

**AP Chemistry**  
**Summer Assignment Packet**  
**Pueblo County High**

**Purpose:**

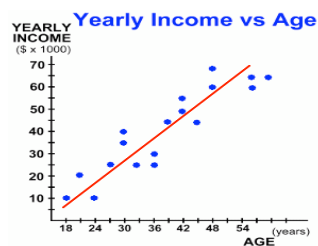
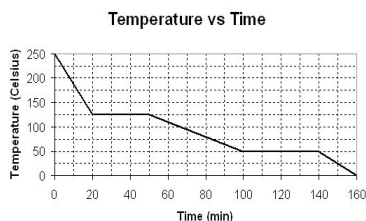
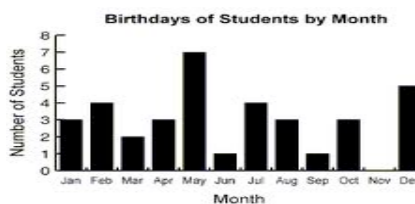
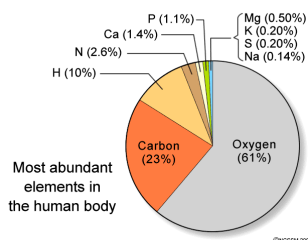
During the summer months before the beginning of the fall semester, all students who plan to take AP Chemistry 1 must complete the following assignment to prepare them for the topics they will study during the course. Through the completion of this assignment, students will review previously learned mathematical concepts, types of bonding, nomenclature, balancing equations, and stoichiometry which form the foundation of this course.

**Assignment:**

1. Download, print, and complete the assignment packet for AP Chemistry from the PCHS website. **SHOW ALL WORK** to receive full credit.
2. The assignment packet solutions will be turned-in on the first day of fall class. A quiz on this material will be given during the first or second week of class.
3. Please take this assignment seriously, as this assignment and the subsequent quiz, will represent the initial assessments for this course.
4. If you have questions about this assignment, email me at the following  
Ms. Devon Burke      [dburke@district70.org](mailto:dburke@district70.org)

## GRAPHING

Scientists use graphs to organize and interpret data and to observe patterns. A well-constructed graph is also a source of additional information about the quantities being studied. Several kinds of graphs can be used in science. These include pie graphs, which show the relationship of parts to a whole; bar graphs, which compare many examples of the same thing; line graphs, which show how one quantity affects the value of another; and scatter plots, which express a trend or relationship between two quantities.



### PREPARING BAR GRAPHS, LINE GRAPHS and SCATTER PLOTS

1. Identify the independent and dependent variables. The independent, or known, variable is one that the scientist chooses and controls. The dependent variable changes as a result of the independent variable.
2. Plot the independent variable on the horizontal (x) axis and the dependent variable on the vertical (y) axis.
3. **Label each axis with the name of the variable and the unit.**
4. **Title your graph.** The title should clearly state the purpose of the graph and include the independent and dependent variables. (Often stated in the form: dependent variable vs independent variable.)
5. If all quantities you are plotting are positive, use the left edge of the graph as the y-axis and the bottom edge of the graph as the x-axis. If some of the quantities are negative, re-draw one or both axes so that they cross. The intersection of the x-axis and the y-axis is the origin (0,0). **DO NOT re-draw the axes unless necessary.**
6. Begin to number the axes at the point where they intersect. **Choose your scale carefully. NO breaks.**
  - a. Each interval along an axis **MUST** represent a logical, convenient amount of that quantity. (Use whole numbers or non-repeating decimals.)
  - b. Each interval along an axis **MUST** represent the same amount of that quantity. Number the 1<sup>st</sup> five lines on each axis. Then to avoid a cluttered appearance, number every other line.
  - c. **Make graphs as large as possible.** Large graphs are easier to read and the information derived from them is more accurate than that from small graphs. **DO NOT** enlarge the graph.
7. Plot each data point. (Hint: use small x's)

### BAR GRAPHS

8. Draw in the bars to the appropriate height and color or shade each one differently.

### LINE GRAPHS

8. Connect the data points with individual straight lines.

### SCATTER PLOTS

8. Carefully sketch a line/curve that "best fits" the data points. **NEVER** "connect the dots."
  - a. If the data points appear to be in a straight line, use a ruler and a sharp pencil to draw the best straight line you can. Have the line go through as many points as possible with approximately the same number of points above the line as below it.
  - b. If the points do not form a straight line, draw the best smooth curve possible.
  - c. **DO NOT** extend a line/curve past the data points (extrapolate); the relationship may not exist.

NAME \_\_\_\_\_

SUMMER WORK

1. Identify each of the following as an element, compound, heterogeneous mixture, homogeneous mixture, or an ion.

_____ Mn <sup>2+</sup>	_____ CO <sub>2</sub>	_____ oxide
_____ tap water	_____ Ni	_____ ferric acetate
_____ air	_____ sulfur	_____ thiosulfate
_____ ammonium	_____ rubidium chromate	_____ C <sub>6</sub> H <sub>6</sub>

2. Classify each of the following properties as physical or chemical.

_____ a) color	_____ d) density	_____ g) volume
_____ b) combustibility	_____ e) odor	_____ h) mass
_____ c) hardness	_____ f) tendency to corrode	

3. Perform the following calculations and express each answer to the correct number of significant figures

a)  $3.24 \text{ m} + 7.0 \text{ m} =$  \_\_\_\_\_  
b)  $2.030 \text{ mL} - 1.870 =$  \_\_\_\_\_  
c)  $0.02 \text{ cm} \times 2.371 \text{ cm} =$  \_\_\_\_\_  
d)  $1818.2 \text{ lb} \times 3.23 \text{ ft} =$  \_\_\_\_\_

