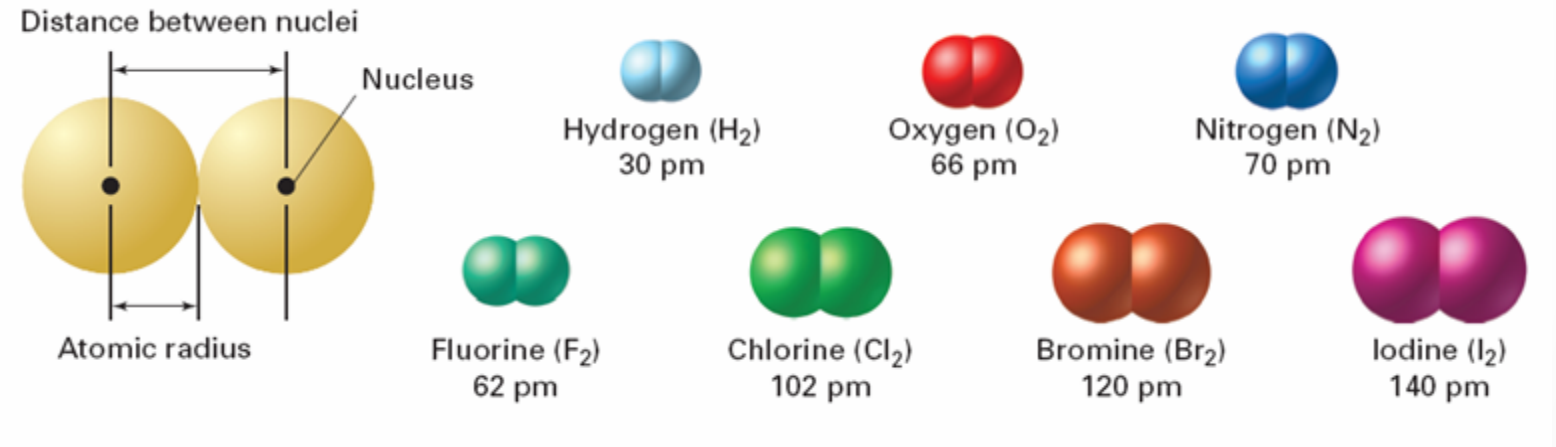
The 3 Main Periodic Trends

- Atomic Size
- Ionization Energy
- Electronegativity

Trends in Atomic Size

