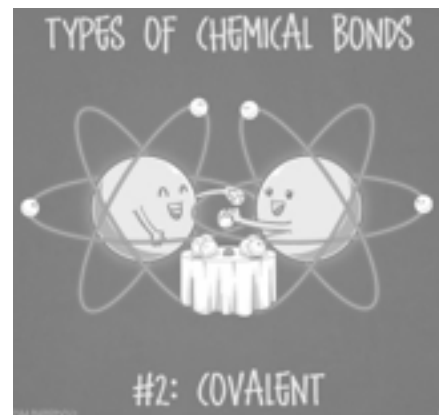


## Covalent Bonds

### Warm Up

- i. What is the main difference between ionic and covalent bonding?  
Explain in terms of electrons.



- ii. What types of elements make up covalent bonds?
- iii. Which of the following are examples of covalent bonds?

- i. NaBr                      b. H<sub>2</sub>O                      c. CH<sub>4</sub>                      d. Li<sub>3</sub>N                      e. F<sub>2</sub>  
f. CaCl<sub>2</sub>

- iv. Draw the Lewis Dot Diagram for the following NEUTRAL atoms.

1. Carbon  
c. Nitrogen

- b. Oxygen

- d. Iodine  
f. Sulfur

- e. Hydrogen

## A Few Helpful Vocab Words...

i. Element

A pure substance made of only one type of atom; CANNOT be broken down by \_\_\_\_\_ means.

Examples: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

ii. Compound

A pure substance made of \_\_\_\_\_ or more types of atoms that are CHEMICALLY BONDED together in \_\_\_\_\_ ratios; CAN be broken down by \_\_\_\_\_ means (undergoing a chemical reaction)

Examples: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

iii. Electronegativity - A measure of an atom's desire to \_\_\_\_\_ an electron.

## Covalent Bonding

A covalent bond occurs when two or more atoms \_\_\_\_\_ electrons in order for each individual atom to have a stable octet (aka having a \_\_\_\_\_)

In technical terms, a Covalent Bond occurs between 2 or more atoms that want to gain an electron (have a \_\_\_\_\_ EN) have to work together. Neither atom is strong enough to completely take the electron away from the other. If this was the case, it would be an \_\_\_\_\_ bond.



# Covalent Lewis Dot Diagrams

## Example 1: CH<sub>4</sub>

### Step 1: Draw the Lewis Dot Diagram

Draw the Lewis Dot Diagram for <b>ONE</b> Carbon Atom	Draw the Lewis Dot Diagram for <b>FOUR</b> Hydrogen Atoms

**Step 3:** Connect the atoms into a structure.

**Remember:** a covalent bond happens for an atom to \_\_\_\_\_ its outer shell by \_\_\_\_\_ electrons.

Check:

ELEMENT	Valence e- it has	Valence e- it wants
Carbon		
Hydrogen		

**Step 2:** Find the total number of valence electrons in ALL atoms:

Structure for CH<sub>4</sub>:

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# Covalent Lewis Dot Diagrams

## Example 2: $\text{NF}_3$

**Step 1:** Draw the Lewis Dot Diagram

Draw the Lewis Dot Diagram for <b>ONE</b> Nitrogen Atom	Draw the Lewis Dot Diagram for <b>THREE</b> Fluorine Atoms

**Step 3:** Connect the atoms into a structure.

**Remember:** a covalent bond happens for an atom to \_\_\_\_\_ its outer shell by \_\_\_\_\_ electrons.

Check:

ELEMENT	Valence e- it has	Valence e- it wants
Nitrogen		
Fluorine		

**Step 2:** Find the total number of valence electrons in ALL atoms:

Structure for  $\text{NF}_3$ :