C8 The Periodic Table

C8.1 Arrangement of elements

Describe the Periodic Table as an arrangement of elements in periods and groups and in order of increasing proton number / atomic number

- The Periodic Table arranges elements in **periods** (horizontal rows) and **groups** (vertical columns) according to increasing **proton number** (atomic number). Elements in the same group have similar chemical properties, while periods show trends in properties across the row as atomic number increases.

Describe the change from metallic to non-metallic character across a period

- In the Periodic Table, as you move **across a period** (from left to right), the elements change from **metallic** to **non-metallic** in character.
- Metallic elements, on the left, lose electrons easily, while non-metals, found on the right, either gain or share electrons.

E.g.

Which trend is shown by the elements across a complete period of the Periodic Table, from left to right?

A metals → non-metals

B metals → non-metals → metals

C non-metals → metals

D non-metals → metals → non-metals

The answer is A.

Identify trends in groups, given information about the elements

- In the Periodic Table, elements in the same group (vertical column) show similar chemical properties because they have the same number of valence electrons, which determines their chemical behaviour. They show a trend or pattern in their physical properties.

- Examples:
  Group I (alkali metals): lithium (Li), sodium (Na), potassium (K) all have 1 valence electron, show increasing reactivity down the group.
  Group VII (halogens): fluorine (F), chlorine (Cl), bromine (Br) have 7 valence electrons and show decreasing reactivity down the group but increasing melting/boiling points.

  Trends allow for the prediction of element properties based on their position in the periodic table.

  E.g.

  The table shows some of the properties of the halogens in Group VII of the Periodic Table.
  Describe one trend in the physical properties of chlorine, bromine and iodine.

period	halogen	colour	physical state at room temperature
3	chlorine	pale yellow-green	gas
4	bromine	dark red-brown	liquid
5	iodine	blue-black	solid

Answer: darker in colour/ gas to solid / increasing m.pt./ increasing b.pt. / increasing density *down the group*