Use Smartboard "Lesson 1-1" Definitions of # System

Math 2
Lesson 1-1: *The Real Number System*

Name Key
Date 8-30-13

You will be working towards the following learning goals in this investigation:

- *I can classify real numbers as rational or irrational according to their definitions and give examples of each.*
- *I can explain why the sum and product of two rational numbers is rational.*
- *I can explain why the why the sum of a rational and irrational number is irrational.*
- *I can explain why the product of a nonzero rational and irrational number is irrational.*
- *I can apply the definition of an integer to explain why adding, subtracting, or multiplying two integers always produces an integer.*

Throughout your mathematical career, you have worked with all types of numbers from the **Real Number System**. Each of you has been randomly given a number from the real number system. Record your number here [ ] Now please stick your number under the number subset where you think it fits best. in envelope. (Answer key on a smart board file)

After you have made your placement of your number, think about then answer the following questions:

1. Why do we have to classify numbers?
   so many #s we have to have a way to refer to a certain set.
2. What are some other subjects/topics that get classified?
   Science → Animals
   music –
   food –
   vehicles –
   rocks –
   Student body

Notes:

Natural Numbers – counting #s
1, 2, 3, 4, 5, 6, 7... where each succeeding # is greater than its previous # by 1.

Whole Numbers –
The set of natural #s and 0.

Integers – the set of positive whole numbers {1, 2, 3...}, negative whole #s {-1, -2, -3...} and 0

Rational Numbers –
A # that can be expressed exactly by a ratio of two integers, excluding zero as a denominator.

Irrational Numbers –
Any # that can be written as non-terminating non-repeating decimals.

Real Numbers –
All rational & irrational #s

After what we discussed, are all numbers placed correctly? Which numbers could be in multiple spots? Move your number to the **most specific** location, if it is not already there.

OVER →

Directions: Check ALL the boxes that apply to each number.

	Natural	Whole	Integer	Rational	Irrational	Real
1. -789			✓	✓		✓
2. π					✓	✓
3. $\sqrt{0.36}$				✓		✓
4. $-\frac{2}{3}$				✓		✓
1st → 5. 0		✓	✓	✓		✓
6. 4.1439..... Doesn't repeat					✓	✓
7. $\frac{-5}{-5}$	✓	✓	✓	✓		✓
8. $2\frac{1}{9}$				✓		✓
9. $1.\overline{48}$				✓		✓
10. $\sqrt{4}$	✓	✓	✓	✓		✓

When you are done, compare your answers with the people around you.

5th starts graphic organizer

Math 2
Lesson 1-1 Follow-up Activity

Name _____
Date _____

In the investigation for Lesson 1-1, you saw an example of a graphic organizer of the Real Number System. Now you are going to create your own graphic organizer for our number system. The categories should include the following:

NOTE: These are not listed in any particular order.

integers, whole numbers, irrational numbers, rational numbers, real numbers and natural numbers.

8th period got to graphic organizer

on shared folder
real # diagram
(smartboard file)

Once you have completed your graphic organizer, place the following numbers in the most specific category.

$0,\ 4,\ -9,\ \frac{-5}{3},\ \sqrt{4},\ -\frac{14}{7},\ \sqrt{17},\ -.\overline{4},\ \pi,\ 3^3,\ 2.9,\ \frac{\sqrt{3}}{2},\ .23,\ \sqrt{49},\ -11,\ 117,\ -5\pi+1,\ \frac{1}{9}$

(Answer key on smart board)

Lesson 1-1 Graphic Organizer Answer key

Lesson 1-1 HOMEWORK:

Give the **most specific** classification for the following numbers.

rational, irrational, integer, whole number, natural number

1. $\sqrt{25}$ 5 natural #
2. -11 Integer
3. 0 whole #
4. $\frac{2}{3}$ rational
5. $\sqrt{31}$ irrational
6. $\frac{12\pi}{24}$ irrational
7. 3.8 rational
8. $\frac{48}{12}$ natural
9. $256.\overline{812}$ rational
10. $5.2 \cdot 10^{-8}$ rational

11. The product of two rational numbers is always rational (*rational, irrational* or *cannot be determined*).
How do you know this? (Provide examples . . . . .) $\frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9}$ can always be written as fraction

12. The sum of two integers is always a(n) integer.
How do you know this? $3+2=5$ $-3+2=-1$ $-3+-2=-5$ $3+-2=1$ $-2+2=0$

13. The sum of two rational numbers is always rational (*rational, irrational* or *cannot be determined*).
How do you know this?

14. The sum of an irrational number and a rational number is always Irrational (*rational, irrational* or *cannot be determined*).
How do you know this? $3+\pi = 6.14159\ldots$ $\frac{1}{3}+\pi = 3.64159\ldots$

15. The difference of two integers numbers is always a(n) Integer.
How do you know this? $8-2=10$ $-6-2=-9$

16. The product of a non-zero rational and an irrational number is always Irrational (*rational, irrational* or *cannot be determined*).
How do you know this?

17. The product of two integers numbers is always a(n) Integer.
How do you know this?

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