CONCEPT: THE ELECTRON CONFIGURATION (SIMPLIFIED)

Electron Orbital Diagrams

- The visual representation of electrons within **orbitals**.
  - □ **Degenerate orbitals**: **Electrons** in the same set of orbitals having _____ energy – filled using *Hund's Rule*.
  - □ **Hund's Rule:** Degenerate orbitals are first _____ -filled before they are totally filled.

Electron Orbital Diagrams

Subshell	Sets of Orbitals	Max Electrons
s		_____
p		_____
d		_____
f		_____

EXAMPLE: Properly fill in the orbitals of an atom that possesses 8 electrons within its *d* set of orbitals.

PRACTICE: Which electron configuration represents a violation of Hund's Rule?

a) 1s 2s 2p

b) 1s 2s 2p

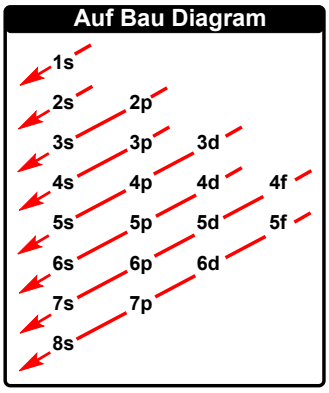
c) 1s 2s 2p

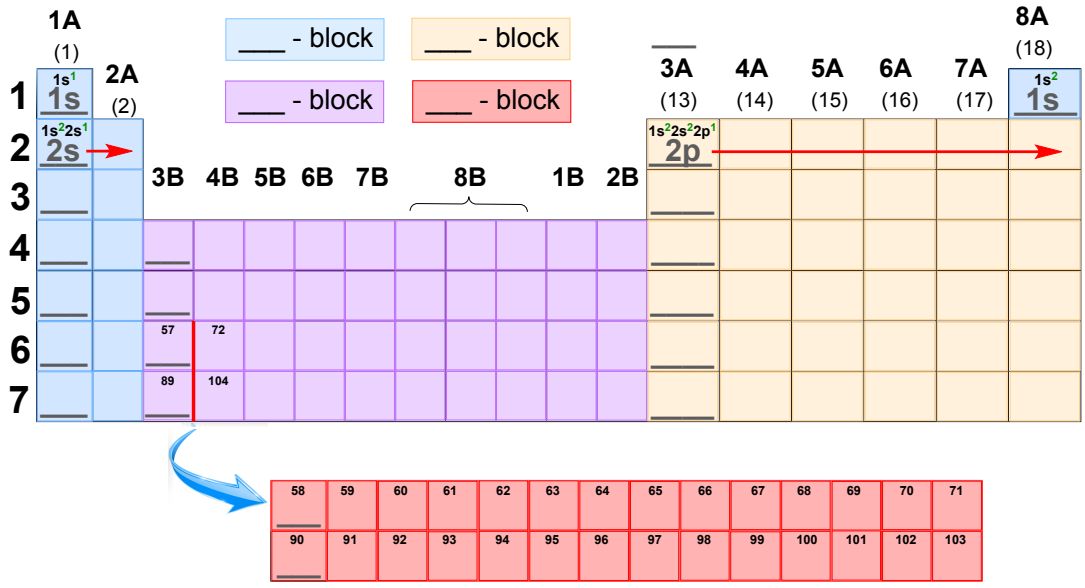
d) 1s 2s 2p

CONCEPT: THE ELECTRON CONFIGURATION (SIMPLIFIED)

Ground State Electron Configurations

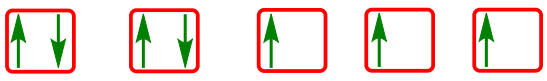
- Distributions of electrons (1s, 2s, 2p …) within orbitals using the *Auf Bau Principle*.
  - □ **Auf Bau Principle:** Starting from 1s, electrons fill _____ energy orbitals before moving to _____ energy orbitals.

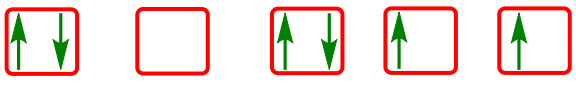


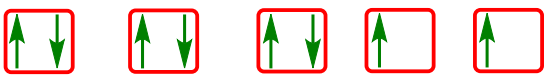


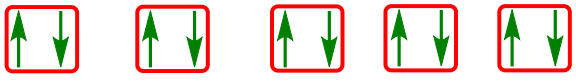
EXAMPLE: Write the ground state electron configuration for the following element: Fluorine (Z = 9)

PRACTICE: Which electron configuration represents a violation of the Auf Bau Principle?

a) 

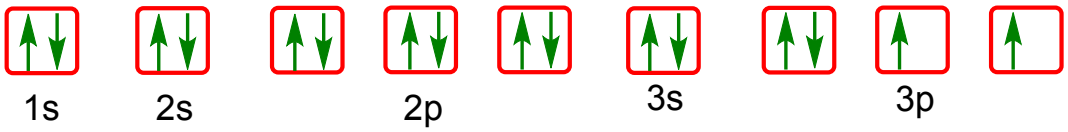
b) 

c) 

d) 

CONCEPT: THE ELECTRON CONFIGURATION (SIMPLIFIED)

PRACTICE: Identify the element with the given electron orbital diagram.



a) Silicon b) Fluorine c) Sulfur d) Chlorine e) Phosphorus

PRACTICE: Write the electron configuration and electron orbital diagram for the following element:

Sulfur (Z = 16)

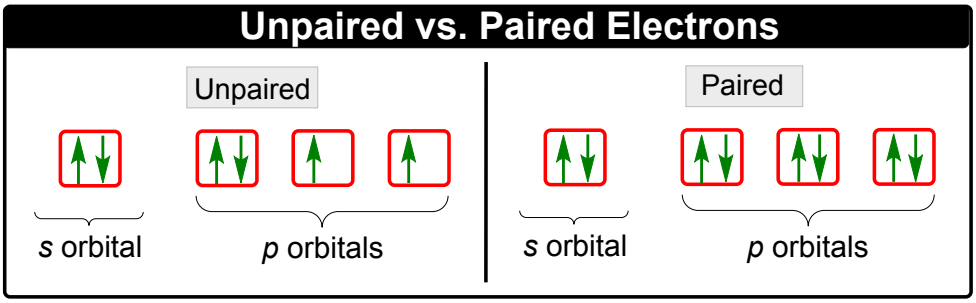
PRACTICE: Write the ground state electron configuration for the following element:

Magnesium (Z = 12)

CONCEPT: ELECTRON CONFIGURATION (SIMPLIFIED)

Unpaired vs Paired Electrons

- Recall, an orbital can hold a maximum of 2 electrons that pair up with opposite spins.
  - □ **Unpaired Electron:** When an orbital contains ____ with its own spin.
  - □ **Paired Electron:** When an orbital contains ____ each with its own spin.



EXAMPLE: Determine the number of unpaired electrons in vanadium.

a) 1 b) 2 c) 5 d) 3

PRACTICE: Which of the following atoms has no unpaired electrons?

a) Ca b) N c) C d) F

PRACTICE: Which of the following atoms has the most unpaired electrons?

a) B b) Si c) P d) O e) Cl