

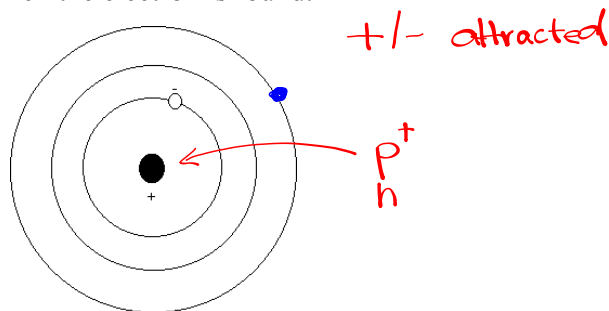
**Check Homework - #30-33**  
**Isotope worksheet**

## Homework - Isotopes Worksheet

Isotope Name	Atomic Number	Mass Number	Symbol	# of Protons	# of Neutrons
carbon - 14	6	14	${}^{14}_6\text{C}$	6	8
oxygen-16	8	16	${}^{16}_8\text{O}$	8	8
hydrogen - 2					
Lawrencium - 257					

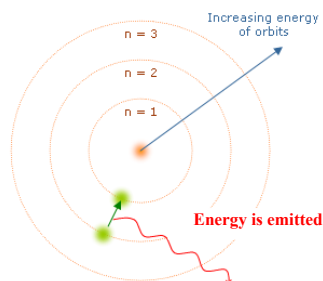
# Bohr Theory

1. Each electron has a fixed quantity of energy related to the circular orbit in which the electron is found.



2. Electrons cannot exist between orbits, but they can move to unfilled orbits if a quantum of energy is absorbed or released.

3. The higher the energy level of the electron, the further it is from the nucleus.



4. The maximum number of electrons in the first three energy levels is 2, 8, and 8.

5. An atom with a maximum number of electrons in its outermost energy level (filled) is stable and therefore unreactive.

GROUPS occur in the Periodic Table because:

elements with the same number of electrons in the outer shell have similar chemical properties.

PERIODS occur in the Periodic Table as one shell becomes filled and electrons have to move to a new shell (energy level)

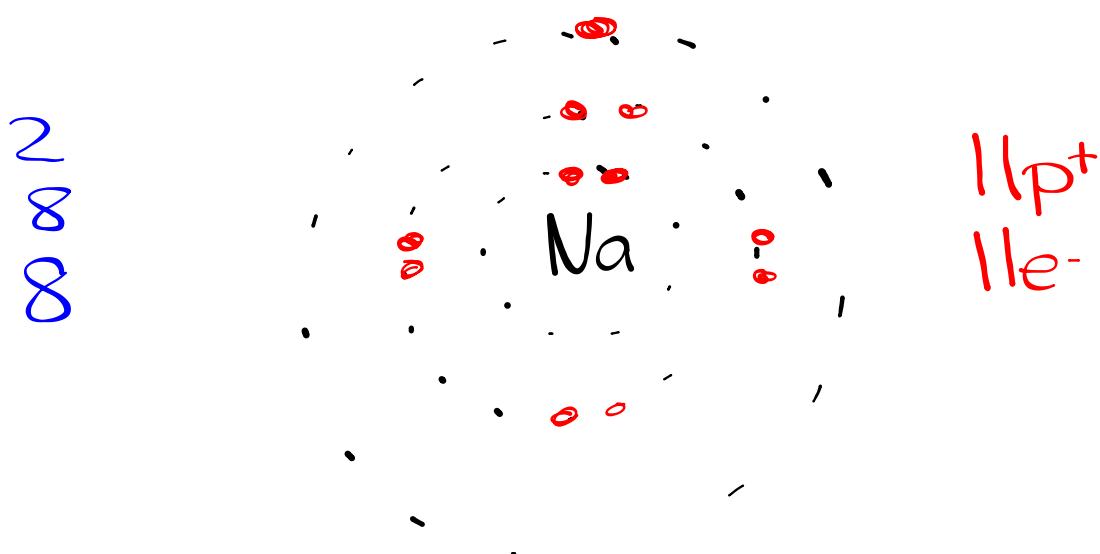
valence electrons - electrons in the highest energy level.

