What are the different types of numbers?

- How many “number families” do you know?
- Can you define them and give examples?
- We group numbers into families, and describe these families in relation to where they “live” among other numbers

Where do you live?

Louisville

Where do you live?

- Where is Louisville?

Jefferson County

Where do you live?

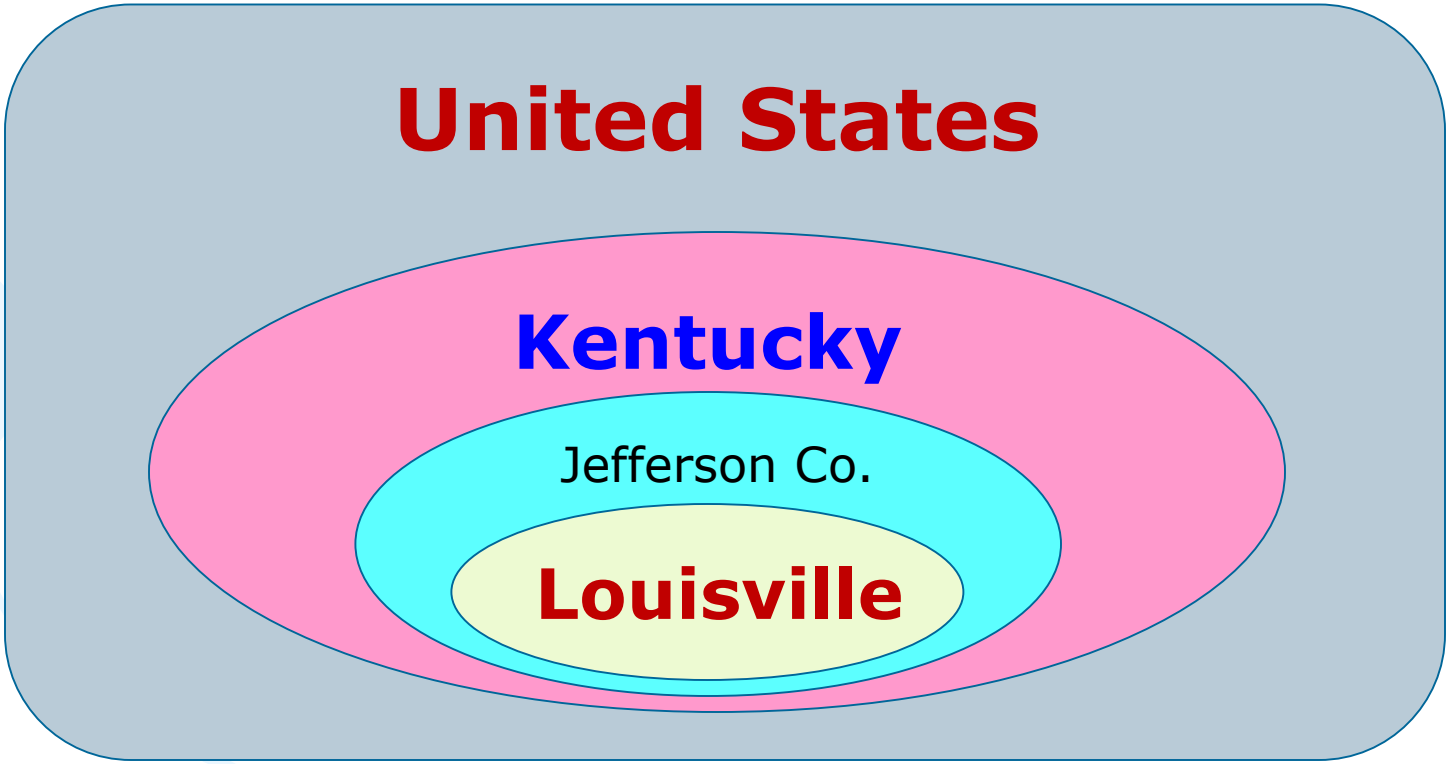
- Where is Jefferson County?

Where do you live?

Where is Kentucky?

