

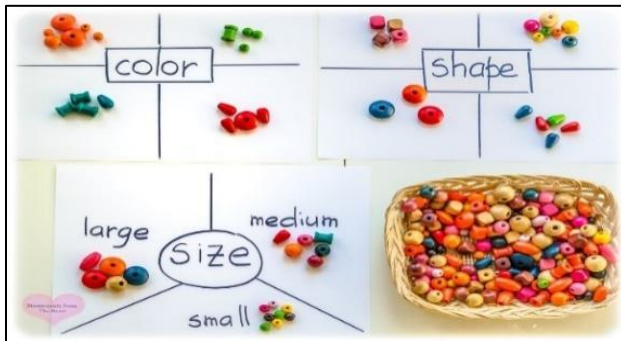


INDIAN SCHOOL AL WADI AL KABIR



CLASS: VI	DEPARTMENT OF SCIENCE 2023-24	DATE: 16.11.2023
HANDOUT	SORTING MATERIALS INTO GROUPS	Note: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

- ❖ Anything that we can see or touch is called an **object**. E.g. A chair, books, water etc.
All objects around us are made of one or more materials.
The systematic arrangement of things based on certain similarities and differences is called **sorting** or **classification**.



❖ **IMPORTANCE OF CLASSIFICATION** -

- Classification helps in the systematic study of objects.
- Classification helps in identifying and locating things.
- It helps to study the properties of objects of one kind
- It helps to understand similarities and dissimilarities among objects.

❖ **MATERIALS** -

The substance which is used in making different objects is known as **Material**.

- An object can be made from different kinds of materials. For example, a bag made of cloth, leather, etc.
- A material can be used to make different kinds of things. For example, plastic can be used to make toys, chairs, etc.
- Some objects can be made from more than one type of material. For example, metal, rubber, plastic and other materials are used to make a bicycle.

MATERIALS	OBJECTS MADE OF THESE MATERIALS
WOOD	Chair, table, plough, bullock cart and its wheels, windows, book-rack
GLASS	Tumbler, mirror, window-pane, test tube, beaker
IRON	Nails, buckets, machines, pipes, utensils
COPPER	Electric Wire, utensils, coins, boilers
ALUMINIUM	Electric wires, utensils, window frames
PAPER	Books, note-books, newspapers, envelope
COTTON	Fabrics (cloth), pillows, mattresses, quilts, wicks
LEATHER	Shoes, bags, purses, suitcases, sofa

OBJECTS	MATERIALS
CHAIR	Wood, metal, plastic, concrete
CLOTHES	Cotton, wool, silk, nylon, polyester
COINS	Copper, silver, gold
UTENSILS	Iron, copper, aluminium, silver, stainless steel
SHOES	Leather, rubber, plastic, canvas

❖ **MATTER -**

Anything that occupies space and has mass is called **Matter**.
It exists in different shapes, sizes, colours and forms.

❖ **SORTING OF OBJECTS BASED ON COMMON PROPERTIES**

Objects are grouped based on physical properties like lustre, appearance, hardness, texture, transparency, physical state and solubility in water.

- **Appearance:** Materials usually look different from each other. **E.g.:** Wood looks different from glass, silver looks different from paper, and plastic looks different from sand.
- **Lustre:** Materials can be grouped as lustrous and non-lustrous based on the shine possessed by them. Those materials which have a shiny appearance are said to be **lustrous**. Metals are generally lustrous. **E.g.:** Gold and Silver.
Continuous exposure to air and moisture causes some metals to lose their lustre.
Those materials which have a dull appearance are said to be **non-lustrous**. **E.g.:** Wood, paper etc.



Gold jewellery – Lustrous



Wooden pieces – Non-lustrous

- **Hardness:** Materials that can be compressed or scratched easily are called **soft materials**.
E.g.: Cotton, sponge.
 Materials that are difficult to compress or scratch easily are called **hard materials**.
E.g.: Iron and most other metals.






Soft materials



Hard materials

- **Transparency:** Materials can be classified as transparent, translucent and opaque based on the transmittance of light by them.

TRANSPARENT	TRANSLUCENT	OPAQUE
Objects that allow light to pass through them completely are called transparent materials. E.g.: Glass, air, clear water etc.	Objects that allow only a small amount of light to pass through them are called translucent objects. E.g.: Butter paper, thin plastic, tissue paper etc.	Objects that do not allow any light to pass through them are called opaque objects. E.g.: Wood, metals, brick walls etc.
		

