1. What is an acid? Give at least characteristics.

2. What is a hydrogen ion made of?

3. Write the formula below showing carbonic acid H+ ions. (Look in your PPT notes)

4. What is a base? Give at least three characteristics.

5. Identify the following substances as either acids or bases:

a. NaOH: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ c. Ca(OH)2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. HCl: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d. H2SO4: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. In the space below, draw the pH scale as it appears in your text. Include all labels (acids, bases, neutral substances, and examples of each)

7. What pH level would a solution have to be in order to be perfectly neutral? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. What level of the pH scale is the most basic? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. What level of the pH scale is the most acidic? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Identify the following pH levels as either ***neutral, weakly acidic, strongly acidic, weakly basic or strongly basic***:

a. pH 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d. pH 13: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. pH 9: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ e. pH 7: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. pH 6: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. In order to neutralize a strong acid, what would you add to it? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What substances would be produced by this reaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13. Write the basic formula of the neutralization process below. (Look in your PPT notes)

14. Common table salt (NaCl) is produced by an acid-base neutralization reaction as shown below:

**NaOH + HCl 🡪 NaCl + H2O**

In the formula above, label the following: ***salt, acid, base, water***

15. Most acid-base neutralizations are very similar to the one above. They usually produce water and a salt. (FYI- A **salt** is a compound formed by replacing the hydrogen in an acid with a metal. NaCl is just one example of the many types of salt). Based on this information, predict what the missing substance is in each of the formulas below. Balance each equation when you are finished! Only use a coefficient of needed.

a. \_\_\_NaOH + \_\_\_HBr 🡪 \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_H2O

b. \_\_\_KOH + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_KCl + \_\_\_H2O

c. \_\_\_Ca(OH)2 + \_\_\_HCl 🡪 CaCl2 + \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. \_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_HF 🡪 \_\_\_KF + \_\_\_H2O