Pre-AP

Chemistry

Summer

Assignment

The first letter of a symbol is ***always*** *capitalized.*

The second letter of a symbol is ***never*** *capitalized.*

Table 2-2
COMMON ELEMENTS AND THEIR SYMBOLS

Name	*Symbol*
aluminum	Al
antimony	Sb
arsenic	As
barium	Ba
bismuth	Bi
bromine	Br
calcium	Ca
carbon	C
chlorine	Cl
chromium	Cr
cobalt	Co
copper	Cu
fluorine	F
gold	Au
hydrogen	H
iodine	I
iron	Fe
lead	Pb
magnesium	Mg
manganese	Mn
mercury	Hg
nickel	Ni
nitrogen	N
oxygen	O
phosphorus	P
platinum	Pt
potassium	K
silicon	Si
silver	Ag
sodium	Na
strontium	Sr
sulfur	S
tin	Sn
titanium	Ti
tungsten	W
zinc	Zn

Memorize the following elements for the class, it will make your life easier!!

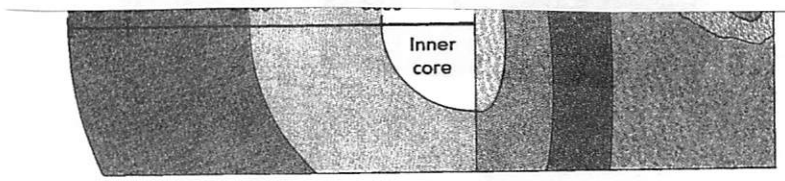

Figure 2-8. Regions of the interior of the earth.

Name: Date: Period:

Metric Conversions and Scientific Notation

1. Write the following numbers in scientific notation
   a. 4521480
   b. 0.0014852
   c. 0.0001248
   d. 32
   e. 8

2. Write the following Scientific Notation numbers as common numbers
   a. 4.5900×10^{10}
   b. 1.204×10^{-4}
   c. 8.41023×10^{5}
   d. 3.715×10^{-2}
   e. 2.001×10^{6}

3. Convert the following to meters
   a. 315 Hm
   b. 0.0125 cm
   c. 2.750×10^{-4} km
   d. 97540 dm
   e. 6.75×10^{2} mm

4. A box has the following dimensions:
   a. Length = 120 mm
   b. Width = 5.20 cm
   c. Height = 84 km

   Calculate the volume of the box in cubic meters

Period ----------

Graphing Skills
Reading, Constructing and Analyzing Graphs

Line Graphs

There are all kinds of charts and graphs used in the science classroom. Graphs are useful tools in science. Trends in data are easy to visualize when represented graphically. A line graph is beneficial in the classroom for many different types of data. Line graphs are probably the most widely used scientific graph. They can be used to show how something changes over time, the relationship of two quantities, and can be readily used to *interpolate* (predict between measured points on the graph) and *extrapolate* (predict beyond the measured points along the same slope) data points that were not actually measured in the lab setting. The analysis of these graphs provides very valuable information.

PURPOSE
In this activity you will learn the basic procedure for constructing and analyzing line graphs.

MATERIALS
4 sheets of graph paper pencil data ruler

PROCEDURE

1. Follow along with your teacher as a sample line graph is constructed. Label a blank piece of graph paper as your teacher explains the important components of a line graph.

2. Use the sample sets of data below to construct line graphs. Place only one graph on each sheet of graph paper and use as much of the graph as possible to display your points. *Do not connect the dots!* Draw the best smooth curve or line of best fit as your teacher demonstrated.

3. Following the steps below will help ensure that all components of the graph are correctly displayed.
   a. **Identify the variables.** Independent on the x-axis and dependent on they-axis.
   b. **Determine the range.** Subtract the lowest value data point from the highest value data point- for each axis separately.
   c. **Select the scale units.** Divide each axis uniforml y into appropriate units using the maximum amount of space available. (Remember that the axes may be divided differently but each square alongthe same axis must represent the same interval.)
   d. **Number and label each axis.** Be sure to include units where appropriate as part of the axis label.
   e. **Plot the data points as ordered pairs.** (x,y)
   f. **Draw the best straight line or best smooth curve.** Use a straight edge to draw your line in such a way that equal numbers of points lie above and below the line.
   g. **Title the graph.** The title should clearly describe the information contained in the graph. It is common to mention the dependent variable first followed by the independent variable.

4. After creating graphs for the 4 data sets below, use the graphs to answer the conclusion questions on your student answer page.

Sample Data Set 1: The following set of data was collected while experimenting with position and time of a miniature motorized car traveling on a straight track.

Position (meters)	Time (minutes)
0	0
15	5
30	10
45	15
60	20
75	25

Sample Data Set 2: The following set of data was collected during an experiment to find the density for an unknown metal.

Mass (g)	Volume (cm
2.00	0.18
5.00	0.44
7.50	0.66
16.00	1.41
24.00	2.11

Sample Data Set 3: The following set of data was collected during an experiment studying the effect of light intensity on rate of photosynthesis.

Percent Transmittance (%1)	Time (minutes)
32.5	0
54.3	5
63.5	10
65.0	15

Sample Data Set 4: The following set of data was collected during an acid-base titration experiment.

pH	Volume of NaOH (mL)
1.80	0.00
1.80	10.00
1.82	20.00
2.00	23.00
3.20	25.00
6.10	30.00
6.20	40.00
6.50	50.00
12.80	51.00
13.50	60.00
13.80	70.00

Name _____

Period _____

Graphing Skills
Reading, Constructing and Analyzing Graphs

Line Graphs

DATA AND OBSERVATIONS

Staple your completed graphs behind this answer page.

CONCLUSION QUESTIONS

Using the graphs that you constructed answer the following questions:

Sample Data Set 1:

1. What is the independent variable for this graph? Explain.

2. What would be the position of the car after 25 minutes?

3. If the experiment were carried out for 80 minutes, what would be the position of the car?

4. Calculate the slope of the line drawn. What does the slope of this line represent? Explain.

5. Write the equation for a straight line including the value that was determined for slope.

Sample Data Set 2:

1. What values were considered when creating the scale for each axis in this experiment?

2. What does a data point on this graph actually represent?

3. What volume would a 20.00 gram sample of this substance occupy?

4. Calculate the density of the substance. (HINT: calculate the slope of the line.)

5. Write the equation for a straight line including the value that was determined for slope.

6. Use the equation and find the mass when the volume is 5.00 cm_3.

Sample Data Set 3:

I. Does this graph represent a linear relationship? Why or why not?

2. What is the dependent variable in this graph? Explain.

3. If the experiment were continued for 30 minutes, what trend in percent transmittance could be expected?

4. Calculate the slope of the line at 5 minutes. What does this represent?

Sample Data Set 4:

1. What is the pH of the solution after 20.0 mL of NaOH are added? After 30.0 mL are added? Would it have been easy to predict this answer?

2. Graphs often help us to understand the progress of a chemical reaction. In the titration graph for this set of data, there are two relatively sharp, upward curves. The middle of these steep rising portions represent equivalence points (point at which the moles of acid and base are equal). Identify the volume of NaOH needed to reach each of the equivalence points.

3. What is the pH at 65 mL. What is the pH expected to do beyond this point with greater additions of the base NaOH? Explain.