

SCIENCE CURRICULUM OVERVIEW LINKED TO NATIONAL CURRICULUM.

Year 6	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Living things and their Habitats	Animals Including Humans	Evolution and inheritance	Evolution and inheritance	Electricity	Light
<p><b>Working Scientifically</b>  <b>uks2w1:</b> planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  <b>uks2w2:</b> taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  <b>uks2w3:</b> recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs  <b>uks2w4:</b> using test results to make predictions to set up further comparative and fair tests  <b>uks2w5:</b> reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations  <b>uks2w6:</b> identifying scientific evidence that has been used to support or refute ideas or arguments.</p>	<p>Children learn that evolutionary taxonomy is the most modern way of grouping organisms. They learn that it is a development of Linnaeus' system, but is superior because it shows how closely organisms are related to each other. Children group 5 mammals (including homo sapiens) into an evolutionary diagram. They use this to explain how closely related the other 4 mammals are to modern humans. They work out the binomial (genus-species) name for each organism.</p>	<p>Children learn about the different components of blood. They learn that red blood cells carry oxygen, white blood cells fight infection, platelets help to prevent bleeding, and that plasma is the medium in which these components are suspended. Children describe the functions of red blood cells, white blood cells, platelets and plasma, and create a pie chart showing the percentage of each component by volume in a typical sample of blood.</p>	<p>Children play a game, modelling the process of evolution by natural selection. They use a die to model the effects of predation and mutation. They observe how a population can change over time due to these natural processes. They try to explain how these processes are modelled in the game.</p>		<p>Children learn about the appearance and function of different electrical components, including switches, bulbs, buzzers, motors, cells and wires. They match pictures of each component to their electrical symbols. They cut and paste descriptions of how each component functions, or write their own.</p>	<p>Children use a ruler to draw the shape of a shadow cast by an object on a simple plan diagram. They predict and then measure the width of each shadow, and try to find what kind of set-up produces the widest shadows.</p>
	<p>Children learn that a dichotomous classification key has exactly two answers to each question. They use the 6 pictures of animals provided to create their own dichotomous classification key. Children discuss why some classification questions are better than others.</p>	<p>Children learn that the human circulatory system is composed of 2 parts - the systemic circulation and the pulmonary circulation. They learn about the role of the heart, blood vessels, and the components of blood such as red and white blood cells, platelets and plasma. In the writing frame provided, children create an information text on the human circulatory system using what they have learned.</p>	<p>Children learn about the life and work of the early palaeontologist, Mary Anning. They use what they have learned to create an interview text, imagining themselves as Mary, answering questions such as 'What do your fossils tell us?' and 'Do you think you received enough recognition for you finds?'</p>		<p>Children learn that electrical cells produce a flow of electrons (current) through the reaction of 2 chemicals inside them. They learn that one measure of the power of a cell is voltage (V) and that connecting cells in series adds their voltages together. Children investigate the effect of changing the number of cells in a circuit. They create the circuits shown in the illustrations, attempt to draw the circuit diagrams, and explain what they observed. They attempt to place the circuits in order of brightness and explain why.</p>	<p>Children learn that a periscope is a device made from 2 angled mirrors that enables the user to see around obstacles. Using the template provided, along with 2 small mirrors, children construct their own simple periscope. They attempt to explain how it works.</p>
	<p>Children learn that Carl Linnaeus developed a classification system which placed organisms into hierarchical groups. They learn about binomial nomenclature. Children sort 20 different objects into Linnaeus' kingdoms. They</p>	<p>Children learn that the human heart is a vital organ. They learn how blood flows through its double pumps system to the lungs and all around the body, supplying oxygen and removing waste products. They create their own 8-part</p>	<p>Children learn what fossils are and how they are formed. They learn how palaeontologists build up a picture of the past using incomplete evidence, most organisms die without leaving a fossil trace. They learn about stratigraphy,</p>		<p>Children look at 6 circuit diagrams. They predict how bright the bulbs will be in each circuit and place them in order of brightness. Using simple apparatus, they construct the circuits shown in the diagrams and test</p>	<p>Children learn that light rays travel in straight lines, and that mirrors can make light reflect (predict) at precise angles, depending on their own position and angle. Children look at 4 simple diagrams. They predict, and then calculate (using a ruler</p>

