Chapter 6: Materials Around Us

Exercises — Let Us Enhance Our Learning

Q1 Visit your kitchen and observe how your parents have organised various edibles. Can you suggest a better sorting method? Write it in your notebook.

SOLUTION

Observe where items like grains, spices, oils, and snacks are kept.
Note which items are stored together and which are kept separately.
Think about a classification based on the properties of the materials — for example, separate dry items from liquids, or group by how often they are used.
A model suggestion: Sort edibles into four groups — (1) grains and pulses (dry, stored in airtight containers), (2) spices and condiments (dry, small quantities), (3) liquids (oil, vinegar, sauces), and (4) fresh produce (vegetables, fruits). This way, similar materials are together and it is easy to find what you need.

Answer: Model answer: Classify kitchen edibles into groups such as grains and pulses, spices, liquids, and fresh produce — placing items with similar properties together for easy access.

Q2 Unscramble the letters (Column I) and match with their properties (Column II).
Column I: (i) T R E M A T, (ii) U L S B E L O, (iii) T N E R P A S N A R T, (iv) E R U S T L
Column II: (a) Objects can be seen clearly through it, (b) Occupies space and has mass, (c) Shiny surface, (d) Mixes completely in water

SOLUTION

Unscramble each word in Column I:
(i) T R E M A T → MATTER
(ii) U L S B E L O → SOLUBLE
(iii) T N E R P A S N A R T → TRANSPARENT
(iv) E R U S T L → LUSTRE

Now match with Column II:
(i) MATTER → (b) Occupies space and has mass
(ii) SOLUBLE → (d) Mixes completely in water
(iii) TRANSPARENT → (a) Objects can be seen clearly through it
(iv) LUSTRE → (c) Shiny surface

Answer: (i) MATTER — (b); (ii) SOLUBLE — (d); (iii) TRANSPARENT — (a); (iv) LUSTRE — (c)

Q3 The containers which are used to store materials in shops and at home are usually transparent. Give your reasons for this.

SOLUTION

Transparent containers allow us to see clearly through them.

When a container is transparent, we can identify the material stored inside without opening it.

This saves time, avoids confusion between similar-looking containers, and helps us check how much of the material is left.

In shops, transparent containers allow customers to see what is being sold, which helps in making choices quickly.

Glass and clear plastic are common transparent materials used for such containers.

Answer: Transparent containers let us see the contents inside without opening them, saving time and making it easy to identify and check the quantity of stored materials.

Q4 State whether the statements given below are True [T] or False [F]. Correct the False statement(s).

(i) Wood is translucent while glass is opaque.

(ii) Aluminium foil has lustre while an eraser does not.

(iii) Sugar dissolves in water whereas sawdust does not.

(iv) An apple is a matter because it occupies no space and has mass.

SOLUTION

(i) FALSE — Wood is opaque (you cannot see through it at all), while glass is transparent (objects can be seen clearly through it).

(ii) TRUE — Aluminium is a metal and metals have lustrous (shiny) surfaces. An eraser is a non-lustrous material made of rubber.

(iii) TRUE — Sugar is soluble in water (it dissolves completely when stirred). Sawdust is insoluble in water (it does not disappear even after stirring).

(iv) FALSE — An apple is matter because it occupies SPACE and has mass. Matter is defined as anything that occupies space and has mass.

Answer: (i) F — Wood is opaque; glass is transparent. (ii) T. (iii) T. (iv) F — An apple is matter because it occupies space and has mass (not 'no space').

Q5 We see chairs made up of various materials, such as wood, iron, plastic, bamboo, cement and stones. Following are some desirable properties of materials which can be used to make chairs. Which materials used to make chairs fulfil these properties the most?
(i) Hardness (does not bend or shake on sitting even after long use).
(ii) Lightweight (easy to lift or to take from one place to another).
(iii) Does not feel very cold when sitting during winters.
(iv) Can be cleaned regularly and made to look new even after long use.

SOLUTION

(i) Hardness: Iron, stone, and cement are hard materials. They do not bend or deform easily even after long use. Iron chairs best fulfil this property among common chair materials.

(ii) Lightweight: Plastic and bamboo are lightweight materials. They are easy to lift and carry from one place to another.

(iii) Does not feel cold in winters: Wood and bamboo do not conduct heat well, so they do not feel very cold to touch during winters. Metal chairs like iron feel cold because metals conduct heat quickly away from the body.

(iv) Can be cleaned and look new: Plastic chairs can be wiped clean easily and do not rust or decay. Iron chairs can also be cleaned and repainted to look new, though they may rust if not maintained.

Answer: (i) Iron (hard, rigid); (ii) Plastic or bamboo (lightweight); (iii) Wood or bamboo (poor heat conductors, do not feel cold); (iv) Plastic (easy to clean and maintain).

Q6 You need to have containers for collection of: (i) food waste, (ii) broken glass and (iii) wastepaper. Which materials will you choose for containers of these types of waste? What properties of materials do you need to think of?

SOLUTION

(i) Food waste: Use a plastic container with a lid. Plastic is easy to clean, does not absorb moisture or odours, and is durable. The container should be opaque (to reduce smell and keep it hygienic), waterproof (food waste may be wet), and easy

to wash.

