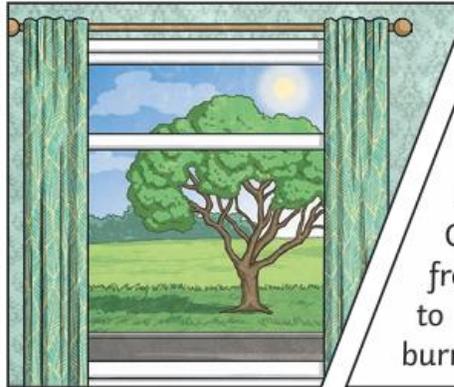




Key Vocabulary	
<b>materials</b>	The substance that something is made out of, e.g. wood, plastic, metal.
<b>solids</b>	One of the three states of matter. <b>Solid</b> particles are very close together, meaning <b>solids</b> , such as wood and glass, hold their shape.
<b>liquids</b>	This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of <b>liquids</b> include water and milk.
<b>gases</b>	One of the three states of matter. <b>Gas</b> particles are further apart than <b>solid</b> or <b>liquid</b> particles and they are free to move around. A gas fills its container, taking both the shape and the volume of the container. Examples of <b>gases</b> are oxygen and helium.
<b>melting</b>	The process of heating a <b>solid</b> until it changes into a <b>liquid</b> .
<b>freezing</b>	When a <b>liquid</b> cools and turns into a <b>solid</b> .
<b>evaporating</b>	When a <b>liquid</b> turns into a <b>gas</b> or vapour.
<b>condensing</b>	When a <b>gas</b> , such as water vapour, cools and turns into a <b>liquid</b> .

### Key Knowledge

Different **materials** are used for particular jobs based on their properties: electrical **conductivity**, flexibility, hardness, **insulators**, magnetism, solubility, thermal **conductivity**, **transparency**.



For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.



### Changes of State



**solid**

The **solid** melts.



**liquid**

The **liquid** freezes.



**liquid**

The **gas** condenses.



**gas**

The **liquid** evaporates.



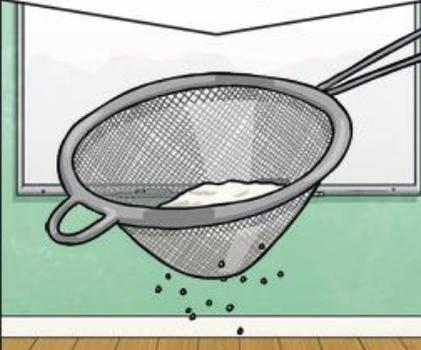
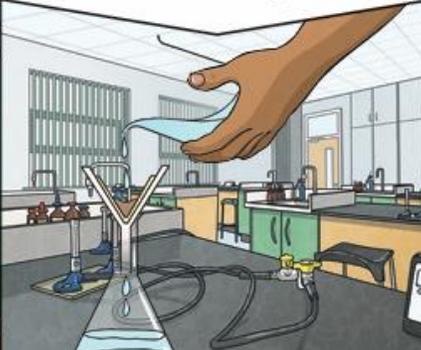
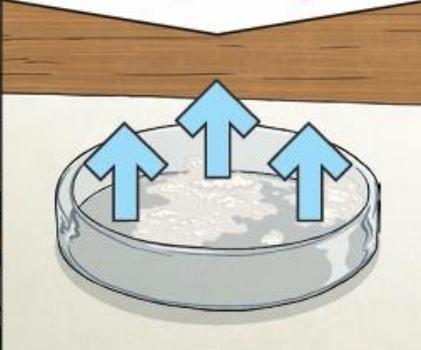
# As a Scientist...

## Key Vocabulary

<b>conductor</b>	A <b>conductor</b> is a material that heat or electricity can easily travel through. Most metals are both thermal <b>conductors</b> (they <b>conduct</b> heat) and electrical <b>conductors</b> (they <b>conduct</b> electricity).
<b>insulator</b>	An <b>insulator</b> is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical <b>insulators</b> .
<b>transparency</b>	A <b>transparent</b> object lets light through so the object can be looked through, for example glass or some plastics.

## Key Knowledge

Reversible changes, such as mixing and dissolving **solids** and **liquids** together, can be reversed by:

<p><b>Sieving</b></p> 	<p><b>Filtering</b></p> 	<p><b>Evaporating</b></p> 
Smaller <b>materials</b> are able to fall through the holes in the sieve, separating them from larger particles.	The <b>solid</b> particles will get caught in the filter paper but the <b>liquid</b> will be able to get through.	The <b>liquid</b> changes into a <b>gas</b> , leaving the <b>solid</b> particles behind.

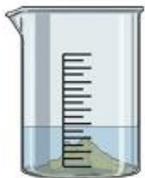
### Dissolving

A solution is made when **solid** particles are mixed with **liquid** particles. **Materials** that will dissolve are known as soluble. **Materials** that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.

Sugar is a soluble **material**.



Sand is an insoluble **material**.



Irreversible changes often result in a new product being made from the old **materials** (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic.





## As a Scientist...

### In year 4 I learnt to:

- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

### In year 5 I will learn to:

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Give reasons based on evidence from comparative and fair tests, for the particular uses of everyday materials, including wood, metals and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

### In Keystage 3 I will learn about:

- the concept of a pure substance.
- mixtures, including dissolving.
- diffusion in terms of the particle model.
- simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography.
- the identification of pure substances.