Pakistan School
Kingdom of Bahrain


ربی زدنی علما
BAHRAIN
PAKISTAN SCHOOL
المدرسة الباكستانية

Class 9th
Subject Chemistry

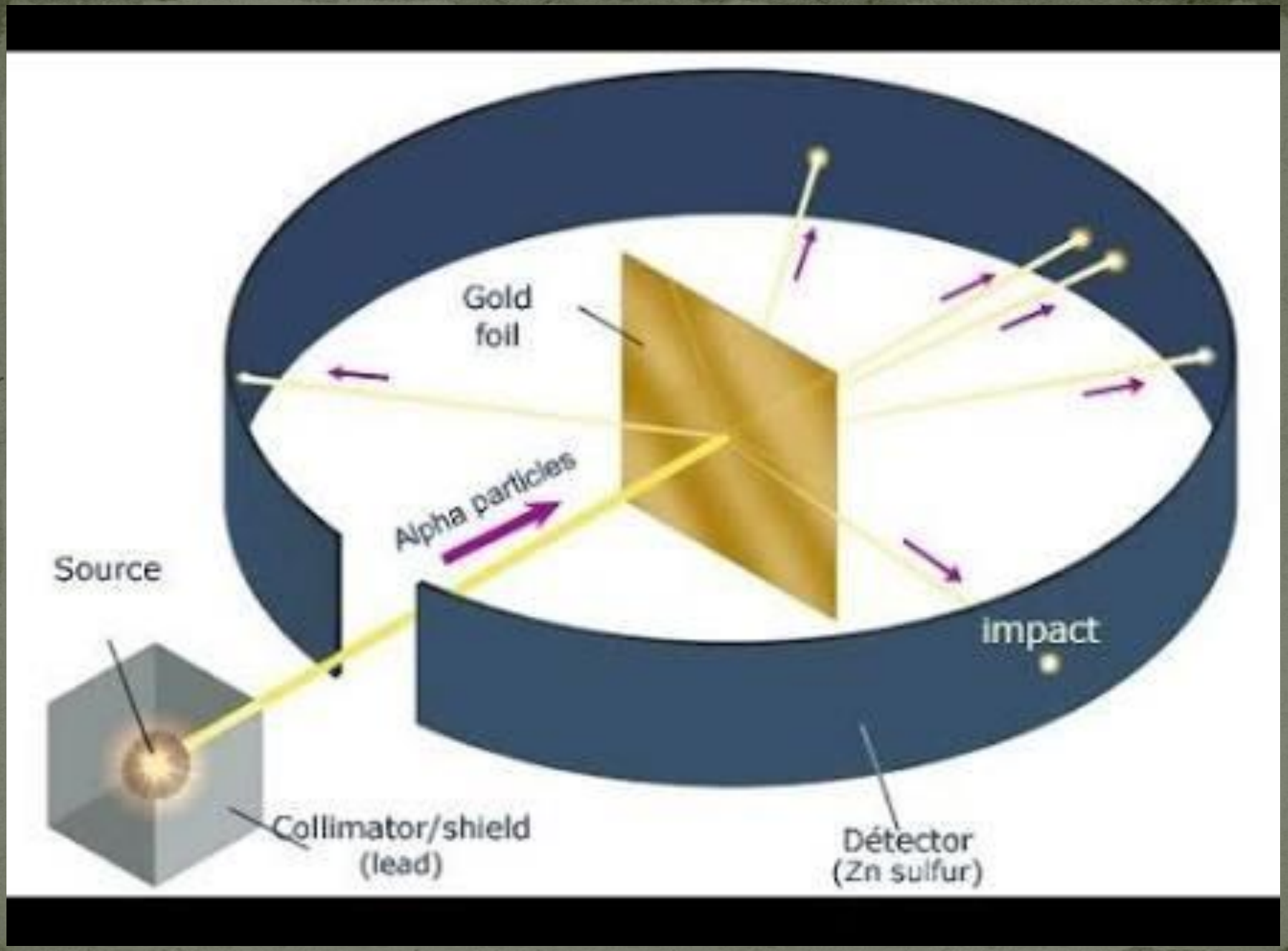
Topic:

Bohr's Atomic Theory

Objectives

At the end of this lesson, students will be able to:

- Explain how Bohr's Atomic Theory different from Rutherford's Atomic Theory.
- Draw Bohr's Model of different Atoms.

