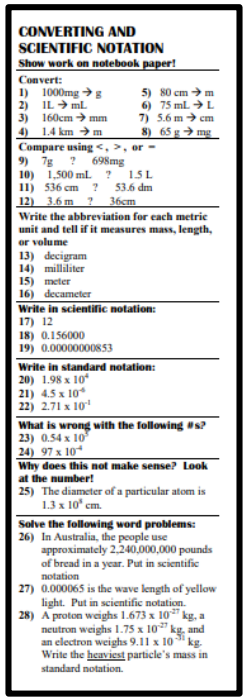
START - Scientific Notation and Metric System



CONVERTING AND SCIENTIFIC NOTATION

Show work on notebook paper!

Convert:

1) 1000mg → g
2) 1L → mL
3) 160cm → mm
4) 1.4 km → m
5) 80 cm → m
6) 75 mL → L
7) 5.6 m → cm
8) 65 g → mg

Compare using <, >, or =

9) 7g ? 698mg
10) 1,500 mL ? 1.5 L
11) 536 cm ? 53.6 dm
12) 3.6 m ? 36cm

Write the abbreviation for each metric unit and tell if it measures mass, length, or volume

13) decigram
14) milliliter
15) meter
16) decameter

Write in scientific notation:

17) 12
18) 0.156000
19) 0.00000000853

Write in standard notation:

20) 1.98×10^{4}
21) 4.5×10^{-6}
22) 2.71×10^{-1}

What is wrong with the following #s?

23) 0.54×10^{3}
24) 97×10^{-4}

Why does this not make sense? Look at the number!

25) The diameter of a particular atom is 1.3×10^{8} cm.

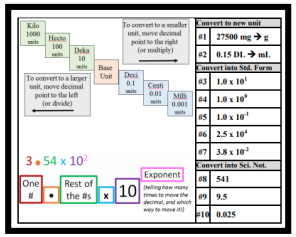
Solve the following word problems:

26) In Australia, the people use approximately 2,240,000,000 pounds of bread in a year. Put in scientific notation
27) 0.000065 is the wave length of yellow light. Put in scientific notation.
28) A proton weighs 1.673×10^{-27} kg, a neutron weighs 1.75×10^{-27} kg, and an electron weighs 9.11×10^{-31} kg. Write the heaviest particle's mass in standard notation.

Show your work here!

Be neat and organized so I can follow what you did and where the work for each question is.

Target: I can perform metric conversions and use scientific notation



Convert to new unit	
#1	27500 mg → g
#2	0.15 DL → mL
Convert into Std. Form	
#3	1.0×10^{4}
#4	1.0×10^{8}
#5	1.0×10^{-1}
#6	2.5×10^{4}
#7	3.8×10^{-2}
Convert into Sci. Not.	
#8	541
#9	9.5
#10	0.025

K	C	Q

Measurements and Conversions Gone Wrong!

Measurements and Conversions Gone Wrong!

