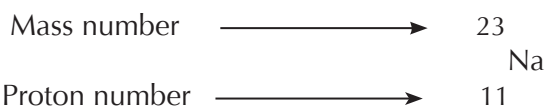


LEARNING OUTCOME

(c) Show an awareness that atoms of an element have a unique number of protons (proton number) and mass number (proton and neutron number).

- Atoms of the **same element** always contain the **same number of protons** and those of different elements contain different numbers of protons.
- An element is identified by its **proton number** (which is also called its **atomic number**). On the Periodic Table of Elements, it is the lower (smaller) number next to the chemical symbol.



- All atoms have the same number of electrons as protons. Hence, the proton number also indicates the number of electrons in the atom.
- The **mass number** of the atom is the **total number of protons and neutrons in the nucleus**. Therefore, the difference between the mass number and the proton number of an element is the number of neutrons in the nucleus of that element.

Link

Lower Secondary Science Matters Volume A (2nd Edition) — Section 8.4

Exam Tip

The mass number of an atom is the total number of protons and neutrons in the atom. It is therefore the total number of particles in the nucleus (nucleons). If you subtract the proton number from the mass number you will find the number of neutrons in the atom.

Common Error

✗ Atoms always have equal number of protons and neutrons.

✓ Atoms always have equal number of charged particles (protons and electrons). The number of neutrons can be the same or higher than the number of protons.

LEARNING OUTCOME

(d) Show an understanding that a molecule is a group of two or more atoms chemically combined together.

- **Molecules** are formed when **atoms combine together**. These molecules may contain atoms of the same element or atoms of different elements.