1. What types of elements occupy space in groups 1 and 2?

2. How many valence electrons do these groups have, respectively?

3. What will their ionic charges be, respectively, if they lose their valence electrons?

4. Metals like to _____ electrons.

5. Non-metals like to _____ electrons.

6. What electrons do the bonding?

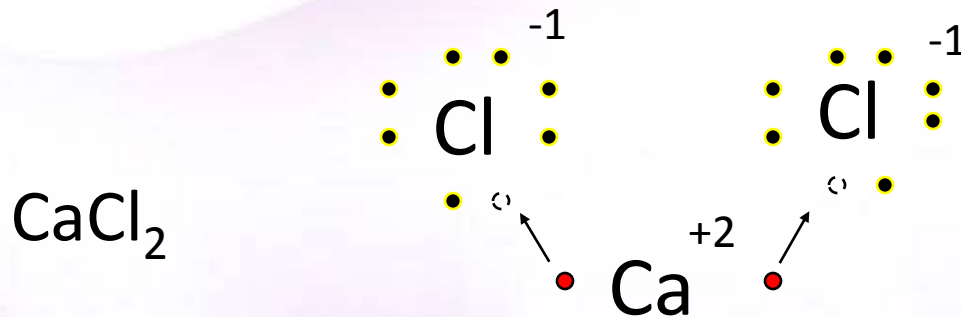# Increases stability of the atoms

Group 1 and 2 metals transfer electrons to Group 16 and 17 nonmetals to create ionic bonds.

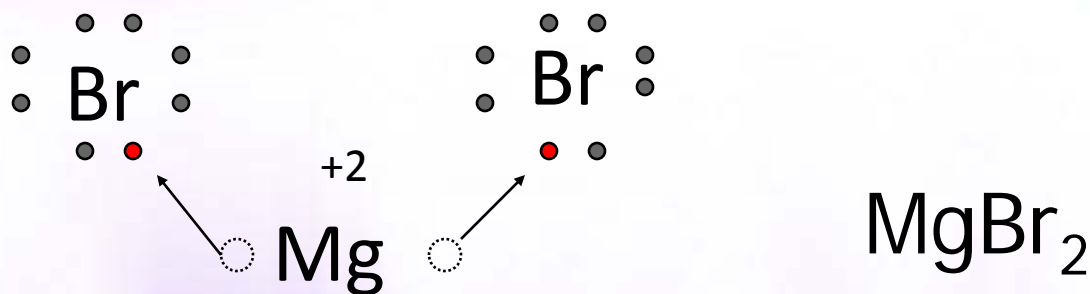**Metals lose electrons & nonmetals gain electrons to achieve noble gas structure!**
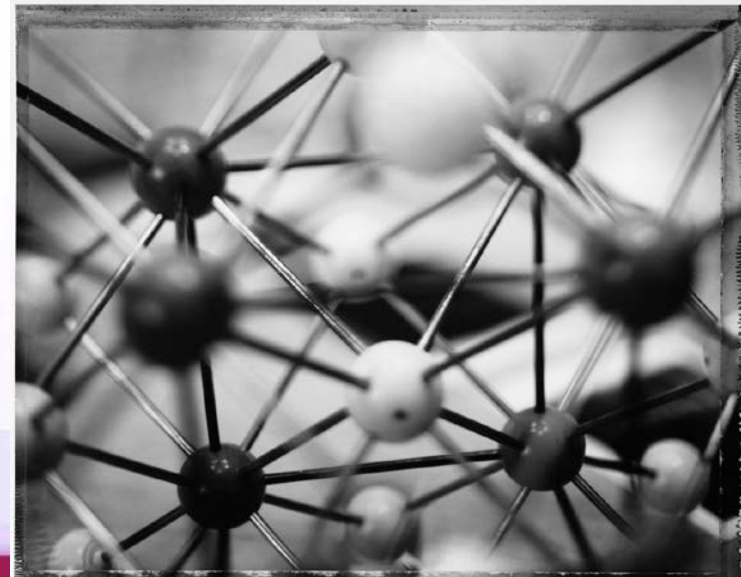
BONDING

A bond forms when... two atoms gain, lose, or share electrons in their outer energy levels.

