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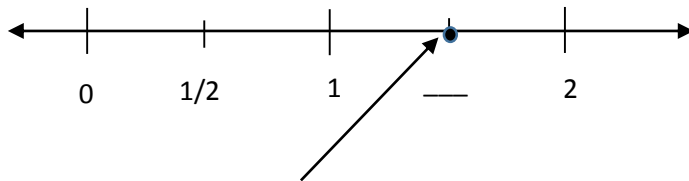
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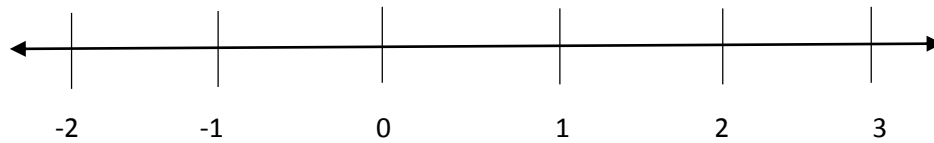
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**Investigation 3.1 Extending the Number Line: Integers and Mixed Numbers - Day 1**

<u>Vocabulary Word</u>	<u>Definition</u>
<b>Mixed Number</b>	A number that is written with both a whole number and a fraction. A mixed number is the sum (add) of the whole number and the fraction.
<b>Improper Fraction</b>	A fraction in which the absolute value of a numerator is greater than the absolute value of the denominator.
<b>Opposites</b>	Two numbers whose sum is 0. For example, -3 and 3 are opposites. On a number line, opposites are the same distance from 0 but in different directions from 0. The number 0 is its own opposite.
<b>Absolute Value</b>	The distance from 0 on a number line. Numbers that are the same distance from 0 have the same absolute value. Distance is always positive.
<b>Rational Number</b>	Any number that can be written as the quotient of an integer and a non-zero integer, such as $\frac{3}{4}$ , $\frac{13}{4}$ , $\frac{3}{1}$ , or $-\frac{3}{4}$ .

Mixed Numbers and Improper fractions on a number line:

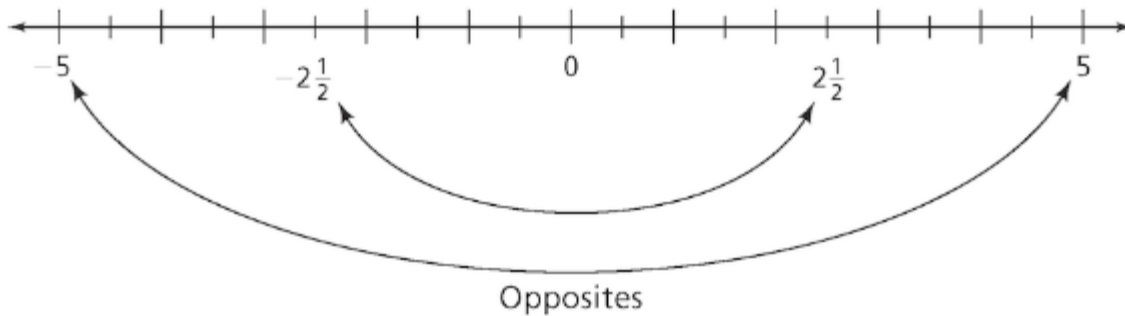
**Question 1:** Why can this point be labeled with two names:  $1\frac{1}{2}$  and  $\frac{3}{2}$ ?**Answer 1:** This point can be labeled  $1\frac{1}{2}$  and  $\frac{3}{2}$  because it is being represented as the mixed number ( $1\frac{1}{2}$ ) and an improper fraction ( $\frac{3}{2}$ ).



- Number lines can be extended in both directions.
- Numbers to the left of 0 (Zero) are marked with a “-“ sign and are read as *Negative one, Negative two, etc.*
- Numbers to the right of 0 (Zero) are positive numbers and are read as *One, Two, etc.*

On the number line below, 5 and -5 are the same distance from 0 but in opposite directions. Therefore, 5 and -5 are opposites.

- The opposite of 5 is -5.
- The opposite of -5 is 5.
- The opposite of  $2\frac{1}{2}$  is  $-2\frac{1}{2}$
- The opposite of  $-2\frac{1}{2}$  is  $2\frac{1}{2}$



**Question 2:** What is the opposite of  $4\frac{1}{2}$ ?

**Answer 2:**  $-4\frac{1}{2}$

**Part A:** On the number line below, mark and label these fractions.

$\frac{1}{4}$   $\frac{2}{4}$   $\frac{3}{4}$   $\frac{4}{4}$   $\frac{5}{4}$   $\frac{6}{4}$   $\frac{7}{4}$   $\frac{8}{4}$   $\frac{9}{4}$   $\frac{0}{4}$   $-\frac{1}{4}$   $-\frac{2}{4}$   $-\frac{3}{4}$   $-\frac{4}{4}$   $-\frac{5}{4}$



**Question 3:** Which of the fractions can be written as mixed numbers? Explain.

**Answer 3:**  $\frac{5}{4}$        $\frac{6}{4}$        $\frac{7}{4}$        $\frac{8}{4}$        $\frac{9}{4}$        $-\frac{5}{4}$

Explanation: When the numerator is larger than the denominator it is an improper fraction. Improper fractions can be written as a mixed number.

**Part B:** On a new number line, mark and label these numbers.

$\frac{1}{3}$   $1\frac{1}{3}$   $2\frac{2}{3}$   $3$   $3\frac{1}{3}$   $-\frac{1}{3}$   $-1\frac{1}{3}$   $-1\frac{2}{3}$



**Question 4:** Which of these numbers can be written as improper fractions? Explain.

**Answer 4:**  $1\frac{1}{3}$        $2\frac{2}{3}$        $3\frac{1}{3}$        $-1\frac{1}{3}$        $-1\frac{2}{3}$

Explanation: When you have the sum of a whole number and a fraction, you can write this as an improper fraction.

**Part C:**

1. What is the opposite of  $\frac{1}{2}$ ? \_\_\_\_\_
2. What is the opposite of the opposite of  $\frac{1}{2}$ ? \_\_\_\_\_
3. What is the opposite of 0? \_\_\_\_\_