Atomic Theory and Periodic Trends

Organization of the Periodic Table

- Mendeleev arranges the elements in his periodic table based on physical and chemical _____
- Elements in the same _____ share similar properties
  - Characteristics repeat in a predictable way
    - Why?
      - To answer this question, we need to look at the structure of the _____

What do you Know about Atoms?

- **In your notebook, without referring to you textbook, draw a diagram of a helium atom.**

- **What information did you provide about the atom in your diagram?**

Elements are made up of Atoms

- _____: Smallest unit of an element that has the properties of that element

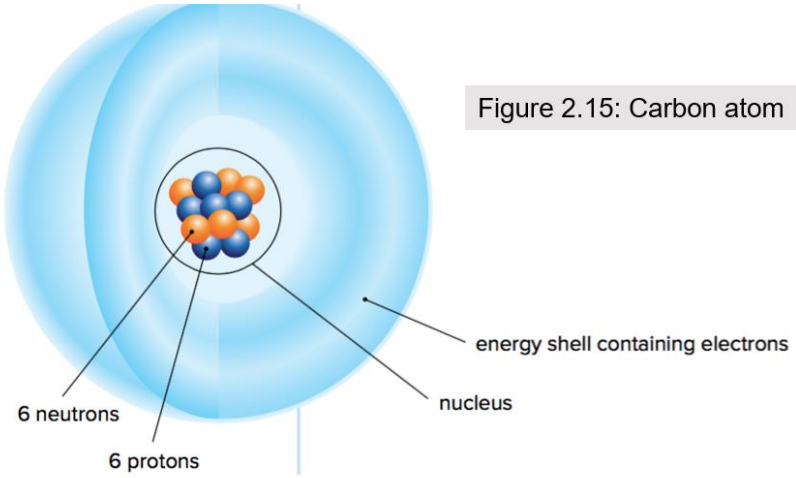


Figure 2.15: Carbon atom

Key Features of Atomic Structure

- Each atom has a tiny, dense _____ with neutrons and protons
- Nucleus is surrounded by _____, which exist in specific electron energy shells
- Most of the _____ of the atom is in the nucleus

Table 2.3 Subatomic Particles

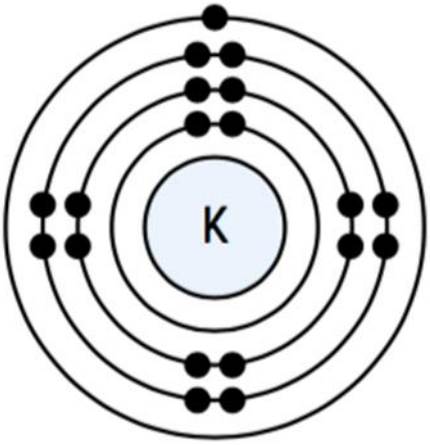
Name	Relative Mass	Electric Charge	Symbol	Location in Atom
proton	1836	+	p^+	nucleus
neutron	1837	0	n^0	nucleus
electron	1	–	e^-	electron energy shells surrounding the nucleus

Comparing Sub Atomic Particles

- Calculating Sub Atomic Particles
  - In an atom
    - the proton # is equivalent to the _____
      - Ex: Carbon's atomic # is 6, how many protons?_____
    - Since an atom is neutral, the # of protons (+) is _____ to the # of electrons (-)
    - The majority of the mass of an atom comes from _____
      - Therefore protons + neutrons = _____

Time out

- **Complete "Parts of an atom" worksheet**
- **Calculate protons, neutrons and electrons for an atom of Lithium, Neon and Phosphorous**



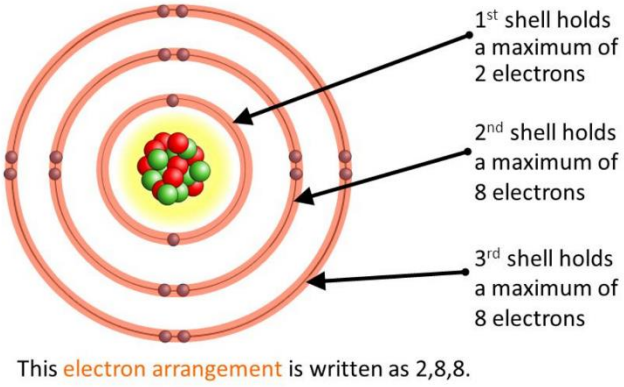
Bohr Diagrams Are a Useful Way to Model Atoms

Bohr diagrams represent the electron arrangements of atoms using _____

- Show how many _____ occupy each specific energy level or shell

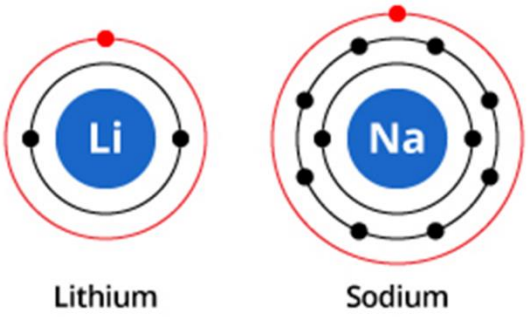
Bohr Diagrams and Energy Shells

- First energy shell: maximum _____electrons
- Second and third energy shell: maximum _____ electrons (for the first 20 elements)



Valence Shell

- **Valence shell** (_____ energy shell)
  - occupied by **valence electrons** (_____ in the outermost occupied energy shell of an atom)



Discussion Questions

1. **Draw a diagram of an atom, labelling protons, electrons, and neutrons.**

2. **List how many electrons can be found in the first, second and third energy shells.**

- **Drawing a Bohr Diagram**
- **Fill in your Bohr Diagram chart for the first 20 elements**
    - **Lets do the first couple together**