

Learning journey	Science	Properties and Changes of Materials	Year 3 Spring 2	
------------------	---------	-------------------------------------	-----------------	---

Building on prior learning	Theme overview	Preparing for future learning	Vocabulary
<p>In KS1 the children will have learned that:</p> <ul style="list-style-type: none"> There are many different materials that have different observable properties. Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass). The properties of a material determine whether they are suitable for a purpose 	<p>Chapter 1: What are mixtures?</p> <p>Chapter 2: What does dissolving mean? What is it?</p> <p>Chapter 3: Deciding how to separate mixtures.</p> <ul style="list-style-type: none"> Mixtures can be separated if the substances have different properties This is because the substances in the mixture are still present and are unchanged There are different techniques for separating mixtures 	<p>In Y4 children will learn that materials can be divided into solids liquids and gases.</p> <p>That materials can change state by heating and cooling.</p> <p>That different substance change state at different temperatures.</p> <p>They will investigate what happens at the melting temperature of solids</p> <p>In Y5 children will learn:</p> <p>That when materials are heated or mixed with other materials they sometimes can be made to turn into new materials.</p>	<ul style="list-style-type: none"> Solid, liquid, gas, properties. Heating and cooling Evaporation, condensation, melting, freezing Boiling, condensation, freezing and melting temperatures. Mixture, separate, sieve. Solution, dissolve, saturated, soluble, insoluble, filter, evaporate, Reversible, irreversible

NC coverage and HWJS skills development	Knowledge organisers
<p><u>National curriculum coverage for Science</u></p> <ul style="list-style-type: none"> Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Decide how mixtures might be separated, including through filtering, sieving and evaporating Demonstrate that dissolving and mixing of materials is reversible Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning <p><u>HWJS skills development</u></p>	<p>Knowledge Block 1: What Mixtures are</p> <p>Substantive Knowledge (key ideas)</p> <ul style="list-style-type: none"> A substance is an object with the same properties throughout. A mixture is when more than one substance is present in the same container <p>Knowledge Block 2: What dissolving is</p> <p>Substantive Knowledge (key ideas)</p> <ul style="list-style-type: none"> When a substance is added to a liquid the substance can disappear- this is called dissolving A mixture of a substance that has dissolved in a liquid is called a solution Not every substance can dissolve in water <p>Knowledge Block 3: Separating Mixtures</p> <p>Substantive Knowledge (key ideas)</p> <ul style="list-style-type: none"> Mixtures can be separated if the substances have different properties This is because the substances in the mixture are still present and are unchanged

What does behaving like scientists mean, can I define it?

What must I teach children so they can do these things?

1a. Use my scientific knowledge to predict what might happen.

1b. Sometimes I will also need to draw upon observations to help me predict

2a. Use my scientific knowledge to hypothesise why *something* happened.

2b. Sometimes I will also need to draw upon observations to help me hypothesise, these may be from my own experiments or from secondary sources (e.g. when hypothesising why some planets have more moons than others)

3. Plan to investigate how one thing affects another

4. Use evidence to describe how one thing affects another

Precise ideas as defined by learning journeys.

- How to observe closely and carefully enough.
- How to measure precisely enough and with appropriate resolution.

Precise ideas as defined by learning journeys.

- How to observe closely and carefully enough.
- How to measure precisely enough and with appropriate resolution.

How to identify, measure and control variables in cause and effect investigations.

How to use evidence to describe how one variable affects another.



A Model of Progression.

1. Pose problems that require the application of knowledge being taught.
2. Deconstruct the problem to define what a child must understand and be able to do to tackle the problem (including what they need to observe and measure), teach these skills and knowledge **at that point**.
3. As children progress through the curriculum they will tackle problems using new ideas, and when the problem requires with closer observation and more precise measurement.

Good enough progression is being able to tackle these problems.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

Setting up simple practical enquiries, comparative and fair tests – use the Planning Mindmap.

Children gather evidence to describe the relationship between variables (cause and effect) by identifying what must be changed, what measured and what must be kept the same.

- There are different techniques for separating mixtures

Separating technique

Substance properties required to work.

Filtration and sieving

A substance that does not dissolve in a liquid.

Different sized substances

- Magnets Some magnetic materials some non-magnetic.
- Evaporation A solid substance dissolved in water and the solid has a higher boiling point than water.
- Floating Some substances float, some substances sink

<p><u>Connections / deepening understanding</u></p> <p>How is the understanding of this area deepened in other areas of the curriculum? What links are there in the other subjects in the curriculum?</p>	<p><u>RADE</u></p> <p>Are the rights of the child relevant in this area of study - do they get referred to in the work?</p>	<p><u>Assessment</u></p> <p>By the end of the unit the children will be able to ... Details of the objectives that they will have covered within this unit of work</p>	
<p>English — Note making and report writing. Geography – Rocks and Soils and how they can be separated.</p>			
<p>Assessment recording for the unit - checking the level of pitch of the work</p>			
<p><u>Key skill(s)/ knowledge to be assessed by the end of the unit</u></p>	<p><u>Lower attaining</u></p>	<p><u>Middle attaining</u></p>	<p><u>Higher attaining</u></p>
<p>Children should clearly be able to sort mixtures into individual substances.</p> <p>When a substance is added to a liquid the substance can disappear- this is called dissolving A mixture of a substance that has dissolved in a liquid is called a solution Not every substance can dissolve in water</p> <p>Mixtures can be separated if the substances have different properties This is because the substances in the mixture are still present and are unchanged There are different techniques for separating mixtures</p>	<p>Children can describe the materials that are mixed together. They begin to identify materials.</p> <p>They begin to understand that some materials ‘appear to disappear’ but in fact dissolve into water.</p> <p>They begin to understand that mixtures of materials that are both unchanged can be separated. They can describe one of these techniques:</p> <ul style="list-style-type: none"> • Filtration and sieving • Magnets • Evaporation • Floating 	<p>Children can describe the materials that are mixed together. They can identify differences, similarities or changes related to simple scientific ideas and processes. Children should clearly be able to sort mixtures into individual substances.</p> <p>They understand that some materials ‘appear to disappear’ but in fact dissolve into water. They know that this is called a solution.</p> <p>They understand that mixtures of materials that are both unchanged can be separated. They can describe these techniques:</p> <ul style="list-style-type: none"> • Filtration and sieving • Magnets • Evaporation • Floating 	<p>Children can describe the materials that are mixed together. They can identify differences, similarities or changes related to simple scientific ideas and processes. Children should clearly be able to sort mixtures into individual substances and accurately describe properties of those materials.</p> <p>They understand that some materials ‘appear to disappear’ but in fact dissolve into water. They know that this is called a solution.</p> <p>They understand that mixtures of materials that are both unchanged can be separated. They can describe these techniques and discuss the ‘substance properties required to work’ – as shown below</p>

			Separating technique	Substance properties required to work
			Filtration and sieving	A substance that does not dissolve in a liquid Different sized substances
			Magnets	Some magnetic materials some non-magnetic
			Evaporation	A solid substance dissolved in water and the solid has a higher boiling point than water.
			Floating	Some substances float, some substances sink

NB: The assessments are completed for two reasons – to enable the class teacher and in turn the subject leader to evaluate the pitch of the learning within the unit in order to consider any necessary updates and for the class teacher to report to parents on the attainment of pupils in the end of year reports