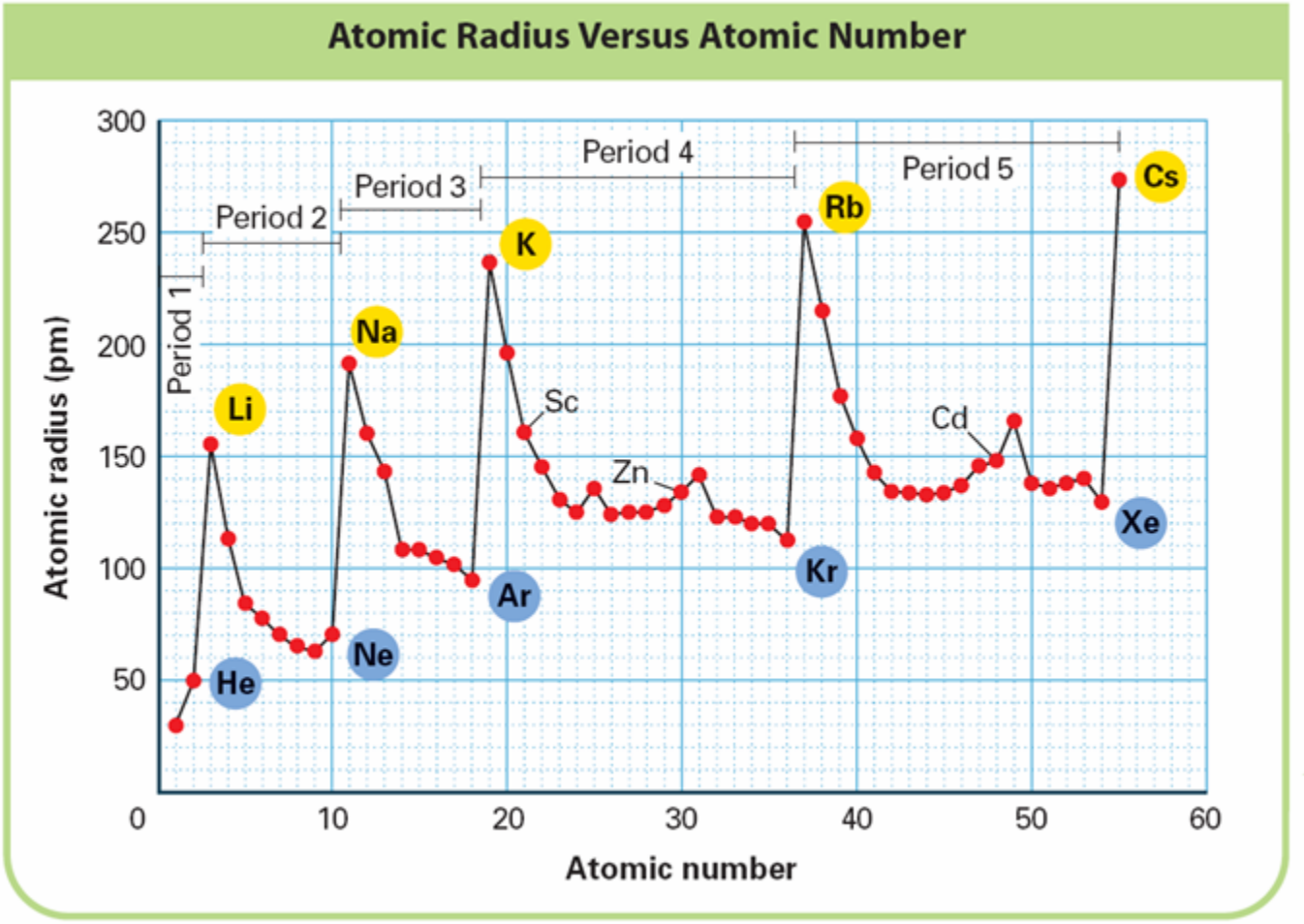
- The atomic radius is one half of the distance between the nuclei of two atoms of the same element when the atoms are joined.



