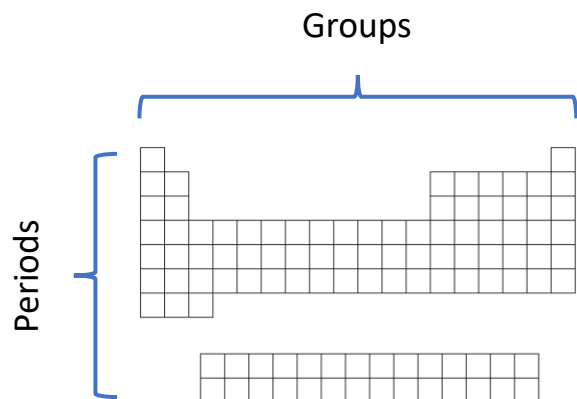




Chemistry Knowledge Organiser

The Periodic Table (Trilogy Science)

Groups and periods



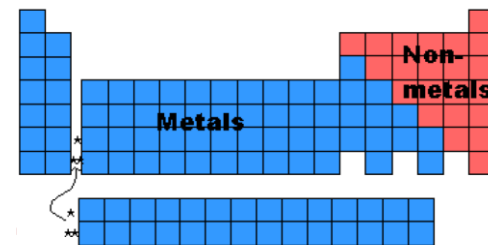
- Elements in the same group have the same number of electrons in the outer shell.
- Same number of electrons in the outer shell gives elements in the same group similar chemical properties.
- As you move across a period the atomic number (number of protons) increases by one.
- As you move down a period the number of electron shells increases by one.

The History of the Periodic Table

- Throughout history scientists have tried to classify substances and many scientists attempted to construct a Periodic Table.
- Before the knowledge of protons, neutrons and electrons, scientists arranged the Periodic table by **atomic weight**. This meant that elements were not always in groups with other elements which have similar properties..
- In 1869 Dimitri **Mendeleev**, published his Periodic Table. He still arranged elements by atomic weight but to make keep elements in groups with similar properties he gaps for elements that he thought had not been discovered yet and he swapped the places of some of the elements based on atomic weights.
- He predicted the properties of elements that had not been discovered and when there were his predictions were found to be very accurate. This led to acceptance of his Periodic Table by other Scientists.
- The modern Periodic Table is ordered by atomic number (number of protons) and we know that the existence of **isotopes** is what made the order by atomic weight incorrect.

Metals and non-metals

- Metals lose electrons forming positive ions
- Non-metals gain electrons forming negative ions





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The Periodic Table (Trilogy Science)

	Physical properties	Chemical Properties	Equations	Trends
Group 1 (Alkali metals)	Soft, low density(most float on water)	React vigorously with water releasing hydrogen	Sodium + Water → Sodium Hydroxide + Hydrogen $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$	More reactive as you go down the group, outermost electron becomes further from the nucleus so it's easier to lose.
Group 7 (Halogens)	Low melting point, exist as a diatomic molecules (Cl_2) in the elemental form	React with group 1 metals to form compounds . Can carry out displacement reactions	Sodium + Chlorine → Sodium Chloride Sodium Bromide + Chlorine → Sodium Chloride + Bromine	Less reactive as you go down the group as it becomes harder to gain an electron. Higher melting point as you go down the group (due to increase in atomic radius leading to stronger forces between molecules).
Group 0 (Noble Gases)	Low melting point/boiling point, exist as individual atoms in the elemental form	Unreactive, as they have a full outer shell	N/A	Higher melting point and boiling point as you go down the group (due to increase in atomic radius leading to stronger forces between atoms)