

# Sorting Materials into Groups

## TALENT & OLYMPIAD

### Introduction

All the objects that we see around us is called material. Materials are made up of matter. For example, animals, insects, birds, plants, trees, houses, machines, tools, tables, chairs, clothes etc are the materials made up of matter. Matter has mass and it occupies space. Mass is used to measure the amount of matter present in an object and volume is used to measure the amount of space occupied by the object.

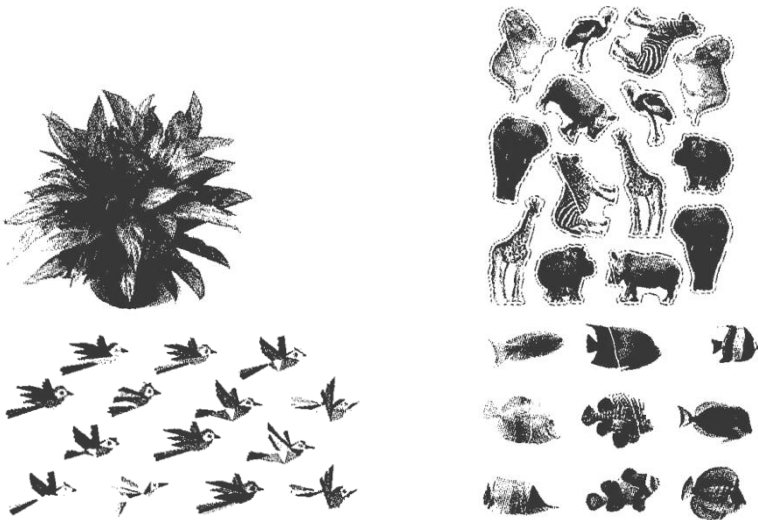
Due to the huge quantity and large variety of materials, it is very difficult to study each one of them separately. Therefore, materials are classified into groups, so that we can study and understand them better.

### Classification of Materials

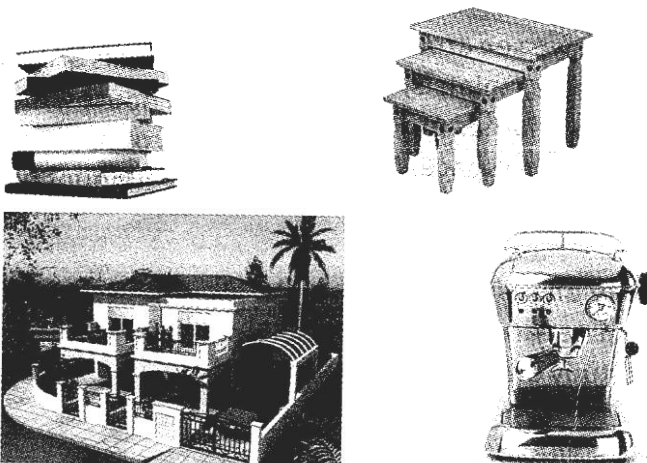
The process of grouping objects according to their shared characteristics is called classification. In other words, the materials having similar properties are kept in the same group.

**For example:** Classification of the following objects into living and non-living things: Plants, books, tables, animals, water, air, birds, fishes, insects, houses, buses, machines.

**Living:** Plants, animals, birds, fishes, insects.



**Non –living :** Books, tablets, water, air, houses, buses, machines.





## Basis of Classification

The characteristics or properties, which are taken as the base for the classification of given objects, are called the basis of classification.

There are a number characteristics which are taken as the base for classification.

For example, 'living and non-living', 'natural and artificial', 'solid, liquid and gas', 'shape', 'colour' etc.

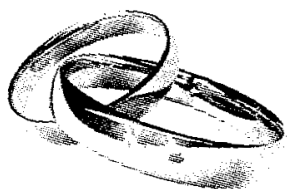
**Note:** You can also classify the materials by selecting the characteristics as per your own choice.



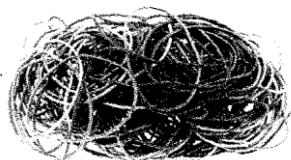
## Properties of Matter

Now let us understand some properties of matter.

**Appearance:** Some objects have shiny appearance called lustre, whereas some materials have dull appearance. For example gold, silver, copper have shiny appearance whereas paper, wood, rubber have dull appearance.



