



Year 5: Properties and Changes of Materials



Kindness Enjoyment Achievement

Key Concepts:

Materials have different uses depending on their properties and state (liquid, solid gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment. Mixtures can be separated by filtering, sieving and evaporation.

Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood and vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.

Recognise that some solids are soluble and explain that they will dissolve in water and can be recovered using evaporation.

Recognise that some solids are insoluble, remaining as a sediment when mixed with water and can be recovered by filtration and sieving.

Recognise that some changes result in the formation of new materials and explain that this kind of change is usually not reversible therefore the original materials cannot be recovered.

Types of Enquiry:

Sorting and classifying:

Sort materials by hardness/ transparency/ electrical/ thermal conductivity and attraction to magnets.

Materials which do/ don't dissolve

Identify reversible and irreversible changes.

Fair/ comparative test:

Which material is best for mopping up spills?

Which material keeps a cup of tea warmest for longest? TAPS- Y5 Materials insulation layers.

Self directed investigation: what might affect how quickly dissolving occurs? TAPS Y5 Materials- dissolving Is there a limit to how much sugar will dissolve?

Use of secondary sources:

Not a main focus of this topic

Change over time:

What happens to skittles sweets when I pour water over them and leave them overnight?

What happens to different materials in suspension over time?

Observe changes after adding bicarbonate of soda to weak vinegar: lemon juice or vinegar.

Vocabulary:

Soft, hard stretchy, rigid, flexible, waterproof, absorbent, thermal conductivity, flexible, durable

Thermal insulator/ conductor

Melting, freezing

Evaporating, condensing,

Water vapour

solid, liquid, gas

changing state

dissolve, solution, soluble, insoluble

suspension

Filter, sieve, filter paper

Rust

Burning

acid

New material

Carbon dioxide



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	<p><u>Pattern seeking:</u> What effect does temperature have on the rate of dissolving?</p> <p><u>Working scientifically skills:</u></p> <p><u>Questioning:</u> Independently ask scientific questions that can be investigated by a fair test Answer own and others questions based on observations they have made.</p> <p><u>Observing:</u> Use thermometers and/ or data logger to measure water cooling & dissolving rates.</p> <p><u>Testing:</u> Make decisions on whether they need to take repeat readings or adjust the observation period and frequency.</p> <p><u>Recording:</u> Decide how to record and present evidence. Tables, line graph for change over time Labelled drawings, observational drawings and writing. Classification keys.</p> <p><u>Communicating:</u></p>	<p><u>How it fits in with the rest of the curriculum:</u></p> <p>Y1: Identify and name a variety of everyday materials including wood, metal, plastic, glass, water and rock. Describe the simple physical properties of a variety of everyday materials & group materials on this.</p> <p>Y2: Distinguish between an object and the material from which it is made. Identify & compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Y3: Sort magnetic and non magnetic materials. Transparent, opaque and translucent sorting.</p> <p>Y4: Electrical conductors and insulators. Distinguish between solids, liquids and gases. Know the names of some gases: oxygen, carbon dioxide.</p>
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	<p>Record results in a letter to shop after investigating characteristics of different object e.g. nappies.</p> <p><u>Concluding:</u> Decide whether parallel groups' evidence supports or refutes their own conclusions and evidence.</p>	<p>Observe that materials change state when heated or cooled and measure the temperature at which this happens.</p> <p>Evaporation and condensation in the water cycle.</p> <p>Things that affect evaporation rates: shape of container, heat, heat source, amount of water.</p> <p>KS3: 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.</p> <p><u>Cross curricular links:</u> DT: cooking</p>
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