

## Key Learning in Science: Year 5

Please Note: There should be plenty of opportunities throughout the year for children to use the school/local environment to observe and identify a variety of plant and animal life cycles. This could be done through an ongoing/monthly nature journal to observe, record and review a variety of examples over a period of time. The unit on 'Human life cycles' can be linked to PSHEE work on 'Relationships' and the Year 5 Science unit 'Habitats and life cycles' rather than being taught as a separate unit.

Environment - Observing Life cycles	Material Properties – Testing Material Properties	Material Changes - Reversible changes
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</li> <li>Describe the life process of reproduction in some plants and animals.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b> Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants and sexual reproduction in animals.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times).</li> <li>Asking pertinent questions.</li> <li>Suggesting reasons for similarities &amp; differences.</li> <li>They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs.</li> <li>Observe changes in an animal over a period of time (for example, by hatching and rearing chicks).</li> <li>Comparing how different animals reproduce and grow.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</li> <li>Compare a variety of materials and measure their effectiveness (e.g. hardness, strength, flexibility, solubility, transparency, thermal conductivity, electrical conductivity).</li> </ul> <p>Temperature and Thermal Insulation</p> <ul style="list-style-type: none"> <li>Heat always moves from hot to cold.</li> <li>Some materials (insulators) are better at slowing down the movement of heat than others.</li> <li>Objects/liquids will warm up or cool down until they reach the temperature of their surroundings.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b> Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials and relating these to what they learnt about magnetism in Year 3 and about electricity in Year 4.</p> <p><b>Note:</b> Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>Carry out tests to answer questions such as 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'</li> <li>Compare materials in order to make a switch in a circuit.</li> </ul>	<ul style="list-style-type: none"> <li>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</li> <li>Demonstrate that dissolving, mixing and changes of state are reversible changes.</li> <li>Changes can occur when different materials are mixed.</li> <li>Some material changes can be reversed and some cannot.</li> <li>Recognise that dissolving is a reversible change.</li> <li>Distinguish between melting and dissolving.</li> <li>Mixtures of solids (of different particle size) can be separated by sieving.</li> <li>Mixtures of solids and liquids can be separated by filtering if the solid is insoluble (un-dissolved).</li> <li>Evaporation helps us separate soluble materials from water.</li> <li>Changes to materials can happen at different rates (factors affecting dissolving, factors affecting evaporation – amount of liquid, temperature, wind speed).</li> <li>Freezing, melting and boiling changes can be reversed (revision from YR4).</li> </ul> <p><b>Notes and Guidance (non-statutory):</b> Pupils should explore reversible changes including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.</p>
<b>Material Changes – Irreversible changes</b>		
<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning, and the action of acid on bicarbonate of soda.</li> </ul> <p><b>Notes and Guidance (non-statutory):</b> Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. <b>Note:</b> Safety guidelines should be followed when burning materials.</p> <p><b>Pupils might work scientifically by:</b></p> <ul style="list-style-type: none"> <li>Observing and comparing the changes that take place, for example, when burning different materials or baking bread or cakes.</li> <li>Researching and discussing how chemical changes have an impact on our lives, for example cooking.</li> <li>Discuss [research] the creative use of new materials such as polymers, super-sticky and super-thin materials.</li> </ul>		