chemistry

GUMMY BEAR CHEMICAL BONDS: IONIC & COVALENT lab

Name _____

Date _____

Block _____

Lab Objectives:

- Distinguish between atoms and molecules.
- Describe the difference between pure substances (elements and compounds) and mixtures.
- Explain the difference between ionic and covalent bonds.

Pre-lab Questions:

1. What are small particles that make up elements and compounds? _____
2. What are two or more of the same atoms bonded together called? _____
3. What are molecules made up of only one type of atom? _____
4. What are two or more different types of atoms that are chemically bonded? _____
5. Which bond involves sharing of a pair of electrons between two atoms? _____
6. Which bond involves the transfer of electrons between two atoms? _____
7. Which bond occurs between two nonmetals? _____
8. Which bond occurs between a metal and a nonmetal? _____

Materials:

- Paper Towel/Paper plate
- Toothpicks
- Gummy Bears
- Colored pencils

Procedure:

1. Color the candy key in Table 1 according to the gummy bears provided.
2. List the names of the atoms involved in Table 2 and Table 3.
3. Identify the number of each atom in the molecule
4. Identify the atoms as either metal or nonmetal
5. Identify the type of bond (ionic or covalent)
6. Make the gummy bear model
7. Color the model in the table
8. Complete post-lab questions.

Table 1. Count the gummy bears you have for each color and match them to the key. Color each gummy bear.

4 Hydrogen	2 Oxygen	1 Carbon
1 Chlorine	2 Sodium	

Table 2. Using your gummy bears and toothpicks, create molecules of the elements below. Fill out the chart completely.

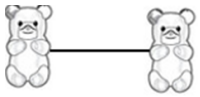
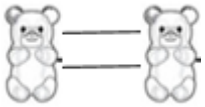
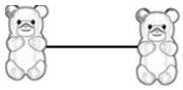
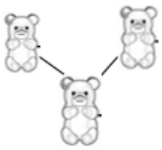
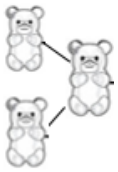
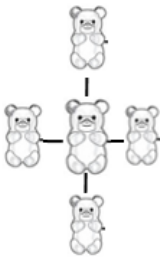
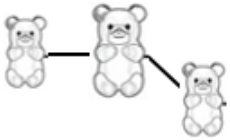
Substance	Formula	Atom Name	Number of Atoms	M or NM	Molecule Model	Type of Bond
Hydrogen gas	H_2					
Oxygen gas	O_2					

Table 3. Using your gummy bears and toothpicks, create molecules of the compounds below. Fill out the chart completely.

Substance	Formula	Atom Name	Number of Atoms	M or NM	Molecule Model	Type of Bond
Salt	NaCl					
Water	H_2O					
Sodium Oxide	Na_2O					
Carbon dioxide	CO_2					
Methane	CH_4					
Sodium hydroxide	NaOH					

*hint: Hydroxide is a polyatomic ion

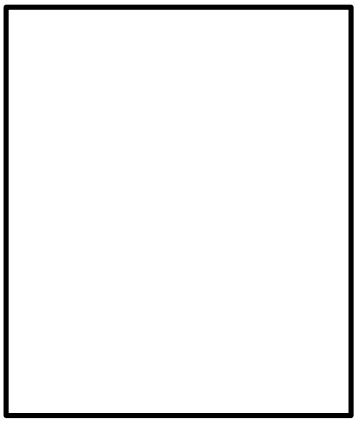
Post-Lab Questions.

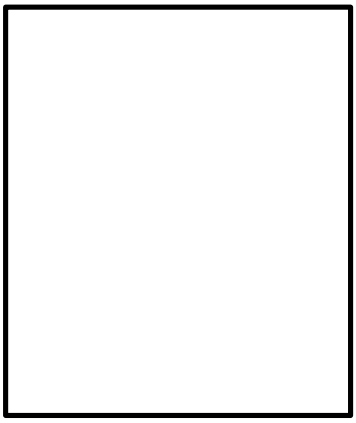
1. What small particle makes up all substances? _____

2. How is a compound different from a molecule? _____
   _____

3. Are all molecules, compounds? Explain. _____
   _____

4-5. Draw a Bohr model of a carbon atom in first box and oxygen atom in the second.





6. Looking at the models above, explain why two oxygen atoms bond to a carbon atom to make a stable molecule of carbon dioxide? (Hint: Look at the valence electrons)
   _____
   _____

7. One of the properties of a pure substance it that they always exist in fixed proportions. How many hydrogen atoms are needed to form 5 water molecules? _____

8. Which substances formed ionic bonds? _____
   _____

9. Which substances formed covalent bonds? _____
   _____

10. Can molecules made from the same atom form ionic bonds? Explain. _____
    _____