Name _____ **Date** _____ **Period** _____

Graphing Homework # ___

Density is an important physical property which can be used to identify a substance. The density of a material describes how much mass is found in a particular amount of space. At room temperature the density of a pure material is the same no matter how much of the material you have. To increase the density of a material the molecules of the substance need to be forced closer together. This can be accomplished by increasing the pressure. For most materials a decrease in temperature will also cause the molecules to move closer together which will increase the density.

One exception to this rule is water. Most materials have the highest density in the solid state where the molecules are closest together. Water is actually most dense as a liquid. This is shown by the fact that ice floats in water. A material which is less dense will float in a fluid which has a higher density. Liquid water has a density of 1 gram / ml so any object which sinks in water will have a density greater than 1 gram / ml.

The data below represents different masses and volumes for aluminum. A graph of these values can be used to find the density.

If molecules spread apart what happens to density?

_____.

Describe 2 ways to increase the density of most materials.

_____
_____
_____ .

What state is the most dense for most substances?

_____

What is the density of liquid water?

_____
_____.

If a material has a density of 0.5 g / ml, will the object float or sink in water?

_____
_____

Volume (cm3)	Mass (grams)
0	0
20	54
40	108
70	189
100	270
120	324
150	405

Create a line graph from the data table on the attached graph paper.

Volume should be plotted on the horizontal (x) axis and Mass should be plotted on the vertical (y) axis.

- create a uniform scale for Volume in cm³ on the x - axis (2 points)
- label the x - axis with both a label and a unit. (2 points)
- create a uniform scale for Mass in grams on the y axis. (2 points)
- label the y - axis with both a label and a unit. (2 points)
- plot all the data points on your graph (2 points)
- connect the points to draw your line (1 point)
- put an appropriate title on top of your graph. (1 point)   © K. Abbott 2005
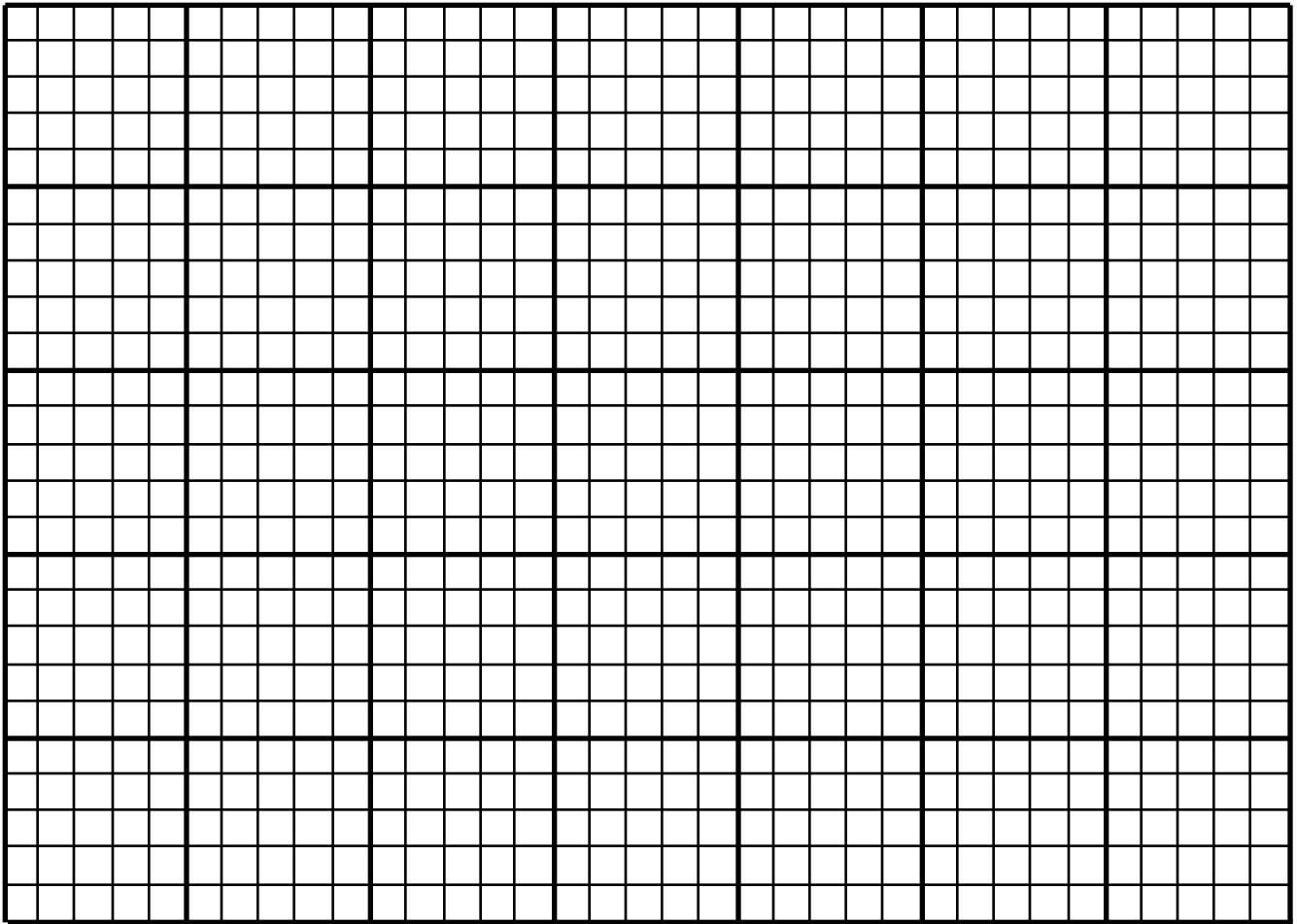
	x - axis	y - axis
Range		
Boxes		
Divide		
Round-up		

Answer the following questions in complete sentences. (2 points each)

1) Calculate the density of Aluminum. (show formula, substitute with units, solve with units)

2) What is the volume of a 380 gram piece of aluminum?

3) What is the mass of a 50 cm^3 piece of aluminum?

4) If the temperature of a piece of aluminum was increased, how would the spacing of the molecules and the density be changed?

5) If a piece of aluminum was cut in half, what would happen to the density?