

Science Progression of Skills and Knowledge States of matter

Key to understanding this document: Black = National Curriculum objectives Red = Knowledge/Skills to be taught Green = Resources to be used

<u>Area of Learning</u>	<u>E Y F S</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>
<u>States of matter</u>					<p>Working scientifically: Making systematic and careful observations. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>SM1: Compare and group materials together, according to whether they are solids, liquids or gases.</p> <p>Show different states of matter by using balloons. In some of the balloons make sure you have frozen water. In other balloons fill with liquid water. Just fill the remaining balloons with gas by blowing into them. Ask the children to feel each of the balloons and decide what a solid is, a liquid and a gas is.</p> <p>Children could act out the different states of matter. Demonstrate how solid particles are all close together and moving slowly. As they become liquids, they remain in close contact but move around more. Finally, as gases, they move around quicker and in a random fashion.</p> <p>Children are given a selection of materials which they must decide if they are solid, liquid or gas. Children could then present their results in a Venn diagram and use this to answer questions about their findings.</p>		

				<p>Working scientifically: Setting up practical enquiries, comparative and fair tests. Making systematic and careful observations. Using a range of scientific equipment. Gathering and recording data using a table. SM2: 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). Children to come up with their own chocolate experiment to see what temperature they think chocolate will melt. Children to decide the melting point of different types of chocolate. Children carry out their own investigation to answer the question 'Do all liquids freeze?'. Children can plan and set their own investigation and draw conclusions from their results.</p> <p>Working scientifically: Setting up a simple practical enquiries. Making systematic and careful observations. Identifying differences, similarities or changes related to simple scientific ideas and processes. Recording findings using simple scientific language and a table.</p> <p>SM3: Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Show children a video of the water cycle e.g. bbc bitesize Children observe the features of the water cycle by placing some plasticine mountains and warm water in a clear bowl. Cover the top of the bowl with cling film. Onto the cling film place ice wrapped in cotton wool (clouds). Children can investigate how different liquids evaporate at different rates. Leave out dishes of different liquids, eg water, vinegar, lemon juice, salty water and tea for the children to observe. Duplicate some and cover</p>		
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				<p>them. What happens to the uncovered dishes? Is anything left behind? Can you smell anything, why?</p> <table border="1" data-bbox="851 268 1550 595"> <thead> <tr> <th rowspan="2">Liquid used for test</th> <th colspan="5">Amount of liquid left and other observations</th> </tr> <tr> <th>Monday</th> <th>Tuesday</th> <th>Wednesday</th> <th>Thursday</th> <th>Friday</th> </tr> </thead> <tbody> <tr> <td>covered lemon juice uncovered</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>covered vinegar uncovered</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>covered salty water uncovered</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>covered water uncovered</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(Table taken from STEM website)</p>	Liquid used for test	Amount of liquid left and other observations					Monday	Tuesday	Wednesday	Thursday	Friday	covered lemon juice uncovered						covered vinegar uncovered						covered salty water uncovered						covered water uncovered							
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Key Resources				<p>Balloons Ice Lemon juice Vinegar Thermometers Data loggers Plastic bowls Clingfilm Plasticine Mirrors</p>																																					