Introduction to Acids & Bases: A WebQuest Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*-Go to my webpage, Physical Science Tab. Last button- Atomic Structures column. Open so that you only have to click on the links*.

1. <http://www.visionlearning.com/library/module_viewer.php?c3=&mid=58&l>

The word acid comes from the Latin word \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ meaning \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Boyle stated that acids taste \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, are corrosive to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, change the color of litmus to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,and become less acidic when mixed with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. He described bases as feeling \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, changing litmus to the color \_\_\_\_\_\_\_\_\_\_\_\_\_\_, and becoming less basic when mixed with an \_\_\_\_\_\_\_\_\_\_\_.

About 200 years later, Arrhenius proposed that water can dissolve many compounds by separating them into their individual \_\_\_\_\_\_\_\_\_\_\_\_\_. He suggested that acids contain \_\_\_\_\_\_\_\_\_\_\_\_\_ and can dissolve in water to release \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Bases dissolve in water to release \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions into the solution.

2. <http://www.chem4kids.com/files/react_acidbase.html>

Every liquid has \_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_ traits. One exception might be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is just water. However, the \_\_\_\_\_\_\_\_\_\_\_\_ ions and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions cancel each other out.

3. <http://chemistry.about.com/od/acidsbases/a/acidbaseformula.htm>

 Give the formula for the following acids: Give the formula for the following bases:

Hydrofluoric Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Sodium Hydroxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hydrochloric Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Potassium Hydroxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hydrosulfuric Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Calcium Hydroxide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Nitric Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Iron (II) Hydroxide- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sulfuric Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Acetic AcidBoric Acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. <http://chemistry.about.com/od/acidsbases/a/acidsbasesterms.htm>

 Scroll down to Properties of Acids.

Complete the following sentences for Acids:

Tastes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Changes litmus from blue to \_\_\_\_\_\_\_\_\_\_\_\_\_.

Solutions are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (conduct electricity).

React with bases to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Neutralization

Create \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ gas when reacting with an active metal.

Five (5) Common acids (scroll down):

Properties of Bases:

Tastes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Feels \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Don’t change the color of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Solutions are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (conduct electricity).

React with acids to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Neutralization

Four (4) Common Bases:

5. <http://chemistry.about.com/od/acidsbases/a/phtable.htm> and <http://www.visionlearning.com/library/module_viewer.php?c3=&mid=58&l>

 Scroll down on the site above until you get to the pH scale. Using the sites above, answer the questions below:

A. pH range of acids \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

B. pH of a neutral substance \_\_\_\_\_\_\_\_\_\_\_\_\_\_

C. pH of a basic (alkaline) substance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use information from the sites above and list the following substances according to pH. For any items not on the site you may google the name of the substance pH and record within the list. The lowest pH should be listed first and the highest base listed last. HCl and NaOH are given as examples.

Substances: Correct Acid-Base **pH** list

Pure water pH 1 HCl

Apples 2

Ammonia 3

Lime (Calcium Hydroxide) 4

Milk 5

HCl 6

Vinegar 7

Baking Soda 8

Human Blood 9

Lemon juice 10

Battery Acid 11

Milk of Magnesia 12

Rain water 13

Egg whites 14 NaOH

Drano

NaOH

6. <http://chemistry.about.com/library/weekly/blacidquiz.htm>

 Take the quiz. Place score here \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. <http://chemistry.about.com/library/weekly/bl060603a.htm>

 Take the quiz. Place score here \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

8. Go to <http://chemistry.about.com/od/chemistryglossary/g/Valence-Electrons-Definition.htm>

 Using the information at this site, write a definition for valence electron.

9. Visit the following site to answer the questions below; <http://dl.clackamas.cc.or.us/ch104-06/valence_electrons.htm>

 (a) What is a quick way to determine the valence electrons for an element?

 (b) How many valence electrons does each of the following elements have? List the number, then draw a Dot diagram to represent the number of valence electrons.

 Carbon, oxygen, nitrogen,

 fluorine, neon, sodium.

 (c) Do valence electrons show a repeating or **periodic pattern**? Explain.

10. Ionic & Covalent Bonding

Activity #1- Introduction to Ionic & Covalent Bonding

Open: <http://www.visionlearning.com/en/library/Chemistry/1/Chemical-Bonding/55>

Scroll down to the headidng “Ionic Bonding”

* Ionic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form between metals and nonmetals.
* In naming simple ionic compounds, the metal is always \_\_\_\_\_\_\_\_\_\_\_ , the nonmetal \_\_\_\_\_\_\_\_\_\_\_\_ (e.g., sodium chloride).

Sodium Chloride

Crystal

* Ionic compounds dissolve easily in water and other \_\_\_\_\_\_\_\_\_\_\_ Solvents.
* In a solution, ionic compounds easily conduct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Ionic compounds tend to form crystalline \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with high melting temperatures.

This last feature, the fact that ionic compounds are solids, results from the intermolecular forces (forces between molecules) in ionic solids. If we consider a solid  \_\_\_\_\_\_\_\_\_\_ of sodium chloride, the solid is made up of many positively charged sodium \_\_\_\_\_\_\_ (pictured as small gray spheres) and an equal number of negatively charged chlorine ions (green spheres). Due to the interaction of the charged ions, the sodium and chlorine ions are arranged in an alternating fashion as demonstrated in the schematic. Each sodium ion is attracted equally to all of its neighboring chlorine ions, and likewise for the chlorine to sodium attraction. The concept of a single molecule does not apply to ionic crystals because the solid exists as one continuous system. Ionic solids form crystals with high melting points because of the strong \_\_\_\_\_\_\_\_\_\_\_ between neighboring ions.

 Scroll down to the heading “Covalent Bonding.”

1. As opposed to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonding in which a complete transfer of electrons occurs, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonding occurs when two or more elements \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons. Covalent bonding occurs because the atoms in the compound have a similar tendency for electrons (generally to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons). This most commonly occurs when two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bond together. Because both of the nonmetals will want to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electrons, the elements involved will share electrons in an effort to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ their valence shells.

2. How many valence electrons are in one atom of hydrogen?

3. How many valence electrons does hydrogen need to have a full first shell?

4. How does the hydrogen atom “pick up” another electron?

5. What compound does hydrogen form?

6. How do hydrogen atoms make a covalent bond?

7. Visit the simulation, Covalent bonding between hydrogen atoms. <http://www.visionlearning.com/img/app/library/objects/Flash/VLObject-1348-030210030248.swf>

 Describe or draw what you see. [Hint watch the electrons!]