signed number. What does 0 points mean?

ANSWER _____

4 You finish a race 1/2 lap behind a teammate. Write your position relative to your teammate as a signed number of laps.

ANSWER _____

5 You have $2.50 less than your savings goal. Write the difference from your goal as a signed number. What would a difference of $0 mean?

ANSWER _____

6 A location is at -11 meters relative to sea level. You travel uphill 14 meters. What is your new elevation? What does 0 meters mean?

ANSWER _____

APPLY IT Show your work

1 Your arcade card starts with $0. You load $30 onto it and spend $18 on games. Write its final balance as a signed amount. What does a balance of $0 mean?

WORK SPACE

ANSWER _____

2 At the start of a school esports match, the teams are tied, so your team's score margin is 0. Your team scores 11 points while the other team scores 19 points. What is your team's score margin now? What does a margin of 0 mean?

WORK SPACE

ANSWER _____

CHALLENGE One step up

In the morning, the temperature is -6°C. It rises 13°C by noon, then drops 10°C by night. Write the noon and night temperatures as signed numbers. Did the temperature cross 0°C during each change? Explain what 0°C means on this temperature scale.

WORK SPACE AND ANSWER

ANSWER KEY

Which Side of Zero?

GRADE 6 · 6.NOS.C.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	At sunrise, the temperature is 8°C below 0°C. Write the temperature as a signed number.	**-8°C**
2	A hilltop is 16 meters above sea level. Write its elevation as a signed number.	**+16 meters**
3	Your game points start at 0. You gain 12 points, then lose 15 points. Write your final points as a signed number. What does 0 points mean?	**-3 points; 0 points means you have neither gained nor lost points overall.**
4	You finish a race 1/2 lap behind a teammate. Write your position relative to your teammate as a signed number of laps.	**-1/2 lap**
5	You have $2.50 less than your savings goal. Write the difference from your goal as a signed number. What would a difference of $0 mean?	**-$2.50; $0 means you have exactly reached your savings goal.**
6	A location is at -11 meters relative to sea level. You travel uphill 14 meters. What is your new elevation? What does 0 meters mean?	**+3 meters; 0 meters means sea level.**

PART 2 · APPLY IT

1. **+$12; $0 means there is no money left on the card.** Add the deposit and spending as signed changes: +30 + (-18) = +12.
2. **-8 points; a margin of 0 means the teams are tied.** Subtract the other team's points from your team's points: 11 - 19 = -8.

CHALLENGE

Noon: +7°C. Night: -3°C. Yes, the temperature crossed 0°C as it rose from -6°C to +7°C and again as it fell from +7°C to -3°C. A temperature of 0°C is neither above nor below zero on the Celsius scale.

Accept positive answers written without a plus sign. For explanations of zero, accept equivalent wording that identifies the reference point in the context.