

Absolute Value

Summary

Recognize absolute value as a distance from zero. Solve problems involving absolute value

Main Core Tie

Mathematics Grade 6

[Strand: THE NUMBER SYSTEM \(6.NS\) Standard 6.NS.7](#)

Materials

Ti-73's

Numberline taped on the floor and one set of Stand-Up Cards

Deck of playing cards for each pair of students

Worksheets: " [Comparing Absolute Value to Opposite](#)", " [Absolute Value Practice](#)"

Foldable: [Opposite Values and Absolute Values](#)

Background for Teachers

Enduring Understanding (Big Ideas):

Absolute value is a distance from zero

Essential Questions:

How does the opposite of n differ from the absolute value n ?

How does the distance of n from 0 compare to the distance of $-n$ from 0? How does n compare to $-n$?

Skill Focus:

Find absolute value of a number. Evaluate absolute value expressions.

Vocabulary Focus:

Absolute value, opposite of a number, evaluate

Ways to Gain/Maintain Attention (Primacy):

patterns, visualization using graphing calculator and number line, cooperative activity, movement

Instructional Procedures

Starter: Find the value for each without a calculator, please.

$$\frac{3}{4} \times 40$$

The opposite of -7

$$-8 \div 2$$

Order these numbers from least to greatest:

$$\frac{4}{5}, 0.9, \frac{2}{3}, 75\%$$

Lesson Segment 1: How is the opposite value of a number different or similar to the absolute value a number?

Use the investigation on the worksheet, "Comparing Absolute Value to Opposite", to help students investigate absolute values and opposite values for numbers. Work with the students to compete down to number 7 at this point of the lesson. Note: You will need to have TI Fonts on your computer in order to show the keys that appear on this worksheet. If you do not, you will see weird symbols rather than the TI-73 keys in the directions.

Have students make the attached Foldable

Lesson Segment 2: How does the distance of n from 0 compare to the distance of $-n$ from 0? How does n compare to $-n$?

With a -10 to 10 number line (can be tape) on the floor, have two students come to the number line

and stand where you direct them as you ask the class the questions that follow. Pairs or teams could use team boards or Smart Pal's to respond.

Person A stand on -5. Person B stand on 5. Q. Which person is closer to 0?

Person A stand on 4. Person B stand on -4. Q. Which person is closer to 0?

Q. What two numbers could you have the students stand on if both numbers are the same distance from 0? *For students who seem to be grasping the concept quickly, challenge them by asking them to generalize. If x is a number on the number line, write a mathematical statement which shows an expression equivalent to $|x|$, greater than $|x|$ and less than $|x|$.*

Emphasize again that absolute value is a distance, and distance is measured in positive units.

Lesson Segment 3: Solve problems involving absolute value

The following games are engaging and give students the opportunity to apply their knowledge of absolute value.

Guess My Number Spinner Game

Use a -10 to 10 number line (can be tape) on the floor. Make two large Stand-Up cards, one with N on it and the other with $-N$ written on it. Divide the class into two teams. Tell the class they will be writing down an absolute value equation you give them and will be guessing a number or numbers that would make that equation true. You will hand students the Stand-Up cards to have them show what number(s) they think make the equation true. Choose different students to be standers for each problem. When you call on a student and they correctly tell the number(s), they come to the overhead to spin a spinner divided into three sections labeled 1-3. If the students spins a 1, their team gets one point. If they spin a 2, their team gets 2 points. If they spin a 3, their team gets 2 points and they subtract a point from the opposing team. Students may discuss the problem for a few seconds with their own team before you call on them. Alternate selecting a student to respond, so teams get an equal opportunity to score. If a person is called on, and is incorrect, a person from the other team may go stand on the number, then spin. On the next problem, it would be that same team's turn regular turn.

As you read and write the problem on an equation on the overhead, use the phrases, "distance from 0" and "absolute value" interchangeably. *Another option would be to not write the equations but instead challenge your more advanced students to write them and share with the class.* Here are the problems.

1. "The absolute value of this number is 4." $|n| = 4$. Guess the number.
2. "The absolute value of this number + 5 equals 8." $|n| = 8$. Guess the number.
3. "The distance this number is from 0 is 6.5." $|n| = 6.5$. Guess the number.
4. "Two more than the distance this number is from 0 is 7." $2 + |n| = 7$. Guess the number.
5. "The absolute value of -4, plus the absolute value of this number is 9." $|-4| + |n| = 9$.
6. "The absolute value of this number subtract the absolute value of a second number is equal to 1." $|n| - |p| = 1$. Guess the number (answers will vary, but must be accurate)

Discussion about each will help students think about evaluating the expressions.

When the game is over, have students do pairs check, where partners work on a problem, then check with another pair to see if they agree. Both partners complete the assigned problem. At this point of the lesson, have the pairs work to complete problem # 8-20 on the worksheet.

Absolute War!

Players: 2

Materials: Deck of cards for each pair of students

Objective: Draw a card with the greatest absolute value.

Procedure: From a shuffled deck, each player draws a card. The player whose absolute value is greatest keeps both cards. When the deck has been depleted, the player who has kept the most cards, wins.

Assign students to complete the Comparing Absolute Value To Opposite worksheet as well as the

Absolute Value practice worksheet.

Strategies for Diverse Learners

"Distance" might be a difficult concept to understand for some students. The video at [Absolute Value in Context](#) illustrates distance very well. Watch video clip from 2:00. English Language Learners might need more practice reading the notation. Make them write it and say it out loud. Absolute value of negative 3 is 3.

Assessment Plan

observation, performance task, questioning

Bibliography

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Authors

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