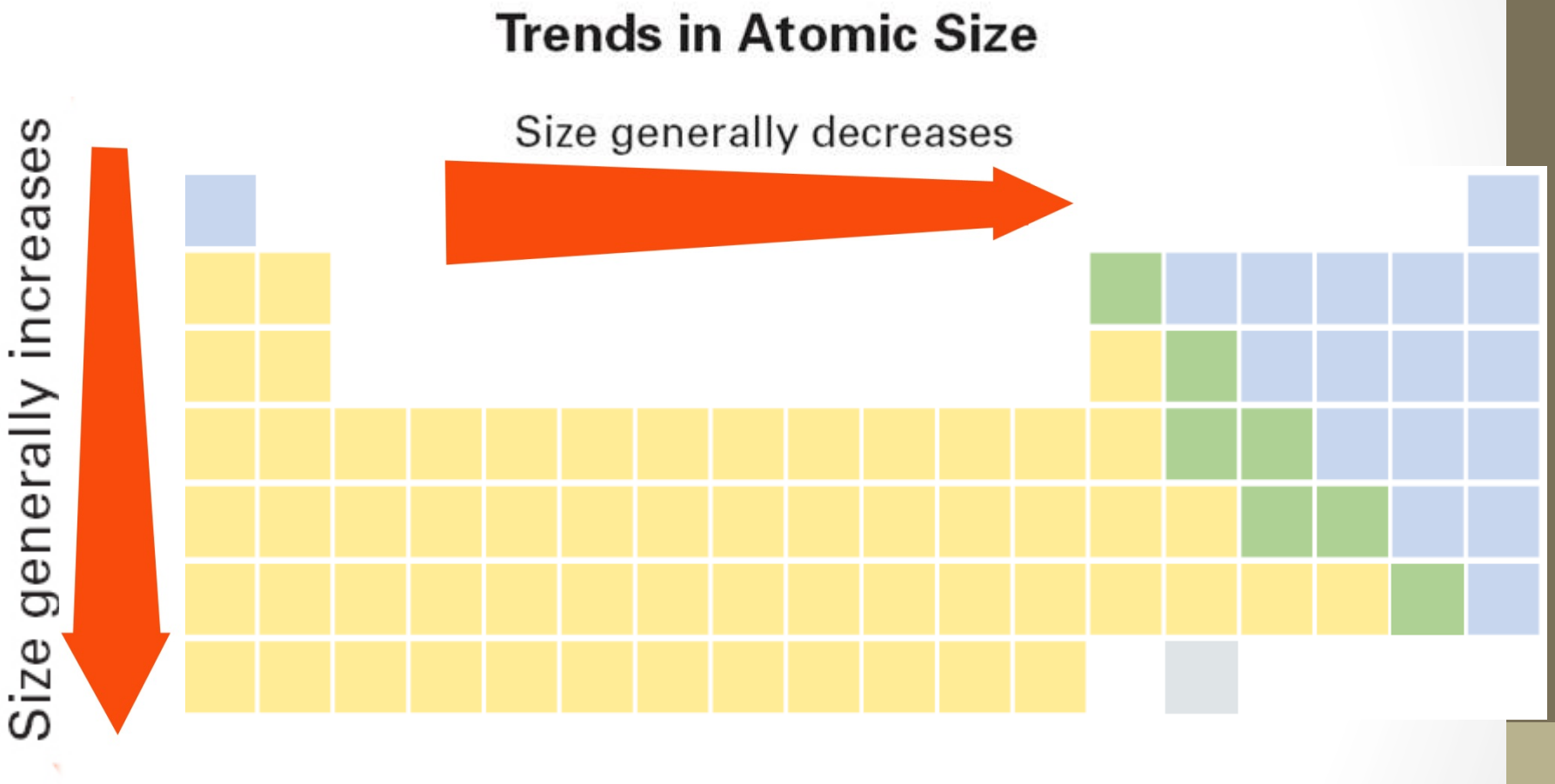
Trends in Atomic Size

- Group and Periodic Trends in Atomic Size
  - In general, atomic size increases from top to bottom within a group and decreases from left to right across a period.