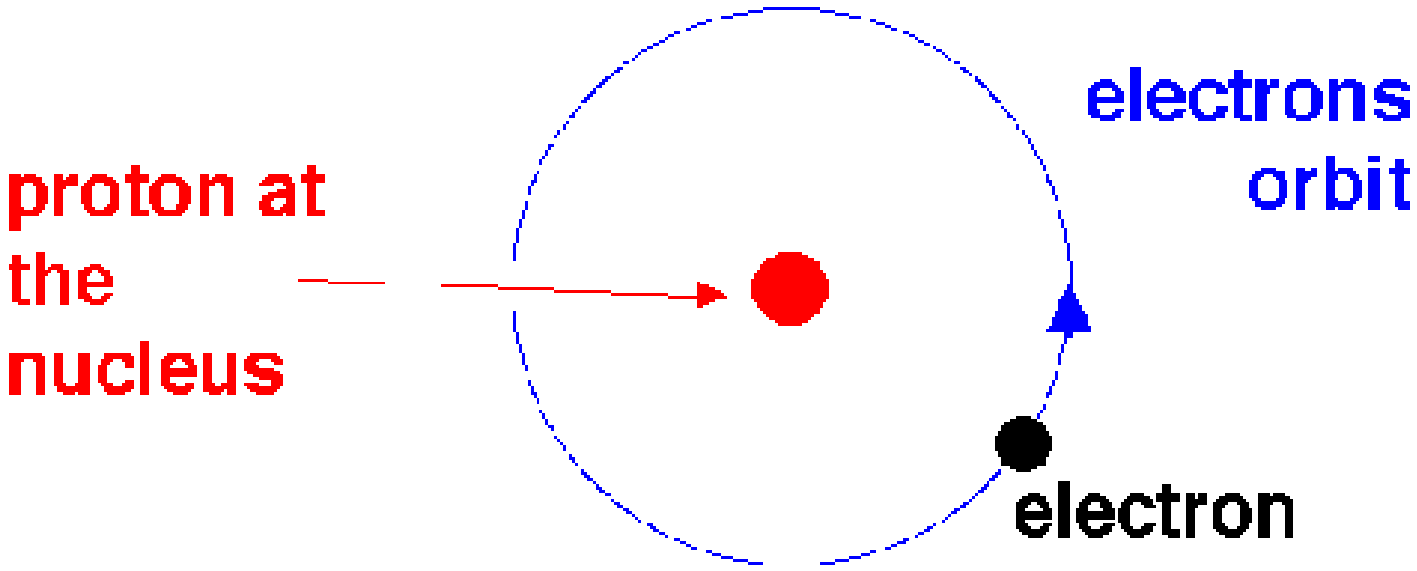

Gold
foil
Alpha particles
Source
impact
Collimator/shield
(lead)
Détector
(Zn sulfur)

In 1913 Neil Bohr presented his atomic model,

He proposed a model for an atom that was consistent with Rutherford's Model.

But it also explains the observed line spectrum of the hydrogen atom.

