Name _____ Date _____ Class _____

CHAPTER 3 REVIEW

Atoms: The Building Blocks of Matter

SECTION 3-1

SHORT ANSWER **Answer the following questions in the space provided.**

1. Why is Democritus's view of matter considered only an idea, while Dalton's view is considered a theory?

2. Give an example of a chemical or physical process that illustrates the law of conservation of mass.

3. State two principles from Dalton's atomic theory that have been revised as new information has become available.

4. The formation of water according to the equation

$$2H_2 + O_2 \rightarrow 2H_2O$$

shows that 2 molecules (made of 4 atoms) of hydrogen and 1 molecule (made of 2 atoms) of oxygen produce 2 molecules of water. The total mass of the product, water, is equal to the sum of the masses of each of the reactants, hydrogen and oxygen. What parts of Dalton's atomic theory are illustrated by this reaction? What other law does this reaction illustrate?

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SECTION 3-1 continued

PROBLEMS **Write the answer on the line to the left. Show all your work in the space provided.**

5. _____ If 3 g of element C combine with 8 g of element D to form compound CD, how many grams of D are needed to form compound CD_2?

6. 84.01 g of baking soda, $NaHCO_3$, *always* contains 22.99 g of sodium, 1.01 g of hydrogen, 12.01 g of carbon, and 48.00 g of oxygen. What percentage of each of these elements is present in baking soda?

_____ **a.** sodium

_____ **b.** hydrogen

_____ **c.** carbon

_____ **d.** oxygen

e. Which law do these data illustrate?

_____

7. Nitrogen and oxygen combine to form several compounds, as shown by the following table.

Compound	Mass of nitrogen that combines with 1 g oxygen
NO	1.7 g
NO_2	0.85 g
NO_4	0.44 g

What is the ratio of the masses of nitrogen in each of the following:

_____ **a.** $\frac{NO}{NO_2}$ _____ **b.** $\frac{NO_2}{NO_4}$ _____ **c.** $\frac{NO}{NO_4}$

d. Which law do these data illustrate?

_____