

Integers and Absolute Value

Lesson 9-2

Name: _____

Date: _____

Class: _____

Key Vocabulary

Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

*... -3, -2, -1, 0, 1, 2, 3 ... shown on a number line
with 0 in the center*

Integer

A whole number that can be positive, negative, or zero.

*+5 means 5 above zero, like 5 floors above ground
level*

Positive

A number bigger than zero, to the right of zero on a number line.

-3 means 3 below zero, like 3 floors underground

Negative

A number smaller than zero, to the left of zero on a number line.

$|-5| = 5$ and $|5| = 5$ — both are 5 units from 0

Absolute value

How far a number is from zero. It is never negative.

3 and -3 are opposites — both are 3 units from 0

Opposite

Two numbers the same distance from zero, on opposite sides, like 3 and -3.

Key Ideas & Notes

- Captain Vega's treasure map has clues hidden at different elevations!
- Some treasures are buried underground (below sea level) and some are on mountaintops (above sea level).
- Sea level is marked as 0.
- A treasure chest is at -4 (4 meters below sea level) and a lookout tower is at +6 (6 meters above sea level).
- Plot each integer on the number line and find its absolute value (distance from zero).

Think About It

- What does the negative sign tell you about the treasure chest's location?
- Which location is farther from sea level — the chest at -4 or the tower at +6?
- How can you find the distance from sea level without worrying about direction?

My Notes

Guided Examples

Example 1

What is the absolute value of -9?

Solution: Absolute value is the distance from zero. -9 is 9 units from zero, so $|-9| = 9$.

Answer: A. 9

Example 2

Which integer has the GREATEST absolute value: -3, 7, -5, 2?

Solution: $|-3| = 3$, $|7| = 7$, $|-5| = 5$, $|2| = 2$. The greatest absolute value is 7.

Answer: A. 7

Example 3

What is $|0|$?

Solution: Zero is 0 units from itself on the number line, so $|0| = 0$.

Answer: A. 0

Write About the Math

The Writing Revolution

I can explain my reasoning using the words integer, positive, negative, absolute value, and opposite.

1. Kernel Sentence subject + verb

Model: Integer is a whole number that can be positive, negative, or zero.

Número entero es un número entero que puede ser positivo, negativo o cero.

Write a kernel sentence about integer. Use a subject and a verb.

Escribe una oración base sobre número entero. Usa un sujeto y un verbo.

2. Sentence Expansion because · but · so

Kernel: Integer matters in math

Número entero importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because
porque

Integer matters in math because ____.

Número entero importa en matemáticas porque ____.

but
pero

Integer matters in math, but ____.

Número entero importa en matemáticas, pero ____.

so
entonces

Integer matters in math, so ____.

Número entero importa en matemáticas, entonces ____.

3. Sentence Types 4 ways to write a math idea

Statement
Afirmación

Tell one true fact about integer.
Di un hecho verdadero sobre integer.

Integer ____.

Question
Pregunta

Ask a question about integer.
Haz una pregunta sobre integer.

How does ____ ?

¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about integer.
Muestra entusiasmo sobre integer.

Wow, ____ !

¡Guau, ____ !

Command
Mandato

Tell a partner what to do with integer.
Dile a un compañero qué hacer con integer.

First, ____ .

Primero, ____ .

4. Explain Your Reasoning use a sentence starter

The absolute value of ____ **is** ____ .

El valor absoluto de ____ *es* ____ .

It means the distance from ____ .

Significa la distancia desde ____ .

I see negatives when ____ .

Veo negativos cuando ____ .

Try It

Solve on your own. Check the answer key when you are done.

1. What is $|0|$?

- A. 0
- B. 1
- C. -1
- D. There is no answer

Show your work:

2. Which statement about absolute value is TRUE?

- A. $|-4| = |4|$ because both are 4 units from zero
- B. $|-4| = -4$ because the number is negative
- C. $|4| > |-4|$ because positive is always bigger
- D. $|-4| = 0$ because negatives cancel out

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A submarine is at -150 meters and a bird is flying at +150 meters. A student says the submarine is closer to sea level because -150 is less than 150. Is the student correct? Explain using absolute value.

Sentence starter: The student is ___ because absolute value measures ___. Since $|-150| = \underline{\quad}$ and $|150| = \underline{\quad}$, both are ___ from sea level. The student confused ___ with ___.

Show your work:

Reflect — Exit Ticket

Which integer has an absolute value of 8 and is located to the LEFT of zero on the number line?

- A. 8
- B. -8
- C. 0
- D. -80

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. 0 — *Zero is 0 units from itself on the number line, so $|0| = 0$.*
2. **Try It 2:** A. $|-4| = |4|$ because both are 4 units from zero — *Absolute value measures distance from zero. Both -4 and 4 are 4 units from zero, so $|-4| = |4| = 4$.*
3. **Exit Ticket:** B. -8 — *To the left of zero means negative. The integer -8 has an absolute value of 8 because it is 8 units from zero.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Integer is a whole number that can be positive, negative, or zero.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).