4. Express each of the following numbers in scientific notation.

a) 300,000,000 _____	c) 0.0000000000423 _____
b) 422000 _____	d) 0.000238 _____

5. Express each of the following numbers in standard notation.

a) $5.985 \times 10^2$ _____	c) $7.065 \times 10^{-3}$ _____
b) $6.28 \times 10^{-6}$ _____	d) $2.5 \times 10^5$ _____

6. Convert the following metric measurements:

$27.5 \text{ mg} =$ _____ g	$2.5 \text{ L} =$ _____ cL	$0.47 \text{ km} =$ _____ mm
$57200 \text{ cm} =$ _____ m	$75 \text{ mL} =$ _____ L	$25 \text{ km} =$ _____ m
$250 \text{ m} =$ _____ km	$5.6 \text{ m} =$ _____ cm	$42500 \text{ cm} =$ _____ km

7. Perform each of the following calculations

a) $75 \text{ }^\circ\text{F} =$ _____ $^\circ\text{C}$	c) $298 \text{ K} =$ _____ $^\circ\text{C}$
b) $32 \text{ }^\circ\text{C} =$ _____ $^\circ\text{C}$	d) $15 \text{ }^\circ\text{C} =$ _____ $^\circ\text{F}$

8. Complete the following table.

Element	Symbol	Atomic Number	Mass Number	Number of protons	Number of electrons	Number of neutrons	Type of element
_____	K	19	_____	_____	_____	21	_____
_____	_____	14	_____	14	_____	15	_____
helium	_____	2	4	_____	_____	_____	_____

9. List the three types of elements and explain where on the periodic table each type is found.

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10. Write the complete and shorthand electron configurations for:

Ga \_\_\_\_\_  
P<sup>3-</sup> \_\_\_\_\_

11. Draw the Lewis dot structure for AlCl<sub>3</sub>.

12. Draw the Lewis dot structure for PBr<sub>3</sub>; sketch and name the 3-D shape; predict the type of bonding (sp, sp<sup>2</sup>, etc); and predict the polarity of the molecule.

13. Draw the Lewis dot structure for NH<sub>4</sub><sup>+</sup>; sketch and name the 3-D shape; predict the type of bonding (sp, sp<sup>2</sup>, etc); and predict the polarity of the molecule.

14. Identify each compound as ionic (I) or molecular (M).

_____ Cr <sub>2</sub> O <sub>3</sub>	_____ iodine (III) chloride	_____ mercuric iodide
_____ N <sub>2</sub> O <sub>5</sub>	_____ carbon tetrachloride	_____ BH <sub>3</sub>

15. Name each of the following compounds.

a)  $\text{NaClO}_3$  \_\_\_\_\_

b)  $\text{H}_2\text{S}$  (acid name) \_\_\_\_\_

c)  $\text{P}_2\text{O}_5$  \_\_\_\_\_

d)  $\text{HClO}_4$  (acid name) \_\_\_\_\_

e)  $\text{N}_2\text{H}_4$  \_\_\_\_\_

f)  $\text{Fe}(\text{C}_2\text{H}_3\text{O}_2)_3$  \_\_\_\_\_

16. Write the correct formulas for the following compounds

a) difluorine monoxide \_\_\_\_\_

b) sulfurous acid \_\_\_\_\_

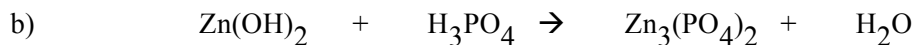
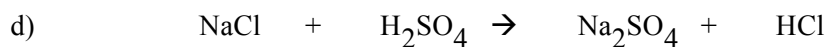
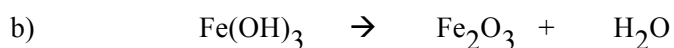
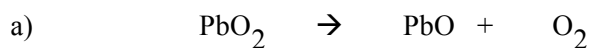
c) sodium phosphite \_\_\_\_\_

d) chlorine heptoxide \_\_\_\_\_

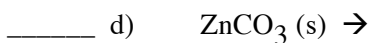
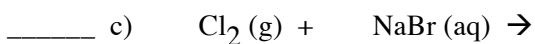
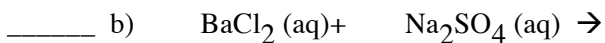
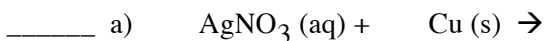
e) copper (II) nitrite \_\_\_\_\_

f) carbonic acid \_\_\_\_\_

17. Balance each of the following equations by writing in the correct coefficient(s).



18. Complete and balance the following equations and identify the type of reaction represented by each equation.



Solve each of the following problem in the space provided. Be sure to label your knowns and unknowns. Show all of your work (including formulas, unit conversions factors, and substitutions). Round final answers to three significant figures and circle.

19. The density of gasoline is 0.638 g/mL. What is the volume of 8900 g of gasoline?

20. Potassium reacts with hydrochloric acid to form aqueous potassium chloride and hydrogen gas.

a) Write the balanced chemical equation with phase notation and solve the following problems.

b) How many liters of hydrogen will be produced if 72.9 g of hydrochloric acid completely react?

c) If 459.1 g of hydrogen are produced, how many atoms of potassium are needed?

21. Use the following data and the graph paper provided to make a graph and draw a best fit straight line with a ruler or a best fit smooth curve through the data points. Use the Graphing handout and be sure to include all components of a good graph.

Mass (kg)	Acceleration ( $\text{m/s}^2$ )
1.0	12.0
2.0	5.9
3.0	4.1
4.0	3.0
5.0	2.5
6.0	2.0

