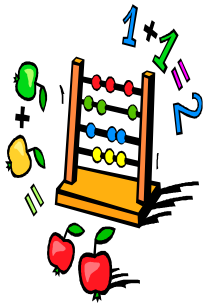
Algebra Connections



Mrs. Alicz's Edition 2 October 2013 Esmond Elementary Jr. High School

Number Sense 101

Essential Question: How do you complete operations with multi-digit numbers and decimals?

Math Goals:

I can…..

…..read and write numbers to trillions.
…..read and write numbers to thousandths.
…..estimate products and quotients of decimals.
…..locate integers on a number line.
…..compare and order integers.
…..find the absolute value.
…..add, subtract, multiply, and divide whole numbers and decimals.

The value of a digit depends on its place in a number. Numbers are written in periods consisting of three digits.

Hundred Trillions	Ten Trillions	Trillions	Hundred Billions	Ten Billions	Billions	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1	2	3,	4	5	6,	7	8	9	0	0	3	4	0	0
Trillions Period		,	**Billions Period**		,	**Millions Period**		,	**Thousands Period**		,	**Ones Period**		

The chart shows the number 123,456,789,003,400 and would be read "1 hundred twenty-three trillion, four hundred fifty-six billion, seven hundred eighty-nine million, three thousand, four hundred.

A **decimal** names a fractional number in place-value form.

$\frac{1}{10} = 0.1$ one-tenth $\frac{1}{100} = 0.01$ one-hundredth $\frac{1}{1000} = 0.001$ one-thousandth

Decimal places are written to the right of the decimal point. The place-value ends with these three letters: ***ths***

ones	decimal place (read as "**and**")	tenths	hundredths	thousandths
1	.	2	3	4

The chart shows the number 1.234 and would be read "one **and** two hundred thirty-four thousandths."

There are several ways to name numbers. They are:

- standard form
  - 4,825 0.635
- word form
  - four thousand, eight hundred, twenty-five
- number-word form
  - 4 thousand, 8 hundred, 25
- expanded form
  - 2,046 = 2 * 1000 + 4 * 10 + 6 * 1
  - 0.72 = 7 * 0.1 + 2 * 0.001

Decimals can name numbers that lie between whole numbers. For example, 1.4 would be between 1 and 2.

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|____|____|____|____|____|____|____|____|____|____|
1.0                  1.4                        2.0
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Name three more numbers between 1 and 2? _____

Operations with Decimals

When adding or subtracting you must make sure that the numbers are lined up by place value. This can be done simply by following three steps:

1) Align the decimal places.
2) Add zeros as placeholders when necessary.
3) Add from left to right.

1 . 3 + 3 . 6 5 1	3 . 6 5 1 – 1 . 3
1 . 3 0 0	3 . 6 5 1
+ 3 . 6 5 1	- 1 . 3 0 0
4 . 9 5 1	2 . 3 5 1

In order to multiply decimals, multiply the same way as with whole numbers. Then count the number of decimal places in both factors. Place the decimal point in the product that many places from the right.

56	5 . 6	1 decimal place
* 14	* 1 . 4	1 decimal place
224	2 2 4	
+ 560	+ 5 6 0	
784	7.8 4	total 2 decimal places

To divide with decimals, rewrite the problem in equivalent form with a whole number for the divisor. Then divide.

5 . 7 6 ÷ 0 . 3 2

0.32 is the **divisor**, or the number you are dividing by. This number must be a whole number, so we must move the decimal point 2 places to the right.

5 . 7 6 ÷ 32	Since we moved the decimal 2 places in the divisor, we must move the decimal in the **dividend**, 5.76 will become 576.
600 ÷ 30	Find a estimate of the **quotient**, by rounding the divisor and dividend creating compatible numbers.
= 20	Our estimate would be 20
576 ÷ 32	Now divide as you do with whole numbers.

```
      1 8.
32  5 7 6.
    3 2↓
    ------
      2 5 6
      2 5 6
    ------
          0
```

How are positive and negative numbers represented on a number line?

Positive numbers are numbers that are greater than 0, located to the right of 0, and written with or without a plus sign; for example, 6 is the same as + 6.

Negative numbers are numbers less than 0, located to the left of 0, and must always be written with a negative sign; for example – 3.

The number 0 is neither positive nor negative.

Two numbers are **opposites** if, on a number line, they are the same distance from 0 but on different sides of 0. For example, 5 and – 5 are opposites; - 2.15 and 2.15 are also opposites. 0 is its own opposite.

Integers are the set of all whole numbers and their opposites.

1) Use a number line and find the opposites of 7, - 4, 1, and 9.
2) What is the opposite of 8.5?
3) What is the opposite of the opposite of 3?
4a) Graph and label the following points on a number line.
A. – 2 B. 9.5 C. – 8 D. – 9.5 E. 5 F. 8
4b) Which points represent integers?
4c) Which pairs of points represent opposites?

When you read a number line from left to right, the numbers are in order from least to greatest. When comparing and ordering rational numbers, start by graphing the numbers on a number line.

Graph each set of numbers on a number line. Then list the numbers in order from least to greatest.

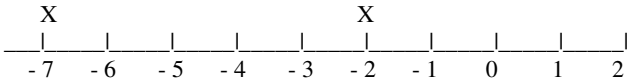
1) 5.6 ; - 8 ; 3.1 ; - 4 ; 7 ; - 2
2) - 14 ; 12 ; - 7 ; 11 ; 18 ; - 2 ; 1 ; 5 ; - 8

Fill in the blank.
3) Negative numbers are _____ than positive numbers.
4) 0 is _____ than all negative numbers.

When comparing rational numbers we write an **inequality**, a statement that two quantities are not equal. We use the **symbols**:

> means "is greater than"
< means "is less than"

Start by graphing the numbers on a number line. The number further to the left is the smallest.



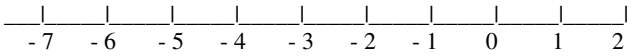
Write two inequalities for the integers – 7 and – 2.

- 7 < - 2 means – 7 is less than – 2
– 2 > - 7 means – 2 is greater than – 7

List the numbers in order from least to greatest.
1) 4 , - 6 , 0 , 8 , - 9 , 1 , - 3
2) - 80 , 88 , 96 , - 14 , 75 59 , - 32
3) - 65 , 34 , 7.6 , -13 , 55 , 62.5 , - 7.6

Compare. Write < or >.
4) - 1 _____ - 3
5) 5 _____ -10
6) -3 _____ 0

The **absolute value** of a number is the number's distance from 0 on the number line. For example, the absolute value of – 3 is 3 because – 3 is 3 units from 0. The absolute value of – 3 is written | - 3 |.



| 2 | = 2 | - 2| = 2

Both 2 and – 2 have an absolute value of 2 since they are both 2 units from zero.

Find the absolute value.
1) | 3 | 2) | - 7 | 3) | 5 |
4) | - 2 | 5) | - 3 | 6) | - 7 |
7) Which pairs of numbers have the same absolute value?
8) If a number is _____, then the number is equal to its absolute value. If a number is _____, then the number is less than its absolute value.

Basic Skills Practice Corner

Complete attached activity sheets. Be sure to show all of your work. **No Work will equal No Credit!**

Students must keep this newsletter with their notes.

Name: _____

Received: _____ Completed: _____

Parent signature: _____

Mrs. Alicz' signature:_____