

Sorting Materials Into Groups

4



IN THIS CHAPTER

- *What is material ?*
- *Properties of materials*

We come across many things in our daily life. Some of these are living and some are non-living. Things have different sizes and shapes such as animals, chair, chalk, birds, insects, shoes, table, plants, utensils, trees and so many other things. All the objects may not be alike.



Clothes



Chair



Table



Toys



Activity Time

Collect and list out at least twenty-five objects that you see in your surroundings. Write at least one use of each of them. Are they all of same size, shape and colour ?

1	3	5
2	4	6

You see a variety of objects around you. There are a few examples of variety of objects on the earth. There is also a variety in the objects in the sky such as the moon, the sun and stars. The process of grouping and sorting objects is called classification. Classification of various objects can be done on the basis of their similarities and dissimilarities. This may be based on their use, colour, size, shape, hardness and texture etc. They can also be classified as living or non-living.

WHAT ARE MATERIALS?

You know that objects are made up of materials. Now we will learn more about them. All materials and substances are made up of matter. All materials have mass and occupy space.

PROPERTIES OF MATERIALS

There are some important features of materials which help you to recognize materials. You can

recognize them by their colour, touch or any other way. These features are called properties of materials.

Appearance

Materials usually look different from one another. Wood looks very different from iron. Iron appears different from copper or aluminium. At the same time there may be some similarities between iron, copper and aluminium that are not there in wood.

These materials have a peculiar shine. It is known as lustre. On the other hand wood has no lustre.



different lustrous objects



clay (smooth)

rocks (rough)



cotton



metal

Hardness

Some substances are harder than others. The property of hardness gives us an idea as to what a substance could be. Different substances have different degrees of hardness. Soap and graphite are soft substances. Iron and steel are hard materials.

Activity Time

Collect the following objects—cotton, wool, a wooden bat, a rubber ball, a small stone, a piece of iron, and a piece of sponge. Now, press these objects one by one with your hand. Write down your observation.



Soft and hard materials

Solubility

You will notice that some substances have completely disappeared or dissolved in water. We say these substances are soluble in water. Sugar, salt and alcohol dissolve in water completely.

We call them soluble substances or solutes and the substances in which they dissolve is called the solvent.



Marine life

Activity Time

Take some solid materials like salt, sugar, sand, pencil shavings, and chalk in small quantities. Now, take five glasses of water and dissolve each material separately in each glass. Use a spoon to mix the contents of each glass.



Salt



Sugar



Sand



Pencil shavings



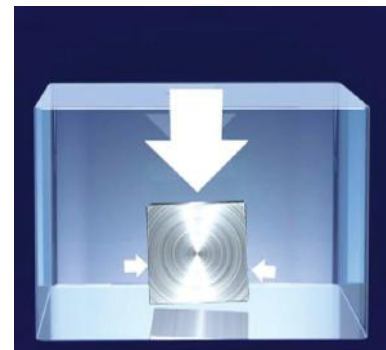
Chalk

Floating or Sinking in Water

If you drop an iron nail in the water, it will sink, but a piece of wood will float on water. If you take equal volume of iron, water and wood, you will find that iron is the heaviest and wood is the lightest. An equal volume of aluminium will be lighter than iron but heavier than water. It will sink in water. An



Iceberg



Sinking object

equal volume of cotton will be lighter than water. If placed on a wax paper, it will float on water. The mass of a substances per unit volume is called its density.

Floating or sinking properties of different Materials

Materials	Whether floats or sinks in water
Stone	
Iron nail	
Sugar cube	
Wax	
Ice	
Coin	

Transparency

You cannot see through a wall, a wooden door, a metal sheet or leaf.

All these are made of opaque materials. You can see through a clean glass window. Glass is a transparent material. Glass, air and water are examples of transparent materials. You have seen that shopkeepers usually prefer to keep biscuits, sweets and other eatables in transparent containers of glass or plastic, so that buyers can see these things easily.

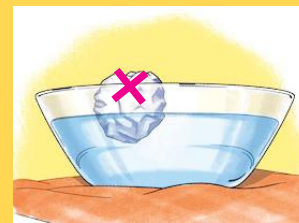


On the other hand, there are some materials through which you are not able to see these materials are called opaque. You cannot tell what is kept in a closed wooden box, cardboard carton or a metal container. Wood, cardboard and metals are examples of opaque materials.



Activity time

Let us find out whether water is opaque or transparent ? Make a cross (×) mark on a white paper. Take a clean glass. Pour some clean water into the glass. Now put the mark paper into it. You can still see the cross mark clearly. Water is also a transparent material.



Know the Keywords :

Hard : If you can't change the shape of any material by pressing, it is called hard.

Soluble : Substance which dissolves in water.

Lustre : Shine

Material : The substance from which a thing is made.

Opaque : Substance that do not allow light to pass through.

Transparent : Substances allowing light to pass through so that bodies can be distinctly seen.



Point to Remember

- All materials and substances are made up of matter. It has mass and occupies space.
- Materials look different from one another.
- The property of hardness gives us an idea as to what a substance could be.
- The mass of a substance per unit volume is called its density.
- There are some materials through which you are not able to see the materials are called opaque.

EXERCISE TIME

A. Answer the following questions :

1. What do you mean by the properties of a material ?
2. Differentiate between transparent and opaque objects.
3. What do you mean by opaque?
4. List any five liquids that are transparent.
5. Name any two hard and soft materials.

B. Match the following :

Column 'A'

1. Chair
2. Iron
3. Metal
4. Hard materials
5. Soft materials

Column 'B'

- (i) gold, silver, copper, iron
- (ii) cricket ball, wood, stone, iron
- (iii) cotton, wool, rubber ball, sponge
- (iv) iron, wood, plastic, brass
- (v) tools, doors, gates, pipes

C. Correct the following statements and rewrite them in your notebook.

1. Sugar does not dissolve in water.
2. Stone is transparent, while glass is opaque.
3. A notebook has lustre, while an eraser does not.
4. Chalk dissolves in water.
5. Oil mixes with water.
6. Vinegar dissolves in water.

D. Tick (✓) the correct option :

1. Which of the following object is transparent ?

(i) water

(ii) steel

(iii) wood

2. Which of the following material is lustrous ?

(i) gold

(ii) paper

(iii) sulphur



Creative Work

- **Perform an activity to show transparency of different materials around you such as cloth, milk, smoke and ink.**
- **Visit a riverside or a pond. Take the following items with you and throw them in water. Observe them which sink and which float in water. Reason out why ?**