Week 4 Packet – Regular Chem

This is *hopefully* all the handouts we will use this week in Regular Chem. Due to the challenging logistics of this year, please offer grace if I miss a handout or if things change during the week. **Please note** – You do not *have* to print. I am just providing the option to make things easier for those who want to print. All of these pages are on the class website, always! www.mychemistryclass.net

***I will put the glue ins for the notes on the front and/or back of the packet cover page like this – since you don't need the cover page for anything you can always just cut these out and glue them in. Trying to save some paper for those of you who are printing! ☺**

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Mass and Temperature Data for Heat Transfer from Unknown Metal Block to Water

Sample	Mass of Metal Block (g)	Mass of Water (g)	Starting Temp of Water (°C)	Ending Temp of Water (°C)
1	15.25	100	22.4	45.3
2	25.61	102	21.8	50.1
3	22.88	100	22.1	29.6

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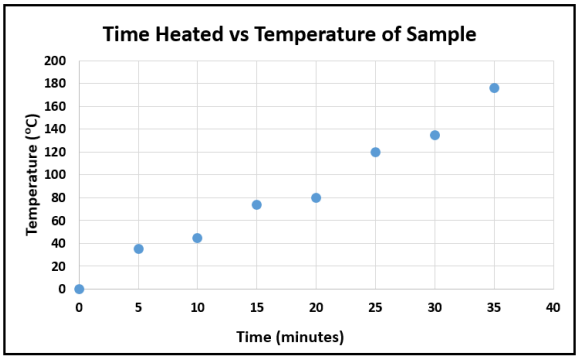

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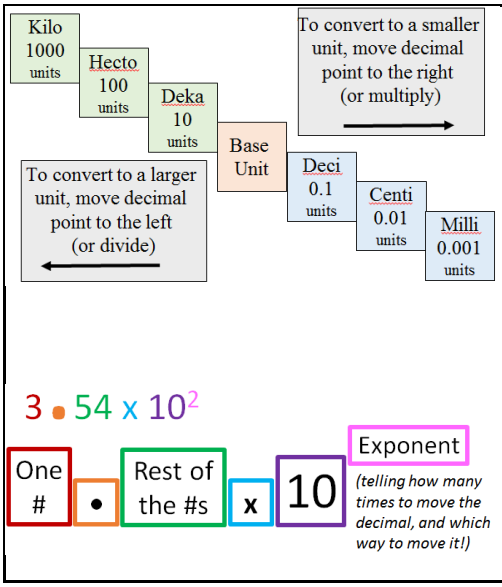

Convert to new unit	
#1	27500 mg → g
#2	0.15 DL → mL
Convert into Std. Form	
#3	1.0×10^{1}
#4	1.0×10^{0}
#5	1.0×10^{-1}
#6	2.5×10^{4}
#7	3.8×10^{-2}
Convert into Sci. Not.	
#8	541
#9	9.5
#10	0.025

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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^{5}
24) 97×10^{-4}

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

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. Make sure you don't forget to look at the exponent in addition to the number itself!

The Density of Pennies

The composition of pennies has changed over time. According to the U.S. Mint,

Pennies dated 1962-1982:	Pennies dated 1982-present:
Composition: 95% copper, 5% zinc	Composition: 97.5% zinc, 2.5% copper
Density of pre-1982 penny = **8.87 g/mL**	Density of post-1982 penny = **7.19 g/mL**

PURPOSE: The purpose of this lab is to determine the densities of pre-1982 and post-1982 pennies.

EQUIPMENT and MATERIALS: Electronic Balance, Pennies (10 pre-1982 and 10 post-1982), Graduated Cylinder (100mL), water

PROCEDURES:

If lab not done in class, watch video and use it to do this sheet:

- ☐ Weigh 10 **PRE-**1982 pennies. **Record this mass.**
- ☐ Fill a graduated cylinder with 50 mL of water.
- ☐ Tilt the cylinder and **gently** slide all ten pennies into the water.
- ☐ Read the volume of the water and the pennies together. **Record this volume.**
- ☐ **Calculate** the volume of the pennies alone by subtracting 50 mL from the final reading of the water level. **Record the volume of the pennies by themselves.**
- ☐ Use the recorded mass and volume of the pennies to **calculate density**.
- ☐ Use the accepted values for density, provided by the U.S. Mint, to **calculate your percent error** for density.
- ☐ Repeat steps 1-7 with ten **POST-**1982 pennies.

OBSERVATIONS/DATA:

PRE-1982 Pennies		POST-1982 Pennies	
Mass of 10 pre-1982 pennies		**Mass of 10 pre-1982 pennies**	
Volume of pennies + water		**Volume of pennies + water**	
Volume of JUST pennies = (Volume of pennies + water) – 50 mL of water		**Volume of JUST pennies =** (Volume of pennies + water) – 50 mL of water	

CALCULATIONS: (SHOW ALL WORK!!! BOX YOUR FINAL ANSWERS!!!)

Calculate the density of PRE-1982 pennies	**Calculate the density of POST-1982 pennies**
Calculate the % error for the density of PRE-1982 pennies	**Calculate the % error for the density of POST-1982 pennies**

POST-LAB QUESTIONS

#	**Question –** *Answer in full detailed answers!*
1	What are three possible sources of error in this lab?
2	How would each source of error affect your calculated density? Make it too big or too small? WHY? Think about the math…
3	How could the existing procedures be modified to yield a more accurate result?

Spaghetti Graphing Activity

- In this lab activity you will determine the relationship between the mass and length of spaghetti noodles.
- You will do this by making a data table where you record the lengths and masses of small pieces of spaghetti.
- In order to make the best possible graph, use widely varying lengths of spaghetti. Record your data in a table.
- When you have measured the masses and lengths of 20 pieces of spaghetti, use your data table to make a line graph.
- You will be graded on how closely your data table and your graph conforms to the rules discussed in class.
- Collect your data in class, you can always finish the graph at home if you run out of time in class, you can't collect your data at home!
- Good luck!

Use this area for your data table

Use this area for your graph