The Bohr Model

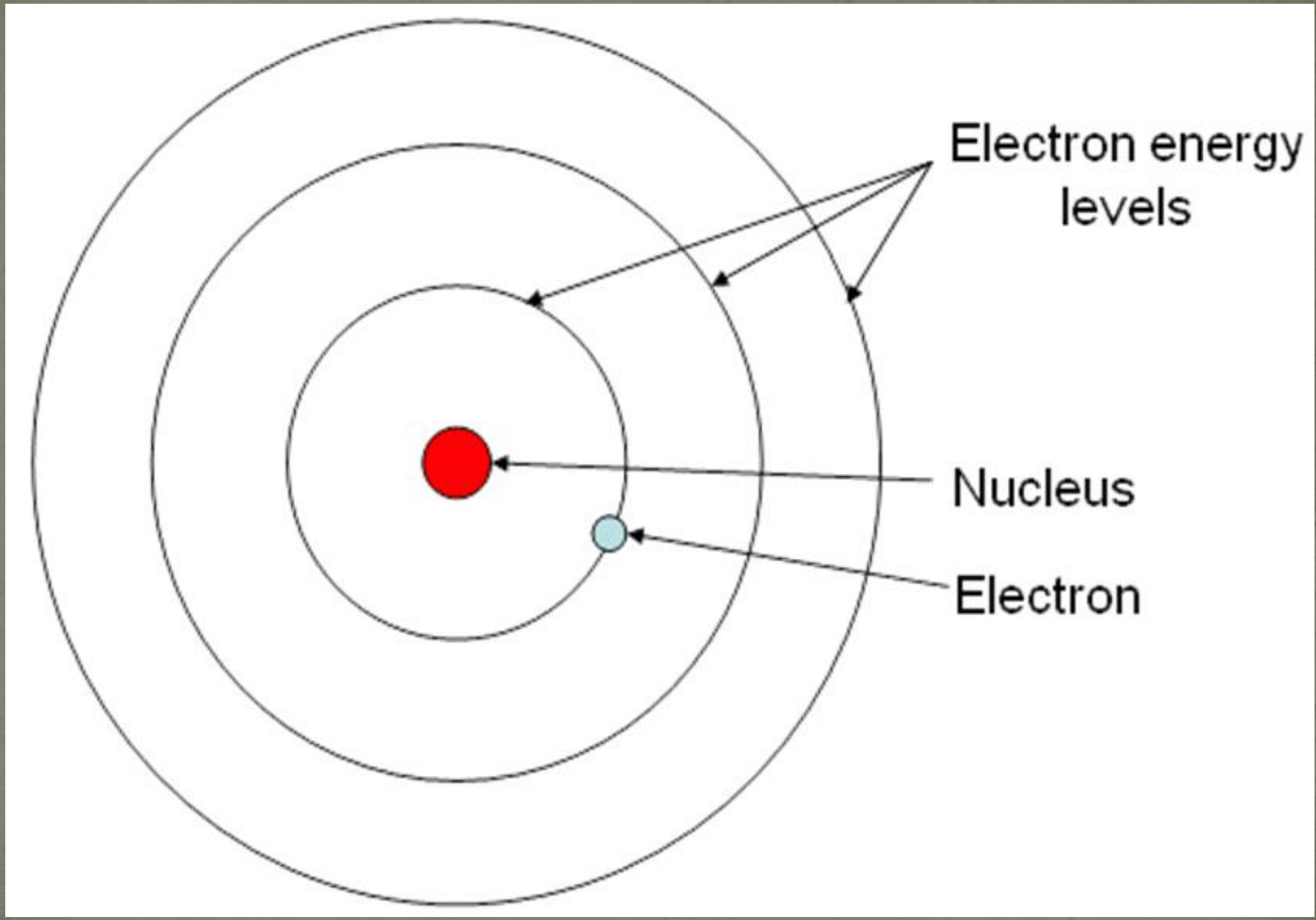


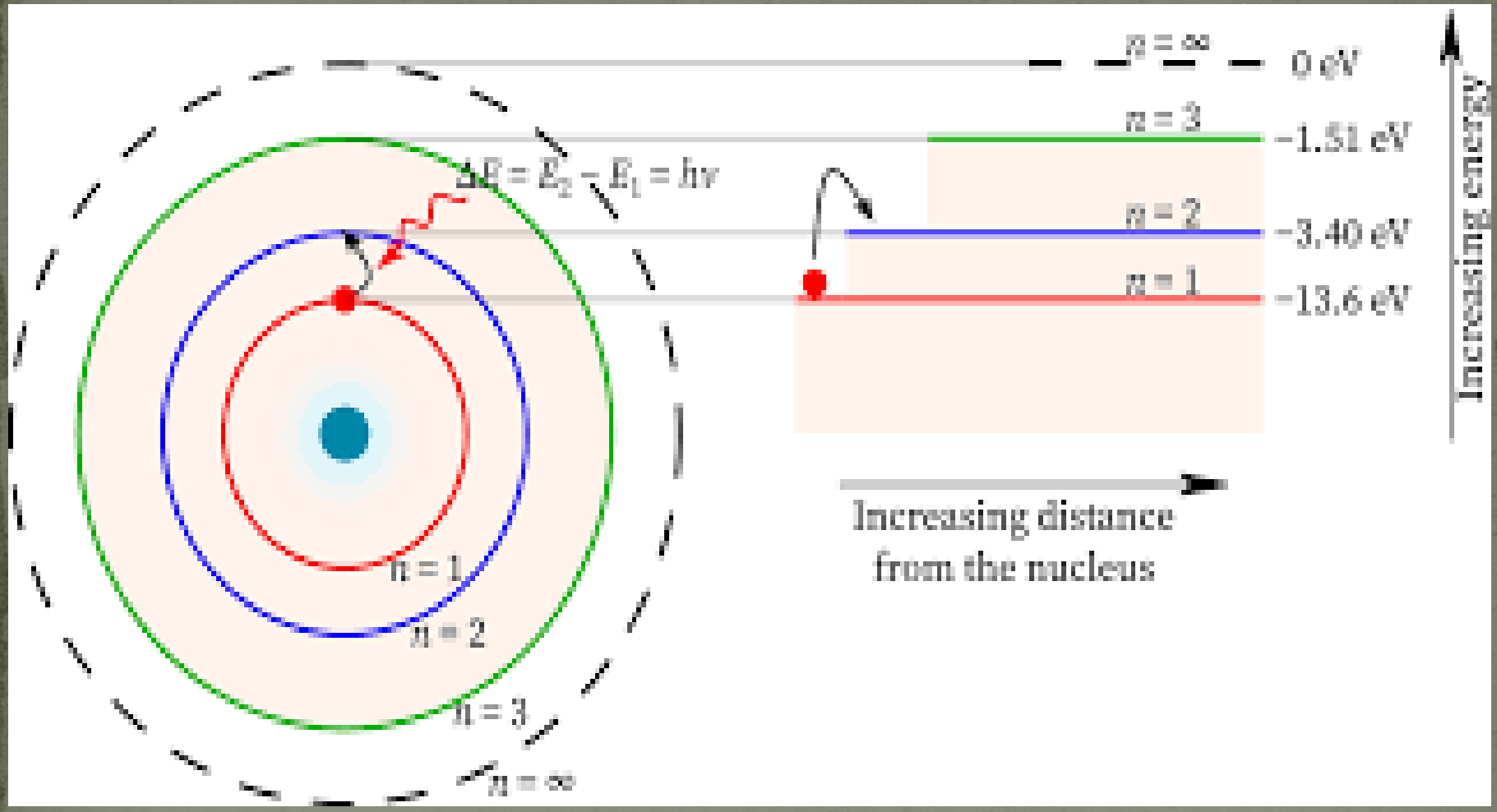
- the hydrogen atom

Main postulates of Bohr's Theory:

- Electrons revolve around the nucleus in circular path, which are known as "**ORBITS**" or "**ENERGY LEVEL**".
- Energy of the electron in an orbit is proportional to its distance from the nucleus.

