



SCIENCE: Chemistry - Materials

Summer A

Year 5



Key Ideas

Materials can be grouped and classified by their properties, eg, magnetic, hard, transparent, flexible, permeable, etc.

Some materials act as thermal conductors, ie, allow heat to pass through them easily, and others can be thermal insulators, ie, keep objects colds for a long time.

Some materials let electricity pass through them easily. These materials are known as electrical conductors. Many metals, such as copper, iron and steel, are good electrical conductors.

Some substances dissolve when you mix them with water. When a substance dissolves, it might look like it has disappeared, but in fact it has just mixed with the water to make a transparent (see-through) liquid called a solution.

A change is called irreversible if it cannot be changed back again. In an irreversible change, new materials are always formed. For example burning wood produces ash.

Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by sieving, filtering or evaporation.

Key Questions

Name five properties we can use to group or classify materials.

What is the difference between a conductor and an insulator?

Which type of materials are usually good electrical conductors?

Explain what happens in a reversible change.

How could you separate a mixture of sand, gravel and water?

Key words

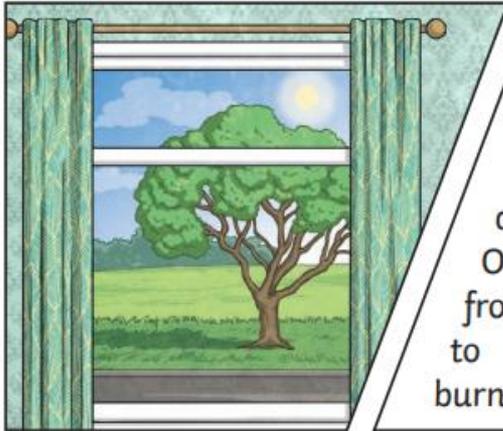
Explanation

Conductor	A material that an electric charge or heat can pass through easily.
Evaporate	When a liquid turns into a gas or vapour.
Filter	The solid particles get caught in a filter paper but the liquid particles go through the filter paper.
Insulator	A material which does not conduct heat or electricity through them very well.
Material	The substance something is made of eg wood, metal, plastic, etc.
Mixture	When two or more substances are mixed together but not chemically joined together, meaning that a chemical reaction has not taken place. Mixtures can be easily separated and the substances in the mixture keep their original properties.
Reversible/ Irreversible	Reversible: materials can be changed back to how they were before the reaction took place eg ice melts to form water then freezes back to ice. Irreversible: a change cannot be reversed and a new material is formed.
Soluble/ Insoluble	Soluble: is when a material is put in a liquid it 'disappears'. It has dissolved and the resulting liquid is called a solution eg, salt in water. Insoluble: the material does not dissolve when it is put into a liquid.
Solution	When a solute (that's the substance being dissolved) dissolves into a solvent (that's the substance that does the dissolving).
Thermal	To do with heat.

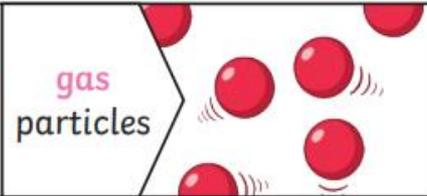
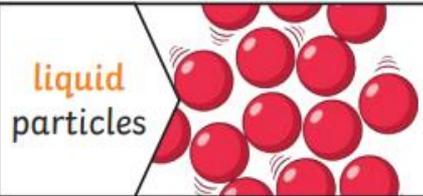
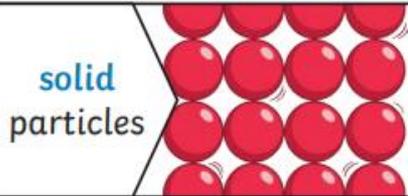
Key Figures who invented new materials

Ruth Benerito	Invented wrinkle free cotton.
Leo Baekeland	Invented a plastic called bakerlite.
John McAdam	Inveted tarmac which covers a lot of our roads.
Spencer Silver	Invented the glue for sticky notes.

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



The **solid** melts.

The **liquid** freezes.



The **gas** condenses.

The **liquid** evaporates.

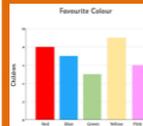


Linked skills:

Tables:

A table is a set of facts and figures arranged in columns and rows. It is a very useful way of organizing numerical information or data.

Bar charts:



Vertical



Horizontal

A bar chart displays information (data) by using rectangular bars of different heights. A vertical bar chart has a vertical axis with numbers on it, and a horizontal axis showing values of something that has been investigated. On a horizontal bar chart the axis values (ie in the numbers and values of things being investigated) are swapped.

Line graph:

A line graph is used to display information which changes over time. It is plotted on a graph as a series of points joined with straight lines.