1.3 SCIENTIFIC NOTATION

Scientific notation is also known as exponential notation			
Scientists frequently must deal with numbers that are very or very			
Scientific notation was created to make a shorter way to write very long numbers.			
This system uses a coefficient between 1-9 and powers of 10)		
General form: N x 10 ⁿ			
N is the coefficient and must be between 1-10 n represents how many times the coefficient i			
Putting standard notation into scientific notation:			
32,400,000,000	0.0000000567		
Class Practice: Write each of these numbers in scientific notation:			
17 =	0.00000614 =		
5134 =	0.0037004 =		
215 =	0.00000038 =		
7,000,631 =	0.01010 =		
Putting scientific notation BACK into standard notation:			

If the number ends with a positive exponent, you are multiplying by 10, therefore move the decimal point to the <u>right</u>. If the number ends with a negative exponent, you are dividing by 10, therefore move the decimal point to the <u>left</u>.

Write each of the following as ordinary numbers.

4.29 x 10 ⁶ =	 4.92x10 ⁻⁵ =
3.286 x 10 ⁴ =	 8.429 x 10 ⁻¹ =
5.92000 x 10 ² =	 5.376 x 10 ⁻² =

Fix the incorrectly written scientific notation

524 x 10³ =

$0.0026 \times 10^{-5} =$	
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Scientific Notation in your Calculator

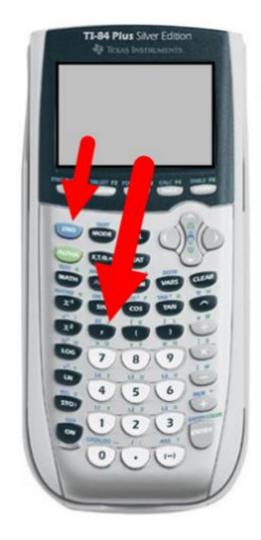
1.57 x 10²³

- 1. Type in the coeffiecent
- 2. Press the button labeled "2nd"
- 3. Press the button with the comma, which is also the "EE" key.

4. Enter your exponent.

5. Press enter

This is what it should look like in your calculator before you press "enter":



Let's Practice

- 1. $(2.3 \times 10^5) \times (7.4 \times 10^8) =$
- $\begin{array}{rrrr} 3. & \underline{2.7 \times 10^8} & \underline{} \\ & 5.2 \times 10^6 + 7.23 \times 10^4 \end{array}$

MEASUREMENTS

Measurement: Quantitative observation consisting of TWO parts.

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Examples: 20 grams, 6.63 x 10⁻³⁴ Joules •seconds, 12.5 km, 75 mph

The Fundamental Base SI Units

<u>MEMORIZE!!!</u>

Physical Quantity	Name of Unit	Abbreviation
Mass	kilogram	kg
Length	meter	m
Time	second	S
Volume	liter	L
Temperature	Kelvin	К
Amount of Substance	mole	mol

Common Prefixes Used in SI system

-Prefixes are used to change the size of the unit

-Please <u>**MEMORIZE</u>** the following common prefixes:</u>

Prefix	Symbol	Meaning	Power of 10 for Scientific Notation
kilo-	k	1000	10 ³
centi-	С	0.01	10-2
milli-	m	0.001	10-3

LENGTH:

-Measurement of distance

-Base SI unit for length is meter (m).

-Common SI units of length:

Unit	Symbol	Meter Equivalent
kilometer	km	1000 m or 10 ³ m
meter	m	1 m
centimeter	cm	0.01 m or 10 ⁻² m
millimeter	mm	0.001 m or 10 ⁻³ m

<u>VOLUME:</u>

-Measurement of the amount of 3-D space occupied by a substance

-Base SI unit for volume is **cubic meter(m³)**

-Commonly measure solid volume in cm³

- $1 \text{ mL} = 1 \text{ cm}^3$ $1 \text{ L} = 1 \text{ dm}^3$

MASS:

-Measurement of the amount of matter present in an object

-Base SI unit for mass is kilogram (kg).

- 1 kg = 2.2046 lbs 1 lb = 453.59 g

HOMEWORK: Scientific Notation & Measurements

Express each of the following numbers in scientific notation keeping the <u>correct number of</u> <u>significant figures</u>.

1.	325	5.	0.361
2.	70	6.	0.0428
3.	96,400	7.	0.00573
4.	6,587,324,000	8.	0.00005673

Write each of the following as ordinary numbers keeping the <u>correct number of significant</u> <u>figures.</u>

9.	3.9734 x10 ⁵	12.	3.88 x10 ⁻²
10.	6.285x10 ³	13.	5.65 x10 ⁻¹
11.	6.7978x10 ²	14.	3.7283 x 10 ⁻⁴

Using a calculator, calculate the following and report the answer in correct scientific notation <u>(YOU DON'T HAVE TO WORRY ABOUT SIGNIFICANT FIGURES)</u>.

16. $8.2 \times 10^{11} \times 1.4 \times 10^{8}$	
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17. $\frac{5.7 \times 10^9}{5.2 \times 10^{10} + 5.93 \times 10^2}$

Using your notes fill in the blank(s) for each question.

18. The base SI unit for MASS is _	, LENGTH is _	, and
for VOLUME is		

19. How many meters are in 2 km?