Building Blocks of Matter

Test #1, 50 Points Possible

Name: _____

Date: _____

Part 1: Multiple Choice (1 point each)

_____ 1. If you want to find the density of an object, you must measure the object's _____ and _____.

A) Mass and weight B) Mass and size C) Weight and buoyancy D) Solubility and weight

_____ 2. Water _____ an element because it _____.

A) is…cannot be broken down into simpler substances.
B) is not…cannot be broken down into simpler substances.
C) is…can be broken down into simpler substances.
D) is not…can be broken down into simpler substances.

_____ 3. Water is _____ and air is _____.

A) an element…a mixture
B) a compound…a mixture
C) a compound…a compound
D) a mixture…a compound

_____ 4. Which of the following statements about mixtures is true?

A) Mixtures are always heterogeneous.
B) Mixtures are always homogeneous.
C) Some mixtures are homogeneous and some are heterogeneous.
D) Mixtures are one example of pure substances.

_____ 5. 27 mL of a certain concentrated acid has a mass of 32 g. What is the density of the acid?

A) 0.85 mL/g B) 0.85 g/mL C) 1.2 g/mL D) 1.2 mL/g

_____ 6. A solution of Kool-aid has a volume of 595 mL. If its density is 1.10 g/mL, find its mass.

A) 541 g B) 655 g C) 458 g D) 379 g

_____ 7. If element A and element B combine to make a mixture…

A) the chemical properties of A and B remain the same
B) the chemical properties of A and B combine into new chemical properties
C) they must combine in a specific ratio in order to make the mixture
D) A and C are true
E) B and C are true

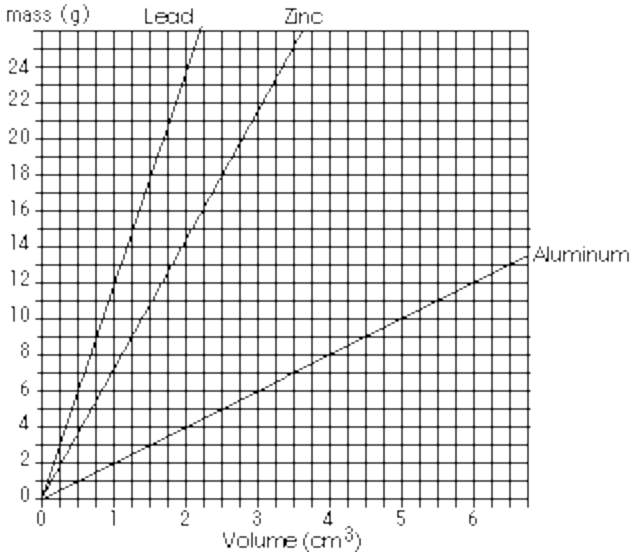
_____ 8. A rock with a mass of 600.0 g had a density of 2.80 g/cm^3. Find the volume of the rock.

A) 1680 cm^3 B) 214 cm^3 C) 422 cm^3 D) 335 cm^3

_____ 9. If element A and element B combine to make a compound…

A) the chemical properties of A and B remain the same
B) the original chemical properties of A and B change into new chemical properties
C) they must combine in a specific ratio in order to make the compound
D) both A and C are true
E) both B and C are true

Use the graph to the right to answer questions 10-12.



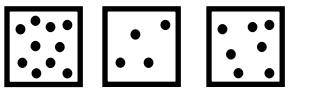
_____ 10. Estimate the volume of 15g of lead.

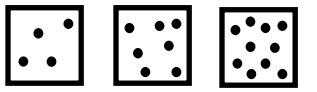
A) 2.1 cm^3 B) 1.3 cm^3 C) 4.4 cm^3

_____ 11. Which metal is the most dense?

A) Lead B) Zinc C) Aluminum

_____ 12. Which of the following shows a correct representation of the particles that make up lead, zinc and aluminum?

A) 

B) 

C) 

_____ 13. The only way to make a certain gas is to combine nitrogen and oxygen in a two to one ratio. There is always twice as much nitrogen as oxygen. The gas is a(n)