**Hardness or Softness:** The materials can be classified on the basis of hardness and softness. Candle, wax, rubber are the examples of soft materials whereas iron, diamond, glass are the examples of hard materials.



**Solubility:** Some materials are soluble in water whereas others are not. Sugar, common salt, washing soda, lemon juice are soluble in water whereas glass, plastic, iron, mustard oil, coconut oil are not soluble in water.

**Density:** Density is the mass per unit volume of a substance. The substances which sink in the water have higher density than water and the substances which do not sink in the water have lower density than water. Substances like iron, copper, aluminium, silver, gold and glass have higher density than water whereas wood, plastic, ice, oil and petrol have lower density than water.

**Transparency:** All the materials have been classified into three groups on the basis of transparency

- ❖ **Transparent:** The materials through which light can pass are called transparent materials. Example glass, water, air, alcohol etc.
- ❖ **Translucent:** The materials through which light can pass partially are called translucent materials. Example Butter paper, ground-glass, tissue paper, muddy water etc.
- ❖ **Opaque:** The materials through which light cannot pass are called opaque materials. Example metals, stones, books, woods etc.

## Commonly Asked



### QUESTIONS



**Which one of the following materials is soluble in water?**

- (a) Plastic
- (b) Washing soda
- (c) Paper
- (d) Chalk powder
- (e) None of these

**Answer: (b)**



**Which one of the following statements is true?**

**Statement 1:** Air is a transparent material

**Statement 2:** Wood is a opaque material

- (a) Statement 1
- (b) Statement 2
- (c) Both statements are correct
- (d) Both statements are incorrect
- (e) None of these

**Answer: (c)**

## SUMMARY



- ❖ All the objects around us are made up of matter.
- ❖ The process of grouping objects according to shared characteristics is known as classification.
- ❖ Metals have generally shiny appearance whereas non-metals have dull appearance.
- ❖ »> The substances which sink in the water have higher density than water and the substances which do not sink in the water have lower density than water.
- ❖ Light can pass through transparent materials.

# Self Evaluation **TEST**



Duration  
10 Minutes

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1. Which one of the following terms is used for the occupied space by an object?

- (a) Mass
- (b) Volume
- (c) Density
- (d) Lustre
- (e) None of these

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2. Which one of the following is correct for the term 'mass' ?

- (a) Mass is the measurement of amount of matter present in an object
- (b) Mass is the measurement of amount of space occupied by an object
- (c) Mass is the measurement of amount of density of an object
- (d) Both (a) and (b)
- (e) None of these

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3. Which one of the following objects has shiny appearance?

- (a) Copper
- (b) Gold
- (c) Silver
- (d) All of these
- (e) None of these

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4. Which one of the following is correct for the term 'Lustre'?

- (a) Hardness
- (b) Softness
- (c) Dull appearance
- (d) Shiny appearance
- (e) None of these

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5. Choose the material from the following which is not soluble in water?

- (a) Sugar
- (b) Common salt
- (c) Wax
- (d) Washing soda
- (e) None of these

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6. Which one of the following statements is correct?

**Statement 1:** The materials which sink in the water have higher density than water.

**Statement 2:** The materials which sink in the water have lower density than water.

- (a) Statement 1
- (b) Statement 2
- (c) Both statements are correct
- (d) Both statements are incorrect

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**7. Choose the object from the following which is opaque.**

- (a) Air
- (b) Water
- (c) Tissue paper
- (d) Metal sheet
- (e) None of these

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**8. Choose the substance from the following which can float in the water.**

- (a) Gold
- (b) Silver
- (c) Wood
- (d) Glass
- (e) None of these

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**9. Choose the hardest material from the following:**

- (a) Wax
- (b) Candle
- (c) Rubber
- (d) Gold
- (e) None of these

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**10. Which one of the following acts as a translucent medium?**

- (a) Water
  - (b) Alcohol
  - (c) Muddy water
  - (d) Wood
  - (e) None of these
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**Answers – Self Evaluation Test**

<b>1.</b>	<b>B</b>	<b>2.</b>	<b>A</b>	<b>3.</b>	<b>D</b>	<b>4.</b>	<b>D</b>	<b>5.</b>	<b>C</b>	<b>6.</b>	<b>A</b>	<b>7.</b>	<b>D</b>	<b>8.</b>	<b>C</b>	<b>9.</b>	<b>D</b>	<b>10.</b>	<b>C</b>
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