United States, USA, North America

I live in…

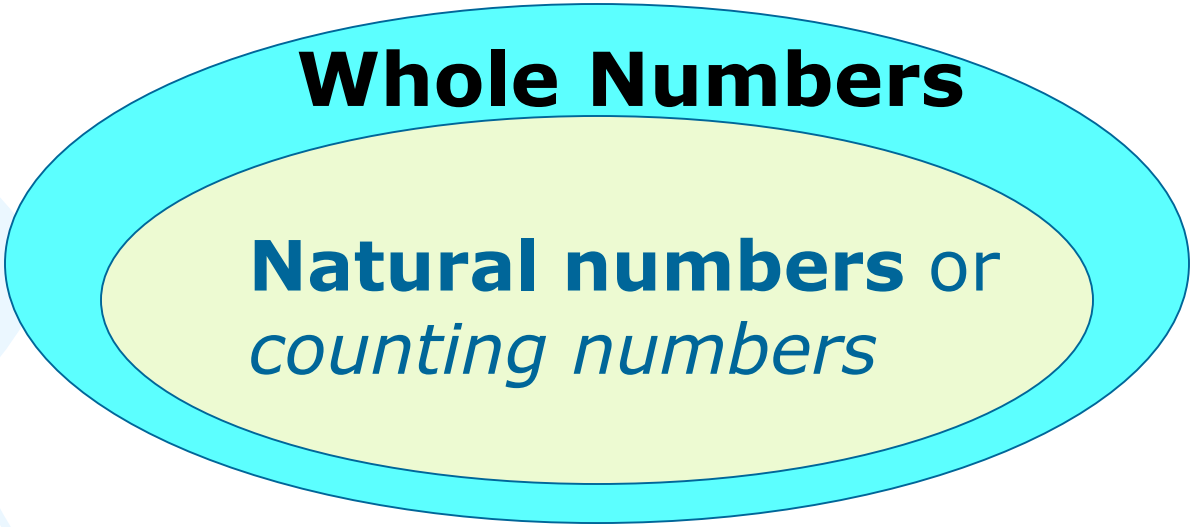


What are the first numbers children learn?

Natural numbers or
counting numbers

1 2 3 4 5 …

How are math teachers' children taught to count?

