Lesson 2.2

Lesson 2-2: Represent Rational Numbers on the Number line

I can...represent rational numbers using a number line.

### Explore it!

The locations of four animals relative to sea level are listed below.

Seagull ¾ yard   **Dolphin** -1/4 yard   **Sea Turtle** -1 yard   **Shark** -0.5 yard

sea level = 0

A.) What can you say about the animals and their positions relative to sea level? *some are deeper in the water measurements by 1/4's yards, 3 animals below sea level 1 animal above sea level*

B.) How can you use a number line to represent the locations of the animals?

1 Sea gull
0 dolphin
Shark
-1 Sea turtle
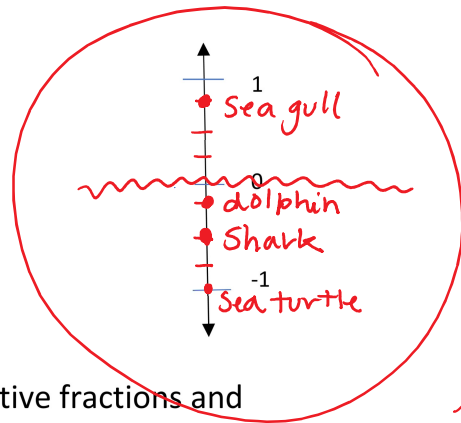
C.) How is representing the locations of negative fractions and decimals like representing the locations of positive fractions and decimals? How is it different?

3/4   -3/4

-1   0   1

Example 1: Understand Rational Numbers

Vocabulary:

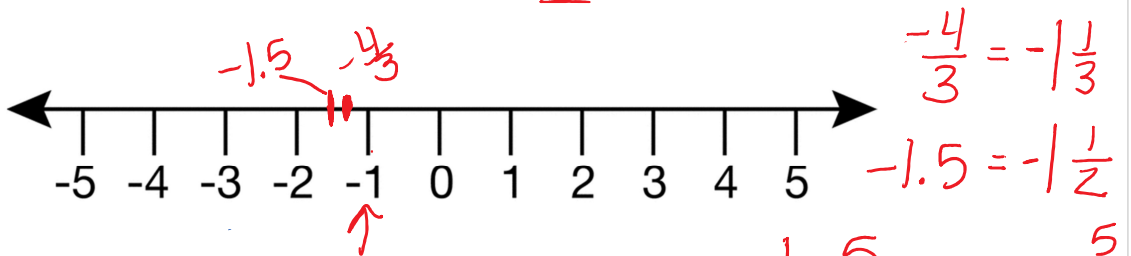**Example 1.** Understand Rational Numbers

Vocabulary:

Rational numbers: Any number that can be written as a quotient of two integers. $\frac{a}{b}$, $b \neq 0$

Fraction

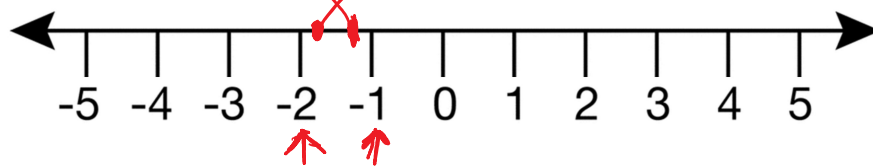How can you find and position -4/3 and -1.5 on a number line?

① mix #

$\frac{-4}{3} = -1\frac{1}{3}$

$-1.5 = -1\frac{1}{2}$

-1.5 -4/3

‹———|———|———|———|———|———|———|———|———|———|———›
   -5 -4 -3 -2 -1   0   1   2   3   4   5

$\frac{1}{hund.} \quad \frac{.}{tens} \quad \frac{1}{ones} . \frac{5}{tenths} \quad \frac{}{hundredths} \quad \frac{5}{10} \text{ thousandths}$

Try it!

How can you find and position -5/4 and -1.75 on the number lines? Write -5/4 and -1.75 as mixed numbers, then plot the points on the number lines.

-5/4 = $-1\frac{1}{4}$ -1.75 = $-1\frac{3}{4}$

‹———|———|———|———|———|———|———|———|———|———|———›
   -5 -4 -3 -2 -1   0   1   2   3   4   5
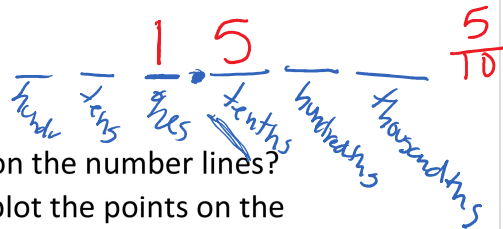
Convince me! Why is it helpful to rename -5/4 and -1.75 as mixed numbers when plotting these points on number lines?

helpful to find whole #, which is it between.

Fraction → decimals

Example 2: Compare and order rational numbers

Harry was asked to compare and order three rational numbers. Show how he can use <, >, or = to compare 2/3, 1.75 and -0.75. Then order these numbers from least to greatest.

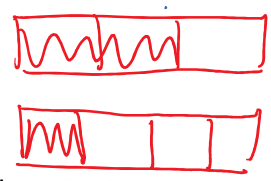$-0.75, \frac{2}{3}, 1.75$

$\frac{2}{3} < 1.75 \left(1\frac{3}{4}\right)$

$\frac{2}{3} > -0.75$

$$\frac{2}{3} > -0.75$$

Try it!

¼ is ordered within the list of numbers in the example above, between which two numbers would it be placed?

$-0.75, \frac{1}{4}, \frac{2}{3}, 1.75$

Example 3: Interpret rational numbers in real-world context

Sam and Randy are scuba diving. Their locations are relative to sea = 0 level. Sam swims at -25 feet and Randy swims at -40 feet. Use <, >, or = to compare the two depths and explain their relationship.

$-25 > -40$

Sam is closer to sea level.

Try it!

At 10:00 PM one winter night, the temperature was -3⁰C. At midnight, the temperature was -7ºC. Use <, >, or = to compare the two temperatures and explain their relationship.

Do you understand?

1.) How can you plot, compare, and order rational numbers using a number line?

→ Turn improper/decimals to a mixed number.
→ The left is negative (smaller). The right is positive (larger)

2.) Why are whole numbers rational numbers? Use 15 as an example.

We can write whole number as fractions. $\frac{15}{1}$

3.) Explain how the inequality -4ºC > -9ºC describes how the temperatures are related.

3.) Explain how the inequality -4ºC > -9ºC describes how the temperatures are related.

−4ºC is warmer than −9ºC.

−9ºC is colder than −4ºC.

Pg 75-76

#15, 18, 21, 22, 23, 25, 27, 28, 31