

## IONIC BONDING

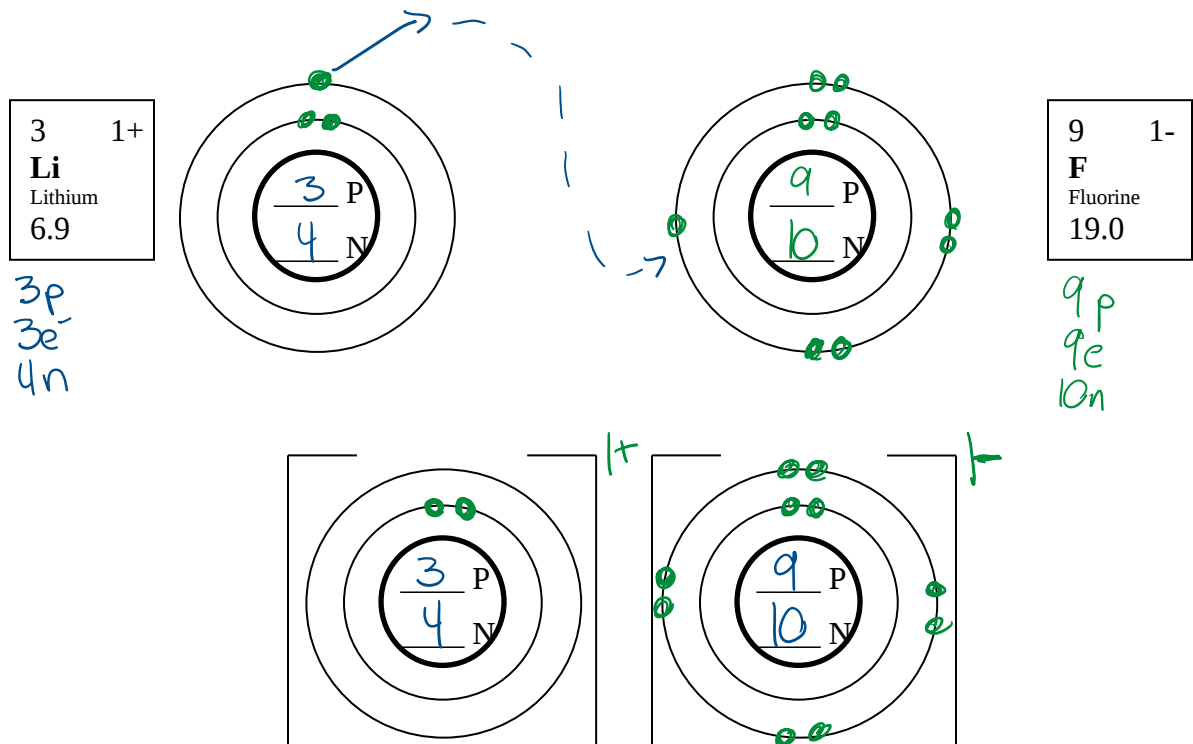
### Ions

- Charged atoms; gains or loses to fill its valence shell (outer electron orbital)
- These extra electrons come from other atoms that are trying to fill their valence shells

Chemical bonds - the relatively strong force of attraction that hold atoms together in a molecule.