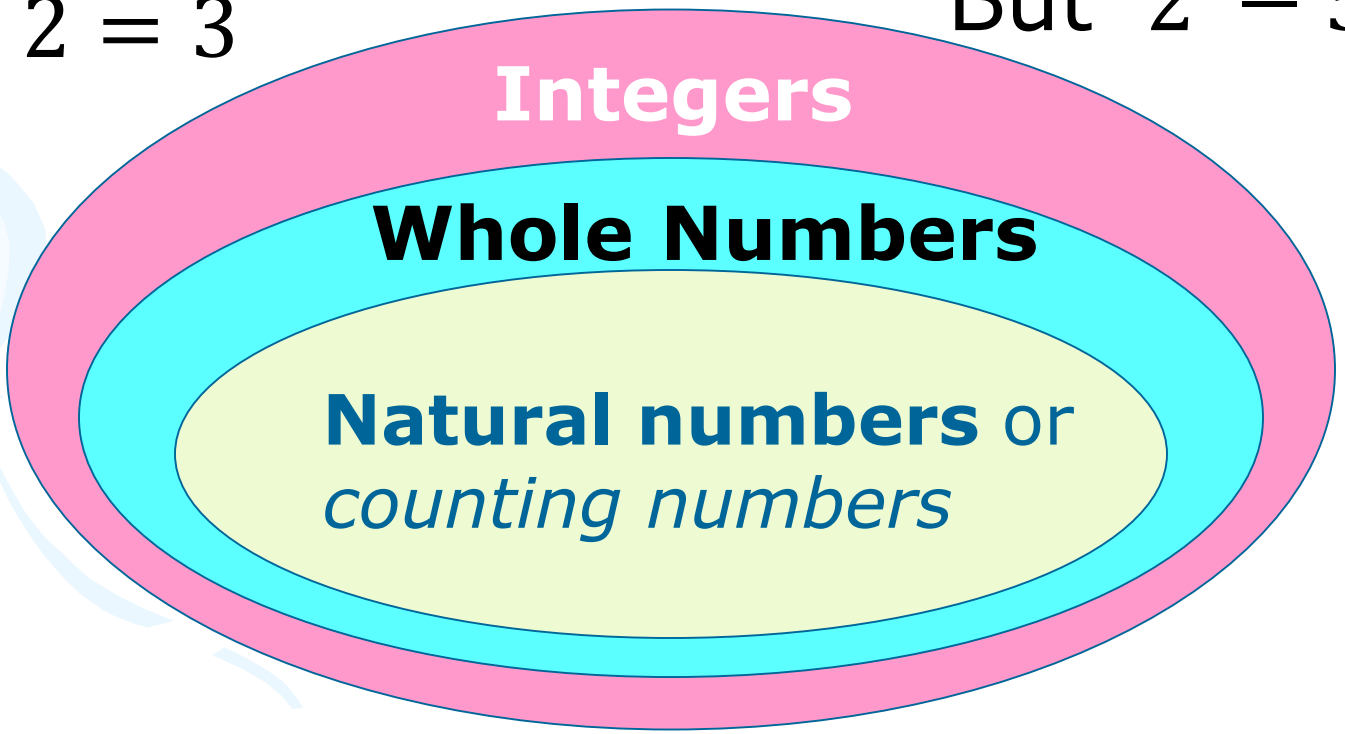


0 *and* 1 2 3 4 5 …

What happens when you *subtract* any two **whole numbers**?

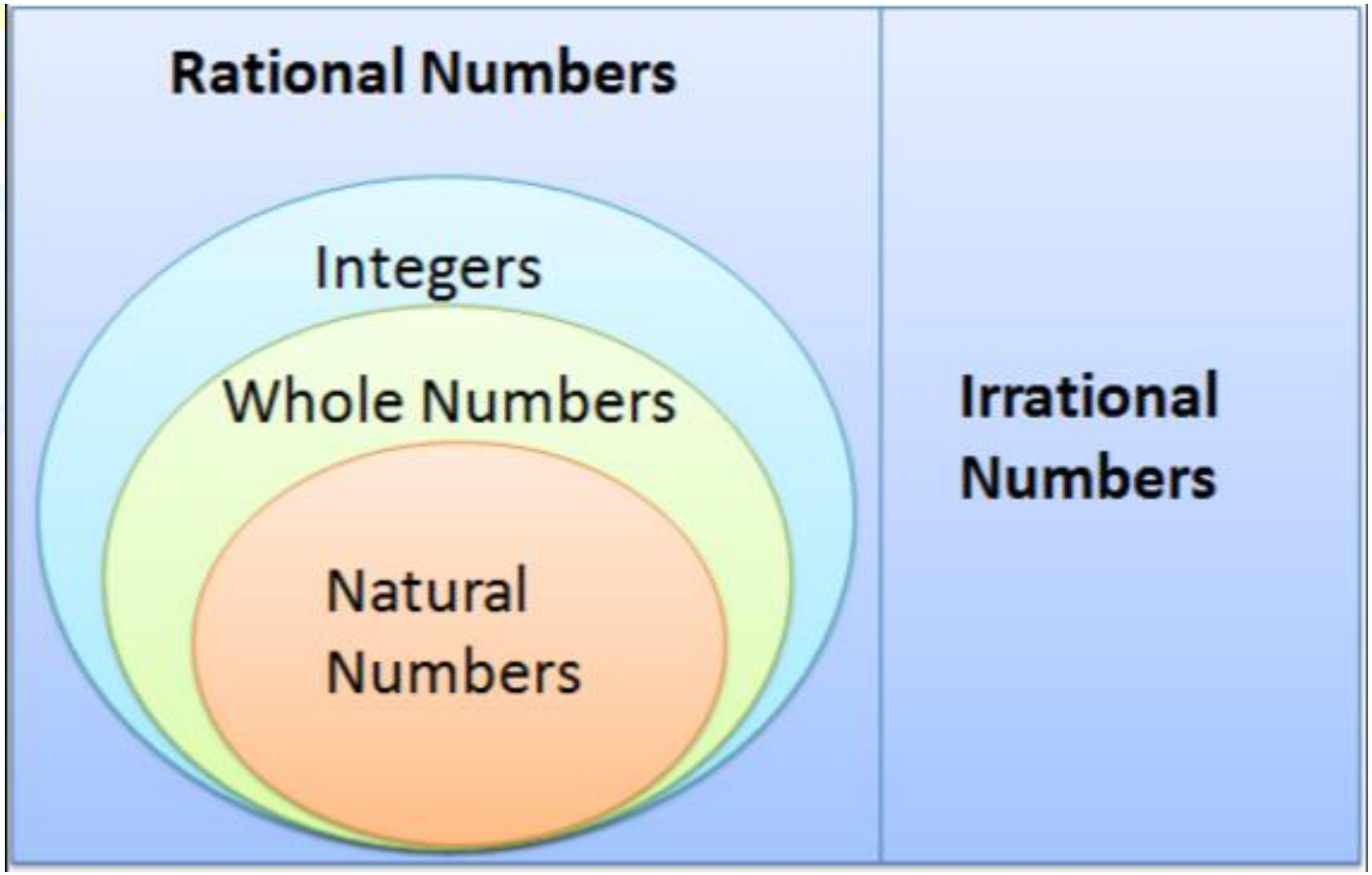
$5 - 2 = 3$

But $2 - 5 = -3$



…−4, −3, −2, −1, 0, 1, 2, 3, 4, 5 …

Real Numbers ($\mathbb{R}$)



