

# One Shot

Class 7th- Science

The World of Metals  
and Non-Metals





# Topics to be Covered

All Topics in One Shot



**Minu, yeh kone mein kaun  
busy hai har waqt?**



**Woh Chacha Ramesh hain.  
Lohar ka kaam karte hain**

**OMG, yeh loha itna  
garam kyun karte  
hain?**

**Beta, loha tabhi  
shape mein aata hai  
jab usko garam karo**







# Introduction to Metals

- Metals are hard, shiny, malleable, and ductile materials that are good conductors of heat and electricity.

Shiny - lustrous



# Introduction to Metals

## Common Examples:

- Iron (Fe): Used to make buildings, vehicles, and tools.
- Copper (Cu): Used in electrical wiring due to excellent conductivity.
- Aluminium (Al): Lightweight, used in aircraft, utensils, and packaging.





# Malleability of Metals

## Malleability ✓

- Malleability is the property of metals that allows them to be hammered into thin sheets without breaking.

## Importance in Daily Life:

- Thin silver foil on some sweets and aluminium foil used for wrapping food items.





## Not-So-Typical Metals

**Are all metals Hard and Solid?**

- Some metals like sodium and potassium are so soft that they can be cut with a knife.
- There is one metal, mercury, that is found in a liquid state at room temperature, which you might have seen in thermometers.



# Ductility of Metals

## Ductility

- Ductility is the property of metals that allows them to be drawn into **thin wires** without breaking.



## Importance in Daily Life:

- Tea strainers
- Electric wires
- Musical instruments





# Sonority in Metals

## Sonority

- Sonority is the property of producing a ringing sound when struck.
- Only metals are sonorous.

## Importance in Daily Life:

- Bells in temples and schools are made of metal because they need to produce a loud, clear sound.

