Pin the Number on the Donkey
(HW for Mid-Winter Break)

LEARNING TARGET:
I can identify, categorize, and explain the differences between different sets of numbers.

In case you forgot what these number sets mean:

Whole Numbers: Whole numbers include zero and counting numbers, such as 1, 2, 3, 4, … et cetera. No negatives, no fractional/decimal pieces of numbers. **NOTE:** $8/4$ is still whole because even though it's written as a fraction, it equals 2 when reduced, and 2 does not have any fractional/decimals pieces. 6.0 is also whole, even though it has a decimal, because it just equals 6. Also, the term **Natural Numbers** means the same thing as whole numbers except natural numbers don't include zero.

Integers: Integers include all the whole numbers, and adds the negatives of whole numbers as well. Examples include …, -3, -2, -1, 0, 1, 2, 3, 4, …, et cetera.

Rational Numbers: Rational numbers are all numbers that can be written as fractions, or as decimals that terminate or have a repeating pattern. All numbers that we have learned so far are rational, as long as they aren't irrational (see below). Remember, this includes all whole numbers and integers as well, because we can write any whole number or integer as a fraction over 1 (ex: $3/1$, $-14/1$, $100{,}000/1$ are all integers AND they are rational numbers). Other examples include $4/5$, 3.98, and $-1/2$.

Irrational Numbers: Irrational numbers are numbers that have decimals that go on forever (don't end), such as π (3.141592653589793…), or the square roots of numbers that aren't perfect squares ($\sqrt{7}$ = 2.645751311064591…). In the previous two examples, we write the "…" to indicate that the number continues, but because irrational numbers go on forever, we have to force ourselves to stop writing it at some point.

DIRECTIONS for (1): Using the Number Sets Venn Diagram on the other side of this sheet, write the numbers in (1) on the diagram in the appropriate places. For example, the number 3 would go inside the Whole Numbers box (which is fully inside Integers and Rational Numbers too, because 3 is an Whole Number, an Integer, and a Rational Number). As another example, -1/2 would go in the Rational Numbers box, but outside the Integers box because as a fraction, it is *not* an Integer, but it *is* a Rational number.

After the numbers with follow-up questions, justify why you placed the number where you did on the diagram.

(1) Write these numbers in the appropriate place on the Number Sets Venn Diagram.

a. 6

- Why did you put 6 where you did on the diagram?

b. $\sqrt{2}$

- Why did you put $\sqrt{2}$ where you did on the diagram?

c. -104

- Why did you put -104 where you did on the diagram?

d. 6.73

- Why did you put 6.73 where you did on the diagram?

e. $\sqrt{16}$

- Why did you put $\sqrt{16}$ where you did on the diagram?

f. -2.0

g. $-\frac{5}{3}$

h. $1.\overline{3}$

i. 0

j. 95

k. -5

l. -14

m. $\sqrt{72}$

n. π

o. 93.12

p. $\frac{10}{5}$

q. $\frac{30}{35}$

r. 19

s. -12

t. -0.8

u. $\sqrt{45}$

v. Choose your own #: _____
   - Why did you put this number where you did on the diagram?

w. Choose your own #: _____
   - Why did you put this number where you did on the diagram?

x. Choose your own #: _____

(2) List which number sets the following numbers are contained in from smallest to largest.

a. EXAMPLE: -4 ANSWER TO EXAMPLE: -4 is in integers and rational numbers.

b. 0.5

c. 7

d. -9

e. $\sqrt{99}$

(3) Name 3 numbers that aren't on this sheet yet that are INTEGERS, but NOT WHOLE NUMBERS.

(4) Name 3 numbers that aren't on this sheet yet that are RATIONAL NUMBERS and are also INTEGERS.

(5) Name 3 numbers that are RATIONAL NUMBERS, but NOT INTEGERS.