Absolute Value

Strand:	Number and Number Sense
Topic:	Identifying and describing absolute value for rational numbers
Primary SOL:	7.1 The student will e) identify and describe absolute value of rational numbers
Related SOL:	7.2

Materials

- Teacher Number Line
- Number Lines for Connections (for extension and differentiation; attached)
- Number Cards Activity Sheets 1–6 (attached) – printed on a different color of paper
- Tape
- Scissors

Vocabulary

absolute value, integer, rational numbers, unit (earlier grades)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Print each number card on a different color of paper. This will help students color match the cards.

2. Display a number line on the floor using tape. Use the integers starting from –20 and ending at 20 as the labels. Place a large red dot on zero.

3. Select two students and have them cut the first two numbers from the Number Cards Activity Sheet 1. Ask the students to place the cards on the number line and stand on their points. Write the two values from the number cards on the board. Facilitate a discussion about the two values. Possible questions to ask include:
   - What are the similarities between the two values?
   - Are the two values opposites?
   - How far is each value from zero on the number line?

4. Remind the students about the term *absolute value* (the distance from zero on a number line). Remind the students about the symbol for absolute value. Discuss with students that the absolute value of zero is zero.

5. Select two new students and have them cut out the next two numbers from Number Cards Activity Sheet 2. Ask the students to place the cards on the number line and stand on their points. Facilitate a discussion about the two values. Have students make a connection that the distance between the two rational numbers on the number line is the absolute value of their difference. Continue the lesson having students display the remaining numbers from Number Cards Activity Sheets 3–6 on the number line.

Assessment

- **Questions**
  - What is the absolute value of a number?

- o Can the absolute value be a negative number? Why, or why not?
- o Is the opposite of a number the same as the absolute value of a number? Why or why not?

- **Journal/writing prompts**
  - o Describe a situation in which you would need to use the absolute value of a number.
  - o Explain the difference between the absolute value symbol and the parentheses symbol.
  - o If the student was given a number line and asked to place the point(s) on the number line that have an absolute value of $5\frac{3}{4}$, at what numbers would they graph the points, and why?

- **Other Assessments**
  - o Give each student an anchor chart to complete for absolute value. The chart should include the definition of absolute value, characteristics of absolute value, examples of absolute value, and non-examples of absolute value.
  - o Create a foldable number line which highlights absolute value.

Extensions and Connections (for all students)

- Have students plot the points for the remaining square roots of perfect squares from 1–400 on the number line.

- Display a line similar to a number line with the months (January through December) as labels. Mark July as the center with a large green dot. Ask students with birthdays in August to stand. Establish that their birthdays are one month from July. Ask students whether anyone else in the room has a birthday one month away (June). Continue with the remaining months and connect this activity with absolute value.

Strategies for Differentiation

- Give students a number line with positive and negative integers. Students can place the end of a piece of string on zero and cut the other length of a given number, such as 7. Keeping one end of the string at zero, rotate the piece of string to the other side of zero. The number the same length as the string has the same absolute value as the original number.

- Use a compass. Place one end of the compass on zero and place a pencil on the number line. Draw a circle. The distance of the circle from zero determines the absolute value.

- Have two students take the same number of steps from zero on the number line in opposite directions. Have classmates discuss how the number of steps correlates to absolute value.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

Number Cards Activity Sheet 1

$$\sqrt{36}$$

$$-6$$

Number Cards Activity Sheet 2

$\dfrac{1}{4}$

-0.25

Number Cards Activity Sheet 3

$$-8\frac{1}{5}$$

$$8.2$$

Number Cards Activity Sheet 4

-12	12

Number Cards Activity Sheet 5

$$9\frac{2}{5}$$

$$-9.4$$

Number Cards Activity Sheet 6

$$\sqrt{196}$$

$$-14$$

Number Lines for Connections