

Topic: Properties of Materials – Plastics and Rubber

Subtopics:

- Identification of Plastics and Rubber
 - Types
 - Properties
 - Uses
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Lesson Objectives:

By the end of the lesson, students should be able to:

1. Identify plastic and rubber materials.
 2. List and differentiate between types of plastics and rubber.
 3. State the properties of plastics and rubber.
 4. Mention common uses of plastics and rubber in daily life.
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1. Identification of Plastics and Rubber

◆ Plastics

Plastics are **synthetic materials** (man-made) produced from chemicals found in crude oil or natural gas. They are **lightweight**, **mouldable**, and **non-metallic**.

Common Plastic Items:

- Water bottles
- Buckets
- Food containers
- Pens

◆ Rubber

Rubber is a **flexible material** that can be **natural** (from rubber trees) or **synthetic** (from chemicals). It is **stretchable** and **resilient**.

Common Rubber Items:

- Tyres
 - Rubber bands
 - Slippers
 - Hoses
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2. Types of Plastics and Rubber

Types of Plastics:

1. **Thermoplastics** – Soften when heated and harden when cooled. Can be reshaped.
 - Examples: Polyethylene (bottles), PVC (pipes), Nylon.
 2. **Thermosetting Plastics** – Once shaped and hardened, cannot be reshaped.
 - Examples: Bakelite (electrical switches), Melamine (plates).
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Types of Rubber:

1. **Natural Rubber** – Obtained from rubber trees (latex). Elastic and flexible.
 2. **Synthetic Rubber** – Made from petrochemicals. More heat and chemical resistant.
 - Examples: Neoprene, Styrene-butadiene rubber (SBR).
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3. Properties of Plastics and Rubber

Property	Plastics	Rubber
Origin	Synthetic (man-made)	Natural or synthetic
Flexibility	Some are flexible, others rigid	Very flexible and elastic
Water Resistance	Excellent	Excellent
Heat Resistance	Varies; thermosets resist heat well	Moderate; melts at high temp

Property	Plastics	Rubber
Electrical Property	Good insulator	Good insulator
Recyclability	Thermoplastics are recyclable	Harder to recycle

4. Uses of Plastics and Rubber

Uses of Plastics:

- Bottles, plates, cups, buckets
- Chairs, basins, and kitchenware
- Pipes (PVC) for plumbing
- Packaging materials
- Electrical insulation (wires, plugs)

Uses of Rubber:

- Tyres (cars, bicycles)
- Footwear (slippers, soles)
- Erasers
- Shock absorbers
- Rubber bands and gloves
- Waterproof hoses and seals