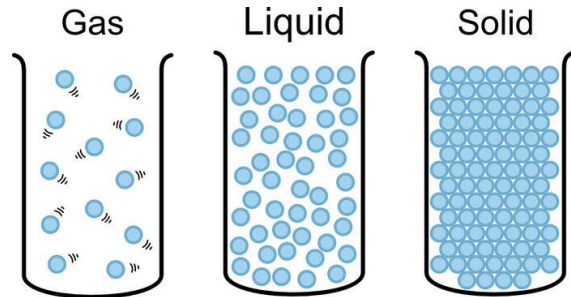




# Materials and their Properties

## Solids, Liquids and Gases



### Gases:

- They are often invisible.
- Do not keep their shape.
- Can change shape or volume.
- Do not take up the same amount of space.
- Can be squashed.

### Solids:

- Have a definite shape and volume
- Do not flow.
- Always take up the same amount of space.
- Do not spread out

### Liquids:

- Have a definite volume, but take the shape of a container.
- Can flow or be poured.
- Are not easy to hold.
- They take up the same amount of space.

## Solutions

A solution is made when a material is dissolved within a liquid. Sugar (the solute) dissolves in water (the solvent) to form a solution.

Materials which will dissolve are soluble. However, Some materials, like sand, are insoluble as they do not dissolve in liquid.

Materials in a solution can usually be separated by evaporation.

## Properties of Everyday Materials

Different materials are chosen for different jobs based on their properties. They could be describe as:

- hard
- soft
- durable
- flexible
- transparent
- opaque
- translucent
- absorbent
- waterproof
- magnetic
- rough
- smooth

For tyres, rubber is a good material as it is durable.

For a saucepan, metal is a good material as it is a conductor of heat to help cook, however a good material for the the handle could be rubber as it is a poor conductor of heat, making it easier to hold.

## Separating Materials

Magnets are used for separating magnetic and non-magnetic materials.

Evaporation is used o separate a soluble solid and liquid.

Filtration is used to separate a solid and a liquid.

Sieving can be used to separate multiple solids.



## Key Vocabulary

solid	Solids have a definite shape and volume.
liquid	Liquids have a definite shape, but take the shape of the container they are in.
gas	Gases have no definite shape or volume.
solution	A solution is created when a material (the solute) is dissolved in liquid (the solvent).
substance	Any type of material.
filtration	The process of separating a solid from a liquid through a filter (usually paper).
sieving	Used to separate a mixture of solids.
dissolving	When a substances dissolves, it mixes with the liquid to create a solution.
soluble	Substances that dissolve in water.
insoluble	Substances that do not dissolve in water.
evaporation	Evaporation is the process where a liquid turns into a gas.
insulator	A material that does not allow heat/electricity to flow through easily.
conductor	A material that does allow heat/electricity to flow through easily.
reversible change	A change that can be reversed and the original materials can be retrieved.
irreversible change	A change that cannot be reversed and the original materials cannot be retrieved.

## Reversible Changes

Reversible changes are when you can get the original materials back after combining them. These can be separated in many different ways. Examples include: changing water into ice or water vapor, melting chocolate or dissolving sugar in tea. The original materials here can all be recovered.



## Irreversible Changes

Irreversible changes mean that you cannot get the original materials back again. Heating and chemical reactions can create irreversible changes. These reactions create new materials, which can often be useful to us.

Examples include: cooking a raw egg, toasting a piece of bread and baking a cake. The original ingredients cannot be recovered here.

