Building Blocks of Matter Extra Review

Name: _____

Date: _____

1. Categorize each of the following as an element (E), compound (C), or mixture (M).

   M a) candy bar M b) paint E c) silver

   C d) carbon dioxide M e) coffee M f) pizza

2. Which of the substances from question 1 would be classified as homogeneous?

   c, d, and e; The candy bar could be if it didn't have peanuts or other chunks. Paint is heterogeneous because you have to stir it—it separates; but because it doesn't need stirring frequently some might call it homogeneous.

3. Which of the substances from question 1 would be classified as heterogeneous?

   Any not mentioned in question 2

4. Gold is a "pure substance." Water is also a "pure substance" even though it is made of more than one thing—hydrogen and oxygen. Explain.

   Since water is not formed by a physical change of mixing it is therefore a pure substance. Anything that is an element or a compound is classified as a pure substance.

5. What component of air—oxygen or nitrogen—combined with mercury to produce the reddish compound in Lavoisier's experiment? Was this combination a chemical or a physical change?

   Chemical change because the red powder had different properties than its components.

6. Lavoisier did two experiments to prove that air was a ___mixture___ and water was a ___compound___.
   (element, mixture, or compound) (element, mixture, or compound)

7. True or False: Kool-aid is an example of a homogeneous mixture and sand is an example of a heterogeneous mixture.

   True

8. If element X and element Y combine to form a compound, how do the chemical properties of X and Y change as the compound is formed?

   The chemical properties of X and Y change completely such that the new compound's properties are completely different from either X or Y.

9. If element X and element Y combine to form a mixture, how do the chemical properties of X and Y change as the mixture is formed?

   The mixture has chemical properties similar to X and Y.

10. When a compound (mixture or compound?) forms the elements always combine in the same definite ratio.

11. The following data were obtained from various rocks.

White Rocks

	Mass (g)	Volume (mL)
Sample #1	42.6	10.1
Sample #2	29.5	7.0
Sample #3	84.9	20.2

Black Rocks

	Mass (g)	Volume (mL)
Sample #1	13.8	4.45
Sample #2	58.4	18.8
Sample #3	60.1	19.4

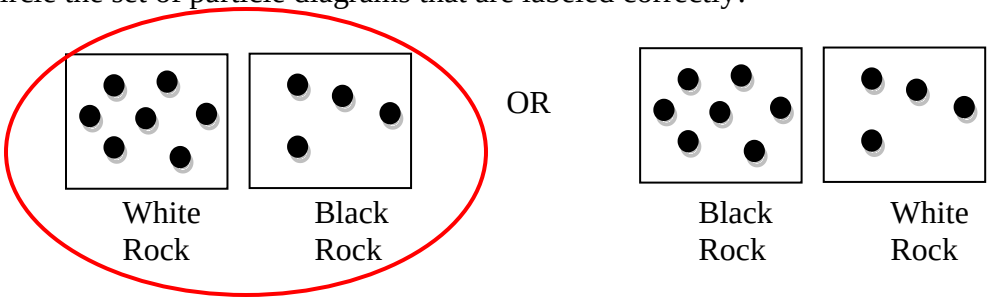
a) Which type of rock--white or black--has the greater density?

White

b) If you were to graph each set of data with Mass on the Y axis and Volume on the X axis, which would have the steeper slope?

White

c) Circle the set of particle diagrams that are labeled correctly?



12. Sketch Lavoisier's experiment in which he used mercury. What did his experiment attempt to explain.

Sketches should look similar to those in ChemQuest 1

13. What is the density of a piece of metal whose mass is 210g and volume is 37 cm^3. Include units.

5.7 g/cm^3

14. A certain liquid has a density of 0.79 g/mL. Calculate the volume of 35g of the liquid.

44 mL

15. Find the mass of a 10 liter boulder whose density is 15.3 kg/L.

153 kg

16. Complete the following problems and round your answer to the correct number of significant figures.

a) $6500 \div 135 =$ 48

b) $(5.6 \times 10^4)(3.68 \times 10^6) =$ 2.1×10^{11}

c) $0.04580 \div 0.00190 =$ 24.1

d) $(1.200 \times 10^3)(4) =$ 5×10^3

e) $7800 \div 45 =$ 170

f) $9820 \div 1.3 =$ 7600

g) $25{,}120 \times 45.8 =$ 1,150,000

h) $0.04520 \div 0.0030 =$ 15

i) $12{,}000 \times 185 =$ 2,200,000

j) $65{,}020 \div 120 =$ 540

17. Perform the following unit conversions.

a) 45.9 cm = 0.000459 km

b) 12,000 kg = 12,000,000 g

c) 0.00443 nm = 4.43×10^{-10} cm

d) 0.00466 km = 4660 mm

e) 3.22 mL = 0.00322 L

f) 10,040 cm = 100.4 m

18. Convert the following from scientific notation to standard notation.

a) 4.29×10^{-7} 0.000000429

b) 6.800×10^5 680,000

c) 7.54×10^9 7,540,000,000