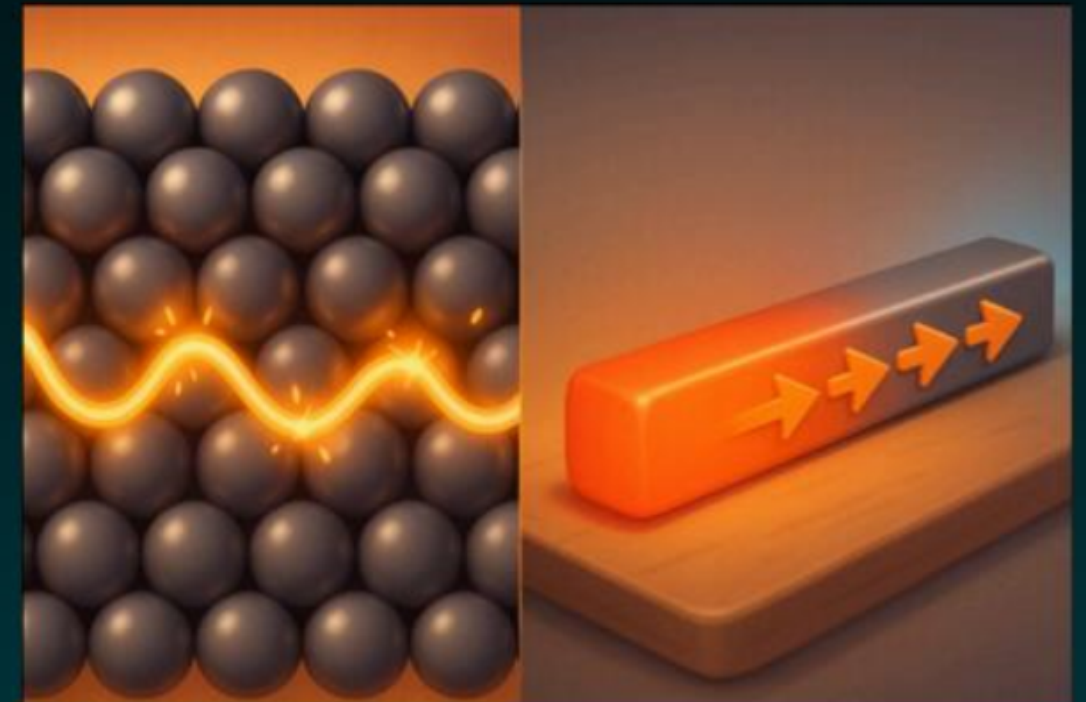




# Heat Conductors

## Why Metals Heat up?

- **Conduction** is the process where heat is transferred through a material without the movement of the material itself.
- Metals conduct heat effectively because their particles are tightly packed and can pass energy quickly.





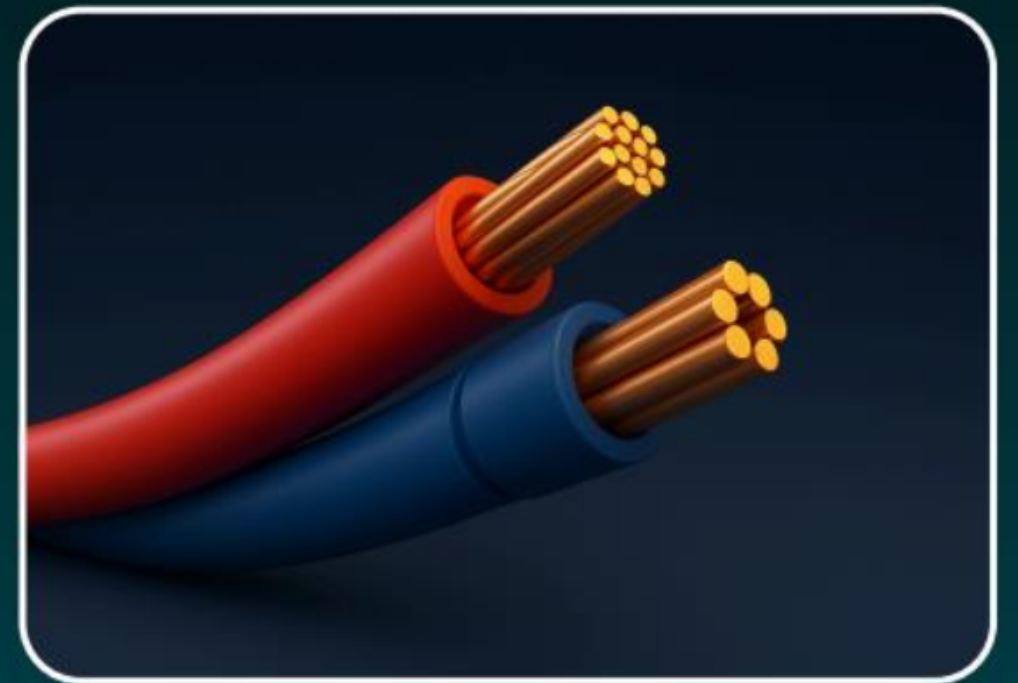
# Metals and the Flow of Electricity


## Electrical Conductors

- Materials that allow electric current to pass through them are called electrical conductors.
- Metals are good conductors of electricity.

### Importance in Daily Life:

- Electrical wiring in homes uses copper and aluminium.





**Yeh gate pe brown-  
brown kya hai? Paint to  
nahi lagta**

**Arre genius, yeh  
rust hota hai**

Bina cover ke chhodge  
toh iron aise hi sadta hai

Iska matlab hawa aur  
paani se reaction hota hai?



Uncle, tools par  
daily oil kyu  
lagate ho ?

Beta, lohe ko moisture se  
bachaana padta hai warna  
rust lag jayegi



Gate ka raaz toh lab  
mein solve ho raha hai

Loha + pani + hawa  
= rust ka formula





# Rusting of Iron

## How Iron reacts with Air and Water?

- Rusting is the slow chemical reaction of iron with oxygen (from air) and water (moisture), forming a reddish-brown flaky substance called rust.