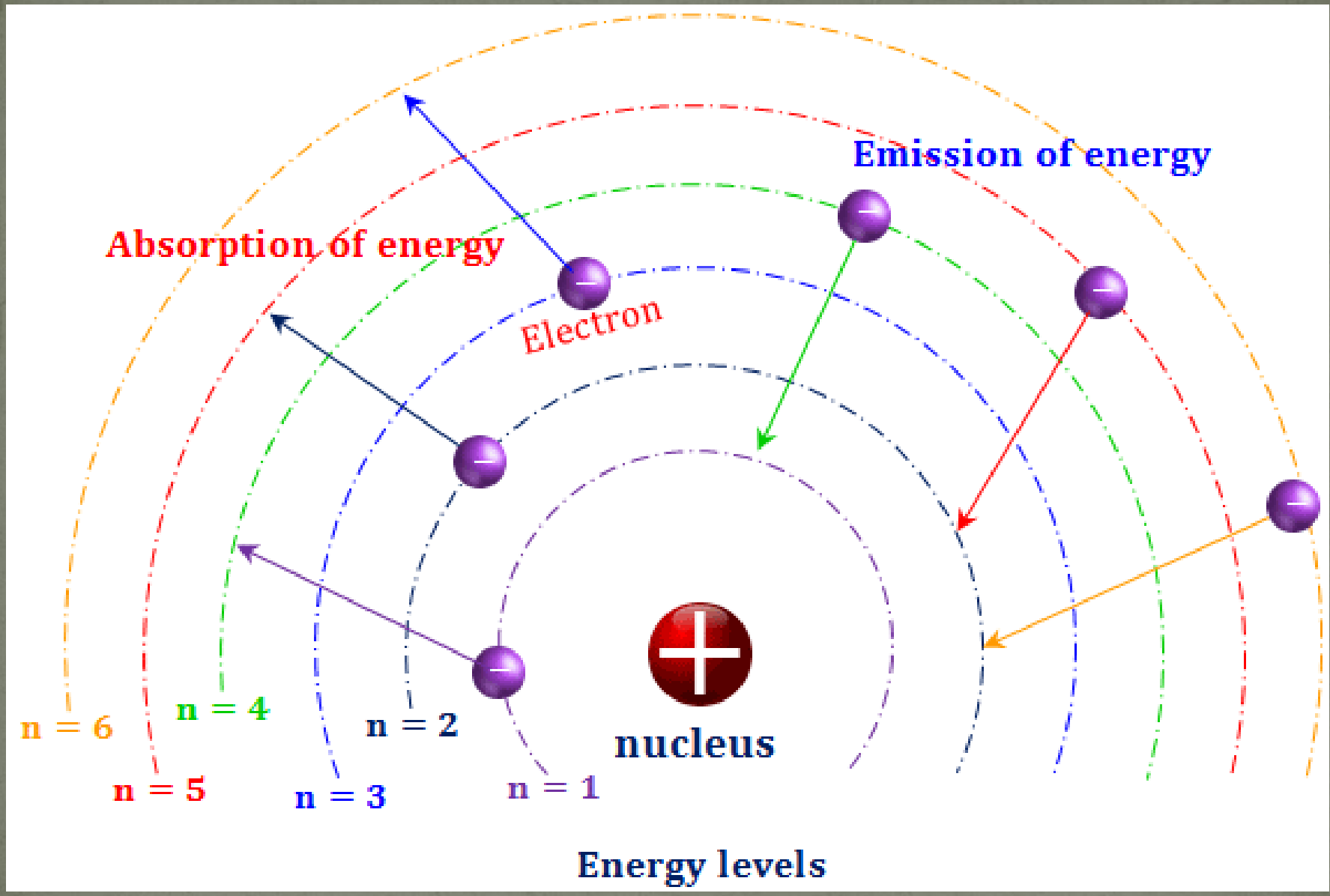
The further the electron is from the nucleus, the more energy it has.


Electron energy levels
Nucleus
Electron


n = ∞
0 eV
n = 3
−1.51 eV
n = 2
−3.40 eV
n = 1
−13.6 eV
ΔE = E2 − E1 = hν
Increasing energy
Increasing distance
from the nucleus
n = 1
n = 2
n = 3
n = ∞

- The electron revolves only in those orbits for which the angular momentum of the electron is an integral multiple of $h/2\pi$ where **h** = Planck's constant (6.6256×10^{-34} J.s)

- Light is absorbed when an electron jumps to a higher energy orbit and emitted when an electron falls into a lower energy orbit. Electron present in a particular orbit does not radiate energy.

