

LESSON NOTES

Subject: Basic Science

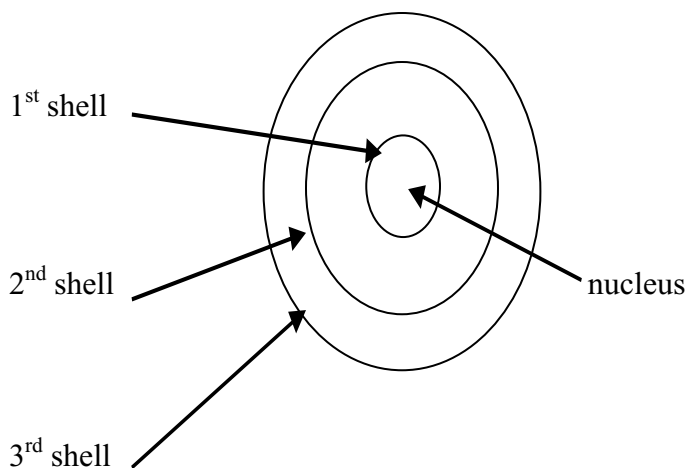
Year/Level: 10

Week 20

Strand	2: MATTER
Sub Strand	2.1 : INVESTIGATING MATTER
Content Learning Outcome	Investigate the structure of an atom and explain the properties of common elements in relation to their position on the periodic table.

Electron shells/Energy levels

- ❖ A region of space in which electrons move around the nucleus of an atom.
- 1st shell
 - ✓ close to the nucleus
 - ✓ has room for only **2 electrons**.
- 2nd and 3rd shell
 - ✓ contain up to **8 electrons in each shell**
- 4th shell
 - ✓ **can hold 18.** (This will be discussed later in higher Form)
- The shell **nearest** to the **nucleus fills up first**.



Outer shell/valence shell

- ❖ **last electron shell** in which there are electrons.
- ❖ The way an element behaves largely depends upon the electrons in the outermost shell.
- ❖ These outer electrons are the ones most commonly involved when atoms joined up with each other.
- ❖ **Metals** generally have **1 or 2 electrons** in their outer shells
- ❖ **Non-metals** have **3 or more electrons** in their outer shells

Octet : group of **8 electrons in a single electron shell**.

NOTE: Atoms with an octet for the outer shell are very **stable and unreactive**. Other atoms can achieve stable octet either by sharing electrons with other atoms or by gaining or losing electrons.

Electron configuration

- ❖ group of numbers which shows the arrangement of the electrons in an atom.
- ❖ **Example:** For the element **sodium (Na)** and **nitrogen (N)**.
Find the number of energy shells and electrons in each shell. Write the electron configuration.

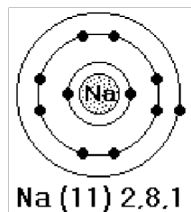
Sodium (Na)

Protons (atomic number) = 11

Electrons = 11

1st shell = 2 electrons, 2nd shell = 8 electrons, 3rd shell = 1 electron (Total electrons = 11)

Electron configuration: Na (2, 8, 1)



Neon (Ne)

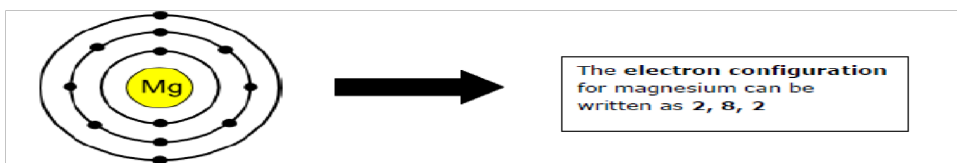
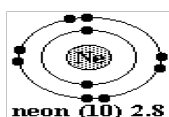
Protons = 10

Electrons = 10

1st shell = 2 electrons, 2nd shell = 8 electrons (Total electrons = 10)

Electron configuration

N : (2,8)



ACTIVITY:

1. In the periodic table, each row is called a _____ .
2. The elements in each _____ have the same number of _____.
3. Each column in the periodic table is called a _____ .
4. Each of the elements in the same _____ have the same number of _____ in their outer shells.
5. The electrons in the outer shell are called _____ electrons.
6. Fill in the table below:

Symbol	Element	Period	# of Shells	Group #	# Valence electrons
C					
Na					
Ne					
H					
Be					
S					
K					
He					

8. Draw the **electron structure diagram** for Oxygen

...STAY SAFE..