

Test Date is: \_\_\_\_\_

**Topics on this Test**

- Elements
- The Periodic Table of Elements
  - Parts of the Periodic Table
  - Families and Properties of Families
- Molecules and Compounds
  - Structure- Chemical Formula and Illustrations
- Atoms
  - Structure: Nucleus, Proton, Neutron, Electrons
  - How atoms bond with each other
- Physical and chemical properties of matter
- Evidence that a chemical reaction has occurred
- Physical and Chemical Properties of a substance before and after a chemical reaction
- Reactants and products in a chemical equation
- Laws of Conservation of Matter and Mass
- Acids, Bases and pH Scale

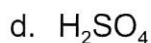
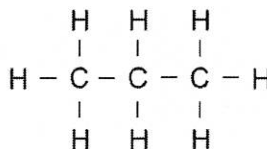
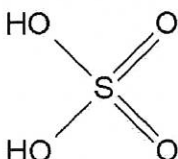
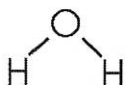
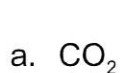
**Be able to answer all of the questions in each Study Section below.**

**Study Section 1: Elements and the Periodic Table**

1. What is an element?  
\_\_\_\_\_
2. How are the elements in the Periodic Table arranged?  
\_\_\_\_\_
3. What are the 4 classifications in the Periodic Table that we talked about, from left to right?  
\_\_\_\_\_  
\_\_\_\_\_
4. What kind of elements are on the left of the “jagged line,” and what kind of elements are on the right?  
\_\_\_\_\_  
\_\_\_\_\_
5. Vertical columns in the Periodic Table are called \_\_\_\_\_.
6. Elements in the same family share similar \_\_\_\_\_.

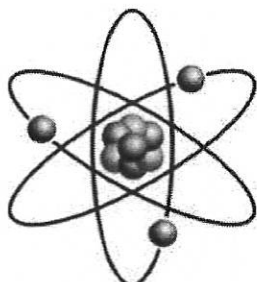
## Study Section 2: Molecules and Compounds

1. A molecule is \_\_\_\_\_.
2. A compound is \_\_\_\_\_.
3. Atoms bond with each other to form molecules by sharing or transferring one or more \_\_\_\_\_.
4. Which of the following molecules are also compounds? (circle all that apply)  
 $N_2$ ,  $H_2$ ,  $NH_3$ ,  $C_{12}$ ,  $CO_2$ ,  $H_2O_2$ ,  $O_2$ ,  $H_2SO_4$
5. Match each molecule to its molecular formula below:



## Study Section 3: Atoms

1. An atom is \_\_\_\_\_.
2. The building blocks of matter are \_\_\_\_\_.
3. Every atom has one \_\_\_\_\_ at its center.
4. Within the nucleus are the \_\_\_\_\_ and \_\_\_\_\_.
5. The protons have a \_\_\_\_\_ charge.
6. The neutrons have a \_\_\_\_\_ charge.
7. \_\_\_\_\_ spin around the nucleus.
8. Electrons have a \_\_\_\_\_ charge.
9. Label the atom below.



## Study Section 4: Physical and Chemical Properties of and Changes in Matter

1. A physical property is

\_\_\_\_\_.

2. A chemical property is

\_\_\_\_\_.

3. Label each of the following properties as Physical (P) or Chemical (C):

- a. \_\_\_ color
- b. \_\_\_ flammability
- c. \_\_\_ shape
- d. \_\_\_ mass
- e. \_\_\_ reactivity
- f. \_\_\_ pH
- g. \_\_\_ state of matter (solid, liquid, gas)
- h. \_\_\_ boiling point (or melting point)

4. Label each of the following changes in matter as a Physical Change (P) or a Chemical Change (C):

- a. \_\_\_ burning a marshmallow and it turns black
- b. \_\_\_ painting your nails with polish
- c. \_\_\_ cooking an egg in a frying pan
- d. \_\_\_ cutting the grass
- e. \_\_\_ sanding a block of wood
- f. \_\_\_ acid rain destroying a marble statue
- g. \_\_\_ steel wool rusting and turning brown
- h. \_\_\_ boiling a pot of water on the stove
- i. \_\_\_ evaporation of rubbing alcohol from your skin

