

PART I GET STARTED

Today's Mathematics

We will use integers to represent direction and position, compare integers, and connect absolute value to distance from zero.

Essential Question

How can one integer communicate both direction and distance?

DO NOW

Represent each situation with a signed number. Then place the four numbers on one number line.

1. A gain of 6 points
2. 9 feet below sea level
3. no change
4. A drop of 4 degrees

SEE IT

A balloon's height changes from 18 feet to 42 feet in 3 seconds.

1. Find the change in height.
2. Divide the change by 3 seconds. What does the result describe?
3. How would the sign change if the balloon were falling?

QUICK WRITE | 2 MINUTES

Explain the difference between an object's velocity and its speed.

PART II INVESTIGATE**VERTICAL MOTION**

Positive velocity represents upward motion; negative velocity represents downward motion. Complete the table and show the calculation for each velocity.

Object	Start	End	Time	Velocity
Balloon A	18 ft	42 ft	3 s	
Balloon B	56 ft	20 ft	4 s	
Parachute	72 ft	24 ft	6 s	
Drone	15 ft	15 ft	5 s	

THINK LIKE A MATHEMATICIAN

1. What does the sign of each velocity tell you?
2. Find the speed of each object. How is speed related to absolute value?
3. Which two objects have velocities that are opposites? Explain.

COMPARE

Why is -9 less than -4 even though $|-9| > |-4|$?

PART III MAKE SENSE AND PRACTICE

WHAT WE CAN CONCLUDE

1. Positive and negative integers describe opposite directions or positions. 2. Opposites are the same distance from zero. 3. $|a|$ is the distance from a to zero, so absolute value is never negative. 4. On a number line, the number farther right is greater.

WORKED MODEL

Order -7 , $|4|$, $-|9|$, 0 from least to greatest. $-|9| = -9$, $|4| = 4$, $-9 < -7 < 0 < 4$

FOCUSED PRACTICE

1. Order -12 , $|-5|$, $-|3|$, 7 from least to greatest.

2. A diver is at -36 feet and a bird is at 28 feet. Which is farther from sea level, and by how much?

MATH WRITE | 5 MINUTES

Explain why two opposite integers have the same absolute value but different meanings in a context.

PART IV PUZZLE PRACTICE

Homework

Name _____

Date _____

WHAT CAN YOU SERVE, BUT NEVER EAT?

Write the letter of each answer in the box containing the exercise number.

SOLVE.

1. $|12|$

2. $|-9|$

3. $|20|$

4. $|-10|$

5. $3 \text{ ___ } -8$

6. $4 \text{ ___ } -4$

7. $|-6| \text{ ___ } -6$

8. $-|-13|$

9. $|-55|$

10. $-|2|$

11. Which fish are closer to the surface: -20 ft or -30 ft?

ANSWERS

- | | |
|--------|-----------|
| S. 10 | A. 9 |
| H. -12 | N. > |
| B. -13 | I. 12 |
| D. 13 | L. = |
| E. -2 | F. 2 |
| L. 55 | N. -20 ft |
| T. 20 | S. -20 |
| R. -10 | P. -30 ft |
| G. -55 | B. -9 |
| A. < | |

CRACK THE CODE

2	3	10	5	6	1	4	8	2	7	9
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