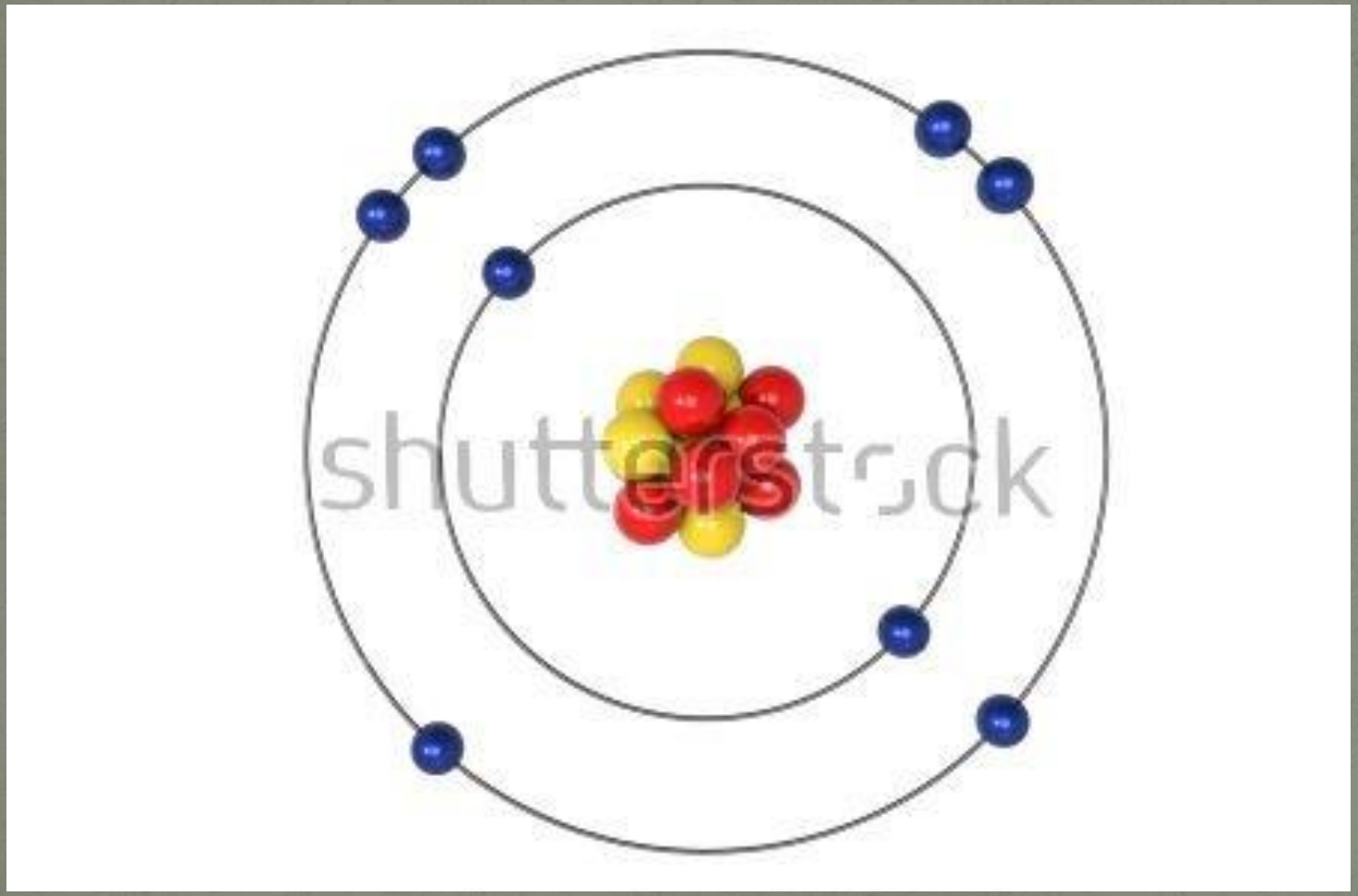

Emission of energy
Absorption of energy
Electron
n = 6
n = 5
n = 4
n = 3
n = 2
n = 1
nucleus
Energy levels