Trends in Atomic Size



Trends in Atomic Size

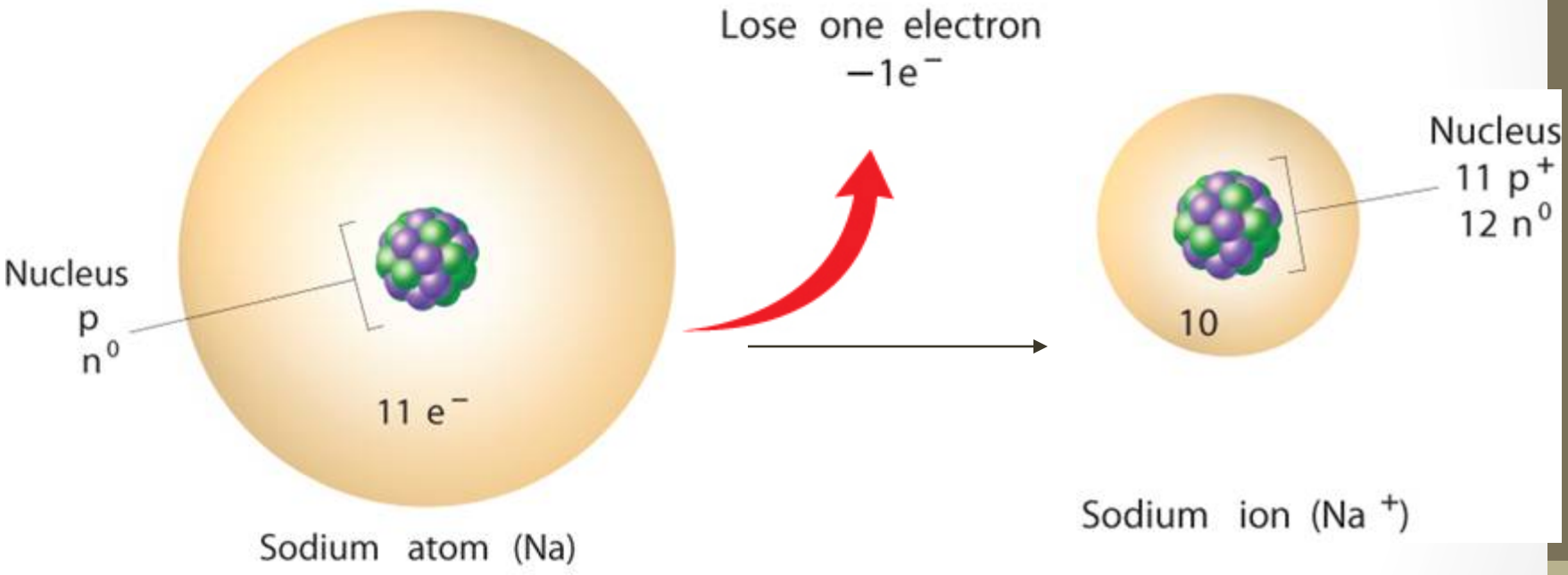


Ions

- Some compounds are composed of particles called ions.
  - An **ion** is an atom or group of atoms that has a positive or negative charge.
  - A **cation** is an ion with a positive charge.