Number Types Song

- Link: https://www.youtube.com/watch?v=m94WTZP14SA

Integers: Comparing and Ordering

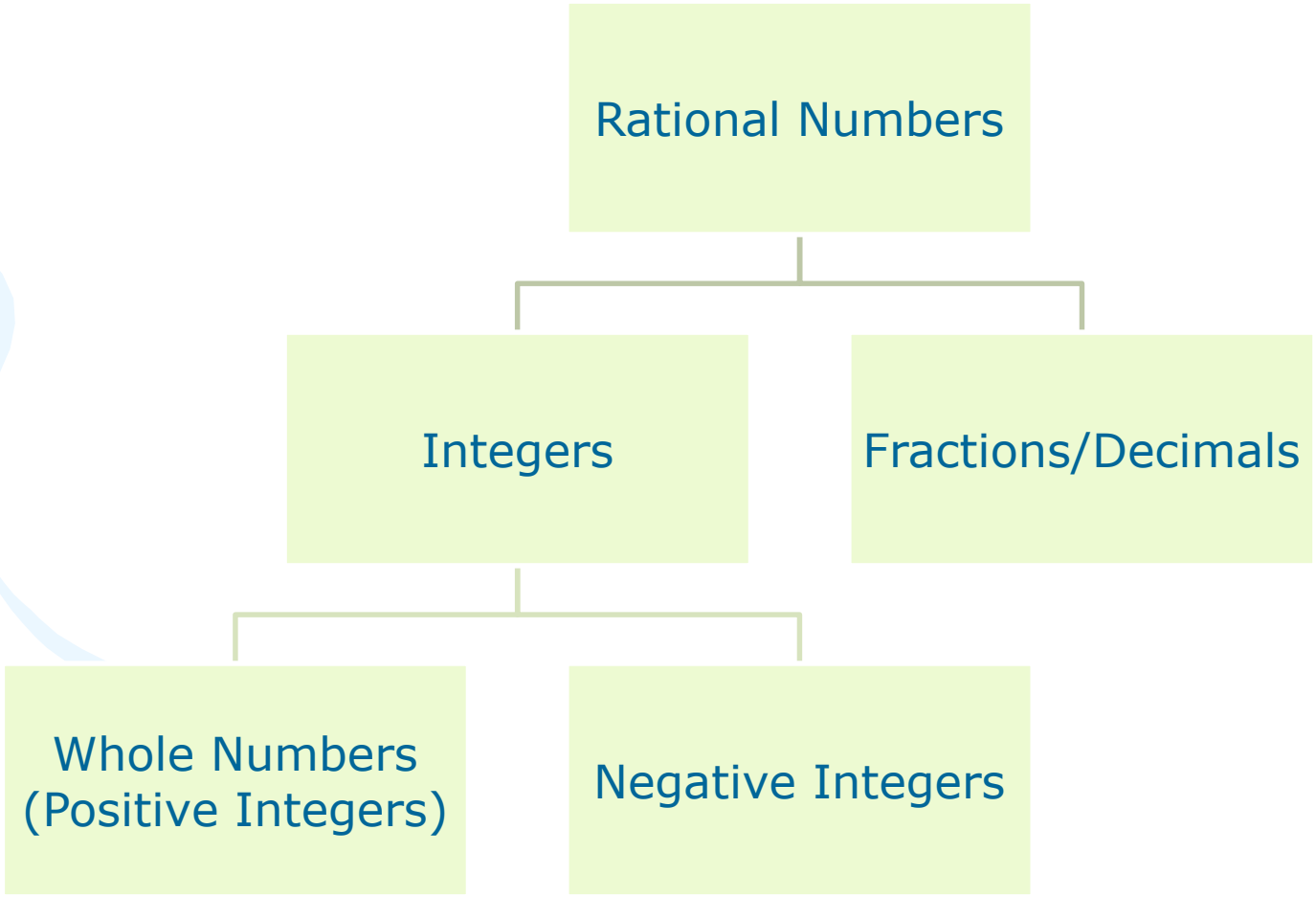
Evaluation Questions

- What are rational numbers?