(ii) Broken glass: Use a hard, thick plastic or metal container. It should be hard and sturdy so the sharp glass pieces do not pierce through it. Avoid cardboard or paper bags as broken glass can cut through them. Properties needed: hardness and puncture resistance.

(iii) Wastepaper: A lightweight container such as a cardboard box or plastic bin works well. Wastepaper is dry and light, so the container does not need to be waterproof. Properties needed: lightweight and easy to empty.

Key properties to consider: hardness, waterproofing, ease of cleaning, and whether the material can withstand sharp or heavy contents.

Answer: (i) Food waste — plastic container (waterproof, easy to clean); (ii) Broken glass — hard plastic or metal container (sturdy, puncture-resistant); (iii) Wastepaper — cardboard box or plastic bin (lightweight, easy to empty).

Q7 Air is all around us but does not hinder us from seeing each other. Whereas, if a wooden door comes in between, we cannot see each other. It is because air is ___ and the wooden door is ___. Choose the most appropriate option:
(i) transparent, opaque
(ii) translucent, transparent
(iii) opaque, translucent
(iv) transparent, translucent

SOLUTION

Air allows us to see objects clearly through it — this is the property of transparent materials.

A wooden door does not allow us to see through it at all — this is the property of opaque materials.

Therefore: air is transparent and the wooden door is opaque.

This matches option (i).

Answer: (i) transparent, opaque

Q8 Imagine you have two mysterious materials, X and Y. When you try to press material X, it feels rigid and does not change its shape easily. On the other hand, material Y easily changes its shape when you press it. Now, when you mix both materials in water, only material X dissolves completely, while material Y remains unchanged. What can materials X and Y be? Can you identify whether material X is hard or soft? What about material Y? Justify your answer.

SOLUTION

Material X:
— It feels rigid and does not change shape easily when pressed → it is HARD.
— It dissolves completely in water → it is SOLUBLE.
— A material that is hard and soluble in water could be salt (common salt / sodium chloride) or sugar. Both are hard crystals that dissolve completely in water.

Material Y:
— It easily changes shape when pressed → it is SOFT.
— It remains unchanged when mixed in water → it is INSOLUBLE.
— A material that is soft and insoluble in water could be clay, wax, or rubber.

Conclusion: Material X is HARD and SOLUBLE (e.g., salt or sugar). Material Y is SOFT and INSOLUBLE (e.g., clay or wax).

Answer: Material X is hard and soluble (e.g., salt or sugar). Material Y is soft and insoluble (e.g., clay or wax).

Q9 (i) Who am I? Identify me on the basis of the given properties.
(a) I have lustre.
(b) I can be easily compressed.
(c) I am hard and soluble in water.
(d) You cannot see clearly through me.
(e) I have mass and volume but you cannot see me.
(ii) Make your own 'Who am I?'

SOLUTION

Each clue (a)–(e) describes a different material:

(a) 'I have lustre' → I am a METAL (such as iron, copper, or aluminium). Metals have shiny, lustrous surfaces.

(b) 'I can be easily compressed' → I am a SOFT material such as a SPONGE or

RUBBER. Soft materials can be compressed or squeezed easily.

(c) 'I am hard and soluble in water' → I am SALT (or SUGAR). Both are hard crystalline solids that dissolve completely in water.

(d) 'You cannot see clearly through me' → I am a TRANSLUCENT material (such as frosted glass or butter paper). The chapter defines translucent as materials through which objects can be seen, but not clearly.

(e) 'I have mass and volume but you cannot see me' → I am AIR. Air is matter (it has mass and occupies space/volume) but it is invisible.

(ii) Sample 'Who am I?' made by the student:
I am soft, non-lustrous, and insoluble in water. You can see clearly through me when I am in thin sheets. Who am I? Answer: Plastic wrap (cellophane).

Answer: (a) Metal (e.g., iron/copper); (b) Sponge or rubber (soft, compressible); (c) Salt or sugar (hard and soluble); (d) Translucent material (e.g., frosted glass or butter paper — objects seen but not clearly); (e) Air (has mass and volume but is invisible).

Q10 You are provided with the following materials — vinegar, honey, mustard oil, water, glucose and wheat flour. Make any two pairs of materials where one material is soluble in the other. Now, make two pairs of materials where one material remains insoluble in the other material.

SOLUTION

From the given materials: vinegar, honey, mustard oil, water, glucose, wheat flour.

Two pairs where one material is SOLUBLE in the other:
Pair 1: Glucose and water — glucose dissolves completely in water (glucose is soluble in water; used in ORS as stated in the chapter).
Pair 2: Vinegar and water — vinegar mixes with water (it is a liquid that blends with water).

Two pairs where one material is INSOLUBLE in the other:
Pair 1: Mustard oil and water — mustard oil does not dissolve in water; it forms a separate layer on top (oil is insoluble in water).
Pair 2: Wheat flour and water — wheat flour does not dissolve in water; it remains as particles even after stirring (wheat flour is insoluble in water).

Answer: Soluble pairs: (1) Glucose in water; (2) Vinegar in water. Insoluble pairs: (1) Mustard oil in water (forms a separate layer); (2) Wheat flour in water (does not dissolve).