Rational Numbers and Coordinates

Lesson 3 Integers on Number Lines

Standards 6.NS.C.6c

Learning target I can locate integers and negative fractions on a number line.

Materials Number lines, coordinate grids, rulers, colored pencils.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about integers on number lines. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Mark zero and equally spaced whole-number ticks. Partition each interval into equal parts for the denominator. Negative values are left of zero on a horizontal line and below zero on a vertical line. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: Draw a horizontal or vertical number line. Plot and label -2/3, 0, and 1. Name the step size of your scale and explain the placement. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch order versus absolute value, coordinate order, and which sign changes in a reflection.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

Mark zero and equally spaced whole-number ticks. Partition each interval into equal parts for the denominator. Negative values are left of zero on a horizontal line and below zero on a vertical line.

Example 1 Draw a horizontal or vertical number line. Plot and label -5, 0, and 2.
Solution -5 < 0 < 2; unit steps. Negative -5 is left of or below 0; 2 is right of or above 0. Use equal intervals.
Example 2 Draw a horizontal or vertical number line. Plot and label -7/3, 0, and 2/3. Name the step size of your scale and explain the placement.
Solution -7/3 < 0 < 2/3; use steps of 1/3. Negative -7/3 is left of or below 0; 2/3 is right of or above 0. Use equal intervals.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 3 Integers on Number Lines

Name _____ Show calculations, models, and units.

1. Draw a horizontal or vertical number line. Plot and label -8, 0, and 3.

2. Draw a horizontal or vertical number line. Plot and label -8, 0, and 2.

3. Draw a horizontal or vertical number line. Plot and label -4, 0, and 6.

4. Draw a horizontal or vertical number line. Plot and label -7/3, 0, and 1.

5. Draw a horizontal or vertical number line. Plot and label -4/5, 0, and 7/5.

6. Draw a horizontal or vertical number line. Plot and label -2, 0, and 5/2.

7. Draw a horizontal or vertical number line. Plot and label -7/3, 0, and 5/3. Name the step size of your scale and explain the placement.

8. Draw a horizontal or vertical number line. Plot and label -4/5, 0, and 2/5. Name the step size of your scale and explain the placement.

9. Draw a horizontal or vertical number line. Plot and label -3/4, 0, and 5/4. Name the step size of your scale and explain the placement.

10. Draw a horizontal or vertical number line. Plot and label -2/3, 0, and 1. Name the step size of your scale and explain the placement.

Integers on Number Lines

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1. -8 < 0 < 3; unit steps
Reasoning Negative -8 is left of or below 0; 3 is right of or above 0. Use equal intervals.

2. -8 < 0 < 2; unit steps
Reasoning Negative -8 is left of or below 0; 2 is right of or above 0. Use equal intervals.

3. -4 < 0 < 6; unit steps
Reasoning Negative -4 is left of or below 0; 6 is right of or above 0. Use equal intervals.

4. -7/3 < 0 < 1; use steps of 1/3
Reasoning Negative -7/3 is left of or below 0; 1 is right of or above 0. Use equal intervals.

5. -4/5 < 0 < 7/5; use steps of 1/5
Reasoning Negative -4/5 is left of or below 0; 7/5 is right of or above 0. Use equal intervals.

6. -2 < 0 < 5/2; use steps of 1/2
Reasoning Negative -2 is left of or below 0; 5/2 is right of or above 0. Use equal intervals.

7. -7/3 < 0 < 5/3; use steps of 1/3
Reasoning Negative -7/3 is left of or below 0; 5/3 is right of or above 0. Use equal intervals.

8. -4/5 < 0 < 2/5; use steps of 1/10
Reasoning Negative -4/5 is left of or below 0; 2/5 is right of or above 0. Use equal intervals.

9. -3/4 < 0 < 5/4; use steps of 1/4
Reasoning Negative -3/4 is left of or below 0; 5/4 is right of or above 0. Use equal intervals.

10. -2/3 < 0 < 1; use steps of 1/3
Reasoning Negative -2/3 is left of or below 0; 1 is right of or above 0. Use equal intervals.