Name _____ **Date** _____

Review

Define the following:

> **Qualitative observations – requires no measurement**
> **Quantitative observations – requires measurement**
> **Element – made of one type of atom**
> **Compound – chemical combination of two or more different atoms**
> **Homogeneous mixture – a mixture that is the same throughout, a solution**
> **Heterogeneous mixture – a mixture that is not uniform throughout**
> **Mass – amount of matter in an object**
> **Volume – amount of space an object occupies**
> **Density – mass per unit volume**

Classify the following as qualitative or quantitative observations:

warm	5.0 g	**solid**
1.5 cm	**heavy**	**green**

Identify as a physical or chemical property:

> a) **the boiling point of a certain alcohol is 78ºC**
>
> b) **diamond is very hard**
>
> c) sugar ferments to form alcohol
>
> d) **a metal conducts an electric current**

Identify as a physical or chemical changes:
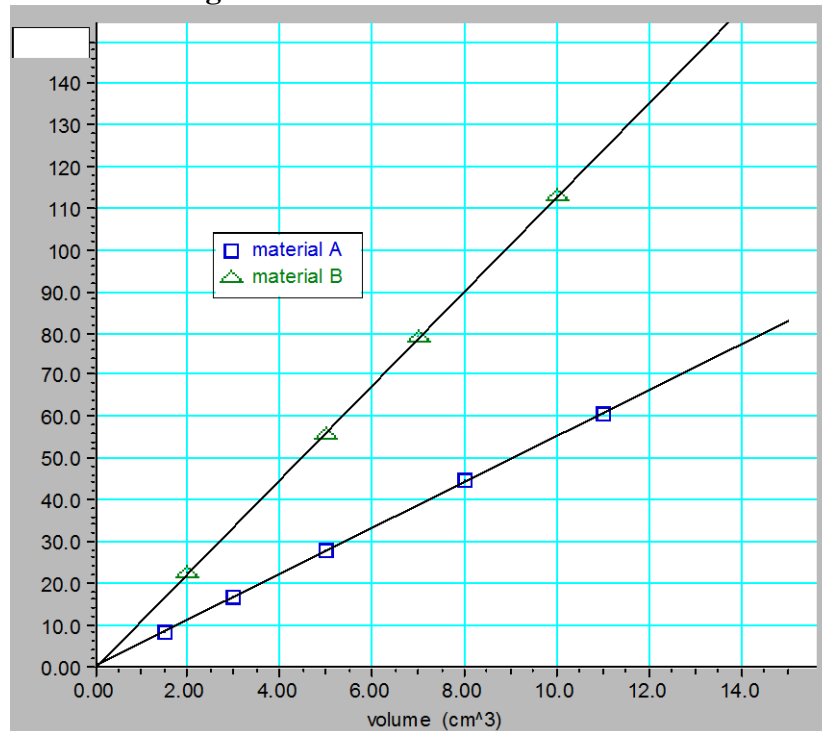
> a) **iron metal is melted**
>
> b) iron combines with oxygen to form rust
>
> c) wood burns in air
>
> d) **a rock is broken into small pieces**

Graphing questions:

9. A student graphed the following data:

a. Determine the density of each substance. Show all your work and include appropriate units.

Material A: $(60.0g – 0.0g)/(11.0cm^3 – 0.00cm^3) = 5.45$ g/cm^3

Material B: $(90.0g – 0.0g)/(8.00cm^3 – 0.00cm^3) = 11.3$ g/cm^3

b. From the graph, estimate
   1. the mass of 6.0 cm^3 of material B. 66.0g

   2. the volume of 40. g of material A 7.2 cm^3

   3. mark on the graph how you found the answers above

c. Use the densities of the two substances as factors to determine the answers to b. Show work and how the units cancel.

      1. $m = d \times v$
            $(11.3 \text{g/cm}^3) \times (6.0 \text{cm}^3)$
            67.8 g

      2. $v = m/d$
            $(40. \text{ g})/ (5.45 \text{g/cm}^3)$
            7.3 cm^3

10.   **Ethanol has a density of 0.789 g/cm^3.**
    a. **What is the mass of 225 cm^3 of ethanol?**
      $m = d \times v$
         $(0.789 \text{ g/cm}^3) \times (225 \text{cm}^3)$
           178 g

    b. **What is the volume of 75.0 g of ethanol?**
      $v = m/d$
         $(75.0 \text{ g})/(0.789 \text{ g/cm}^3)$
          95.1 cm^3

11. **What is the density of water in g/mL? Why?**

       1 g/ml because every ml has a mass of 1 gram

12. **The cup is a volume widely used by cooks in the US. One cup is equivalent to 225 cm^3. If 1 cup of olive oil has a mass of 205 g, what is the density of olive oil in g/cm^3?**

    1 cup $\dfrac{225 \text{ cm}^3}{1 \text{ cup}}$ = 225 cm^3

    $D = \quad \dfrac{m}{V} \quad = \quad \dfrac{205 \text{ g}}{225 \text{ cm}^3} \quad = \quad \dfrac{0.911 \text{ g}}{\text{cm}^3}$

Gold has a density of 19.4 g/ cm³. A cube of gold measures 4.23 cm on each edge:

14.   What is the volume of the cube?

$v \;=\; l \times w \times h$

$(4.23 \text{ cm})(4.23 \text{ cm})(4.23 \text{ cm})$

75.7cm^3

15.   What is its mass? How many significant figures should you include in your answer and why?

$m \;=\; d \times v$

$(19.4 \text{ g/cm}^3) \times (75.7 \text{ cm}^3)$

1470 g