

Name: \_\_\_\_\_

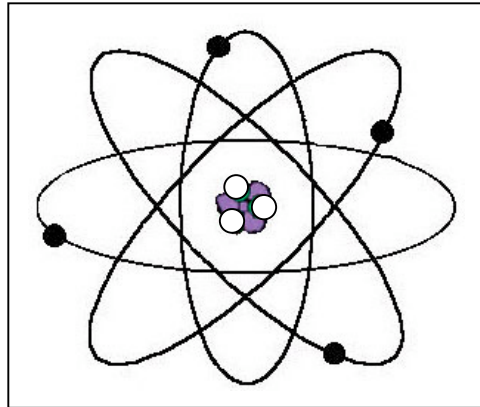
Date: \_\_\_\_\_

Period: \_\_\_\_\_

Biology: Biochemistry

Chemistry Basics

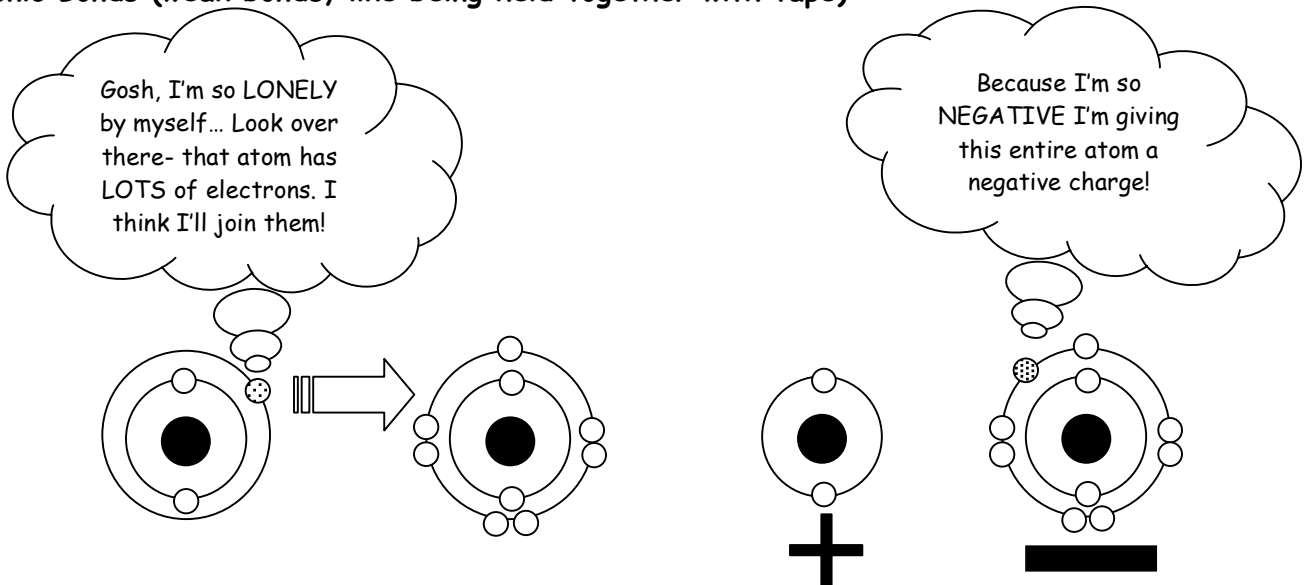
### Atom Structure



1. Protons have a \_\_\_\_\_ charge and are found in the nucleus.
2. Neutrons have a \_\_\_\_\_ charge and are found in the nucleus.
3. Electrons have a \_\_\_\_\_ charge and are found orbiting the nucleus
4. Label a proton, neutron and electron in the atom above.
5. When an atom is missing one or more electrons it will have a \_\_\_\_\_ charge.
6. When an atom has one or more extra \_\_\_\_\_ it will have a \_\_\_\_\_ charge.
7. An atom with a charge is called an \_\_\_\_\_.

### Three Types of Bonds

#### I. Ionic Bonds (weak bonds, like being held together with tape)

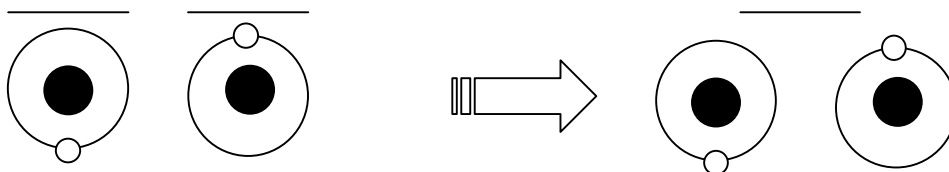


8. What will happen to the positively and negatively charged atoms?
9. Give an example of an ionic compound:

## II. Covalent Bonds (Strong Bonds, like holding something together with nails or bolts)

Sharing electrons between two or more atoms makes a very strong bond called a covalent bond. Sometimes electrons are shared equally, called a **non-polar** bond.

10. Label the atoms before and after bonding.

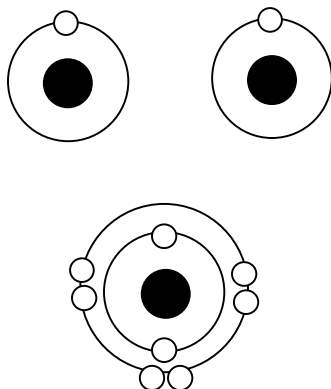


*Each atom above has one electron. Atoms prefer to have as many electrons as they can fit in the orbit around the nucleus*

11. After the arrow, draw what it might look like if these two shared their electrons

Sometimes an atom can be more "attractive" to an electron than another atom. This leads to a covalent bond where electrons are not shared equally. We call this a **polar bond**.

12. Write the name of each atom below, and then draw how they might share their electrons



13. Which of these three atoms will have the electrons most of the time (hogging them)?

14. If electrons spend more time at one end of the molecule than the other, what might this do to the charge?

## III. Hydrogen Bonds (weak bonds- like holding something together with Velcro)

These are VERY important bonds in biology. Most of the time, our body can't break down covalent bonds without help. But hydrogen bonds are weak enough that they don't pose a problem. Water is a molecule whose properties depend on the hydrogen bond.

15. Draw an example of a hydrogen bond to the molecule in number 12.

16. What type of bond above (ionic, non-polar covalent or polar covalent) leads to hydrogen bonds and why?

17. If you have two water molecules together, would you expect them to sit "hydrogen to hydrogen side" or "hydrogen to oxygen side." Why do you think this happens?