  - An **anion** is an ion with a negative charge.

Ions

- **Positive and negative ions form when electrons are transferred between atoms.**



Ions

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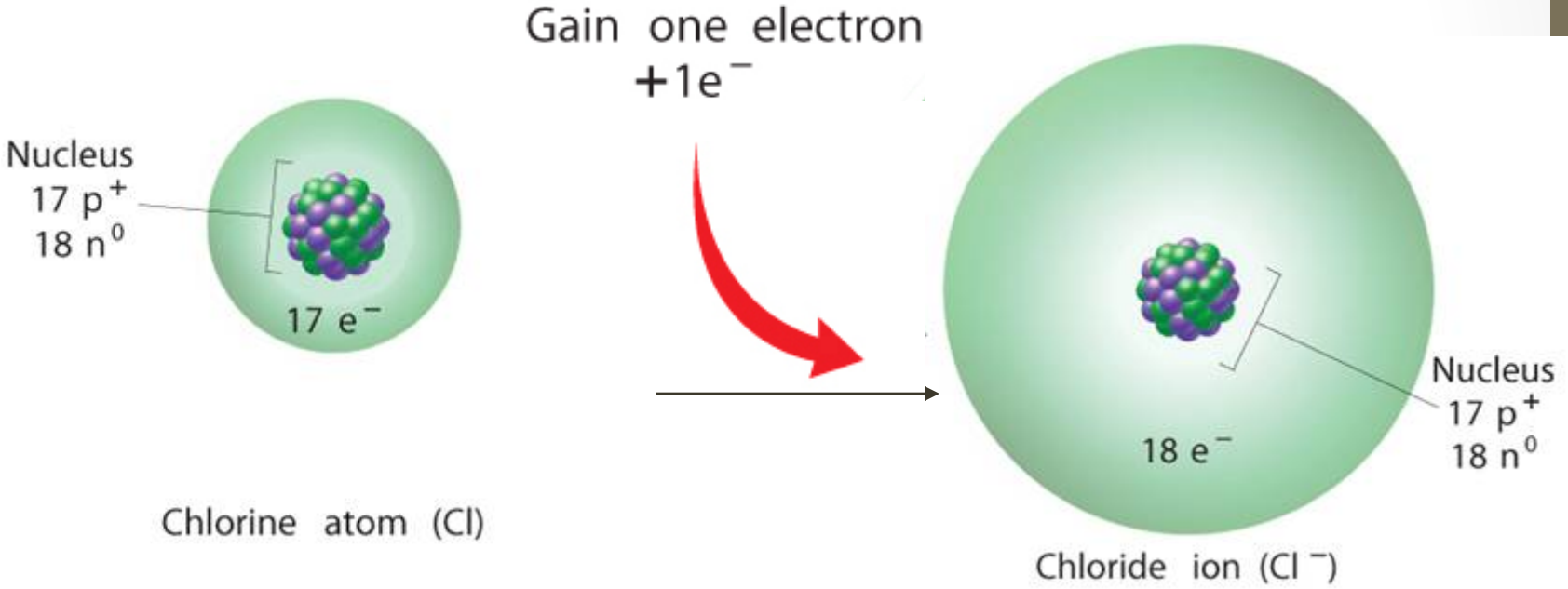
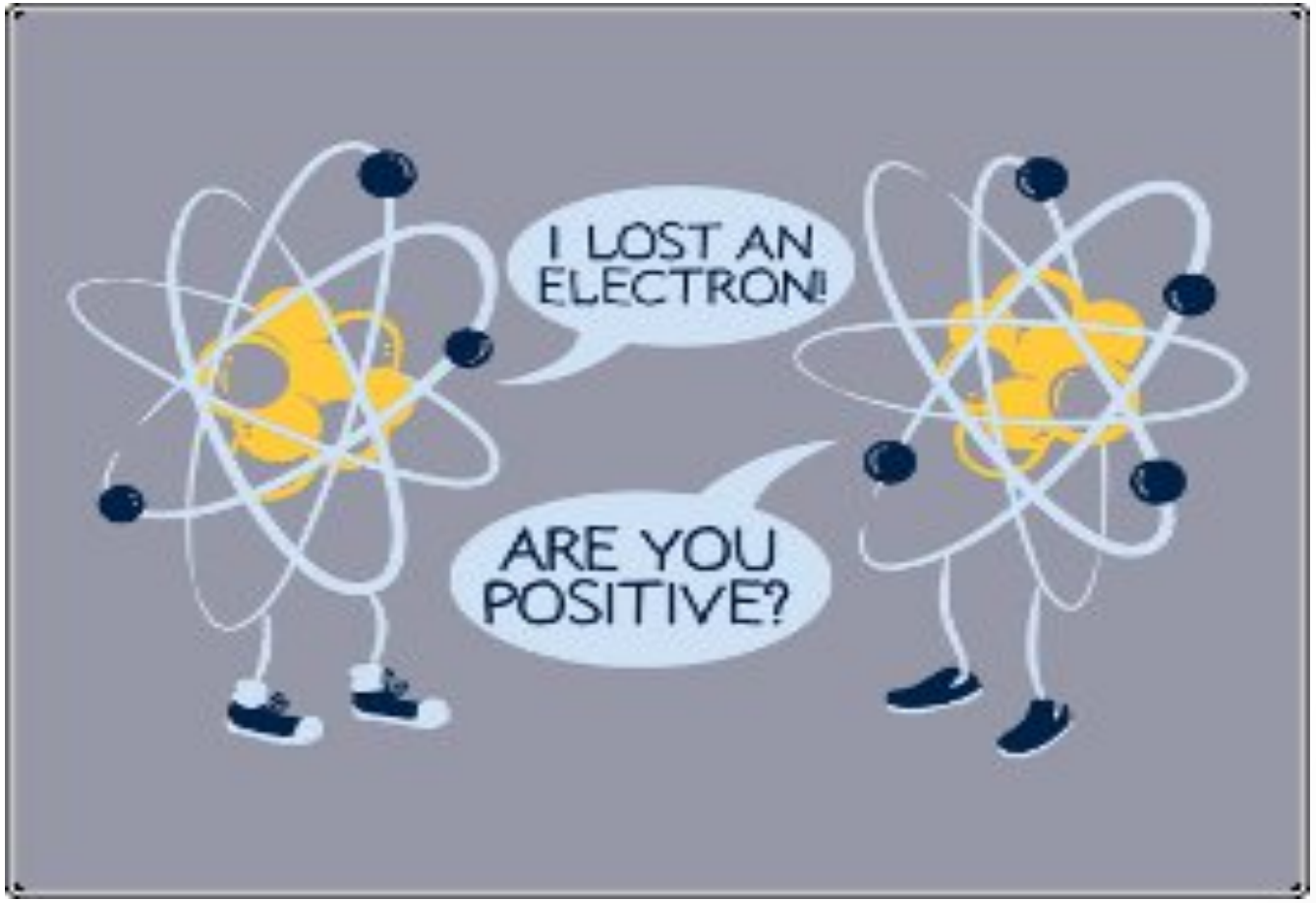


