Warm-up:

## Atomic Size

There are two basic trends in atomic size on the periodic table.

1. In each column, the atomic size (radius) tends to increase as you move from the top to the bottom of the column.
2. In each row (period), the atomic size tends to decrease as you move from left to right.

Following the guidelines above, determine which of each pair would most likely be larger.

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a. Mg or Ca
b. Y or Ru
c. C or Ge
d. Ne or Xe
e. W or Au
f. Zn or Hg

- Valence: electrons in the outermost shell → reacting electrons
- Shielding: buffering electrons in between the nucleus and valence


Orbital Diagram Rules: ☆memorize

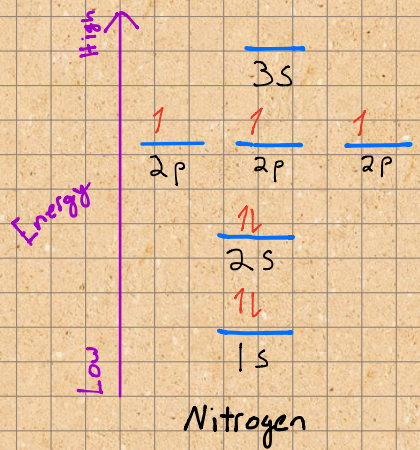
1) Aufbau Principle: lowest energy orbitals must be filled first
   ↳ Electrons are drawn with arrows: up arrow = positive spin
   down arrow = negative spin

2) Pauli Exclusion Principle: orbitals can hold up to two electrons → must have opposite spin  He → $\frac{\uparrow\downarrow}{1s}$

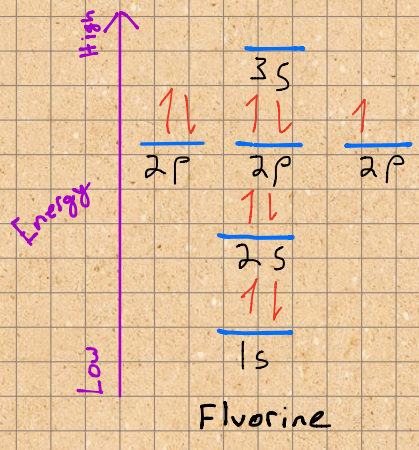
3) Hund's Rule: When filling subshells of the same level, each orientation must have 1 e⁻ in it before pairing

$\frac{\uparrow\downarrow}{2p}$ $\frac{\uparrow}{2p}$ $\frac{\uparrow}{2p}$

Electron Orbital Diagram:

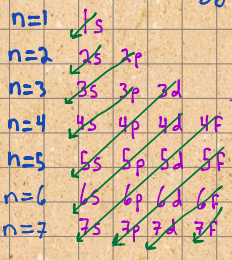



Nitrogen




Fluorine

## Principle Energy Level:




- Electron configurations: Shorthand notation for orbital diagrams
  - Nitrogen: $1s^2 2s^2 2p^3$ → 5 valence $e^-$
  - Fluorine: $1s^2 2s^2 2p^5$ → 7 valence $e^-$

- Noble gas configuration: Shorthand for the shorthand
  - Rb: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ (37 $e^-$ total)
  - Noble gas for Rb: $[Kr]\ 5s^1$