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## S1 New Curriculum chemistry

Theme: Particle Nature of Matter

### S1 New Curriculum Chemistry Chapter 4 – Using matter

**Materials** are substances that are used to make objects, structures, or products. They can be natural or artificial and have different properties based on their composition and use. Common solid materials are metal, ceramic, glass, wood, plastic and fibres.

#### Types of Materials and their properties.

1. **Metals** – Strong, durable, and good conductors of heat and electricity (e.g., iron, aluminum, copper).

Fig. 1: Some of the things made of metal at home



Trial 1: Name and give uses of thing in Fig. 1

2. **Ceramics** – Hard and heat-resistant, used in tiles, and pottery. Ceramics are made by mixing clay with water, moulding and heating the material to form a hard but brittle structure.





6. **Natural Materials** – Found in nature, such as wood, wool, cotton, and stone.

Fig. 5: Some of the things made of natural materials



**Trial 4:** Identify natural materials from which items a – f in Fig. 5 are made of.

### Recycling materials

Recycling materials is an essential process that helps reduce waste, conserve natural resources, and minimize environmental pollution. It involves collecting, processing, and reusing materials to create new products instead of discarding them.

### Common Recyclable Materials

- **Paper & Cardboard:** Newspapers, office paper, magazines, and packaging materials.
- **Plastics:** Bottles, containers, and packaging with recyclable symbols.
- **Metals:** Aluminum cans, steel, and copper.
- **Glass:** Bottles and jars (excluding ceramics and heat-resistant glass).
- **Electronics:** Computers, batteries, and mobile phones.
- **Organic Waste:** Compostable food scraps and biodegradable materials.

### Benefits of Recycling

- **Reduces landfill waste:** Less trash means less environmental pollution.
- **Conserves resources:** Saves raw materials like trees, minerals, and fossil fuels.
- **Energy efficiency:** Recycling requires less energy than producing new materials.
- **Economic growth:** Creates jobs in recycling industries.
- **Protects ecosystems:** Reduces habitat destruction caused by excessive resource extraction.

### Problems faced in recycling plastics

Recycling plastics comes with several challenges that make the process difficult and less efficient. Here are some key problems:

- **Contamination:** Many plastics are mixed with food, liquids, or other materials, making them harder to recycle.
- **Sorting Difficulties:** Different types of plastics require separate recycling processes, but they often get mixed, reducing efficiency.
- **Limited Recycling Infrastructure:** Some regions lack proper recycling facilities, leading to more plastic waste ending up in landfills.
- **High Costs:** Recycling plastic can be expensive due to labor, equipment, and transportation costs.
- **Low Market Demand:** Recycled plastic is often less desirable than new plastic, making it harder to sell and use.
- **Complexity of Certain Plastics:** Some plastics, like thermoset plastics, cannot be easily recycled due to their chemical structure.

### Revision questions

1. State any important properties of the following material that determine their use;
  - (a) Ceramics
  - (b) Plastics
  - (c) Wood
  - (d) cement
2. (a) Describe how ceramics are made.
  - (b) List three uses of ceramics
  - (c) What are physical properties of ceramic that make them suitable for their use?
3. (a) Why should we recycle material?
  - (b) What are the problems involved in recycling plastic.

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Thanks

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