

Year 5 – Spring Term: Properties and Changes of Materials

Knowledge Organiser Properties of Materials

Key Vocabulary

Key Word	Definition
comparative test	Undertaking a test with a controlled variable to help answer questions.
elasticity	The ability of a material to resume its normal shape after being stretched or compressed.
plasticity	The ability for a material to be easily shaped or moulded.
crude oil	A natural oil formed by carbon deposits and organic materials.
perforate	To pierce or puncture something.
extraction	To remove something from its natural setting.
thermal conductivity	The ability of a material or substance to conduct or transfer heat.
inexhaustible	Something unable to be used completely because there's too much of it to be all used up.

Science Subject Knowledge Skills

In this topic, I will:

- I know that some materials will dissolve in water to form a solution.
- I know that not all materials react the same way when mixed with water; some will float, sink, dissolve or react.
- I know that dissolving is a reversible change.
- I know that soluble materials, such as sugar, are able to be separated from water through evaporation.
- I know that filtering is a good way to separate water from insoluble materials, such as sand.
- I can identify a range of mixing processes, dissolving processes or changes of state that are reversible.
- I know that an irreversible change occurs when two materials react with each other to form a new substance.
- I can explain what would happen to a variety of materials when they were heated and cooled, and explain whether these are reversible or irreversible changes.
- I know that some materials change state when they are heated or cooled.
- I know that when a material is burned, it produces a new product (e.g. gas or ash), which makes burning an irreversible change.
- I can identify the properties of a variety of everyday materials, such as whether it is magnetic, conductive, soluble, flexible, etc.

Science Working Scientifically Skills:

In this topic, I will:

- I can mix a variety of materials with water to see whether they will dissolve, float, sink or react, recording the results in a table.
- I can classify materials depending on whether they dissolve, float, sink or react when mixed with water.
- I can investigate different irreversible changes by mixing different materials together, observing the results and explaining what has happened.
- I can compare and classify a variety of everyday materials based on their properties.
- I can carry out a variety of investigations to explore the properties of materials to see if they e.g. conduct electricity, are magnetic, are soluble, etc.
- I can give reasons, based on evidence from comparative and fair tests, for uses of everyday materials.
- I can plan, set up and carry out a fair test, drawing conclusions and presenting the results.

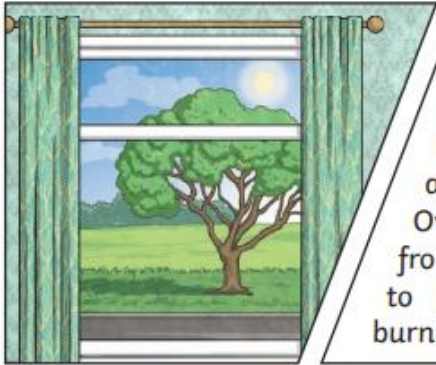
Natural resources which are used in every day life include: water, air, trees and plants, and cotton.

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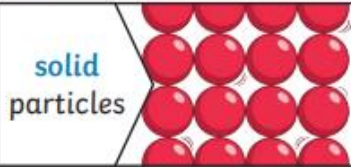
Some insulating materials found in our houses include fibre glass loft insulation, cavity wall filler and double-glazed windows.

Key Knowledge

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



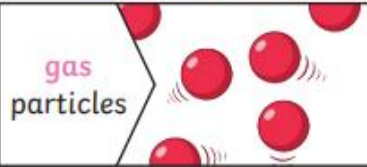
For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.



solid particles



liquid particles



gas particles

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**.



At the end of this topic, I will:

- Know that some materials will dissolve in liquid to form a solution
- Use knowledge of solids, liquids and gases to decide how mixtures and solutions might be separated
- Explain that some changes form new materials, and that these changes are not usually reversible
- Identify when a change caused by heating or cooling is reversible or irreversible.
- Investigate the materials needed for something to burn and the new materials formed by burning
- Compare and group together everyday materials on the basis of their properties
- Give reasons for the particular uses of everyday materials in relation to their properties

Changes of State

solid



The **solid** melts.

The **liquid** freezes.

liquid



The **gas** condenses.

The **liquid** evaporates.

gas



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