**Lesson 2.2 & 2.3 - Scientific Notation**

**Vocab:**

**Scientific Notation –** method of expressing very large or small numbers as product of a number greater than or equal to 1 and less than 10 to a power of 10

**Standard Notation** – number as it is written out on paper

**2.2 – Scientific Notation of Positive Powers:**

*Standard to Scientific*

* *Step 1 –* Place decimal between first and second digit on the left to make it between 1 and 10
* *Step 2 –* Count from decimal point to the right.
* *Step 3 –* Use that as power of 10

Ex 1: 125,000

 Step 1: 1.25

 Step 2: 1.25000 (there are 5 places to the right of the decimal)

 Step 3: 1.25 \* $10^{5}$

*Scientific to Standard*

* *Step 1 –* Find the power of 10
* *Step 2 –* Count that number of places to the right.
* *Step 3 –* Add zeros in the blanks

Ex 2: 5.96 \* $10^{4}$

 Step 1: $10^{4}$ (4 places to the right of the decimal)

 Step 2: 5.9600

 Step 3: 59,600

**2.3 – Scientific Notation of Negative Powers**

*Standard to Scientific*

* *Step 1 –* Starting from the left, find the first non-zero digit, after is the new decimal place.
* *Step 2 –* Count the number of spaces you moved from original to new decimal place.
* *Step 3 –* Make that number the negative power of 10

Ex 3: 0.00496

 Step 1: 4.96 is our new base

 Step 2: Since we moved 3 places to the right, our power will be 3

 Step 3: 4.96 \* $10^{-3}$

*Scientific to Standard*

* *Step 1 –* Find the power of 10
* *Step 2 –* Count that number of places to the left.
* *Step 3 –* Add zeros in the blanks

Ex 4: 1.23 \* $10^{-4}$

 Step 1: $10^{-4}$

 Step 2: 000123 (we moved 4 places left of the original decimal)

 Step 3 0.000123