

Identifying and Explaining Periodic Trends Using the Periodic Table

- Effective Nuclear charge (ENC) – describes the relative attraction between the positive nucleus and electrons

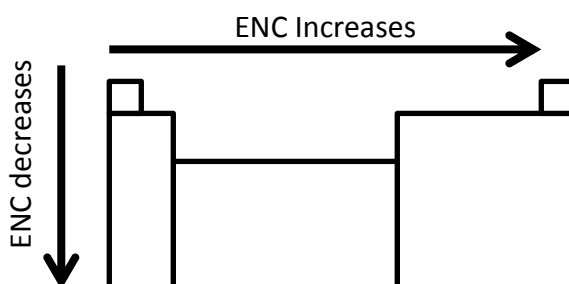
- Protons are positive
- Electrons are negative

These two subatomic particles
Are attracted to each other

Opposites attract!

- Protons and electrons are attracted to each other → attraction
- Electrons are repulsed by other electrons (they do not like being next to each other!) → repulsion

- ENC arguments are the most important arguments in explaining overall trends in the periodic table!!!!***



- Critical Question:** Why does ENC decrease going down a group?
 - Has to do with electrons being placed in higher energy levels (farther from the nucleus so they “feel” less of an attraction)
 - Electron shielding explains this more completely though, that is a topic we will get to in AP
- As you go to the right across a period the electrons are more attracted to the nucleus
- As you go down a family the electrons are farther from the nucleus so they are less attracted
- We ignore noble gases in trends since they do not react with anything!

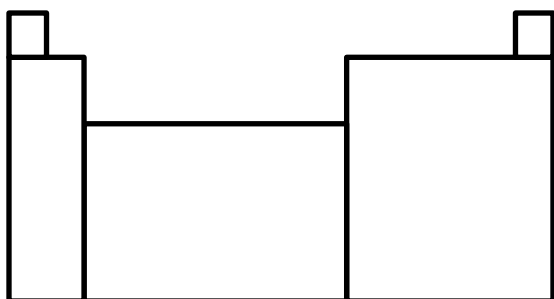
Periodic Trends

Atomic Radius

•**Atomic radius** - a measure of the size of its atoms, usually the distance from the nucleus to the boundary of the electron cloud.

Attraction (ENC):

Energy levels:



Ionic Radius

•**Ionic Radius** – atomic radius of an ion

Positive ions:

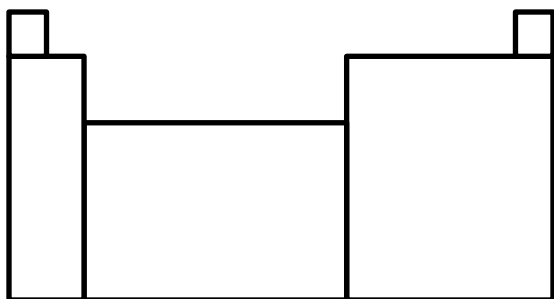
Negative ions:

Ionization energy

•**Ionization energy** – the energy required to remove an electron

Attraction (ENC):

Energy levels:



Electronegativity

•**Electronegativity** - the ability of an atom to attract electrons to itself.

Attraction (ENC):

Energy levels:

