

Lesson 86

Course 2-Teacher Notes

Objective: TSW identify the counting numbers, whole numbers, integers, and rational numbers. TSW show how counting numbers, whole numbers, integers, and rational numbers are related.

In mathematics we give special names to certain sets of numbers. Some of these sets are the counting numbers, the whole numbers, the integers and the rational numbers. In this lesson we will review each of these **number families** and discuss how they are related.

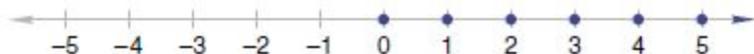
Counting Numbers (Natural Numbers): The numbers we say when we count.

Counting numbers: 1, 2, 3, 4, 5, ...

Whole Numbers: The members of the whole number family are the counting numbers as well as zero. (As I say, the numbers we say when we draw a basic number line.)

Whole numbers: 0, 1, 2, 3, 4, 5, ...

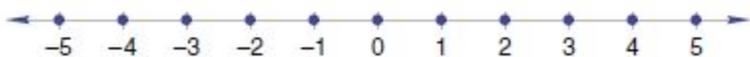
If we were to use a dot to mark each whole number on a number line, the graph would look like this:



**Notice there are NO dots to the left of zero. Notice there are also NO dots between the whole numbers.

Integers: The integer family includes all the whole numbers and their opposites. Remember, zero is not positive or negative.

If we were to graph integers, the graph would look like this:

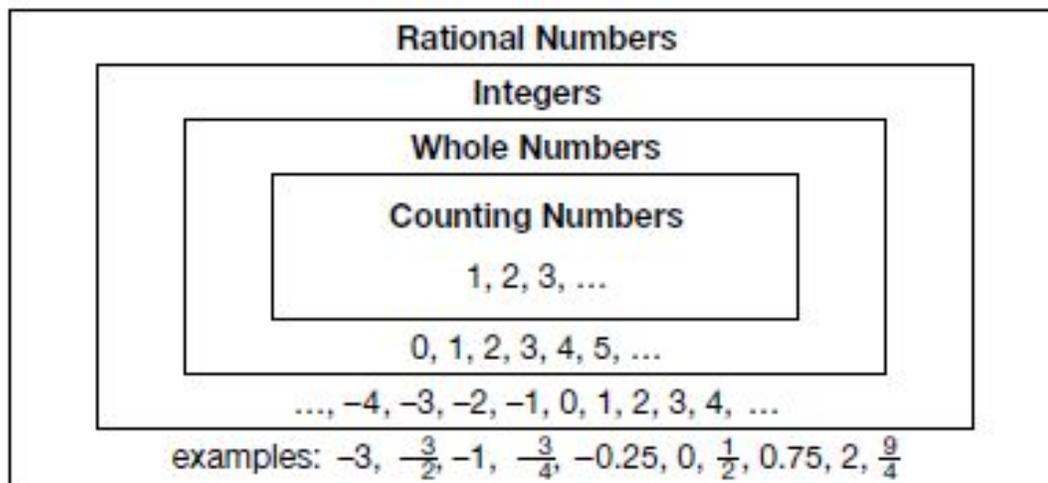


Rational Numbers: The family of rational numbers includes ALL numbers that can be written as a ratio (fraction).

Examples:

$$\frac{1}{2} \quad \frac{5}{3} \quad \frac{-3}{2} \quad \frac{-4}{1} \quad \frac{0}{2} \quad \frac{3}{1}$$

Let's look at how these families are all related:
(Never, Wait, In, Rain)



Example 1.

Graph the integers that are less than 4.

Solution:



Question: $\frac{1}{2}$ is less than 4, why didn't we graph it? $\frac{1}{2}$ is a rational number not integer.

Example 2.

Answer True or False.

a. All whole numbers are integers.

Solution: True

b. All rational numbers are integers.

Solution: False.

You Try!!!!

a. Graph the integers greater than -4 .

Solution:



b. Graph the integers less than 4.

Solution:



Answer true or false. If the statement is false, explain why and give an example that proves it is false.

c. Every integer is a whole number.

Solution: False. -1 is an integer but not a whole number.

d. Every integer is a rational number.

Solution: True.