Review: Building Blocks

Name: _____

Date: _____

1. Lavoisier said, "There are at least two kinds of airs in air." Explain why when he made that statement he was claiming that air was not an element.

2. If Lavoisier conducted his mercury experiment with 100 mL of air trapped inside of the swan necked retort and bell jar, how much would he expect the mercury to rise in the bell jar?
   A) 10 mL   B) 20 mL   C) 50 mL   D) 100 mL

3. Explain your answer to the previous question.

4. True or False… Correct the false ones to make them true!

   _____ a) Compounds can be homogeneous or heterogeneous.

   _____ b) Elements are always homogeneous.

   _____ c) Mixtures can be homogeneous or heterogeneous.

   _____ d) Aluminum is an example of an element.

   _____ e) Water is a homogeneous compound.

   _____ f) Milk that has been pasteurized is a pure substance.

5. Antoine Lavoisier used _____ in his experiment to prove that air is not a _____.
   (mercury or water?)   (element, compound, or mixture?)

6. When sulfuric acid is poured on sugar, the sugar bubbles and fizzes. Water actually boils away from the sugar until only a chunk of black carbon remains. This is evidence that sugar is a…
   A) Element   B) compound   C) mixture

7. Using either the term "physical change" or "chemical change," explain your answer to question 6.

8. Every sample of kryptonite ever analyzed has been found to be 12.1% krypton gas and 87.9% iron metal. This suggests that kryptonite is a
   A) Element   B) compound   C) mixture

9. Explain your reasoning for your answer to question 8.

10. Consider kryptonite from questions 8 and 9. Do you expect kryptonite to be homogeneous or heterogeneous? Justify your choice.

11. Salt water is a _____ _____.
      homogeneous or heterogeneous?   mixture or compound?

12. A bowling ball has a density of 6.5 kg/L and a mass of 5 kg. What is its volume?

13. A 43 g piece of gold has a volume of 2.9 cm^3. A piece of silver has a mass of 75g and a volume of 6.7 cm^3. Which metal has the greater density—the gold or the silver?

14. What is the density of the fish whose mass is 5.75g? (Hint: Use the diagram at the right to find the volume in mL of the fish first.)
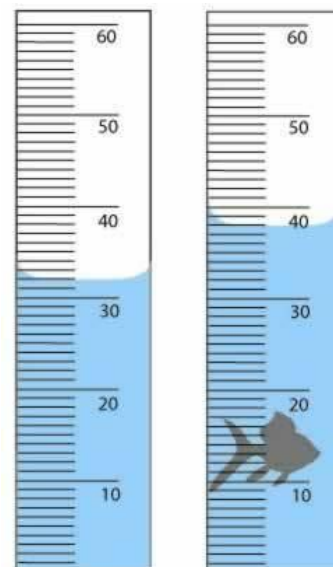
15. Convert the following numbers to scientific notation.
   a) 14,020,000   b) 0.00030020   c) 5200

16. How many significant figures are in each of the following numbers.
   a) 0.0030320   b) 120,020   c) 10.0   d) 24.01   e) 145,000   f) 0.0003650

17. Perform the following calculations making sure that your answers have the correct significant figures.

   a) 1300 x 125 = _____   f) $(1.2\times10^{-5})(3.00\times10^{12})$ = _____

   b) (2150)(10) = _____   g) 0.0022÷0.0510 = _____

   c) 4000 ÷ 12 = _____   h) (0.04500)(0.20) = _____

   d) $4.5\times10^9 \div 10$ = _____   i) 0.420 x 0.003 = _____

   e) 358 x 200 = _____   j) 3200 ÷ 2 = _____

18. Perform the following conversions between units:

a) 2.55 m = _____ cm   e) 12,040 µL = _____ mL

b) 0.327 L = _____ mL   f) 2.87 cm = _____ nm

c) 10.5 kg = _____ mg   g) 402 mg = _____ kg

d) 203 mm = _____ m   h) 3.25 km = _____ cm

19. There are 12 ounces of Coke in each can and 24 cans in each case. A pallet of Coke contains 80 cases of Coke. Use this information to answer the following questions.

a) How many cans of Coke would there be in ¾ of a pallet?

b) How many ounces of Coke are there in 1.5 cases?

c) During one year someone drank 450,000 ounces of Coke. How many cases did the person drink?

d) A store ordered 420 cases of Coke.
   i.   How many pallets did the store order?

   ii. How many ounces did the store order?