Rational numbers are a subset of the **real numbers**, and include any number that can be put in the form of $\frac{a}{b}$ where both a and b are integers

- How do we compare and order rational numbers?

Rational Numbers



Whole Numbers

- Positive numbers that (*in simplest form*) are not fractions or decimals.

Can you convert whole numbers into *fractions* or decimals?

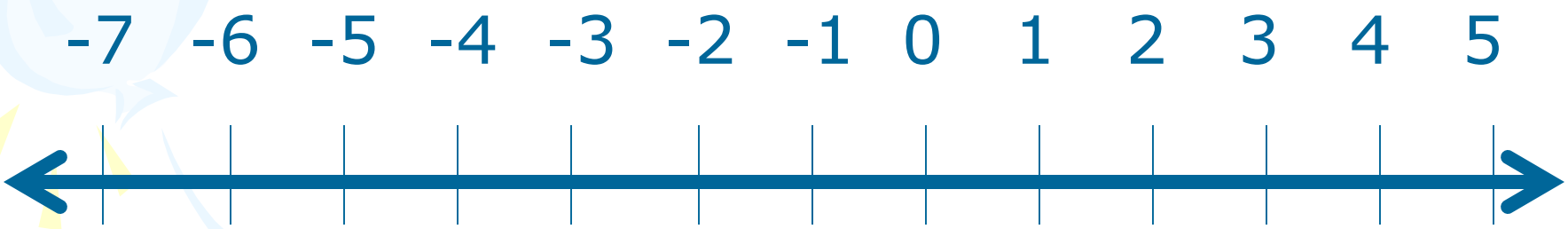
ABSOLUTELY!

2 as *fraction is* $\frac{2}{1}$ and as a decimal is 2.0

Notes!

Integers

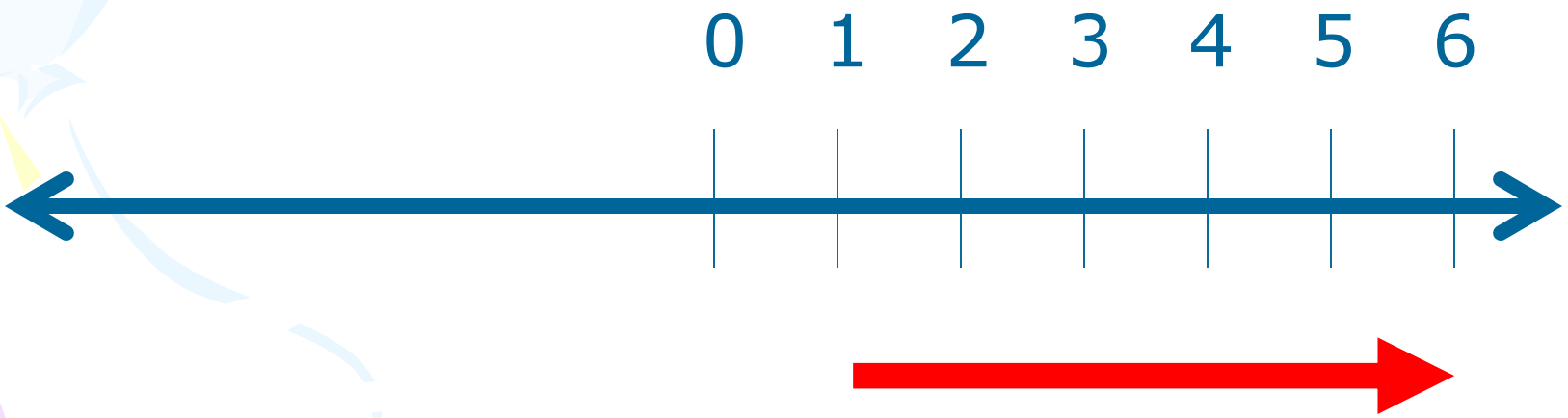
- The set of whole numbers and their opposites (or *additive inverses*).



Notes!