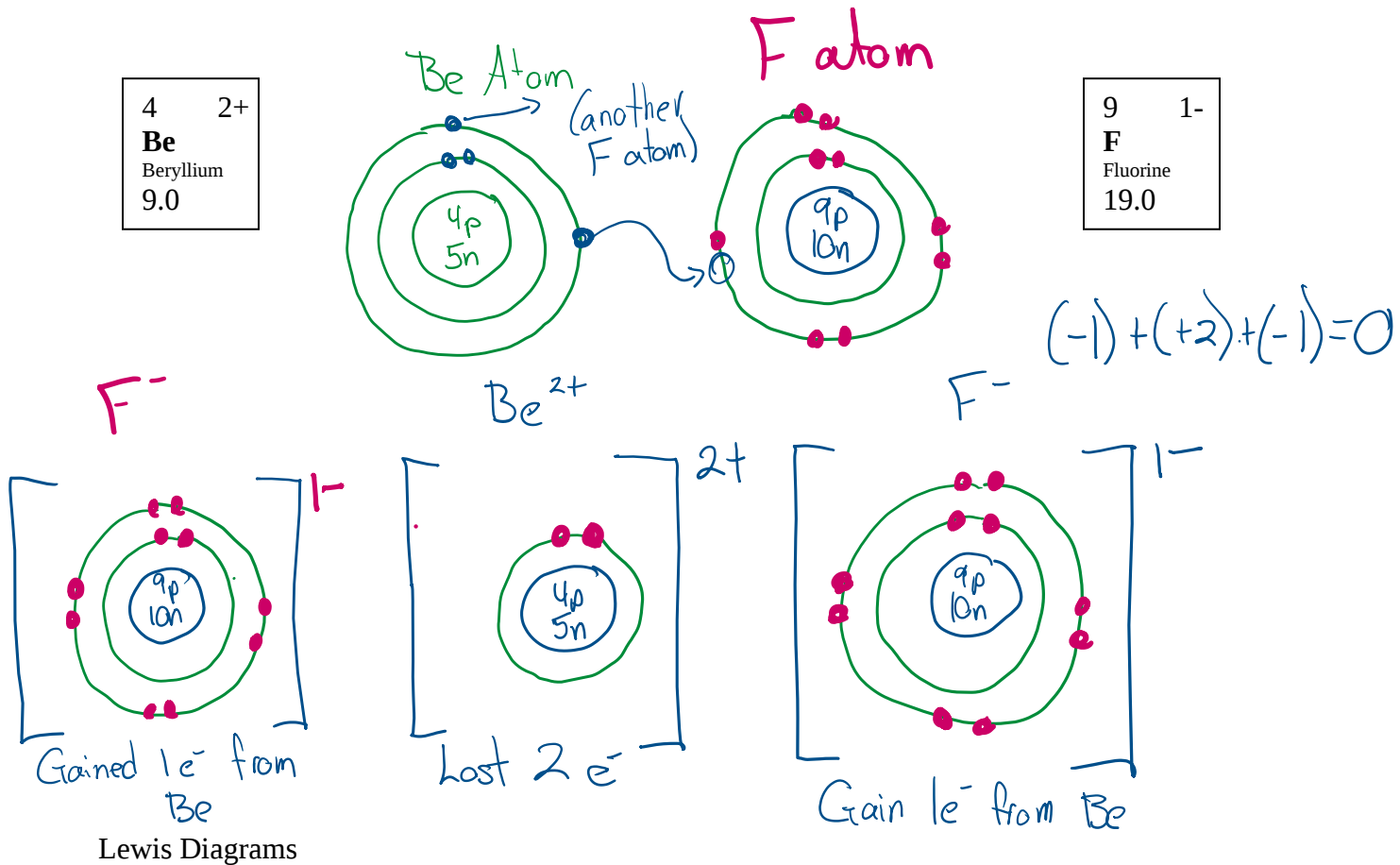
### Ionic Bonding

- Bonding of two or more oppositely charged ions
- Metal atoms have electrons to give from the outer valence  $\rightarrow$  forms a positive ion called a cation
- Non-metal atoms need to accept electrons to fill the outer valence  $\rightarrow$  forms a negative ion called an anion
- When this happens, the ions become bonded together (opposite charges attract)
- Example: lithium and fluorine



## Lesson 3

- Example: beryllium and fluorine (charges must balance)



- An easier way of showing bonding between atoms is using Lewis diagrams → use solid dots to represent valence or outer electrons

A simple way to remember the number of valence electrons in an atom is to use the last digit in the group number (i.e., the column number from the periodic table).

## Lesson 3

# Valence

1 2

1 2

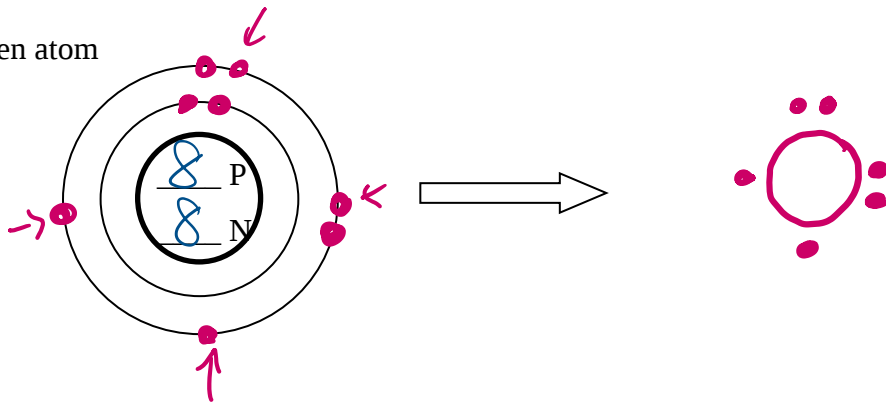
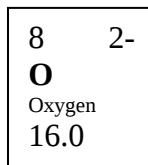
3 4 5 6 7 8

