

Magnesium (Mg)

A compact revision sheet for quick reference. For interactive temperature states, 3D structure, orbitals, maps, comparisons, trends and quizzes, return to the online Magnesium guide.

12 Atomic number	Mg Magnesium	24.305 Relative atomic mass
----------------------------	------------------------	---------------------------------------

1. Quick facts

Property	Value	Meaning for a student
Group	2	Alkaline-earth metal
Period	3	Three occupied electron shells
Block	s	Valence electrons enter an s orbital
Electron configuration	[Ne] 3s ²	Two outer 3s electrons
Common oxidation state	+2 / Mg ²⁺	Mg commonly forms a 2+ ion
Electronegativity	1.31 (Pauling)	Attraction for bonding electrons
Atomic radius	≈173 pm	Useful for periodic-trend comparisons
Density	≈1.74 g/cm ³	Relatively light structural metal
Melting point	≈923 K (650 °C)	Solid below this at about 1 atm
Boiling point	≈1363 K (1090 °C)	Gas above this at about 1 atm

2. Atomic structure and electron configuration

Atomic feature	Value
Protons	12
Electrons in a neutral atom	12
Valence electrons	2
Shell arrangement	2, 8, 2
Ground-state configuration	1s ² 2s ² 2p ⁶ 3s ²

Why Mg²⁺ is common

Magnesium has two outer-shell 3s electrons. Losing both leaves a 10-electron, neon-like arrangement. Removing another electron would mean disturbing the filled inner-shell core, so +2 is the characteristic oxidation state in ordinary magnesium chemistry.

Magnesium (Mg) - occurrence, uses and revision

3. Where magnesium occurs

Context	Key point
Earth's crust	Magnesium is widespread and makes up roughly 2% of Earth's crust by mass.
Seawater	It is one of the most abundant dissolved elements in seawater.
Important minerals	Dolomite, magnesite, brucite, carnallite and olivine are important magnesium-bearing minerals.
Modern production	Primary magnesium production is strongly concentrated in China, with smaller production in several other countries.

4. Stable isotopes

Isotope	Approx. natural abundance	Neutrons
^{24}Mg	78.99%	12
^{25}Mg	10.00%	13
^{26}Mg	11.01%	14

5. Uses and importance

Use	Why it matters
Lightweight alloys	Low density makes magnesium attractive where reducing mass matters.
Metallurgy	Used in alloying and metal-processing applications.
Bright-light applications	Burning magnesium produces an intense white light.
Refractory materials	Magnesium oxide is useful in heat-resistant materials.
Biology connection	A magnesium ion lies at the centre of chlorophyll.

6. History in brief

Magnesium compounds were known before the metal itself. Joseph Black distinguished magnesia from lime in the 18th century. Humphry Davy obtained magnesium in 1808 using electrochemical methods, and Antoine Bussy later produced a purer metallic form. The name is associated with Magnesia in Greece.

7. Quick revision prompts

Question	Short answer
Where is Mg?	Group 2, Period 3, s-block
How many valence electrons?	2
Most characteristic ion?	Mg^{2+}
State at room temperature?	Solid
Which family?	Alkaline-earth metals
What should you compare Mg with?	Na, Al, Be and Ca for useful periodic trends

Continue learning online

Temperature states • mass/property comparisons • maps • trends • orbital and crystal viewers • quizzes

elementlookup.com/magnesium/

Printed copy? Type the short address above into your browser.