Positive Integers

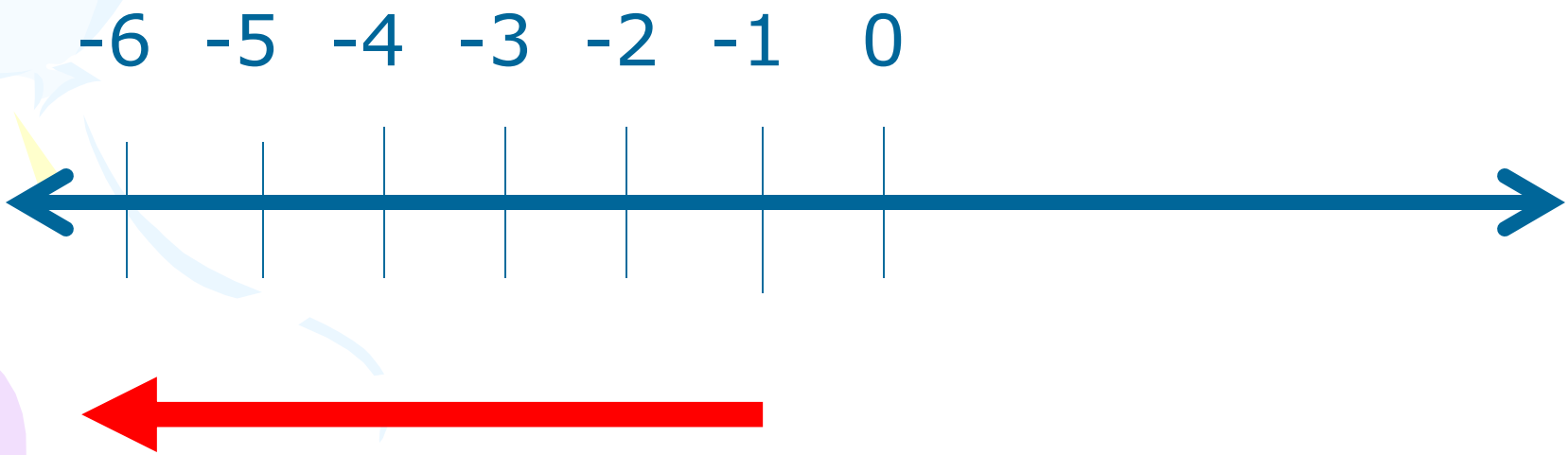
- Integers greater than zero.



Notes!

Negative Integers

- Integers less than zero.

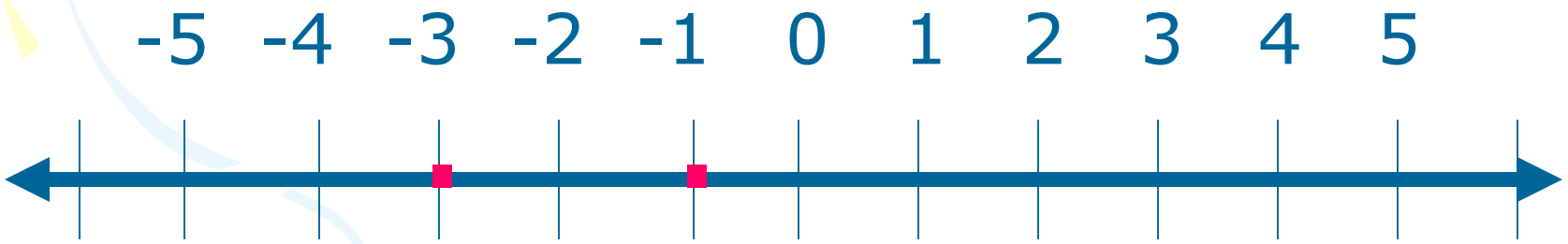


Notes!

Comparing Integers

- The further a number is to the right on the number line, the greater it's value.

  Ex: -3 __<__ -1



-1 is on the right of -3, so it is the greatest.

Comparing Integers

- The farther a number is to the right on the number line, the greater it's value.

