Jumpstart

1) What do you already know about the different types of bonding? (ionic vs. covalent)

2) What do you want to learn about bonding?

Introduction to Types of Bonds

Why bother making bonds?

Atoms want to have a full outer shell like the noble gases have:

What happens during a chemical reaction?

A CHEMICAL REACTION IS A CHANGE TO THE ELECTRONS:

transferring or sharing electrons in order to make "bonds"

Which electrons are involved in bonding?

- **Valence Electrons:** The e- in the highest occupied energy level of an atom

During a Chemical Reaction

- Ionic – electrons transferred
- Covalent – electons shared
- Metallic – free flowing electrons

Types of Chemical Bonds

Ionic
Bond between: (Metal - Nonmetal)

Covalent
Bond between: (Nonmetal - Nonmetal)

Metallic
Bond between: (Metal - Metal)

IONIC BONDS

Transferring Electrons

Properties of Ionic Compounds

- They are solids with high melting points (typically > 400°C)
- Many are soluble in water

Properties of Ionic Compounds

- Molten compounds conduct electricity well because they contain mobile charged particles (ions).
- Aqueous solutions conduct electricity well for the same reason.

Properties of Compounds

Properties of compounds often have VERY different properties than the individual elements.

Sodium is an explosive metal

Chlorine is a poisonous gas.

Sodium Chloride you put on your fries

COVALENT BONDS

Sharing Electrons

Properties of Covalent Bonds

- Don't Conduct Electricity
- Low melting points
- Usually not soluble in water

METALLIC BONDS

Free Flowing Electrons

Watch this video clip:

https://www.youtube.com/watch?v=V5tj-xADB1c

Properties of Metals

- Solid at room temperature (except for mercury…it is a liquid!)
- Conduct electricity
- Malleable
- Ductile
- Have a wide range of melting points.

WHY ARE PROPERTIES OF COMPOUNDS/MOLECULES SO DIFFERENT THAN THE PROPERTIES OF THE INDIVIDUAL ATOMS THEY MAKE UP?

Because chemical properties are due to the electron configuration of the valence electrons. During bonding, this configuration changes.