



**Science Autumn 1 Year 4 Chemistry -States of Matter**

**TAPS Assessment: Investigating Ice Cubes**

**Key vocabulary:** Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle

National Curriculum	Week	NC - Coverage	Disciplinary Knowledge	Substantive Knowledge	Activity Outline
<p><b>The national curriculum for Science aims to ensure that all pupils:</b></p> <p><b><u>Working Scientifically Lower KS2</u></b> pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> <li>§ asking relevant questions and using different types of scientific enquiries to answer them</li> <li>§ setting up simple practical enquiries, comparative and fair tests</li> <li>§ making systematic and</li> </ul>	<b>1</b>	Compare and group materials together, according to whether they are solids, liquids or gases	Observe closely and classify a range of solids and liquids.	Knows how to distinguish between a solid, liquid and gas.	Ask children to think about what they already know about solids, liquids and gases. Collate their ideas using KWL grids. Give children time to observe what happens when currants are added to lemonade. After the initial observation and discussion, give children three cards with the words 'solid', 'liquid' and 'gas' written on them and ask to explain their observations using these three words.
	<b>2</b>	Compare and group materials together, according to whether they are solids, liquids or gases.	Classify materials according to whether they are solids, liquids and gases.	Knows how to distinguish between a solid, liquid and gas.	Give children images and where possible, the actual materials to consider and explore e.g. toothpaste, sand, flour and milk. In addition, choose materials that the state is harder to define. Ask children to discuss and justify their grouping including overlaps. (e.g. Venn Diagram) Ask children to write what they now understood about solids, liquids and gases.



<p>careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <p>§ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p> <p>§ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>§ reporting on findings from enquiries, including oral and written explanations, displays or</p>	<p><b>3</b></p>	<p>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)</p>	<p>Make careful observations of the similarities and differences between the two types of chocolate buttons.</p>	<p>Knows that some materials change state when they are heated or cooled..</p>	<p>Give the children two chocolate buttons to look at and consider how they are the same and different. Ask children to predict which chocolate button they think will melt the quickest and given equipment to test this out. Children to carry out the enquiry and write a conclusion.</p>
	<p><b>4</b></p>	<p>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)</p>	<p>Make careful observations of the similarities and differences between the liquids and the frozen cubes.</p>	<p>Knows the temperatures at which ice, water and water vapour change state.</p>	<p>Put liquids in an ice cube tray and place them in the freezer. Give children small amounts of liquids to explore and children to compare them with the frozen cubes to explore before freezing and after freezing.</p>



<p>presentations of results and conclusions § using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions          § identifying differences, similarities or changes related to simple scientific ideas and processes          § using straightforward scientific evidence to answer questions or to support their findings</p> <p><b><u>Subject Content</u></b></p> <ul style="list-style-type: none"> <li>· compare and group materials together, according to whether they are solids, liquids or gases</li> <li>· 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)</li> </ul>	<p>5</p>	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Set up investigations to explore changing the rate of evaporation. To describe the visible changes.</p>	<p>Knows the part played by evaporation and condensation in the water cycle.</p>	<p>Before the lesson ask children to make handprints on a paper towel using water. Children to start making observations to see how the prints start to change. Children to determine how long before the prints disappear.</p>
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<p>· identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <p><b>School Context</b></p> <p>Non-reversible change in the context of food preparation.</p> <p><b>Common Misconceptions</b></p> <p>Some children may think: • 'solid' is another word for hard or opaque • solids are hard and cannot break or change shape easily and are often in one piece • substances made of very small particles like sugar or sand cannot be solids • particles in liquids are further apart than in solids and they take up more space • when air is pumped into balloons, they become lighter • water in different forms – steam, water, ice – are all different substances • all liquids boil at the</p>	<p>6</p>	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Use secondary sources to find out about the water cycle.</p>		<p>Guided by the teacher, ask children to role-play the water cycle and use this to help them to label a water cycle diagram. Now ask children to sort factual sentences about the key scientific words. Children to use this information to write about the water cycle.</p>
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<p>same temperature as water (100 degrees) • melting, as a change of state, is the same as dissolving</p> <ul style="list-style-type: none"> <li>• steam is visible water vapour (only the condensing water droplets can be seen)</li> </ul>					
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**Science Autumn 2 Year 4 Physics -Sound**