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	<p>discuss the elements from Linnaeus's system that we still use, those that we have abandoned, and why.</p>	<p>explanation text, showing how blood is pumped around the body. They cut and paste, or write their own descriptions.</p>	<p>and that organisms found in lower layers of rock tend to have died earlier. Children use a diagram showing a simplified cross-section of rock to date 3 different organisms, working out when they appeared, when they died out, and how long they lived for. Children compare the organisms to each other and discuss which lived most recently. Using fossil evidence, children make their best guess at how the animal may have looked when alive, showing this in a diagram.</p>		<p>their predictions. They try to explain what they observed.</p>	<p>and protractor) the best position for a mirror, so that the viewer (a car driver) can see an object (a motorcycle headlamp). They look for patterns between different distances and angles in their diagrams.</p>
<p><b>Knowledge and Understanding</b> <b>Statutory requirement</b> <b>6a1:</b> 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 <b>6a2:</b> give reasons for classifying plants and animals based on specific characteristics. <b>6b1:</b> identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood <b>6b2:</b> recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function <b>6b3:</b> describe the ways in which nutrients and water are transported within animals, including humans. <b>6c1:</b> recognise that living things have changed over time and that fossils provide information about living</p>	<p>Children learn that animals can be classified as vertebrates (those that have a spinal column) and invertebrates. They learn that vertebrates have a common ancestor and comprise the fish and tetrapod. Children identify 18 organisms as vertebrates or invertebrates and place them in the correct sub-group (fish, birds, mammals, amphibians, reptiles, insects, arachnids, molluscs, worms).</p>	<p>Children learn to measure their heart rate in beats per minute (bpm) by taking their radial pulse. They take and record their resting heart rate, then perform a vigorous exercise and measure their heart rate afterwards at an interval of 1 minute for 8 minutes. Children record their results in a table and transfer them to a line graph. Children interpret their results, discussing how their heart rate changed over time and why.</p>	<p>Children read a fictitious autobiography of Charles Darwin. They learn about his early life, his role in the voyage of the HMS Beagle, his relationship with Alfred Russel Wallace, and how he developed and published his theory of natural selection. Children use the information in the autobiography to create their own third-person information text about the life of Charles Darwin.</p>		<p>Using the template and illustration provided, children create their own wire loop game. They attempt to get the wand from one end of the loop to the other without triggering the bulb or buzzer. Children explain how their game functions and attempt to draw a circuit diagram for their game.</p>	<p>Children learn about the main parts of the human eye, including the cornea, iris, pupil, lens, retina and optic nerve. They use this information to create and label their own diagram of a human eye, cutting and pasting the descriptions provided or writing their own.</p>
	<p>Children learn that arthropods are a large and diverse phylum (group), comprising insects, arachnids, crustaceans and myriads. They learn that all arthropods have a segmented body, a hard exoskeleton, and jointed legs. Children use a dichotomous classification key to identify 10 different arthropods. They discuss why arthropods have certain body features in common.</p>	<p>Children learn about the active ingredient in alcoholic drinks (alcohol or ethanol), and that the strength of a beverage can be measured as the percentage alcohol by volume (% ABV). They learn about the short and long-term effects of alcohol consumption. Children look at 16 different servings of different alcoholic drinks. Using the serving size and %ABV, they calculate how much alcohol (in ml) and how many units of alcohol are in each beverage. They</p>	<p>Children learn about the process of evolution by natural selection. They learn that offspring inherit traits of their parents, and that they might occasionally carry a random mutation which gives them a survival advantage and that they pass on to their own offspring. They learn that this process can change a population over time. Children use what they have learned to create an explanation text. They cut and paste the diagrams and</p>		<p>Using the illustration provided, children construct their own burglar alarm. They construct their own switch using a clothes peg and a card insulator which is attached to the area being surveyed. Children draw a circuit diagram for their burglar alarm and explain how it works.</p>	<p>Children learn that light travels in straight lines and can be made to follow a path by placing mirrors in its path. Children use a simple grid and position mirrors at 45° angles to make light travel through a maze. They solve 12 increasingly difficult problems, and use a blank sheet to create their own.</p>

