

## Bonding Basics - Covalent Bonds

Name \_\_\_\_\_

Complete the chart for each element.

Element	# of Protons	# of Electrons	# of Valence Electrons	# of Electrons to Fill Outer Shell
Carbon				
Chlorine				
Hydrogen				
Phosphorus				
Oxygen				
Sulfur				
Nitrogen				

Follow your teacher's directions to complete each covalent bond.

(1) Hydrogen + Hydrogen

(2) Hydrogen + Oxygen

(3) Chlorine + Chlorine

(4) Oxygen + Oxygen

(5) Carbon + Oxygen

(6) Carbon + Hydrogen

## Bonding Basics - Covalent Bonds

## Answer Key/Teacher Notes

Complete the chart for each element.

Element	# of Protons	# of Electrons	# of Valence Electrons	# of Electrons to Fill Outer Shell
Carbon	6	6	4	4
Chlorine	17	17	7	1
Hydrogen	1	1	1	1
Phosphorus	15	15	5	3
Oxygen	8	8	6	2
Sulfur	16	16	6	2
Nitrogen	7	7	5	3

Follow your teacher's directions to complete each covalent bond.

### (1) Hydrogen + Hydrogen (Diatomic Element)

1- Write the symbols for each element.

2 - Use Fruity Pebbles (or other cereal/candy with more than one color) to create the Lewis structure for each.

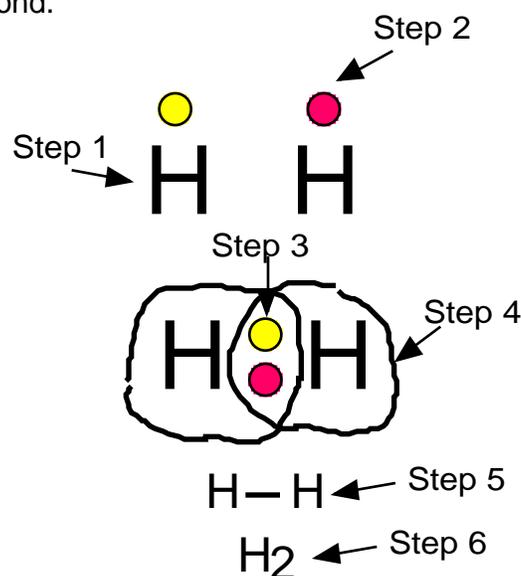
3 - Rearrange the electrons (or cereal pieces) to pair up electrons from each atom.

4 - Draw circles to show the sharing of electrons.

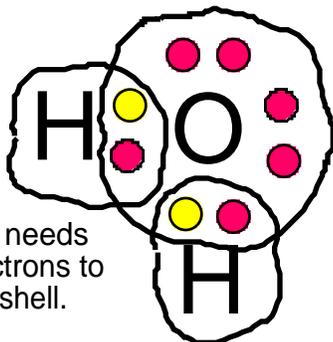
5 - Draw the bond structure using symbols and lines. Use one line for each pair of electrons that is shared.

6 - Write the chemical formula for each molecule.

7 - Have the students use a pencil or crayon to draw the electrons as they remove the pieces of cereal.

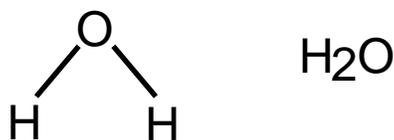


### (2) Hydrogen + Oxygen



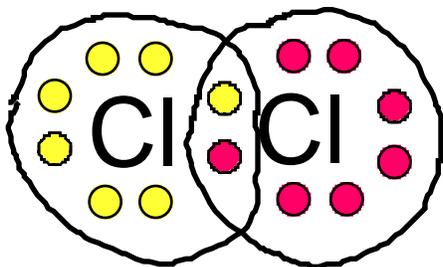
Each H atom needs a total of 2 electrons to fill the outer shell.

The O atom needs a total of 8 electrons.



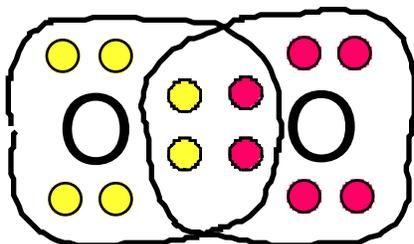
Students should start with one hydrogen and one oxygen. They should understand that the oxygen atom needs two electrons to fill its outer shell, which means they will need a total of two hydrogen atoms to complete the bond.

(3) Chlorine + Chlorine (Diatomic Element)



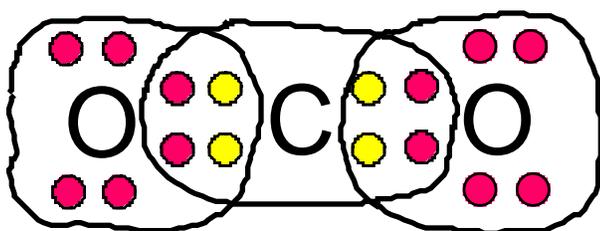
Each chlorine atom needs one more electron to fill the outermost energy level. By sharing one pair of electrons, both atoms are able to complete their outer shells.

(4) Oxygen + Oxygen (Diatomic Element)



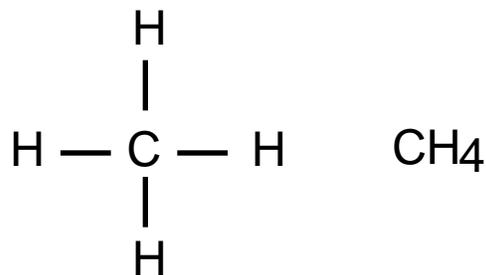
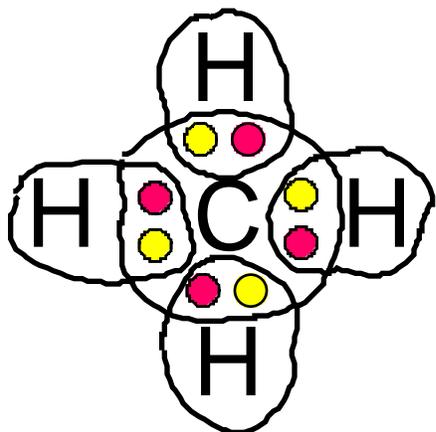
Each oxygen atom needs two more electrons to fill the outermost energy level. By sharing two pairs of electrons, both atoms are able to complete their outer shells.

(5) Carbon + Oxygen



Each oxygen atom needs two more electrons to fill the outermost energy level and the carbon atom needs four electrons. By sharing two pairs of electrons, all three atoms are able to complete their outer shells.

(6) Carbon + Hydrogen



Each hydrogen atom needs one more electron to fill the outermost energy level and the carbon atom needs four electrons. By sharing one pair of electrons, hydrogen and carbon are able to complete their outer shells.