**TAPS Assessment: Investigating Pitch**

<p><b>Key vocabulary:</b> Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>					
<p><b>National Curriculum</b></p>	<p><b>Week</b></p>	<p><b>NC - Coverage</b></p>	<p><b>Disciplinary Knowledge</b></p>	<p><b>Substantive Knowledge</b></p>	<p><b>Activity Outline</b></p>



<p><b>The national curriculum for Science aims to ensure that all pupils:</b></p> <p><b><u>Working Scientifically Lower KS2</u></b> pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> <li>§ asking relevant questions and using different types of scientific enquiries to answer them</li> <li>§ setting up simple practical enquiries, comparative and fair tests</li> <li>§ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> </ul>	1	Identify how sounds are made, associating some of them with something vibrating.	Make predictions about the pitch and volume of sounds.	Knows how sounds are made, associating some of them with vibrating.	Ask children to participate in a carousel of activities to make observations when making sounds. In each case, ask children to see and/or feel the vibrations and link these to the sound produced.
	2	Identify how sounds are made, associating some of them with something vibrating.	Draw conclusions about the pitch and volumes of sound.	Knows how sounds are made, associating some of them with vibrating.	Ask the children to explain how their ideas about sounds had changed.
	3	Recognise that vibrations from sounds travel through a medium to the ear	Identify and show how sound travels through particles and into the ear	Knows how sound travels from a source to our ears.	Ask children to discuss the concept cartoon (see PLAN) and investigate whether sounds can travel through solids, liquids and gases. Take children outside to explore; tapping wood and metal structures and see if they can hear when they put their ears to the other end.
	4	Recognise that vibrations from sounds travel through a medium to the ear	To grade the loudness (volume) of the sound out of ...	Knows how sound travels from a source to our ears. Know that sounds get fainter as the distance from the	Continue from lesson 3. Ask children to create string tin phones and investigate how the sound of clapping travels across the playground. Ask children to record the evidence gathered during their exploration.



<p>§ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p>			<p>To draw a table adding appropriate headings in order to record findings.</p>	<p>sound source increases</p>	
<p>§ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>§ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>§ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <p>§ identifying differences, similarities or changes related to simple scientific ideas and processes</p> <p>§ using straightforward scientific evidence to</p>	<p>5</p>	<p>Find patterns between the pitch of a sound and features of the object that produced it.</p>	<p>To consistently use comparative language to link cause and effect.</p>	<p>To know the patterns between the pitch of the sound and the features of the object.</p>	<p>Children to investigate various musical instruments and objects to explore the pattern between the pitch of the sound and the instruments' features. Record the patterns they observe in their books.</p>



<p>answer questions or to support their findings</p> <p><b>Subject Content</b></p> <p><b>Pupils should be taught to:</b>          Identify how sounds are made, associating some of them with something vibrating          Recognise that vibrations from sounds travel through a medium to the ear          Find patterns between the pitch of a sound and features of the object that produced it.          Find patterns between the volume of a sound and the strength of the vibrations that produced it          Recognise that sounds get fainter as the distance from the sound source increases</p> <p><b>School Context</b></p> <p>Exploration of sounds made by musical instruments with different vibrating components</p> <p><b>Common Misconceptions</b></p>	<p>6</p>	<p>Recognise that vibrations from sounds travel through a medium to the ear</p>	<p>To construct a simple table to record his evidence.          To report findings and draw simple conclusions.</p>	<p>To know that vibrations can travel through materials other than air.</p>	<p>Ask children to consider how they could muffle a loud sound. They were given a range of fabrics to consider using e.g. tin foil, foam, bubble wrap, newspaper</p>
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<p>Pitch and volume are frequently confused, as both can be described as high or low. Some children may think:</p> <ul style="list-style-type: none"><li>• sound is only heard by the listener</li><li>• sound only travels in one direction from the source</li><li>• sound can't travel through solids and liquids</li><li>• high sounds are loud and low sounds are quiet.</li></ul>					
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