$CaCl_2$

Calcium ion will give up its outer electrons to both chlorine atoms

IONIC BOND

Form between two oppositely charged ions (metal to nonmetal) one gains and one loses electrons (electron transfer)
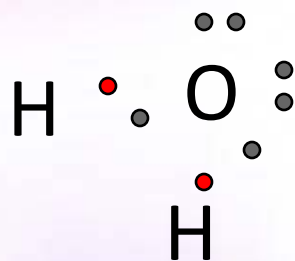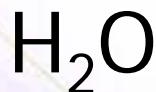
Br   Br   +2   Mg $MgBr_2$

Strong bonds form

COVALENT BOND

Form when atoms *share* one or more pairs of electrons = nonmetals to nonmetals

Oxygen only needs two electrons so hydrogen shares its one valence electron so that both atoms fill their outer shells.
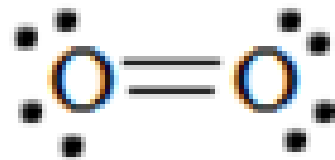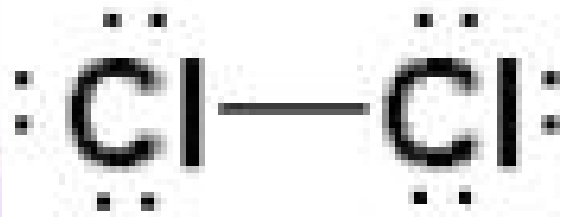
H_2O

Weaker bonds form

COVALENT BOND (CON'T)

Nonmetals have fewer electrons than they need to have stable outer shell

Ex. Group 7 can bond with other Group 7 by sharing 1 electron from each atom

Both atoms get to 8 electrons = HAPPY!!

This sharing forms 1 covalent bond made of 2 electrons & the molecule is stable!

Videos!

- [Short Video on NaCl and Water](#)

- [Longer Video on Bonding](#)

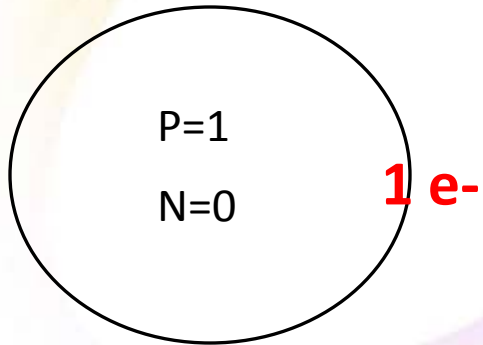- [Hindenburg Disaster](#)

ELECTRON DOT DIAGRAMS

An electron-configuration notation in which only the valence electrons of an atom of a particular element are shown
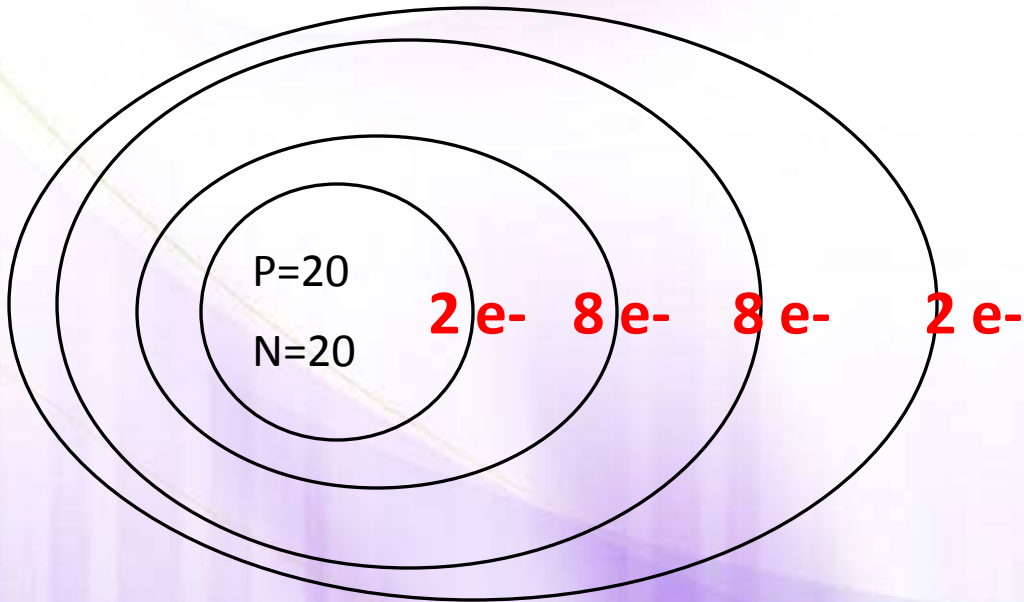
Indicated by dots placed around the element's symbol

