



Medium Term Unit Planning

Topic Name: Science – Materials	
Learning outcome: The children will be able to identify the properties of different materials, considering how this provides them with a purpose. The children will progress further drawing on their understanding of the states of matter to investigate how materials are changed through processes such as sieving, dissolving and evaporating.	
Hook: A material hunt around the school followed by a letter from Severn Trent asking the children to investigate what is contaminating the river.	Topic Showcase (e.g. display, museum, performance, presentation): Designing their own dissolving experiment.
Oracy: Lesson 3 – the children will present the way they have grouped their materials, trying to convince the class that their grouping is the best way to do it.	Key Vocabulary: Dissolving, properties, materials, purpose, grouping, changing, soluble, insoluble, evaporating, condensation, heat, solid, liquid, gas, states of matter, sieving, filtering, magnetic, solution, reversible, irreversible, reaction, burning, mixing, melting.
Key Texts (whole class reading/end of the day book/Talk for Writing Texts etc.): <ul style="list-style-type: none"> • Chromatography by Chris Woodford – WCR text • Heston's Craziest Recipes – WCR text • Spurting Science: Erupting Diet Coke with Mentos - WCR text 	
Citizenship/Community Opportunities (Focus – change in attitude/increase knowledge and awareness/make a difference): Children to be aware of the impact that humans have on the environment, specifically the rivers (link to rivers topic) and what happens when the river is contaminated.	



Medium Term Unit Planning

Experiences/Visits/Visitors:

School grounds walk

Main subjects covered:

Science

Science threshold concepts:

Work scientifically

This concept involves learning the methodologies of the discipline of science.

Chemistry – Materials

This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.

Notes:

This scheme of work will be linked to the children's topic 'Rivers'.

Lesson title and learning Intention	Threshold concepts (success criteria)	Milestones (success criteria)	Lesson structure/differentiation
1. To show what I know about materials and the properties they possess.	Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.	Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility,	Children will watch the sorting hat scene from HP with the focus of trying to identify the different materials present, their purposes and their properties. The focus will be



Medium Term Unit Planning

	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>conductivity (electrical and thermal), and response to magnets.</p> <p>Present findings in written form, displays and other presentations.</p> <p>Plan enquiries, including recognising and controlling variables where necessary.</p>	<p>on the words (properties) we use to describe the materials. The children will then be given different items ready to discuss why they are used based on their properties. End by considering different tests that you may use when investigating the properties of the materials.</p>
<p>2. To use my knowledge of materials to predict whether magnets will attract or repel.</p>	<p>Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.</p> <p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Describe magnets as having two poles.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Use test results to make predictions to set up</p>	<p>Children will discuss what magnets are and how they are used. The children will begin by predicting and then investigating whether magnets will attract or repel. As an extension, the children will then investigate whether the strength of the magnet impacts this. They will then draw and label a magnet</p>



Medium Term Unit Planning

		<p>further comparative and fair tests.</p> <p>Present findings in written form, displays and other presentations.</p>	<p>in their book, along with materials they found to be magnetic.</p>
<p>3. To compare and group materials based on evidence from fair tests.</p>	<p>Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.</p> <p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets.</p> <p>Plan enquiries, including recognising and controlling variables where necessary.</p> <p>Use appropriate techniques, apparatus,</p>	<p>The children will use the tests that they discussed in the first lesson to test the properties of different materials. They will fairly test their hardness, conductivity, solubility, magnetism and transparency. The children will then be able to group the materials that they have investigated ready to present their method of grouping to the class.</p>



Medium Term Unit Planning

		<p>and materials during fieldwork and laboratory work.</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.</p>	
<p>4. To describe how mixtures might be separated through filtering, sieving and evaporating.</p>	<p>Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.</p> <p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work.</p>	<p>Begin by recapping the three states of matter. Show the children the letter from Severn Trent asking them to identify river contaminants (separate the mixture). Children will work in tables to use the equipment provided to decide how to separate the mixture and in what order to do this, drawing on their</p>



Medium Term Unit Planning

			knowledge of the three states of matter.
5. To explain how materials dissolve to form a solution.	<p>Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.</p> <p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</p> <p>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.</p>	Introduce the children to the concept of dissolving, using their everyday experiences as examples to draw upon. Children will conduct an experiment to investigate which materials are soluble/insoluble.
6. To explain that changes in material can be reversible or irreversible.	<p>Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties, uses and how they may be altered or changed.</p>	<p>Demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>Explain that some changes result in the</p>	Introduce the children to the notions of reversible and irreversible changes by referring to our previous investigations. Explore different examples of such changes. Children will



Medium Term Unit Planning

	<p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning, oxidation and the action of acid on bicarbonate of soda.</p> <p>Use test results to make predictions to set up further comparative and fair tests.</p> <p>Present findings in written form, displays and other presentations.</p>	<p>complete investigate what happens when bicarbonate of soda and vinegar are mixed together, scientifically explaining their observations.</p>
<p>7. To design their own experiment.</p>	<p>Chemistry – Investigate Materials This concept involves knowing there are a range of materials; understanding their properties,</p>	<p>Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</p>	<p>The children will recap properties of materials. Children will then design, set up and carry out their experiment to determine the best materials to be</p>



Medium Term Unit Planning

	<p>uses and how they may be altered or changed.</p> <p>Work scientifically This concept involves learning the methodologies of the discipline of science.</p>	<p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</p> <p>Use test results to make predictions to set up further comparative and fair tests.</p> <p>Plan enquiries, including recognising and controlling variables where necessary.</p> <p>Record data and results of increasing complexity using scientific diagrams</p>	<p>used when making a Titanic model at home. This will then be tested fairly at school for a final evaluation.</p>
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Medium Term Unit Planning

		and labels, classification keys, tables, bar and line graphs, and models.	
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