- **Solubility in water:** Materials can be grouped based on their solubility in water.
 - Substances that completely dissolve in water are said to be **soluble** in water.
E.g.: Salt and sugar are completely soluble in water and form a single layer with water.
 - Substances that do not dissolve in water even on stirring are said to be **insoluble** in water.
E.g.: Chalk powder and sand settle down in the water. They form a distinct layer of water.

➤ **Solubility of liquids in water** -

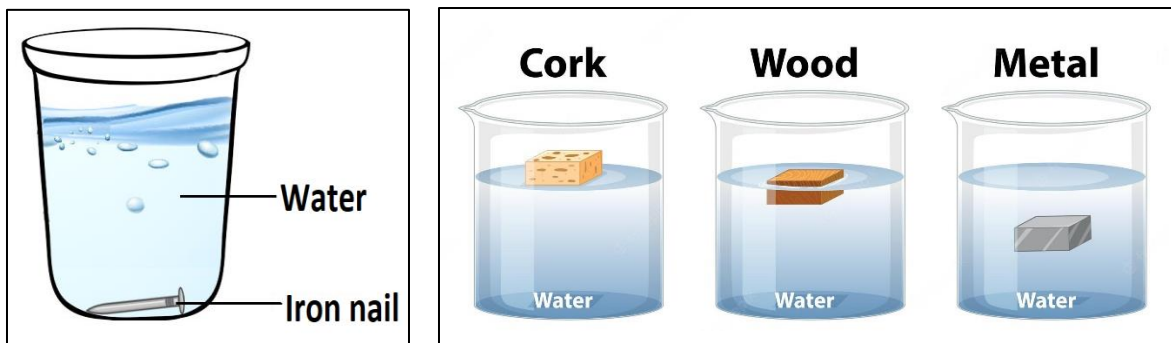
- Liquids that get completely mixed are called **miscible** liquids.
E.g.: Honey, milk, vinegar etc.
- Liquids that do not mix are called **immiscible** liquids.
E.g.: Mustard oil, kerosene etc.

➤ **Solubility of gases in water** -

Some gases are soluble in water whereas some gases are not soluble in water. Plants and animals that live in water use oxygen and carbon dioxide dissolved in water for their survival. Gases like nitrogen and hydrogen do not dissolve in water.

MATERIALS SOLUBLE/MISCIBLE IN WATER	MATERIALS INSOLUBLE/IMMISCIBLE IN WATER
Milk	Flour
Washing soda	Chalk powder
Copper sulphate	Sand
Common salt	Wax
Sugar	Glass
Alcohol	Kerosene
Potassium permanganate	Plastic

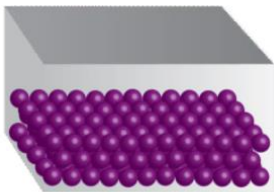
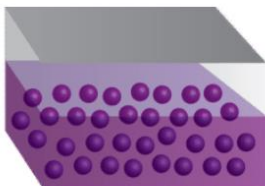
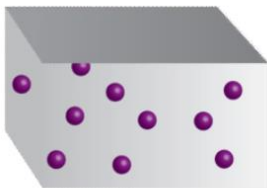
- **Density – Floating or sinking:** Some materials are heavier than water whereas some materials are lighter than water. The heaviness or lightness of a material is indicated by the term density. A substance which is heavier than water is said to have a higher density than water whereas a substance which is lighter than water is said to have a lower density than water.
 - The material which sinks in water is heavier than water.
E.g.: iron, aluminium, gold, silver, stone
 - The material which floats on water is lighter than water.
E.g.: A piece of wood, plastic, dry leaves, oil, ice



➤ **PHYSICAL STATE:**

Most of the materials are grouped based on their physical state, i.e. solid, liquid or gas.

The main differences between these three states are given in the table shown below.

PHYSICAL PROPERTY	SOLIDS	LIQUIDS	GASES
SHAPE	Has a fixed shape	Takes up the shape of the container	Takes up the shape of the container
VOLUME	Fixed volume	Fixed volume	Changes volume to fill its container
FLUIDITY	Does not flow easily	Flows easily	Flows easily
COMPRESSIBILITY	Not easy to compress	Not easy to compress	Easy to compress
SPACE BETWEEN PARTICLES	Most closely packed  Solid	Less closely packed  Liquid	Far apart from each other  Gas

PREPARED BY Ms NEENA ALEX	CHECKED BY HoD SCIENCE
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