G9 Science: Class 1 Homework

1. Convert each of the following to the units indicated. **[6 marks]**

   a. 6.42 kg = _____ g

   b. 64 731 mg = _____ g

   c. 0.17 g = _____ mg

   d. 43.8 kL = _____ L

   e. 256.89 cm^3 = _____ m^3

   f. 5345 L = _____ m^3

2. Match the correct letter with the definition on the right. **[6 marks]**

   a. Evaporation _____ A gas changes to a liquid

   b. Sublimation _____ A liquid changes to a solid

   c. Freezing _____ A gas changes to a solid

   d. Condensation _____ A solid changes to a liquid

   e. Deposition _____ A liquid changes to a gas

   f. Melting _____ A solid changes to a gas

3. Classify each of the following properties of a cake as qualitative or quantitative. **[6 marks]**

   a. It is circular in shape _____

   b. Its mass is 1.5 kg _____

   c. It tastes like chocolate _____

   d. It is 30cm in diameter _____

   e. Its icing is melting _____

   f. It weighs 10 lbs. _____

4. Classify each of the following as a pure substance, mechanical mixture, solution or alloy. **[10 marks]**

   a. Soil _____
   b. Black Coffee _____
   c. Air _____
   d. Pure Gold _____
   e. Brass _____
   f. Oxygen Gas _____
   g. Chicken Noodle Soup _____
   h. Baking Soda _____
   i. Milk _____
   j. Cake Batter _____

5. Classify each of the following changes as physical (P) or chemical (C). If both (P/C) provide a brief explanation. **[15 marks]**

   a. When molasses is warmed, it becomes less viscous _____
   b. When a chair is painted, it has a new colour _____
   c. When sugar is stirred into hot water, it dissolves _____
   d. When egg whites are cooked, they become opaque _____
   e. When wood is sawed, some of it changes to sawdust _____
   f. When wood is burned, ashes remain _____
   g. When vinegar is added to baking soda, bubbles are seen _____
   h. When grapes are fermented, they turn into wine _____
   i. Copper turns from reddish-brown to green when oxidized _____
   j. A block of cheese is grated to form smaller pieces _____
   k. Melting gold to make jewelery _____
   l. Moth balls gradually vapourize in a closet _____
   m. Fogging a mirror with your breath _____
   n. Slicing potatoes for fries _____
   o. Chlorine gas liquefies at -35°C under normal pressure _____

6. Classify each of the following elements as metals, metalloid or nonmetals. **[6 marks]**

    a. Strontium _____
    b. Germanium _____
    c. Bromine _____
    d. Fluorine _____
    e. Cobalt _____
    f. Silver _____

7. Find the element symbol on the periodic table that corresponds to the element listed. **[6 marks]**

    a. Mercury _____
    b. Indium _____
    c. Radon _____
    d. Cesium _____
    e. Rubidium _____
    f. Francium _____

8. Define the following terms in your own words: **[6 marks]**

    a. Lustre
    _____
    b. Brittleness
    _____
    c. Malleability
    _____
    d. Ductility
    _____
    e. Viscosity
    _____
    f. Compound
    _____

Challenge Problems

9. Calculate the mass of a liquid with a density of 2.3 g/ml and a volume of 30ml. Use the GRASS method and show all work. **[5 marks]**

10. An irregular object with a mass of 12 kg displaces 1.75L of water when placed in an overflow container. Calculate the density of the object. Use the GRASS method and show all work. **[5 marks]**

11. A piece of wood that measures 3.2cm by 5.7cm by 7.3cm has a mass of 100g. What is the density of the wood? Would it float on water? Use the GRASS method and show all work. **[6 marks]**

12. A plastic ball has a mass of 150g. If the density of the ball is 0.80 g/cm^3, what is its volume? Use the GRASS method and show all work. **[5 marks]**

13. A flask that weighs 345.8 g is filled with 225 mL of carbon tetrachloride. The weight of the flask and carbon tetrachloride is found to be 703.55 g. From this information, calculate the density of carbon tetrachloride. Use the GRASS method and show all work. **[5 marks]**

14. A piece of PVC plumbing pipe displaces 60 mL when placed into a container of water. If the pipe has a mass of 78 g, what is the density of PVC? Use the GRASS method and show all work. **[5 marks]**

15. Describe three clues that tell you that you are observing a chemical change. Give an example to illustrate each clue you described. **[6 marks]**.

16. Explain the following statement with an example: "The freezing point of a substance is the same temperature as the melting point of the same substance." **[2 marks]**

17. When a sample of blue crystals is heated, a vapour is given off and a white powder remains. Analyze whether a physical or a chemical change occurred and give reasons for your answer. **[3 marks]**

18. A dented table tennis ball can sometimes be "repaired" by placing it in a cup of hot water. Use the particle theory of matter to explain how this is possible. **[3 marks]**

19. Carbon fibre is now replacing aluminum as the material used to make racing bicycle frames.
    a. The density of carbon fibre can be less than half the density of aluminum. Why is this property an advantage for the racing bicycles? **[1 mark]**

    b. What other physical properties and chemical properties should carbon fibre have if it is to be used to make bicycles? **[2 marks]**

20. You have learned that adding salt lowers the freezing point of ice. You want to test if adding salt will also have an effect on the boiling point of water. Design an experiment to test your question.

    a. What is your hypothesis? **[1 mark]**

    b. Explain briefly how you plan to conduct your experiment. **[2 marks]**

    c. Identify your independent variable and your dependent variable. **[2 marks]**

    d. How would you display your data? Sketch a model of your graph below based on your hypothesis. **[3 marks]**

    e. If your results do not support your hypothesis, does that mean your investigation was not successful? Explain and suggest ways to improve your experiment. **[3 marks]**