A) Element B) Mixture C) Compound

_____ 14. No one has ever succeeded in breaking down a chemical called Wolfram into something simpler. And no one has ever combined other substances to make Wolfram. Based on this evidence alone, Wolfram is most likely

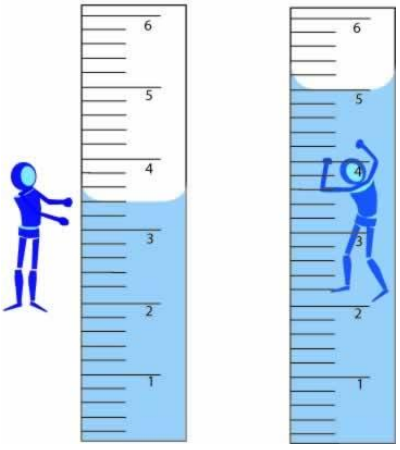
A) An element B) A compound C) A mixture

_____ 15. All matter is either pure substances or _____.

A) Compounds B) Elements C) Mixtures D) None of these

_____ 16. What is the density of a person whose mass is 70 kg and whose volume (in liters) is found using the diagram at the right.

A) 38.9 kg/L
B) 43.8 kg/L
C) 0.0257 L/kg
D) 0.0228 L/kg



_____ 17. In Lavoisier's experiment which component of the air combined with mercury?

A) Oxygen
B) Nitrogen
C) Carbon dioxide

_____ 18. Lavoisier's water experiment worked because

A) Heating water produces hydrogen and oxygen.
B) Inflammable air becomes flammable when mixed with regular air.
C) Oxygen is attracted to iron, forming rust.
D) Hydrogen gas reacts with water and gives off oxygen.

_____ 19. Which of the following observations did Lavoisier make?

A) The component of air that reacts with mercury is the same component that allows for fire.
B) The part of the air that we breathe is the same part of the air that allows a candle to burn.
C) The "azote" (gas left over after the red compound formed with mercury) wouldn't allow a candle to burn nor a mouse to breathe.
D) All of these

Part 2: True/False: Put A for True and B for False—(1 point each)

_____ 20. If an object's density is greater than water's density, it will float in the water.

_____ 21. All compounds are homogeneous.

_____ 22. An element can only be broken down by chemical means, not physical.

_____ 23. Glucose is always 40% carbon, 53% oxygen, and 7% hydrogen. This evidence points to glucose being a compound, not a mixture.

_____ 24. Lavoisier used mercury to prove that water is a compound.

_____ 25. Compounds cannot be separated.

_____ 26. Mixtures can be homogeneous or heterogeneous.

_____ 27. The following number has 3 significant figures: 0.0003680

_____ 28. The following number has 2 significant figures: 40

Part 3: Numbers

29. Complete the following problems using the correct number of significant figures. **Put your final answer in the blank to the left of each problem.** (1 point each)

a) (0.00420)(120) = _____

b) 0.07060 ÷ 0.12556 = _____

c) 100 ÷ 3 = _____

d) (2040)(2.0) = _____

e) 4320 ÷ 30 = _____

f) (450)(124) = _____

30. Convert the following units.

a) 15.7 cm = _____ km

b) 15,700 mg = _____ g

c) 0.00443 L = _____ nL

d) 0.00096 km = _____ m

e) 3.22 mL = _____L

f) 10,040 µm = _____ cm

31. Change the following into scientific notation.

a) 40,000,000

b) 42,030,000,000,000

c) 0.000000060

d) 0.002030

Part 4: Short Answer (6 points)

32. The following involves Lavoisier's experiment with the rifle barrel.
    a) Describe the experiment with the rifle barrel. What was the setup like? What did he do? (2pts)

    b) What important claim did he make after performing this experiment? (1 pt)

    c) What evidence did Lavoisier use to support his claim? (1 pt)

33. Students placed a metal cube on a balance and found its mass to be 24.3g. Then they put 35.4 mL of water into a graduated cylinder and dropped the metal into it. The water level increased to 47.9 mL. Calculate the density of the metal. **Include units and correct significant figures**. (2 points)