



Spring 2		States of Matter				
<b>Prior learning</b>	Properties of Materials: Year 1 – identify materials and describe properties; Year 2 – identify and compare suitability of materials					
<b>Lesson objective</b>	Compare and group the 3 states of matter	Explore how particles behave in solids, liquids and gases	Investigate melting points	Explore freezing and boiling points	Explore evaporation and condensation	Understand the water cycle
<b>Key vocabulary</b>	matter solid liquid gas volume	particle bond arranged cooled heated	particle melting melting point temperature thermometer	freezing reverse boiling sublimation deposition	evaporation condensation absorb water vapour process	water cycle precipitation surface runoff transpiration groundwater
<b>Creative context</b>						
<b>Substantive knowledge</b>	Compare and group materials together, according to whether they are solids, liquids or gases	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)	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)	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)	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature
<b>Disciplinary knowledge</b>	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	Using straightforward scientific evidence to answer questions or to support their findings	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment,	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables



			Including thermometers and data loggers			
<b>Recorded learning</b>	<p>Sort familiar substances and classify them as solids, liquids or gases. Write a sentence to explain how each state of matter behaves.</p> <p>Challenge Task: Encourage the children to think of their own examples of substances and add these to the table.</p>	<p>Complete table to describe how particles behave in each of the states of matter. Apply this to water, stating the name of water in its 3 forms, drawing the appearance and particles and writing a description of how the particles behave.</p> <p>Challenge Task: Ask the children to label the arrows to describe whether the substance has been heated or cooled to change state.</p>	<p>Investigate the melting points of different foods. First order their foods from those which they think will have the highest melting point to those with the lowest. Then, melt the food. Record the temperature of the food when it turns from a solid to a liquid.</p> <p>Were the predictions right? Which food has the lowest and highest melting point?</p>	<p>Create a bar chart of the boiling points of a variety of substances from the data set provided. Then answer the questions on the handout.</p> <p>Challenge Task: Ask the children to research the boiling points of further substances and include them in their bar chart.</p>	<p>Investigate how rapidly water placed in locations with different temperatures will evaporate. Place 4 cups or beakers of water in various locations.</p> <p>Identify variables, control variables and how to conduct a fair test. Write a prediction of which container of liquid they believe will evaporate more quickly and why.</p> <p>Use a table to record the capacity over 14 days, or until the water has evaporated.</p> <p>Write conclusions.</p>	<p>Create water cycle diagram, explaining the processes of evaporation, condensation and precipitation.</p> <p>Challenge Task: Encourage the children to include additional keywords in their diagrams, such as transpiration, groundwater and surface runoff.</p>
<b>Future learning</b>	Properties of Materials Year 5 – changes in materials					