13 14 15 16 17 18

Transition metals

Variable Valence

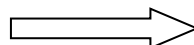
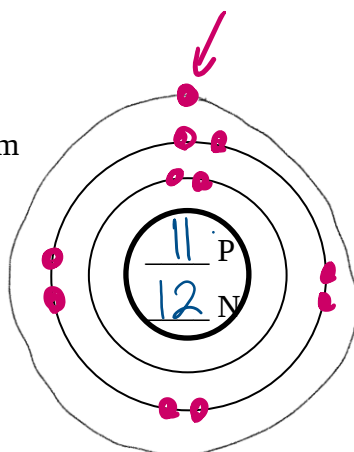
- Example: Oxygen atom



### Lesson 3

Example: Sodium atom

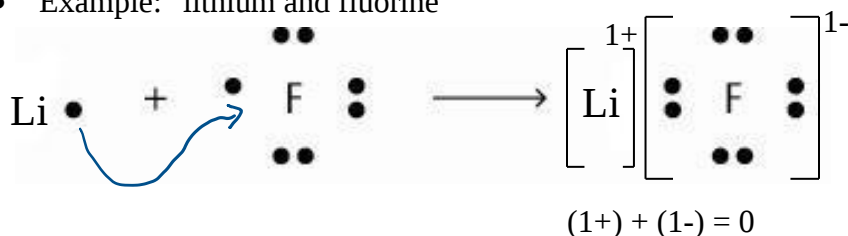
|           |    |
|-----------|----|
| 11        | 1+ |
| <b>Na</b> |    |
| Sodium    |    |
| 23.0      |    |



When forming compounds, the key is to make sure that the ion charges

cancel (equal 0).

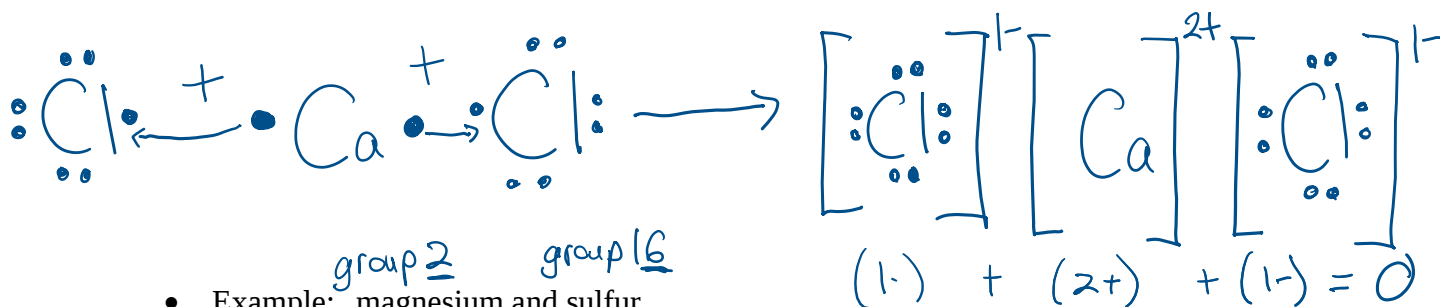
- Example: lithium and fluorine



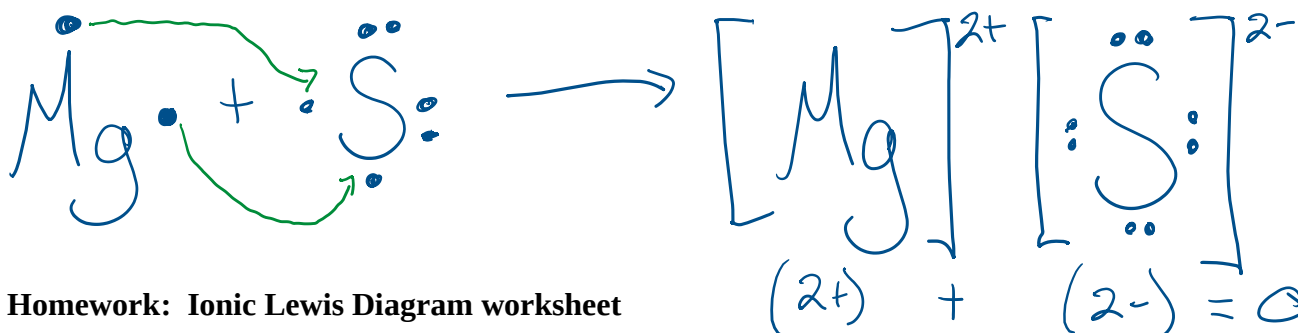
\*\* Note that for the positively charged cations, there are no electrons drawn in for the Lewis Diagram.

2 valence e<sup>-</sup>    7 valence e<sup>-</sup>  
group 2    group 17

- Example: calcium and chlorine



- Example: magnesium and sulfur



**Homework: Ionic Lewis Diagram worksheet**