

# Science

## Learning Outcomes



Content of this grid is from the [National Curriculum in England: science programmes of study](#) with adapted outcomes from the [STEM Schemes of Work for Students Working up to Level 1](#) and [STEM Schemes of Work for Students Working between Level 1 and 4](#). The 'Working Scientifically' outcomes of the National Curriculum are incorporated into the different topics covered.

| States of Matter                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| By the end of KS5 pupils should know:                                                                                                                             | Redway Pre-Formal Pathway<br>Encounter → Foundation                                                                                                                                                                                                                                                                                                                                                                                                                           | Redway Semi-formal Pathway<br>Core → Development                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Redway Formal Pathway<br>Enrichment → Enhancement                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. Compare and group materials together according to whether they are solids, liquids or gases.                                                                   | <ul style="list-style-type: none"> <li>a. Show curiosity when exploring a variety of different solids made from different materials.</li> <li>b. Show curiosity when exploring a variety of different liquids (e.g., water, cooking oil, liquid soap, glycerine, syrup etc.)</li> <li>c. Experience things that contain gases (e.g., balloons, soap bubbles, bubbles in fizzy drinks).</li> <li>d. Experience gases through smell (e.g., in aromatherapy sessions)</li> </ul> | <ul style="list-style-type: none"> <li>a. Recognise there is a difference between materials that are solids and materials that are liquids.</li> <li>b. Know you can easily hold a solid.</li> <li>c. Can identify if a material is a solid or a liquid.</li> <li>d. Explore things that contain gases (e.g., balloons (air and helium), soap bubbles, bubbles in fizzy drinks).</li> <li>e. Know that most gases you can't see, but some you may be able to smell (e.g., perfume, cooking smells)</li> </ul> | <ul style="list-style-type: none"> <li>a. Know that solids have a fixed shape and volume.</li> <li>b. Know that liquids have a fixed volume and take the shape of the container they are in.</li> <li>c. Know that liquids flow easily.</li> <li>d. Know that gases take the shape and volume of the container they are in and flow very easily.</li> <li>e. Can group materials according to whether they are solids, liquids, or gases.</li> </ul> |
| 2. 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) | <ul style="list-style-type: none"> <li>a. Show curiosity when exploring materials that melt when they are warmed (e.g., with hands or a hair dryer) such as:                             <ul style="list-style-type: none"> <li>i. Ice</li> <li>ii. Butter</li> <li>iii. Chocolate.</li> </ul> </li> </ul>                                                                                                                                                                    | <ul style="list-style-type: none"> <li>a. Know that when some solids are heated, they melt and become liquids.</li> <li>b. Know that when liquids are cooled, they solidify and become solids.</li> </ul>                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>a. Understand the terms melting, solidifying, and boiling and how they relate to changes in state.</li> <li>b. Understand how to use a thermometer correctly.</li> <li>c. Can read the temperature on a thermometer.</li> </ul>                                                                                                                                                                               |

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|                                                                                                                                               |                                                                                                                                                                                               | <p>c. Know that when liquids are heated, they boil and become gases.</p>                                                                                                                                                                                                                                                                                     | <p>d. Can measure the temperature at which some solids melt (e.g., ice, butter, chocolate)</p> <p>e. Can safely measure the temperature at which water boils</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>3. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> | <p>a. Experience the cooling effect of water evaporating from their skin.</p> <p>b. Show curiosity when exploring condensation formed on cold objects.</p> <p>c. Experience rain and fog.</p> | <p>a. Observe that puddles of water gradually disappear over time.</p> <p>b. Observe that puddles in warm sun disappear more quickly than those in the cool shade.</p> <p>c. Investigate how water appears on the surface of cold objects but not warm ones.</p> <p>d. Know that clouds are made from water.</p> <p>e. Know that rain comes from clouds.</p> | <p>a. Understand what is meant by evaporation and condensation.</p> <p>b. Can plan and carry out an experiment to investigate the effect of temperature on the rate of evaporation of water.</p> <p>c. Can show how their experiment is a fair test.</p> <p>d. Know that there are four main stages to the water cycle:</p> <ul style="list-style-type: none"> <li>i. Evaporation – water evaporates from the oceans to become water vapour.</li> <li>ii. Condensation – the water vapour cools and condenses to form clouds.</li> <li>iii. Precipitation – droplets of water join together in clouds and fall as rain.</li> <li>iv. Collection – The rain runs into streams and rivers and flows back into the ocean.</li> </ul> |

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The Redway School