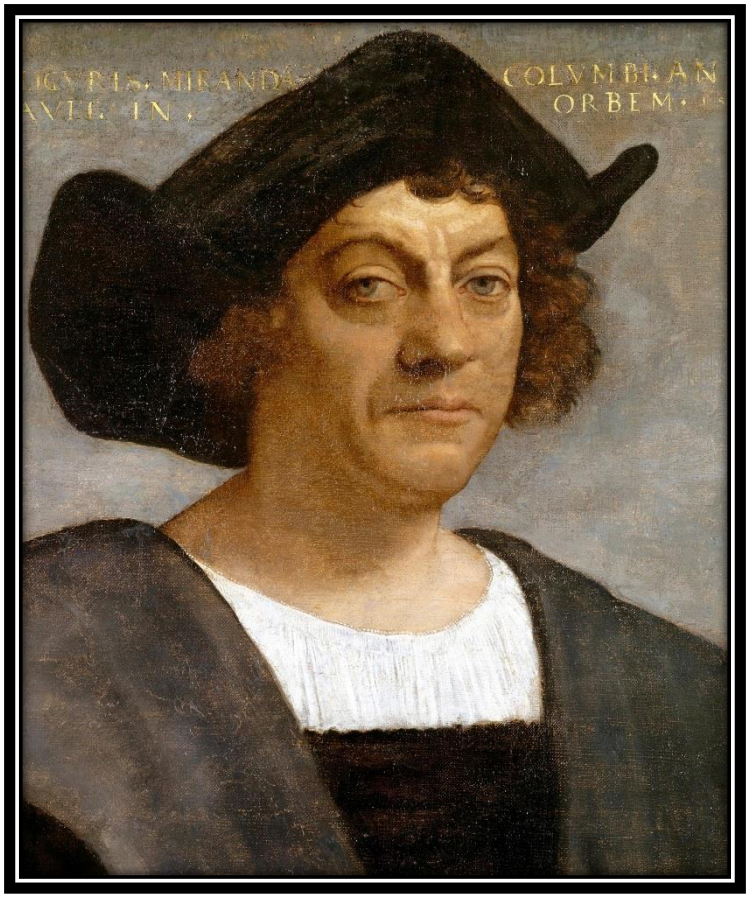
<u>1999</u>

NASA lost a Mars orbiter - $125 million loss. A calculation was done with *pound-force seconds*, not *Newton seconds*.

Measurements and Conversions Gone Wrong!

<u>1983</u> – Air Canada plane ran out of fuel in the air. They thought the fuel was weighed in *kilograms*, but it was weighed in *pounds*.

Measurements and Conversions Gone Wrong!



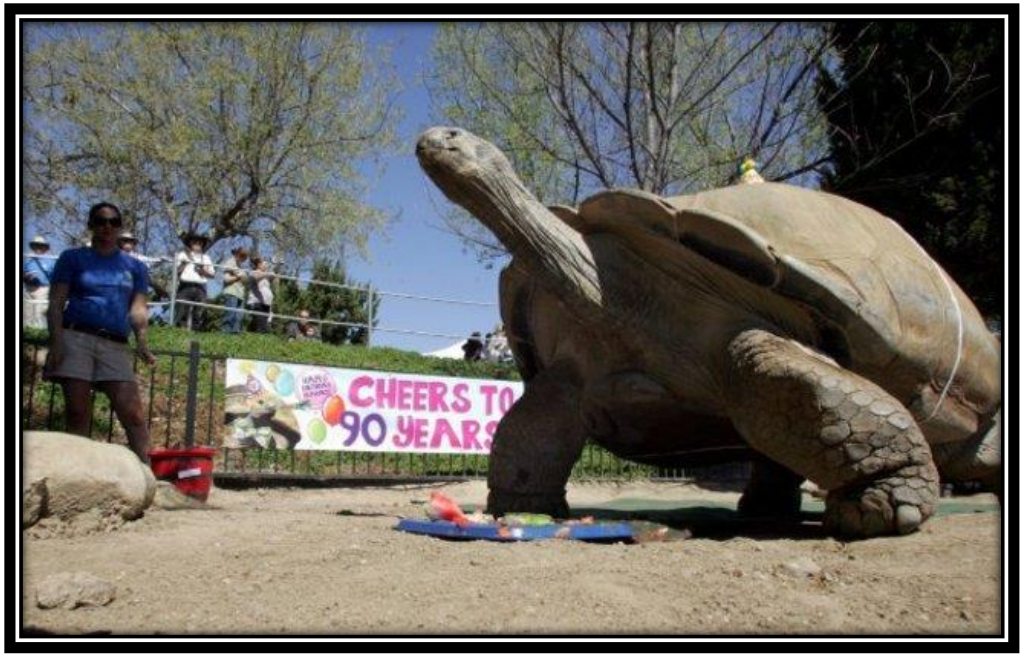
<u>1492 </u>Columbus ended up in Bahama's not Asia. Measured in *Roman miles* not *Nautical miles*.

