



## Year 6 Science Age Related Expectations

All children are assessed against the Age Related Expectations (ARE) within the different curriculum subjects. The ARE's are taken from the National Curriculum but are consolidated to reflect what we expect of a child. For example, three or four national curriculum targets might be summarised in one ARE. Judgements are generally based on a variety of different sources but will generally be a combination of on-going formative assessment in class, book work and formal summative testing.

The curriculum for science aims to ensure that all pupils: develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics; develop understanding of the nature, processes and methods of science through different types of science enquiries. Y6 Pupils will build on and consolidate their knowledge and understanding of the entire KS2 curriculum. They will become confident and competent in planning and carrying out scientific investigations. They will improve their scientific knowledge and understanding which will be demonstrated in written and verbal explanations, solving problems and reporting scientific findings.

	Key Performance Indicators	Age Related Expectations
<b>Working scientifically</b>	<ul style="list-style-type: none"> <li>- Plan enquiries, including recognising and controlling variables where necessary.</li> <li>- Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work.</li> <li>- Take measurements, using a range of scientific equipment, with increasing accuracy and precision.</li> <li>- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.</li> <li>- Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.</li> <li>- Present findings in written form, displays and other presentations.</li> <li>- Use test results to make predictions to set up further comparative and fair tests.</li> <li>- Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<p>A child should use simple and appropriate scientific language and terminology to talk about what has been found out and when working scientifically. (at least: method, observe, pattern, results, measure, compare, record, group, equipment, fair)</p> <p>A child should read and spell scientific vocabulary at a level consistent with their word reading and spelling knowledge at key stage 1.</p> <p>A child should decide on a simple method for a fair test that will answer the investigation question, select the appropriate equipment, identify the variables and identify some hazards suggesting how to be safe.</p> <p>A child should take measurements using a range of equipment with increasing accuracy and precision repeating the measurements where appropriate. They should present the data in tables and on graphs including the headings and units with a suitable scale.</p> <p>A child should present and report predictions and conclusions using scientific evidence, describing any patterns in data. They should compare relationships using the 'er' statement.</p> <p>A child should describe how to improve the investigation and suggest other investigations. Eg 'How does changing the number of bulbs affect brightness of bulb?' can become 'How does changing the number of cells affect the brightness of the bulb?'</p>
<b>Physics To understand electrical circuits</b>	<ul style="list-style-type: none"> <li>- Use recognised symbols when representing a simple circuit in a diagram.</li> <li>- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.</li> <li>- Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.</li> </ul>	<p>A child will be able to represent series circuits as scientific diagrams using appropriate symbols for the components.</p> <p>A child will be able to describe how changing a component in a series circuit affects the other components, like the brightness of a bulb. They will use data as evidence for their ideas.</p> <p>A child will be able to identify errors in series circuits and explain why a bulb may not light.</p>
<b>Physics To understand light</b>	<ul style="list-style-type: none"> <li>- Understand that light appears to travel in straight lines.</li> <li>- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes.</li> <li>- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes.</li> </ul>	<p>A child will identify light sources and explain how we see.</p> <p>A child will be able to draw diagrams that show the path of light from an object to an eye.</p> <p>A child will use diagrams to show how light is reflected and how shadows are formed.</p> <p>They will be able to decide where to place mirrors to make a periscope.</p> <p>They will describe how the size and shape of a shadow is affected by the position and type of light source.</p> <p>A child will describe materials as opaque, translucent and transparent.</p>



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<p><b>Chemistry</b> <b>To investigate materials (Review and consolidate)</b></p>	<ul style="list-style-type: none"> <li>- Understand how 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 evaporating.</li> <li>- Demonstrate that dissolving, mixing and changes of state are reversible changes.</li> <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, oxidation and the action of acid on bicarbonate of soda.</li> </ul>	<p>A child will be able to explain that solids remain in the solution when they dissolve and can be recovered by evaporation. They will be able to identify several factors that affect the rate at which a solid dissolves;</p> <p>A child will recognise that irreversible changes often make new and useful materials. They will identify when changes of materials are reversible or non-reversible and explain how they know.</p> <p>A child will be able to describe how to appropriately separate different mixtures of materials, including solutions. They will use the terms evaporate, filter, sieve.</p> <p>A child will explain why rust is formed and is irreversible.</p> <p>A child will compare the characteristics of different states of matter (solids, liquids and gases) and describe how materials can change state (with reference to temperature), using this to explain everyday phenomena, including the water cycle, based on first-hand observation of changes of state. They will use the terms melt freeze evaporate condense.</p>
<p><b>Biology</b> <b>To investigate living things.</b></p>	<ul style="list-style-type: none"> <li>- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</li> <li>- Give reasons for classifying plants and animals based on specific characteristics.</li> </ul>	<p>A child will use and construct keys to identify animals, plants and microorganisms..</p> <p>A child will be able to group animals and plants by identifying common features.</p>
<p><b>Biology</b> <b>To understand evolution and inheritance</b></p>	<ul style="list-style-type: none"> <li>- Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>- Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>- Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</li> </ul>	<p>A child can describe how fossils are formed. They can compare features of fossils to describe living things from the past, identifying similarities and differences. They will describe how fossils of skulls provide some evidence for evolution.</p> <p>A child will recognise that characteristics are passed from parents to offspring and identify inherited features in animal species and human families.</p> <p>A child will use the ideas of inherited characteristics, variation between offspring and adaptation to their environment to describe how living things may have changed over time and evolved.</p> <p>A child will represent feeding relationships in food chains using the key terms producer, consumer, herbivore, carnivore and omnivore. They will describe how a change in the environment may affect the animals and plants in the food chain.</p> <p>A child will describe how some living things are adapted to survive in a variety of conditions. They can explain that variation in offspring over time can make animals more or less able to survive.</p>
<p><b>Biology</b> <b>To understand animals including humans.</b></p>	<ul style="list-style-type: none"> <li>- Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>- Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>- Describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul>	<p>A child will be able to name, label diagrams and describe the functions of the main parts of the musculoskeletal and circulatory systems in humans.</p> <p>A child will be able to describe the effects of diet, exercise, drugs and lifestyle on how their bodies function in the long and short term.</p> <p>A child will identify the components of a healthy and varied diet and describe the effects of a poor diet. They will be able to describe why people need different types of diets eg Diabetic, athlete.</p> <p>A child will recognise that the heart is a pump. The muscle wall keeps contracting and squeezes the blood in it forcing blood to move round the body. They will recognise that during exercise the heart beats faster to take blood more rapidly to the muscles.</p> <p>A child will label a skeleton and identify the parts of the skeleton that move and which parts of the body need an improved blood supply e.g. when you swim it is your arms, shoulders and legs. They will explain after exercise we feel hotter and tired because our muscles have worked harder.</p>