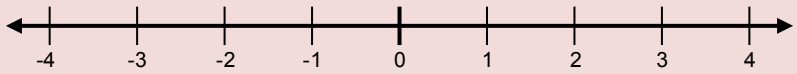
Packet 1: Introduction to Integers

Dear Parents/Guardians,

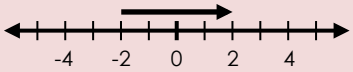
In Integers: Packet 1, students graph integers on a number line as well as ordered pairs on a coordinate plane. Students use temperature as the context to compare, order, and find the difference of integers. Students use arrows on number lines in the context of elevation to indicate direction and length to understand the meaning of opposites and absolute value. Encourage your student to practice using the number lines to locate points, direction and distance.

Integers and the Number Line

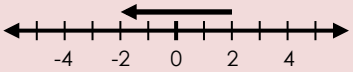
A number line is a visualization of the real numbers as a straight line. Usually tick marks are used to represent specific benchmark numbers. Number lines can go horizontally (like the example below) or vertically.



Students will use arrows to show distance and direction on a number line.



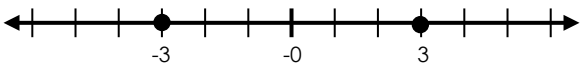
The arrow starts at -2 and indicates it is moving in a positive direction to get to 2. The arrow represents 4.



The arrow starts at 2 and indicates it is moving in a negative direction to get to -2. The arrow represents -2.

Opposites and Absolute Value

The opposite of a number is its additive inverse. On a number line, the opposite of a number is its reflection through zero.



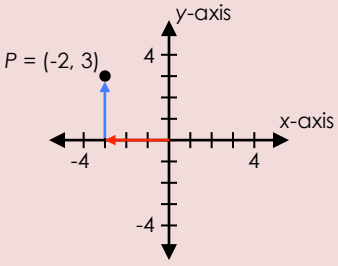
Example: The opposite of 3 is -3. Likewise, the opposite of -3 is 3.

The absolute value of a number $|x|$ is the distance from x to zero on a number line.

Example, $|-3| = 3$, since the distance from 0 to 3 is 3. $|3| = 3$, as the distance from 0 to 3 is also 3. Note that opposites have the same absolute value.

Graphing in the Coordinate Plane

The diagram to the right is an example of a coordinate plane, with the x-axis and *y*-axis labeled. Points on the coordinate plane can be identified as an ordered pair (x, *y*). The origin is located at (0,0).



The x-coordinate indicates the direction and distance to move horizontally. The y-coordinate indicates the direction and distance to move vertically.

Example: To graph the point *P*(-2, 3) start at the origin. Move 2 units to the left and 3 units up. Note that order matters. The point (3, -2) indicates moving 3 units to the right and 2 units down, which is a different location.

INTEGERS PACKET 1

By the end of the packet, your student should know…

- How to graph integers on a number line Lesson 1.1
- How to compare and order temperatures on a vertical number line Lesson 1.1
- The meaning of opposites and absolute value Lesson 1.2
- How to scale and graph ordered pairs of integers on a coordinate plane Lesson 1.3

Additional Resources

- For definitions and additional notes please refer to section 1.5.
- For plotting integers on a number line: http://youtu.be/kvPxr7HA6Sc
- Opposites and absolute value: http://youtu.be/OfY7GZ1HnGE
- Coordinate graphing: http://youtu.be/1O12C9EcdFo