Whole Numbers and Their Opposites

Lesson Overview

In this lesson, students will be using their understanding of integers and number lines to demonstrate opposite quantities. Students will collaborate and communicate their understanding of mathematical terminology through real-world contexts. By the end of the lesson, students will make conclusions that opposite quantities add to make zero.

Standards Addressed

7.NS.1a	Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*
7.NS.1b	Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative.

Disciplinary Literacy Best Practices

Table Talk
Think-Ink-Pair-Share

Lesson Plan

Time Required: One 60-minute Class Period

Disciplinary Vocabulary: absolute value, additive inverse

Materials Needed:

- Article: "How are distances and absolute value related?"
- Exit Ticket

Assessment:

Exit Ticket

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Engage

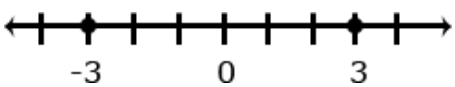
- Situation: "Barbara Jean deposited $350 into her bank account."
- Question: "What would be the counter situation or the opposite situation?"
- Students will write their counter solution and explain why their answer is the counter solution. Students exchange papers with a partner and read one another's answers.
- Teacher will lead a class discussion about the answers written by students. Students should dialogue regarding which answer is correct and explain why. The teacher should avoid providing input or correcting the counter situations that students present at this point.
- Following the discussion, students will draw a number line and plot the points for both the original situation and the counter situation on their paper. Allow two students to share their work using the document camera (if available), one that has been graphed correctly and one that has not.
- Students will write two or three sentences comparing the two number lines shown.

Explore

- Teacher will draw the correct number line on the board and ask students what they are noticing about each of the numbers.
- Students should notice that both numbers are the same distance from zero. Facilitate discussion, if necessary, so that students make this discovery for themselves.
- Question: "What would happen if we combined these two numbers (+350 and -350)?" Students should record their answer on their paper and provide proof of why their answer is correct.
- Allow students to share their answer with the class.

Explain

- Teacher will lead the class in a whole group discussion on opposite numbers and their sum. By the end of the discussion, students should know and understand the concept of opposite quantities combine to a sum of zero.
- Teacher will provide multiple examples of pairs of opposites on number lines. For example, "-3 and 3 are shown to be opposites on the number line because they are equal distance from zero. Therefore, they have the same absolute value. The sum of the number (3) and its opposite (-3) is zero."



- Examples should include real-world contexts, such as the one identified in the standard.
- Exit Ticket: Situation: "Joe pays $200 on his cable bill."
    1. What is the counter situation?
    2. Graph the situation and the counter situation on a number line.
    3. If the situation and counter situation were combined together, what would they equal? How do you know?

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Teacher Reflections and Biographical Information

Students need to understand that negative integers are not just numbers on a number line. They show direction and position. They are best used with money to show a loss or decrease in value.

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