5. When sulfuric acid is poured on a sponge (cellulose-  $C_6H_{10}O_5$ ) a chemical reaction occurs. List physical and chemical properties of each substance before the reaction occurred and properties of the substance after.

a. Before:

i. sponge- \_\_\_\_\_

ii. acid- \_\_\_\_\_

b. After: \_\_\_\_\_

## Study Section 5: Chemical Reactions

1. List 5 pieces of EVIDENCE that a chemical change has occurred:

c. \_\_\_\_\_

d. \_\_\_\_\_

e. \_\_\_\_\_

f. \_\_\_\_\_

g. \_\_\_\_\_

6. Look at the properties before and after. Has a chemical change occurred?  
yes / no

Properties Before	Properties After
grey-black	black
powdered solid	gas and ash
	bright light and loud sound produced

7. Look at the properties before and after. Has a chemical change occurred?  
yes / no

Properties Before	Properties After
brown, shiny metal	brown, shiny metal
malleable and ductile	malleable and ductile
straight wire	curved into coils

8. In a chemical equation, the reactants are

\_\_\_\_\_

9. In a chemical equation, the products are

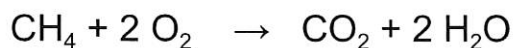
\_\_\_\_\_

10. In the equation below, label the reactants and the products.



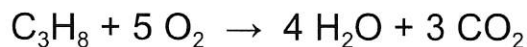
## Study Section 6: Law of Conservation of Matter and Mass

1. The Law of Conservation of Matter says that in a chemical reaction,  
\_\_\_\_\_.
2. The Law of Conservation of Mass says that in a chemical reaction,  
\_\_\_\_\_.
3. The point to remember is that in a chemical reaction, what you start with is  
\_\_\_\_\_.
4. In a chemical reaction, atoms are not created or destroyed, they are just  
\_\_\_\_\_.
5. Tell the number of each type of atom in the equation below.



LEFT: C \_\_\_ H \_\_\_ O \_\_\_ → RIGHT: C \_\_\_ H \_\_\_ O \_\_\_

6. Tell the number of each type of atom in the equation below.



LEFT: C \_\_\_ H \_\_\_ O \_\_\_ → RIGHT: C \_\_\_ H \_\_\_ O \_\_\_

7. Which of the compounds below could be a product for the reactants:  $2 \text{Hg} + \text{O}_2$

How do you know? \_\_\_\_\_

- a.  $3 \text{Hg}_2\text{O}_6$
- b.  $\text{H}_2\text{SO}_4$
- c.  $2 \text{HgO}$
- d.  $\text{HgCl}_3$

8. Which of the pairs of compounds below could be the reactants for the product:

$2 \text{SO}_3$  How do you know? \_\_\_\_\_

- a.  $\text{CO}_2 + \text{H}_2\text{O}$
- b.  $2 \text{SO}_2 + \text{O}_2$
- c.  $\text{H}_2\text{O} + \text{SO}_4$
- d.  $\text{NaCl} + \text{O}_2$

## Study Section 7: Acids, Bases and the pH Scale

1. The pH scale measures how \_\_\_\_\_ or \_\_\_\_\_ a solution is.
2. The pH scale goes from \_\_\_\_\_ to \_\_\_\_\_.
3. Substances with a pH of \_\_\_\_\_ are acids.
4. Substances with a pH of 7-14 are \_\_\_\_\_.
5. A pH of 7 is called \_\_\_\_\_.
6. \_\_\_\_\_ has a pH of 7 and is neutral.
7. Some common acids and their pH values:
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
8. Some common bases and their pH values:
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
9. Which of the following is the strongest acid?
  - a. Substance A (pH = 5.6)
  - b. Substance B (pH = 7.8)
  - c. Substance C (pH = 2.5)
10. Which of the following is the strongest base?
  - a. Substance A (pH = 10.9)
  - b. Substance B (pH = 13)
  - c. Substance C (pH = 8)
11. An acid reacting with a base forms a \_\_\_\_\_.
12. To "neutralize" a base, react it with a(n) \_\_\_\_\_.
13. T / F Only acids can hurt you.