Number of Valence Electrons	Electron-dot Notation	Example
1	X·	Na·
2	·X·	·Mg·
3	·X·	·B·
4	·X·	·C·
5	·X·	·N·
6	:X·	:O·
7	:X·	:F·
8	:X:	:Ne:

ELECTRON DOT DIAGRAMS

P=1
N=0
1 e-

H •

P=20
N=20
2 e- 8 e- 8 e- 2 e-

• Ca •

ELECTRON DOT DIAGRAMS

1. Determine # of valence electrons
2. Correctly place the electrons around symbol

Nitrogen: N

Hydrogen: H

Ammonia: NH_3

ACTIVITY TIME!

Ionic vs. covalent.. Which will win???

Looking at the difference between sugar and salt.

Sugar!

Salt!

WEDNESDAY 10/7 - BELLRINGER

1. Table salt (NaCl) has what kind of bond?

2. Table sugar (sucrose, $C_{12}H_{22}O_{11}$) has what kind of bond?

3. When heated, what happened to the bonds in sugar?

4. When heated, what happened to the bonds in salt?

5. Provide the electron dot structure for Barium (Ba), Iodine (I), and Cesium (Cs).
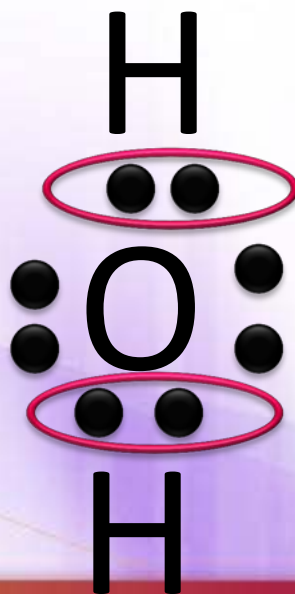
ELECTRON DIAGRAMS
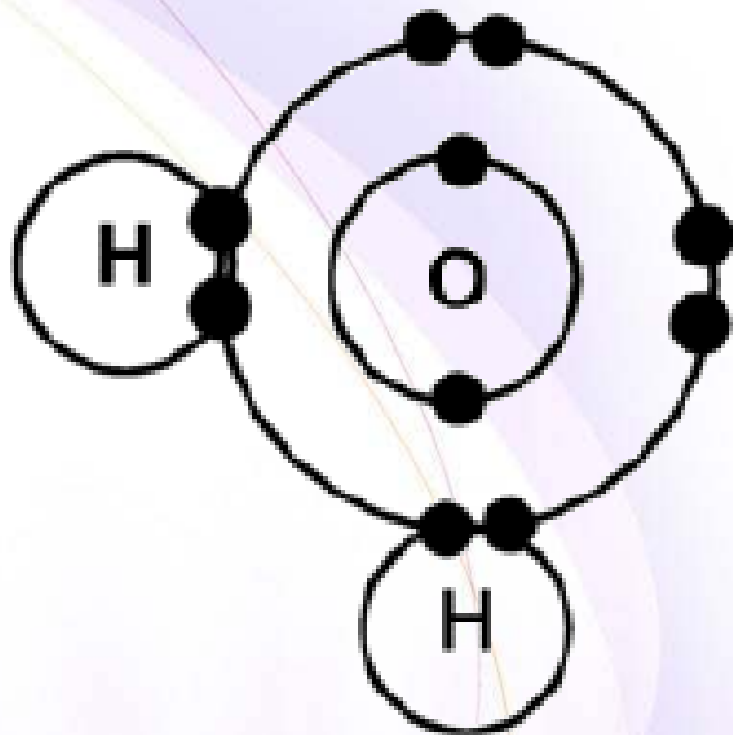
1. Electron Dot Diagram:

Hydrogen: H

H •

Oxygen:

Water: H_2O

Covalent bonds!