Ionic Size

- **Cations are always smaller than the atoms from which they form.**
- **Anions are always larger than the atoms from which they form.**


I LOST AN ELECTRON!
ARE YOU POSITIVE?

Trends in Ionization Energy

- Trends in Ionization Energy

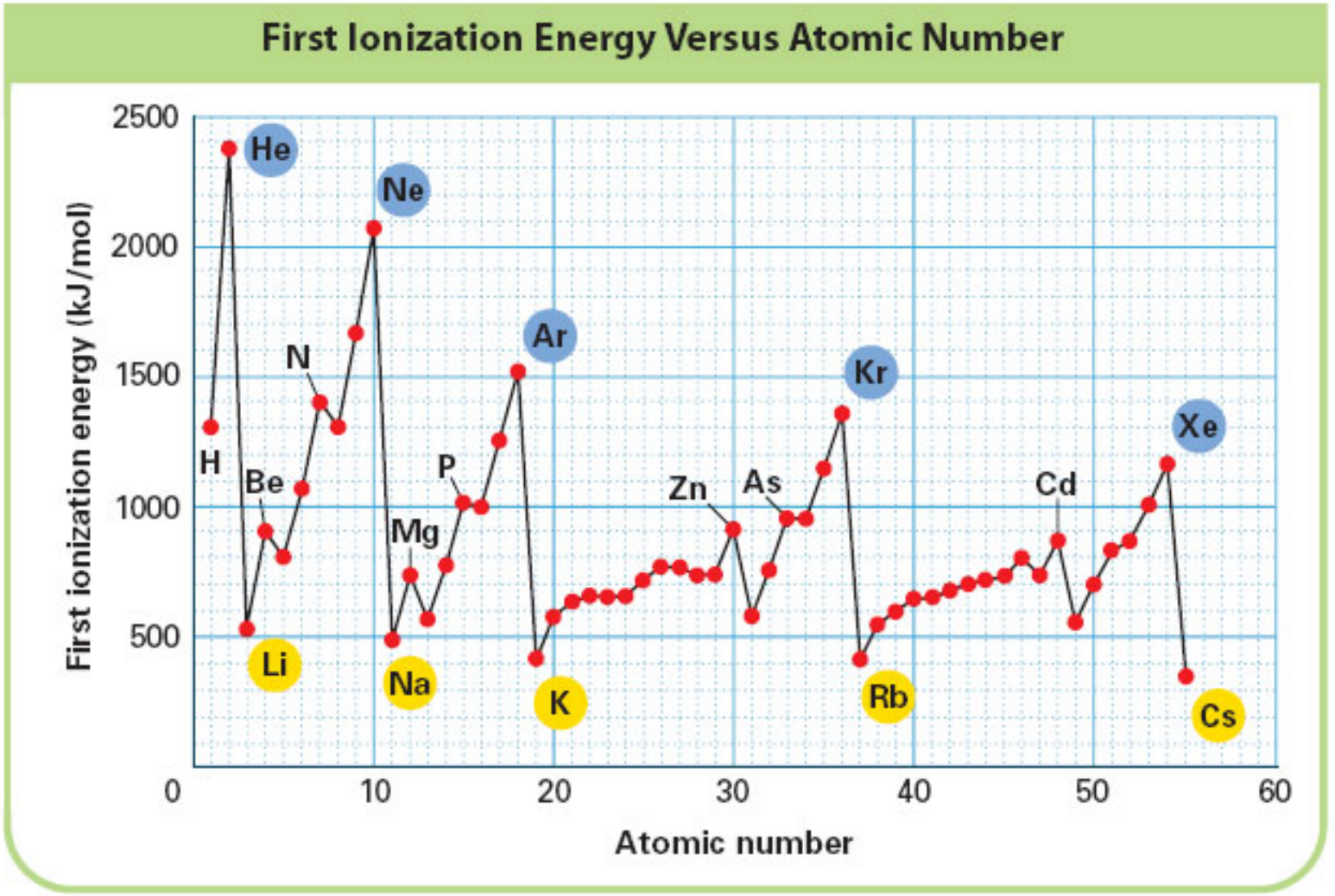
Trends in Ionization Energy

- The energy required to remove an electron from an atom is called **ionization energy**.
  - The energy required to remove the first electron from an atom is called the first ionization energy.

