Chemistry · Revision

Periodic Table Guide

How to read the periodic table and predict how an element behaves from where it sits. This shows the first 20 elements; use your exam board's full table in the exam.

The first 20 elements

1	2	3	4	5	6	7	0
1 H							2 He
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca						

metal non-metal or metalloid · Column numbers are groups. Small numbers are atomic numbers.

How it's organised

- Elements are in order of **atomic number** (the number of protons).
- **Periods** are rows. The period number is the number of occupied electron shells.
- **Groups** are columns. Elements in a group have the same number of outer electrons, so they react in similar ways.
- Metals are on the left and in the middle. Non-metals are on the right.

Reading an element: sodium

Number	Tells you	Sodium, mass number 23, atomic number 11
Atomic number	protons (and electrons in an atom)	11 protons, 11 electrons
Mass number	protons + neutrons	23 − 11 = 12 neutrons
Electron shells	fill 2, then 8, then 8	2, 8, 1: group 1, period 3

Group 1: alkali metals

- Soft, low density, one outer electron.
- React with water to make a metal hydroxide and hydrogen.
- **Reactivity increases down the group**: the outer electron is further from the nucleus and more easily lost.

Group 7: halogens

- Non-metals made of diatomic molecules such as Cl_2, with seven outer electrons.
- Melting and boiling points increase down the group.
- **Reactivity decreases down the group**: it is harder to attract an extra electron.
- A more reactive halogen displaces a less reactive one from its salt: $Cl_2 + 2KBr \rightarrow 2KCl + Br_2$.

Group 0: noble gases

- Full outer shells make them very unreactive.
- Boiling points increase down the group.

Transition metals

- Found in the middle block, between groups 2 and 3.
- Often form coloured compounds and ions with different charges, such as Fe^{2+} and Fe^{3+}.
- Often useful as catalysts, and generally harder and denser than group 1 metals.

Common slip: reactivity goes in opposite directions: group 1 gets more reactive going down, and group 7 gets less reactive.

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