⇒ for representative elements, the number of valence electrons is equal to the last digit of the group number

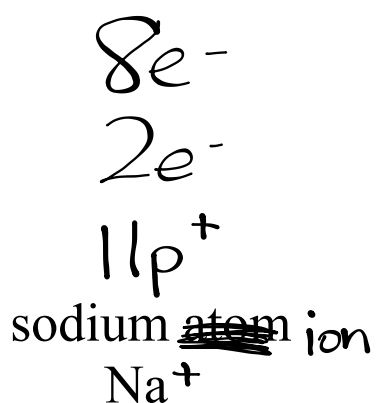
<http://www.webelements.com/>

**Noble Gases** (Group 18) are not reactive since their outer energy level is filled and therefore they do not need to gain or lose electrons to other atoms (atoms always try to gain or lose electrons to reach a complete stable outer energy level)



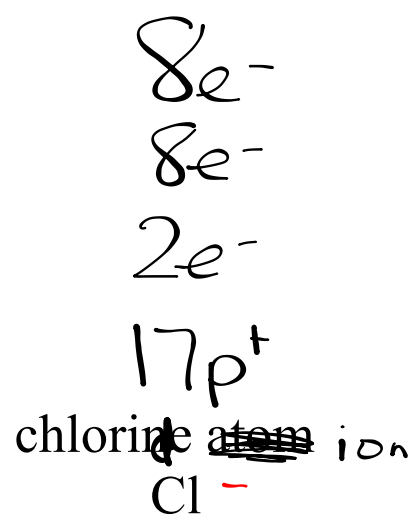


## Electron Energy Diagrams



lost  $1e^-$   
metals

Cations (positive)



gain  $1e^-$   
 non-metals

- ends in -ide

Anions  
 (negative)

lose	lose	lose	X	gain	gain	gain	X
<del>1e<sup>-</sup></del>	<del>2e<sup>-</sup></del>	<del>3e<sup>-</sup></del>	<del>4e<sup>-</sup></del>	<del>5e<sup>-</sup></del>	<del>6e<sup>-</sup></del>	<del>7e<sup>-</sup></del>	<del>8e<sup>-</sup></del>
2e <sup>-</sup>	2e <sup>-</sup>	2e <sup>-</sup>	2e <sup>-</sup>	2e <sup>-</sup>	2e <sup>-</sup>	2e <sup>-</sup>	2e <sup>-</sup>
3p <sup>+</sup>	4p <sup>+</sup>	5p <sup>+</sup>	6p <sup>+</sup>	7p <sup>+</sup>	8p <sup>+</sup>	9p <sup>+</sup>	10p <sup>+</sup>
Li	Be	B	C	N	O	F	Ne

# Ions

Ion - an atom which takes on an electrical charge. Ex. Na<sup>+</sup> or Cl<sup>-</sup>

Cations - are usually formed from metallic atoms that lose electrons.

Ex. Ag<sup>+</sup>

- positively charged ions
- use the full english name of the atom from which it was formed followed by the word 'ion'

Ex. silver ion

Anions - are usually formed from nonmetallic atoms which have gained an electron.

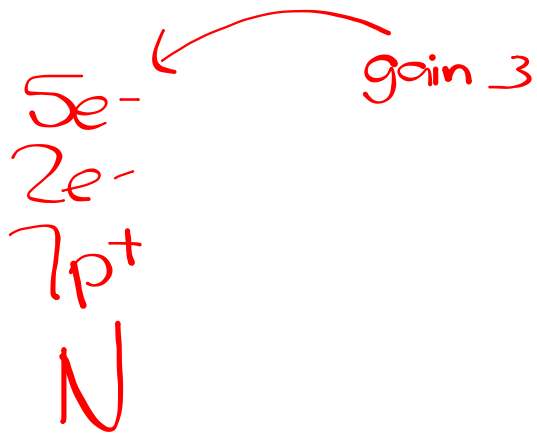
Ex. F<sup>-</sup>

- negatively charged ions
- names of anions are formed by using the english name of the nonmetallic atom as a stem and adding the suffix -ide followed by the word ion.

Ex. fluoride ion



Name	Symbol	<sup>+</sup> Protons	<sup>-</sup> Electrons	Ionic Charge
sulfide ion	$S^{2-}$	16	18	2-
<del>Mercurium</del> atom	Te	52	52	0
nitride ion	$N^{3-}$	7	10	3-



## **Today's Assignment**

### Ions Worksheet