## Condition for Rusting:

- Iron + Water + Oxygen → Rust (Iron oxide)





# Corrosion

## Different Metals, Different Reactions

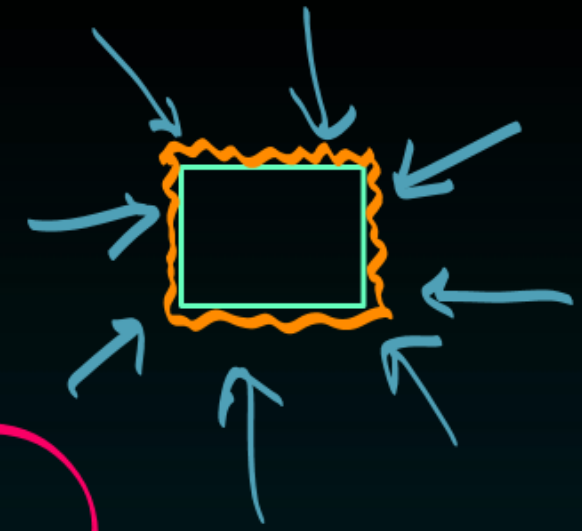
- Corrosion is the slow damage of metals when they react with air, moisture, or chemicals. It's not just iron that rusts.
- Silver turns black when it forms silver sulphide in the air.
- Copper forms a green layer of copper carbonate.





# Rust Prevention

**How to Protect Metals from Rusting?**



Zinc( $Zn$ )