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<p>things that inhabited the Earth millions of years ago  <b>6c2:</b> recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents  <b>6c3:</b> identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.  <b>6d1:</b> recognise that light appears to travel in straight lines  <b>6d2:</b> use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye  <b>6d3:</b> explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes  <b>6d4:</b> use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.  <b>6e1:</b> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  <b>6e2:</b> 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  <b>6e3:</b> use recognised symbols when representing a simple circuit in a diagram.</p>		<p>place the beverages in order of strength.</p> <p>Children learn that smoking involves inhaling tobacco smoke which contains the active ingredient, nicotine. They learn about the many health issues associated with smoking, such as cancer, heart damage, lung damage, and reproductive damage. They learn about other negative effects such as the unpleasant smell, high cost, and effects on the skin. C</p>	<p>explanations provided, or create their own</p> <p>Children learn that offspring inherit traits from their parents, and that organisms that reproduce sexually combine traits from two parents. Children learn about human-created hybrids. They create a simple family tree for a range of organisms - the labradoodle, the mule, the zonkey and the loganberry, and discuss which traits they have inherited from their different-species parents.</p>		<p>Children learn about how traffic lights are central to road safety. They use simple apparatus to construct a set of traffic lights, with a single switch (which they construct themselves) turning two lights on and off in turn. Children create a suitable casing for their traffic lights. They consider how they could construct a 3-way traffic light.</p>	<p>Children learn that we see light sources because they create light which travels in a straight line into our eyes. They learn that we can see non-light sources because light from light sources reflects (bounces) off them into our eyes. Children use a selection of images to build their own diagram showing how we see light sources and non-light sources.</p>
	<p>Children choose 4 different local micro-habitats to investigate. They predict and then observe which types of invertebrate they might find in each micro-habitat, using the arthropod identification key provided. Children record their results in a table and then transfer their results to a bar chart. They discuss which micro-habitat is most diverse in terms of invertebrate population.</p>	<p>Children learn that our bodies are constantly using energy, and that we get all of our energy from food. They learn that we can store excess food energy in our bodies in the form of fat deposits to help us in times of starvation. Children look at 6 different people profiles. They calculate whether each person is eating the right amount of food,</p>	<p>Children learn that over time, the process of natural selection can cause a range of beneficial traits (adaptations) to build up in a population. They look at the polar bear, barn owl and penguin, identify three useful adaptations, and explain the survival advantage that they provide. There is also a blank sheet so that children can research another animal's adaptations.</p>		<p>Children look at 5 different defective circuit illustrations. They explain why each circuit will not work. They change each circuit so that it will work, showing this in a circuit diagram. They test their improvements with simple apparatus.</p>	<p>Children learn that white light is a combination of different colours, and that these colours exist on the visible light spectrum. They learn how white light can be split up into its component colours. Children use a prism and a light source to create a rainbow effect and discuss how it is cause. They learn that a range of colours can be combined into white light.</p>
	<p>Children choose an area in the local environment to study. Using the tree classification key provided, children complete a tally chart showing the frequency of each type of tree in the local area. They transfer their results to a bar chart.</p>	<p>Children learn about the many benefits of physical exercise, and identify some aerobic exercises. Children carry out a survey, identifying the most popular forms of exercise in their class or school. They record their results in a tally chart, displaying their results in a horizontal bar chart. They identify the most popular forms of exercise and suggest ways in which they can be promoted in school.</p>	<p>Children learn that all organisms possess adaptations, not just animals. Children examine 3 plants - the dandelion, cactus, and Venus fly trap - and identify 3 adaptations for each. There is a blank sheet so that children can research another plant and describe its adaptations.</p>		<p>Children learn that electrical components can be represented by symbols in circuit diagrams. They learn that wires are always shown as unbroken horizontal or vertical lines. Children look at 8 different circuit illustrations. They draw an accurate circuit diagram for each illustration and, if possible, create the circuit using simple apparatus.</p>	<p>Children learn that shadows are formed when light is blocked by an opaque object, creating a pattern of light on a surface. Children investigate what happens to its shadow when an object is moved towards a light source. They predict and then measure the width of an objects shadow at different distances from the light source. Children record their information in a table and use it to create a line graph. They attempt to explain the relationship between distance and shadow width.</p>