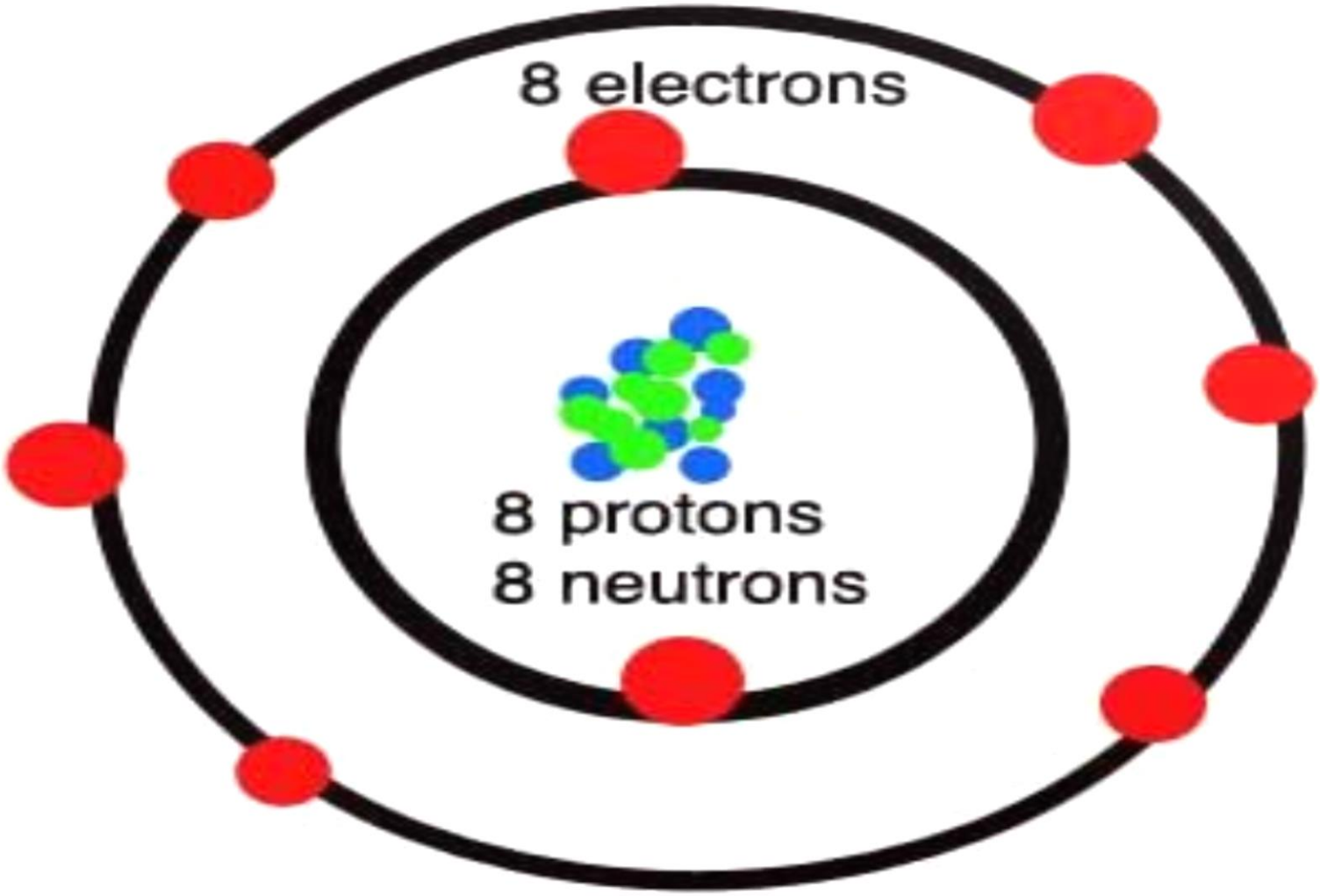
- The energy of the light emitted is exactly equal to the difference between the energies of the orbits.

$$\Delta E = E_2 - E_1$$

Where ΔE is the energy difference between any two orbit with energies E_1 and E_2

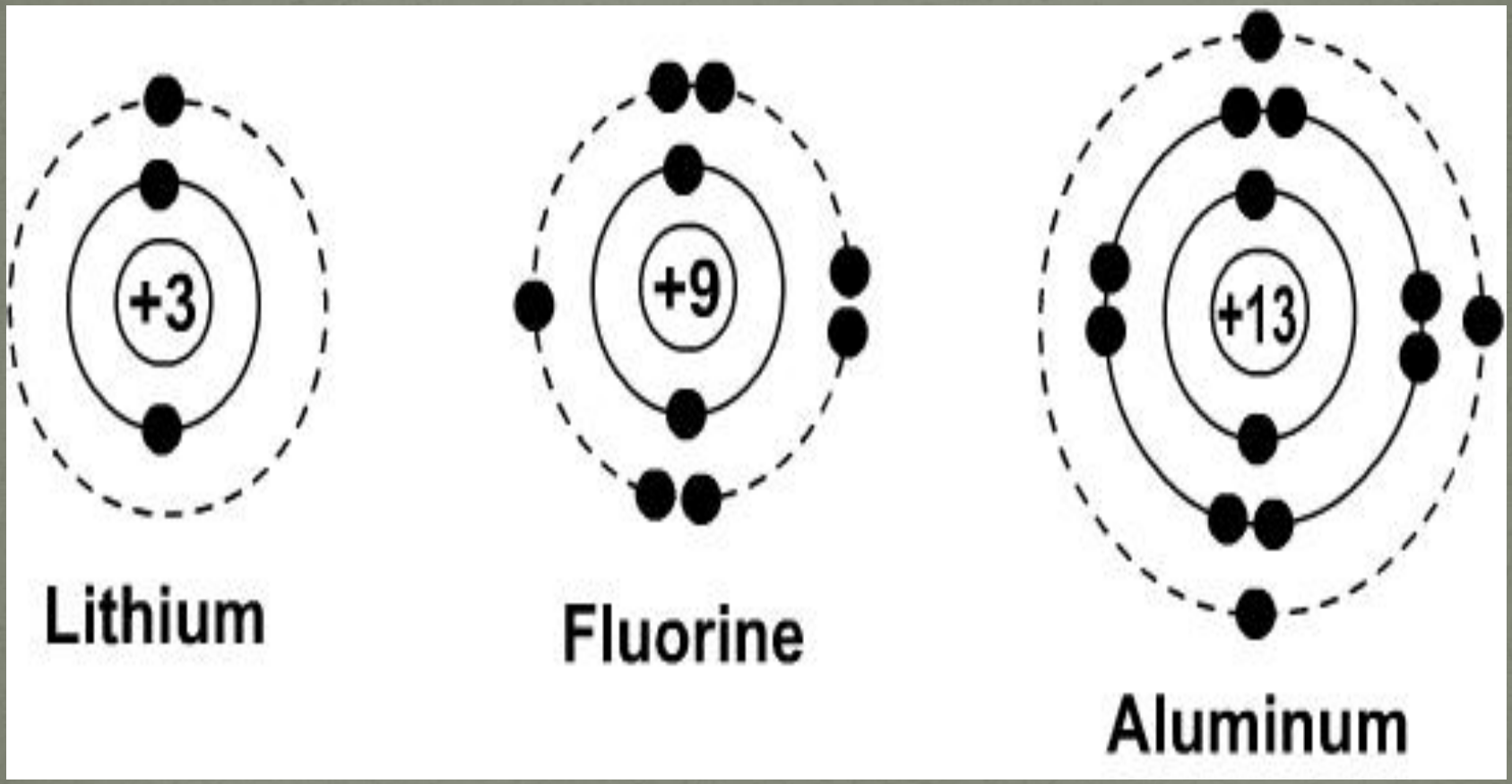
Bohr's Model of Oxygen
(Atomic No.8 Mass No. 16)