2. Pictorial Diagrams:

EOC WORKBOOK

Pg. 36 (all)
Pg. 37 (all)

What happens if it is not the neutral element.. But the ion??

Na

Cl

Mg

BONDS

- **Covalent Structures:** make molecules and SHARE ELECTRONS
  - Example: H_2O, CO_2, $C_{12}H_{22}O_{11}$

- **Ionic Structures: make ionic crystals and** TRANSFER ELECTRONS
  - Example: $NaCl$, KI, CaF_2

IONIC STRUCTURE

A. **When positive and negative ions surround each other, they form tightly packed structures called ionic crystals or crystal lattices**

- **Substances with network (ionic) structures are usually strong solids with high melting and boiling points**

- **Substances made of molecules have lower melting and boiling points**
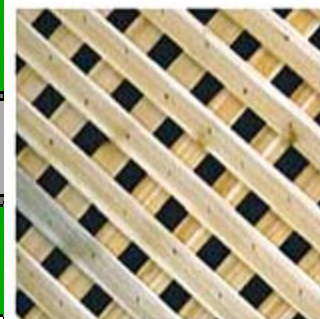
Na⁺

Cl⁻
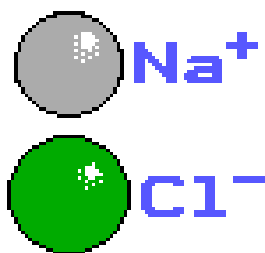
Crystal lattice of sodium chloride, NaCl
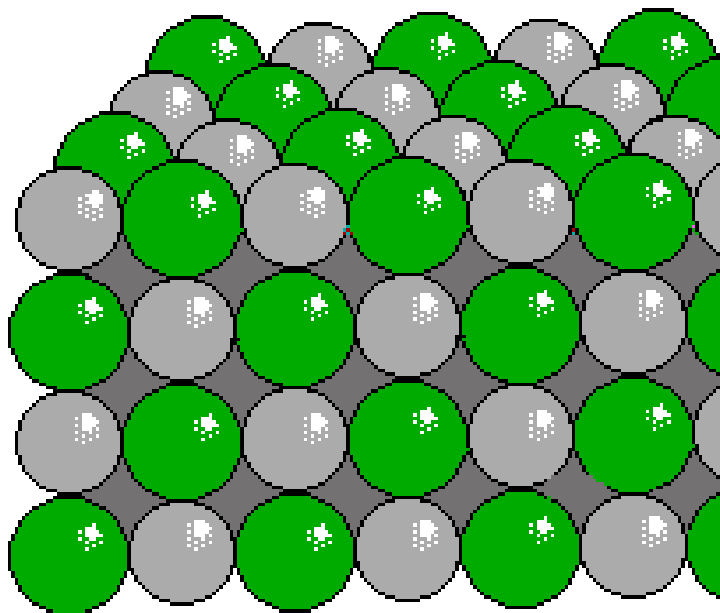
Standard Lattice

Semi-Privacy Lattice

Privacy Plus Lattice

Square Lattice

Salt: Up close and personal

Make some observations of salt under a microscope!!

- http://www.sciencenetlinks.com/lessons.php?BenchmarkID=4&DocID=173
- http://www.sciencenetlinks.com/lessons.php?BenchmarkID=4&DocID=173
- http://www.mos.org/sln/sem/sem.html

- **SECTION 1 REVIEW**

Pg. 606 # 4, 5

- **EOC REVIEW**

Pg. 626 # 4-6, 11, 14, 17, 18

EOC WORKBOOK!!!

Pg. 38 (all)

Pg. 39 (all)