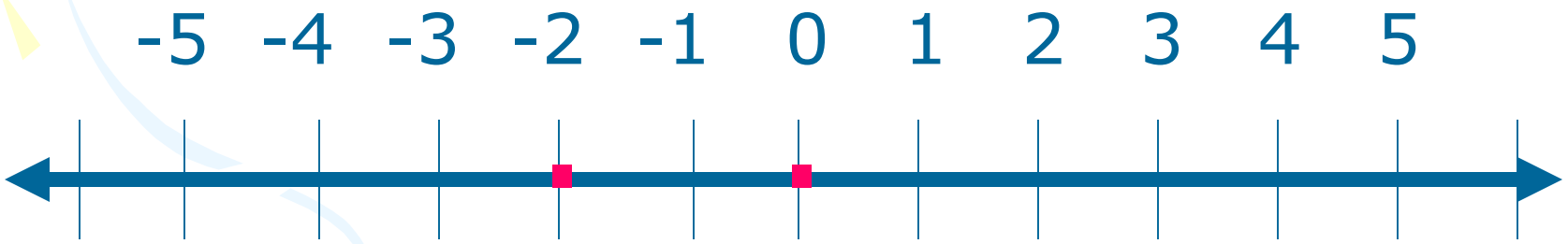
Ex: 2 __>__ -5

2 is on the right of -5, so it is the greatest.

Comparing Integers

- The farther a number is to the right on the number line, the greater it's value.

Ex: 0 **>** -2



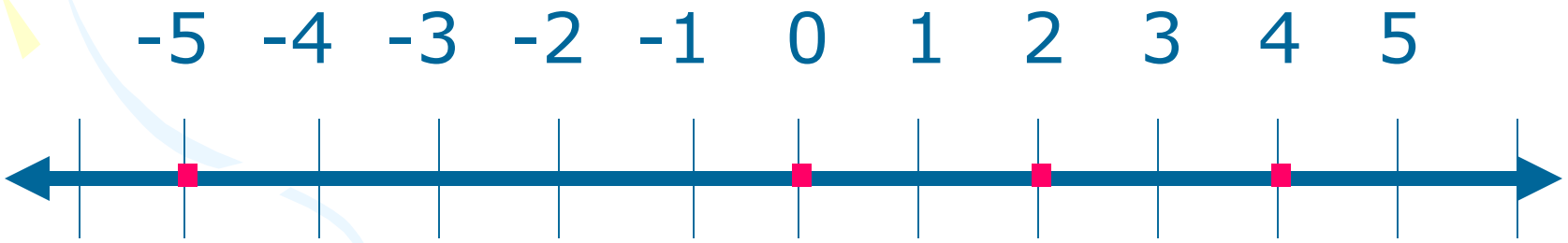
0 is on the right of -2, so it is the greatest.

Notes!

Ordering Integers

When ordering integers from *least to greatest* follow the order on the number line from *left to right*.

Ex: 4, -5, 0, 2



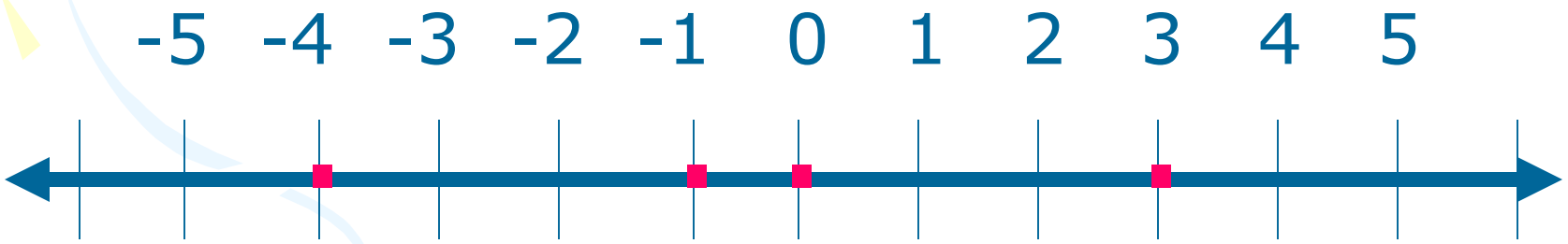
Least to greatest: -5, 0, 2, 4

Notes!

Ordering Integers

When ordering integers from *greatest to least* follow the order on the number line from *right to left*.