**Painting**



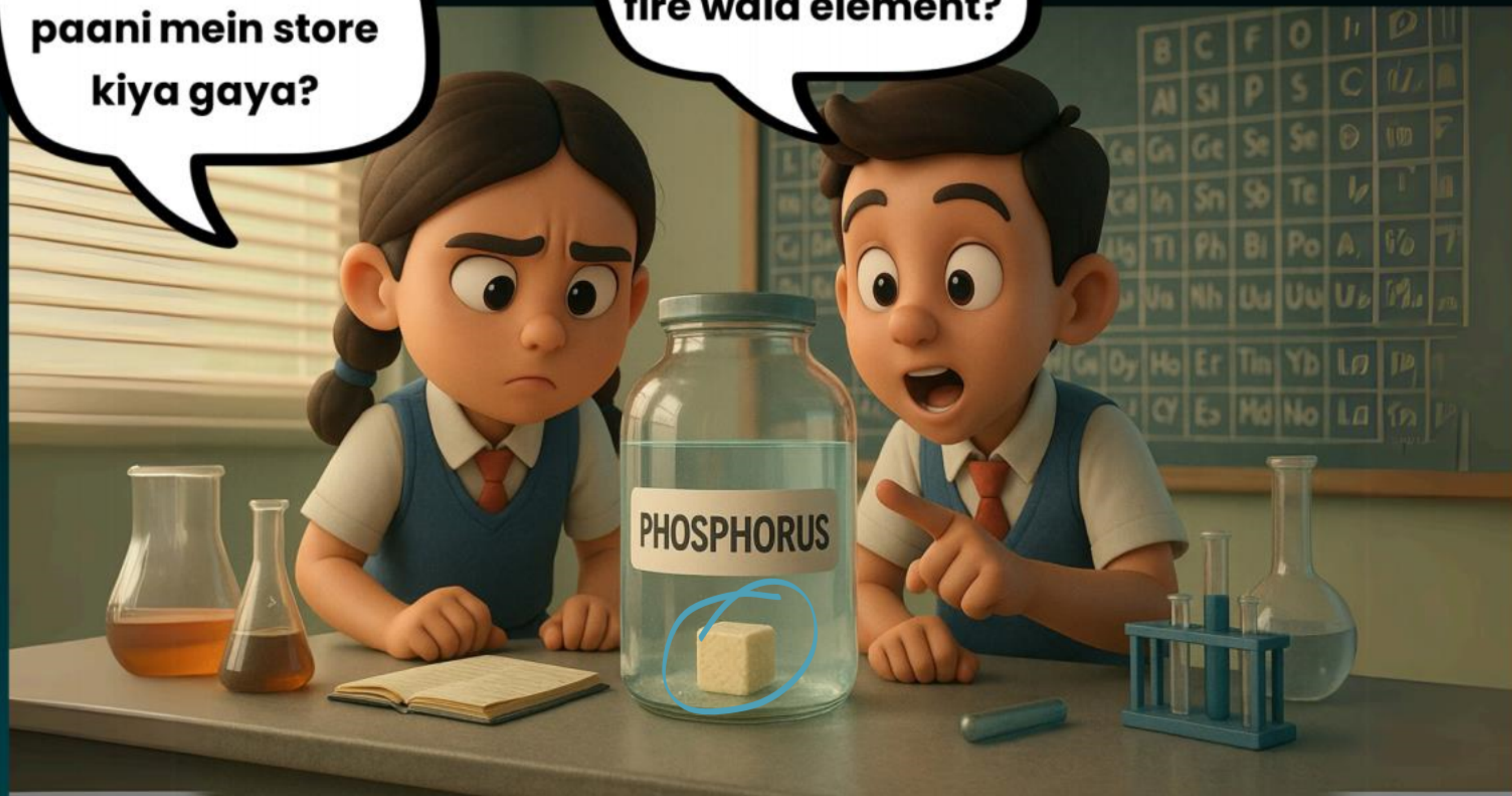
**Oiling/Greasing**



**Galvanization**

**Kya? Chemical ko  
paani mein store  
kiya gaya?**

**Arre! Water mein  
fire wala element?**



White phosphorus  
hawa mein hi jal uthta  
hai... that's why it lives  
underwater



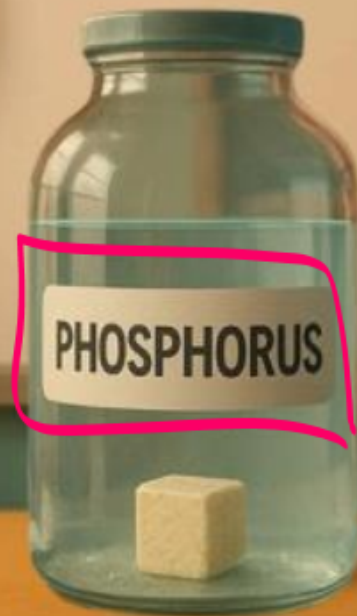
Some things are too hot  
to handle... unless stored  
underwater!

White phosphorus  
= fire king

Paani = security guard



EINSTEIN





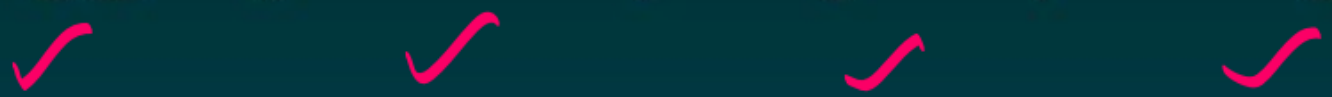
# Understanding Non-Metals

## What are Non-Metals?

- Non-metals are materials that do not exhibit metallic properties.
- They are usually poor conductors of heat and electricity, brittle, and lack luster.

## Common Examples:

- Oxygen, Carbon, Sulphur, Nitrogen





# Non-Metals in Daily Life

## Essential Non-Metals and their Everyday Roles

- **Oxygen** – Supports respiration; essential for all living beings. Used in hospitals for breathing support.
- **Nitrogen** – Makes up 78% of air; used in **fertilizers** to enhance soil fertility and aid plant growth.





# Non-Metals in Daily Life

## Essential Non-Metals and their Everyday Roles

- **Chlorine** – Used to disinfect drinking water, making it safe for consumption.
- **Carbon** – Found in fuels like **coal**; also in **pencils** (graphite) and is essential in **organic compounds**.





THANK  
YOU