Measurements and Conversions Gone Wrong!

<u>2004</u>

Tokyo Disneyland's Space Mountain Accident. The building designs changed from inches to metric scale. An axle got made thinner than it should have been.

Measurements and Conversions Gone Wrong!



<u>2001</u>
LA Zoo loans Clarence to another zoo. Clarence destroys the enclosure. They thought he was 250lbs but it was 250 kg! 250kg is bigger than 250lbs!

Why the Metric System?

- We all need to speak the same "math language."
- Everyone else uses it!
- It is easier!

The British: Hey guys, we developed this thing called the metric system…

Americans:

Adult deer are as tall as a bicycle. They weigh as much as 800 hamburgers.

How is it easier?

- Metric system works on "BASE TEN"
- Everything is changed by a factor of 10
- English system is total random!

Unit	Compared to "base" unit of a meter
Meter	1
Decameter	10
Hectometer	100
Kilometer	1000

[illegible]	Compa[illegible] "base" unit of [illegible]
F[illegible]	1
[illegible]rd	3
[illegible]athom	6.0761
Rod	[illegible]6.5
Chain	6[illegible]
[illegible]urlong	660[illegible]
[illegible]ile	5,280
[illegible]tical mi.	6,076.1
Lea[illegible]	15,840

Converting Metric System

- Just move the decimal!

To convert to a smaller unit, move decimal point to the right (or multiply) →

Kilo
1000
units

Hecto
100
units

Deka
10
units

Base
Unit

Deci
0.1
units

Centi
0.01
units

Milli
0.001
units

To convert to a larger unit, move decimal point to the left (or divide) ←

What are the "Base Units?"

Measuring	Unit
Length	Meter
Volume	Liter
Mass	Gram
Time	Second
Temp	Kelvin
# of molecules	Mole

Kilo
1000
units

Hecto
100
units

Deka
10
units

Base Unit

Deci
0.1
units

Centi
0.01
units

Milli
0.001
units

How do I remember the prefixes?

King Henry Died By Drinking Chocolate Milk

K	**H**	**D**	**B**	**D**	**C**	**M**
I	**E**	**E**	**a**	**E**	**E**	**I**
L	**C**	**K**	**s**	**C**	**N**	**L**
O	**T**	**A**	**e**	**I**	**T**	**L**
	O				**I**	**I**

Guided Practice

27500 mg → g

STEP 1
Are you going up or down the "ladder?"

STEP 2
How many steps to get there?

STEP 3
Move decimal that many times, in that direction

K H D B d c m

2 7 5 0 0.

27.500 g

Guided Practice

0.15 DL = _____ mL

STEP 1
Are you going up or down the "ladder?"

STEP 2
How many steps to get there?

STEP 3
Move decimal that many times, in that direction

K H D B d c m

0.1500

1500 mL

Tired of really big or really small numbers???

- Use scientific notation!
- Move your decimal and rewrite it in "scientific notation format"

$3 \cdot 54 \times 10^{2}$

(tells us how many times to move the decimal, and which way to move it!)

One #	•	Rest of the #s	x	10	Exponent

Big or small?		
x $10^{\text{positive \#}}$	“Big” #	Multiplying by 10’s
x $10^{\text{negative \#}}$	“Small” #	Dividing by 10’s

Guided Practice			
1.0×10^{1}		2.5×10^{4}	
1.0×10^{0}		3.8×10^{-2}	
1.0×10^{-1}			

Practice problems need to be done in your notebook!
They are part of the notes!

Guided Practice			
1.0×10^{1}	10	2.5×10^{4}	25000
1.0×10^{0}	1	3.8×10^{-2}	0.038
1.0×10^{-1}	0.1		

Guided Practice	
541	
9.5	
0.025	

Practice problems need to be done in your notebook!
They are part of the notes!

Guided Practice	
541	5.41×10^{2}
9.5	9.5×10^{0}
0.025	2.5×10^{-2}

YouTube Link for This Presentation

https://youtu.be/AidlHXdxkiw