8 electrons
8 protons
8 neutrons

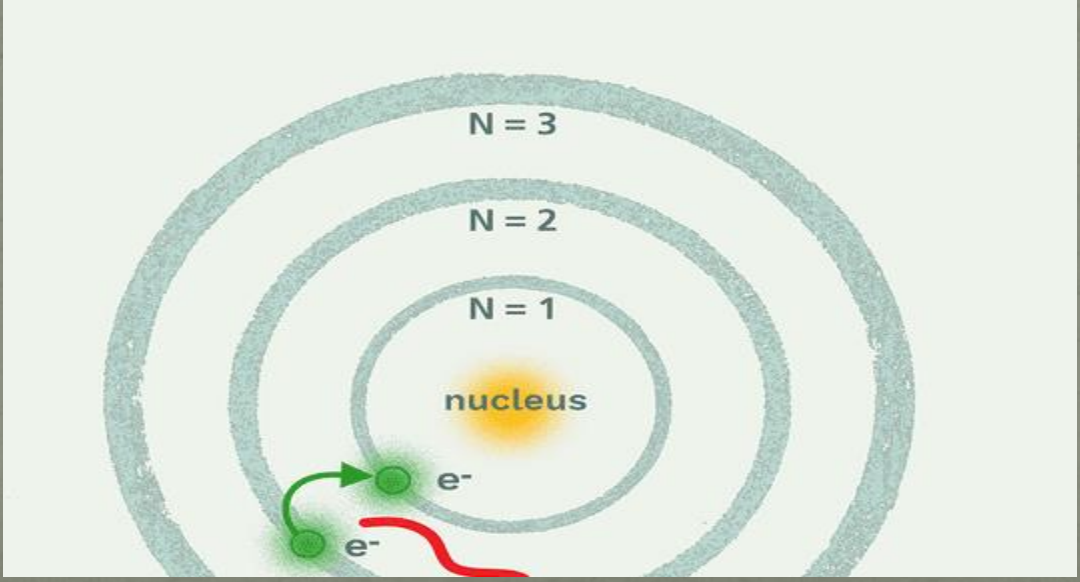
No of neutron:

Li : 4 F: 10 Al: 14



PLENARY

- Electrons revolves around the nucleus? T/ F
- Light is _____ When an Electron jumps to a higher energy orbit. (Emitted/ Absorbed)
- Which one of the followings orbit has lower energy?



HOME WORK

- Draw Bohr's Model for the following atoms indicating the location for electrons, protons and neutrons,
- Carbon (Atomic No. 6 Mass No. 12)
- Chlorine (Atomic No. 17 Mass No. 35)


STAY
home
STAY
safe

ALLAH HAFIZ