	SHS LEARNING ACTIVITY	CHEM1-02-04

Name: _____   **Score/Mark:** _____

Grade and Section: _____   **Date:** _____

Strand: ☐ **STEM**   ☐ **ABM**   ☐ **HUMSS**   ☐ **ICT (*TVL Track*)**

Type of Activity :   ☐ Concept Notes   ☐ Skills: Exercise/Drill   ☐ Illustration
☐ Laboratory Report ☐ Essay/Task Report ☐ Other: _____

Activity Title: 02-04.Identical atoms are atoms of the same element   v03

Learning Target: To explain that there are 118 chemical elements, each with its own type of atom

Authors/References: Victor Sojo

Atoms are made of **protons** and **neutrons** in the **nucleus**, and **electrons** distributed in **orbitals** around the nucleus.

If two atoms are identical, they are atoms of the same chemical **element**.

There are 118 known elements. Some have names you may recognize, like carbon, gold, silver, oxygen, hydrogen, or sodium; but there are many with less famous names, such as thulium, seaborgium or praseodymium.

If we compare two atoms, their number of protons could be the same or it could be different, and the same applies to neutrons and electrons.

We can consider what would happen if we vary the number of each of the three subatomic particles. We will do this in detail in later LASs, but just as an introduction:

- **Protons** determine the **element**: atoms with a different number of protons in the nucleus are atoms of different elements. Carbon always has 6 protons, uranium always has 92, and hydrogen only 1.

- **Electrons** determine the **ion**: since protons are positive and electrons negative, if we vary the number of electrons the atom will have a charge and we instead call it an "ion" (pronounced "eye-on").

- **Neutrons** determine the **isotope**: two atoms can be different just in their number of neutrons. These are called "isotopes" of the element. Carbon, for example, has three natural isotopes; nitrogen has two.

Question

How many electrons do the (neutral) atoms hydrogen, carbon, and uranium have? Does this mean they always have an equal number of protons and electrons?