






Key Vocabulary

Key Word	Definition
Conductor conductive	a material that allows heat / electricity to pass through it
Thermal	Using or producing heat
Change of state	From a solid to liquid, liquid to gas liquid to solid etc
mixture	a mixture is a material made up of two or more different chemical substances which are not chemically bonded.
dissolve	To mix with a liquid and become part of that liquid
solution	A mixture of 2 or more substances . A solute is a substance dissolved in another substance , known as a solvent
Soluble insoluble	Soluble can dissolve Insoluble – cannot dissolve
Solute	A substance that dissolves in water
filter	The separation of a mixture , using a tool to separate particles

UKS2 Science Unit Materials and their Properties

Properties of Materials

conducts energy	
insulates energy	
transparent	
waterproof	
durable (strong)	
magnetic	

Soluble Materials

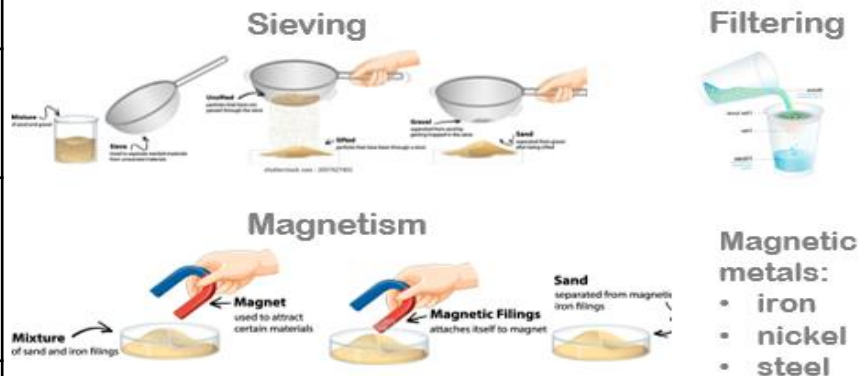
Some solids **dissolve** in water (**SOLUBLE**).



Some solids do not **dissolve** in water (**INSOLUBLE**).



Separating Materials



Working Scientifically Skills



Science Enquiry



Learning Sequence

Lesson 1

What are the different properties of everyday materials?

Lesson 2

Investigate the effects of thermal conductors and thermal insulators

Lesson 3

Explore hardness of different materials

Lesson 4

Which materials are soluble in water?

Lesson 5

Investigate the solubility of materials

Lesson 6

How can mixtures be separated?
Filtering, sieving, evaporating, magnetism.

Prior Learning	Future Learning
<ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials) Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. (Y3 - Forces and magnets) Compare and group materials together, according to whether they are solids, liquids or gases. (Y4 - States of matter) Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). (Y4 - States of matter) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Y4 - States of matter) 	<p>Y6 (New Change to ESW Curriculum)</p> <ul style="list-style-type: none"> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. (Y6 -Properties and changes of Materials) Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (Y6 - Properties and changes of Materials) Identify dissolving, mixing and changes of state are reversible changes. (Y6 -Properties and changes of Materials) Observe some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. (Y6 -Properties and changes of Materials) Chemical reactions as the rearrangement of atoms. (KS3) Representing chemical reactions using formulae and using equations. (KS3) Combustion, thermal decomposition, oxidation and displacement reactions. (KS3) Defining acids and alkalis in terms of neutralisation reactions. (KS3) The pH scale for measuring acidity/alkalinity; and indicators. (KS3)

Year	5	Topic	Properties of Materials
	<ul style="list-style-type: none"> 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. <p>IMPORTANT Notice: Outcomes below are to be carried out in Year 6 (New Change to ESW Curriculum)</p> <ul style="list-style-type: none"> 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 metals, wood and plastic. 		

Assessment of correct language

Can use understanding of properties to explain everyday uses of materials, for example, how bricks, wood, glass and metals are used in buildings

- Can explain what dissolving means, giving examples
 - Can name equipment used for filtering and sieving
 - Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solution or mixtures by evaporation , filtering or sieving.
- Can describe some simple reversible and non reversible changes to materials , giving examples

Applying knowledge

- Can create a chart or table grouping/comparing everyday materials by different properties
- Can use test evidence gathered about different properties to suggest an appropriate material for a particular purpose
- Can group solids based on their observations when mixing them with water
- Can give reasons for choice of equipment and methods to separate a given solution or mixture such as salt or sand in water
- Can explain the results from their investigations

Today, we are focusing on:



Working Scientifically

Asking questions

Asking questions that can be answered using a scientific enquiry.



Making predictions

Using prior knowledge to suggest what will happen in an enquiry.



Setting up tests

Deciding on the method and equipment to use to carry out an enquiry.



Observing and measuring

Using senses and measuring equipment to make observations about the enquiry.



Recording data

Using tables, drawings and other means to note observations and measurements.



Interpreting and communicating results

Using information from the data to say what you found out.



Evaluating

Reflecting on the success of the enquiry approach and identifying further questions for enquiry.



Types of Enquiry

Comparative / fair testing

Changing one variable to see its effect on another, whilst keeping all others the same.



Research

Using secondary sources of information to answer scientific questions.



Observation over time

Observing changes that occur over a period of time ranging from minutes to months.



Pattern-seeking

Identifying patterns and looking for relationships in enquiries where variables are difficult to control.



Identifying, grouping and classifying

Making observations to name, sort and organise items.



Problem-solving

Applying prior scientific knowledge to find answers to problems.