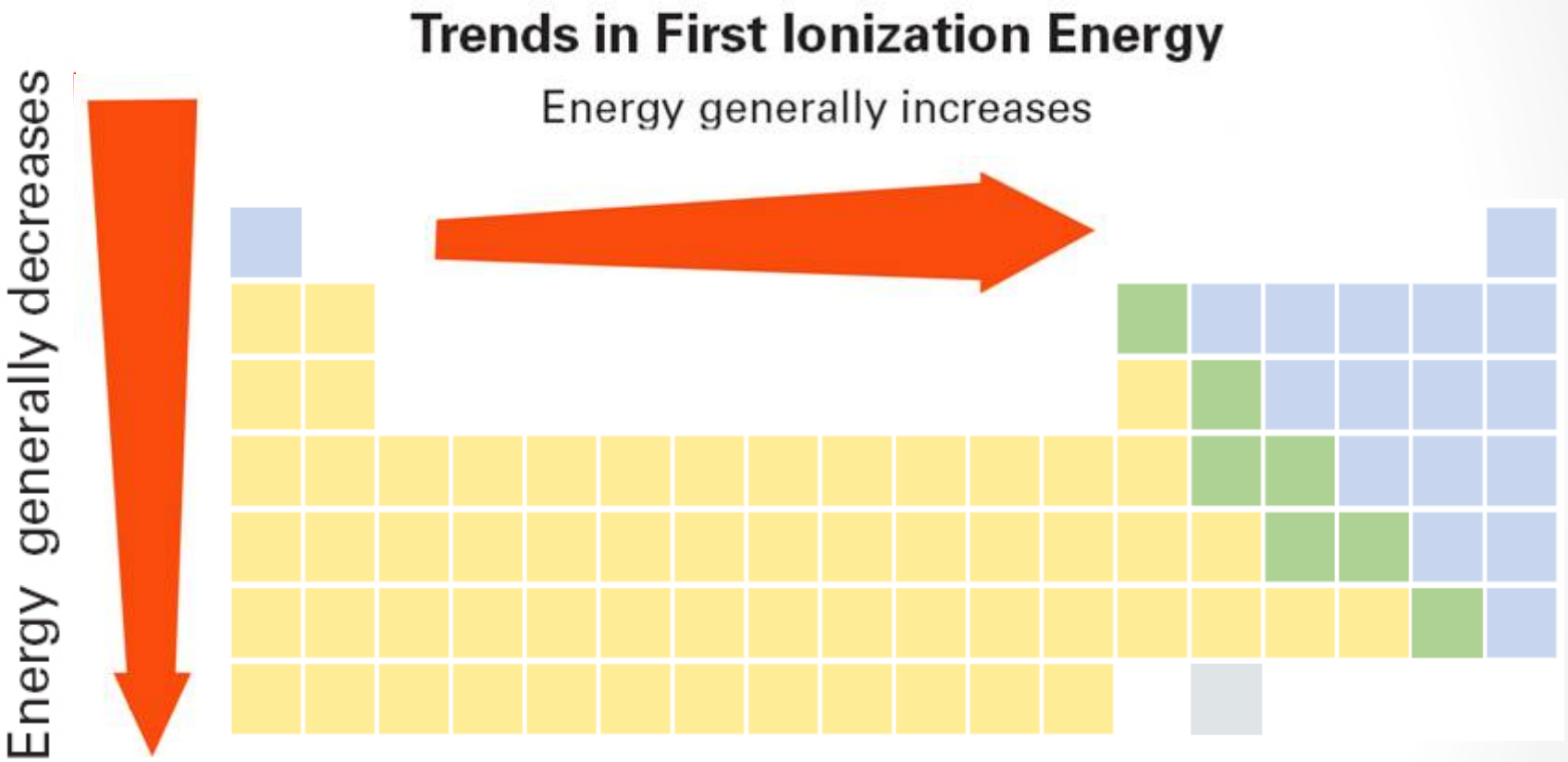
Trends in Ionization Energy

- Group and Periodic Trends in Ionization Energy
  - First ionization energy tends to decrease from top to bottom within a group and increase from left to right across a period.
  - The higher the nuclear charge, the harder it is to remove electron. Therefore, ionization energy is larger.

Trends in Ionization Energy



Trends in Ionization Energy



Trends in Electronegativity

- Trends in Electronegativity
  - **Electronegativity** is the ability of an atom of an element to attract electrons when the atom is in a compound.
    - In general, electronegativity values decrease from top to bottom within a group. For representative elements, the values tend to increase from left to right across a period.
    - The greater the nuclear charge, the more easily the atom attracts electrons. Except for noble gases, whose electron configuration is full, so no more room for electrons!

Trends in Electronegativity

- Representative Elements in Groups 1A through 7A

Table 6.2

Electronegativity Values for Selected Elements

H 2.1						
Li 1.0	Be 1.5	B 2.0	C 2.5	N 3.0	O 3.5	F 4.0
Na 0.9	Mg 1.2	Al 1.5	Si 1.8	P 2.1	S 2.5	Cl 3.0
K 0.8	Ca 1.0	Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8
Rb 0.8	Sr 1.0	In 1.7	Sn 1.8	Sb 1.9	Te 2.1	I 2.5
Cs 0.7	Ba 0.9	Tl 1.8	Pb 1.9	Bi 1.9		

Trends in Electronegativity