Ex: -4, 3, 0, -1

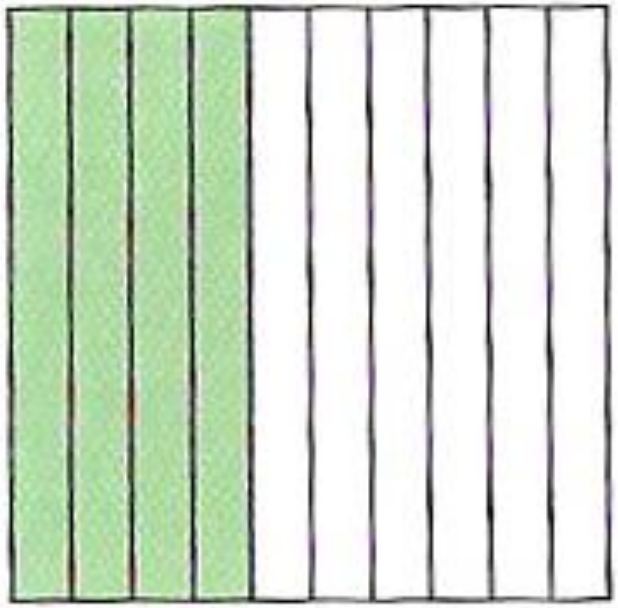


Greatest to least: 3, 0, -1, -4

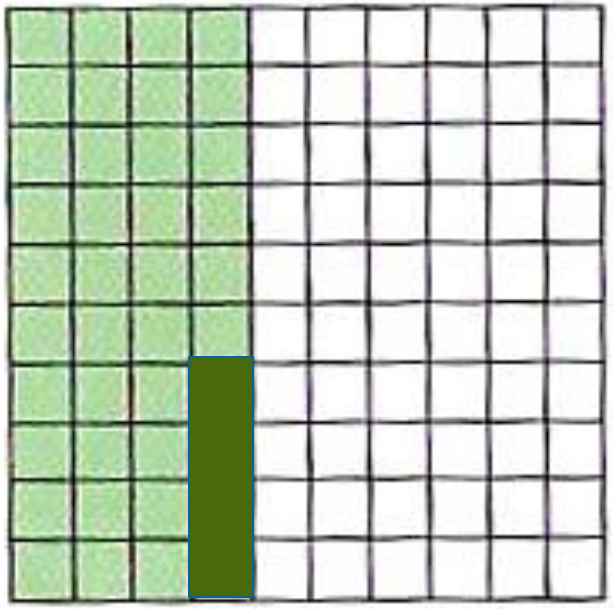
Using Models

- If you are comparing tenths to hundredths, you can use a tenths grid and a hundredths grid. Here, you can see that 0.4 is greater than 0.36.

0.4



0.36



Notes!

Comparing Fractions Strategy

- If the denominators are the same, how can you compare them?
- Compare the numerators.
- If the denominators are *not the same*, then rewrite the fractions using a common denominator.
- The new fractions *should be equivalent* to the original fractions.

Writing Equivalent Fractions

- One way to find a common denominator is to multiply the two original denominators.

$\frac{5}{6} \cdot \frac{4}{4} > \frac{3}{4} \cdot \frac{6}{6}$

x 4

$\frac{20}{24}$

$\frac{18}{24}$

x 6

6 x 4 = 24

20 > 18

BIG IDEA: *What did you multiply each fraction by?*

BIG IDEA: *You multiply each fraction by a form of* ***1***

- Another way to compare fractions is to find the LCM of both denominators.
- Use the LCM as the new denominator in the equivalent fractions.

9, 18, 27, (36), 45

12, 24, (36), 48, 60

$$\frac{5}{9} < \frac{7}{12}$$

x 4 x 3

$$\frac{20}{36} \quad \frac{21}{36}$$

$20 < 21$

Notes!

Ordering Fractions

- Find the LCM of the denominators.
- Use the LCM to write equivalent fractions.
- Put the fractions in order using the numerators.

Example - Order from Least to Greatest:

$\frac{3}{8}$ $\frac{2}{5}$ $\frac{1}{4}$

x 5 x 8 x 10

$\frac{15}{40}$ $\frac{16}{40}$ $\frac{10}{40}$

8, 16, 24, 32, (40), 48

5, 10, 15, 20, 25, 30, 35, (40)

4, 8, 12, 16, 20, 24, 28, 32, 36, (40)

1/4 , 3/8 , 2/5

Sum of **zero**, product of *one*

Additive Inverse

- Additive inverse is also known as negative of a number.

For any rational number a/b, a/b+(-a/b)= (-a/b)+a/b = 0

Therefore, -a/b is the additive inverse of a/b and a/b is the

Additive Inverse of (-a/b).

Reciprocal

- Rational number c/d is called the reciprocal or **Multiplicative Inverse** of another rational number a/b if a/b * c/d = 1

HOMEWORK TIME!!!!