

	Autumn Term		Spring Term		Summer Term
Year 6	Evolution and Inheritance	Living things and their habitats (Classification)	Light	Electricity	Life Cycles
<b>Learning Objectives</b>	<ul style="list-style-type: none"> <li>Know about evolution and can explain what it is.</li> <li>Know how fossils can be used to find out about the past.</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- 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> </ul>	<ul style="list-style-type: none"> <li>Classify living things into broad groups according to observable characteristics and based on similarities and differences.</li> <li>Give reasons for classifying plants and animals based on specific characteristics.</li> </ul>	<ul style="list-style-type: none"> <li>Recognise 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 eye.</li> <li>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.</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.</li> <li>Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</li> </ul>	<ul style="list-style-type: none"> <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> <li>Use recognised symbols when representing a simple circuit in a diagram.</li> </ul>	<ul style="list-style-type: none"> <li>Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird.</li> <li>Know the process of reproduction in plants.</li> <li>Know the process of reproduction in animals.</li> </ul>
<b>Working Scientifically Skills</b>	<ul style="list-style-type: none"> <li>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</li> <li>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> <li>Using test results to make predictions to set up further comparative and fair tests</li> <li>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</li> </ul>

	<ul style="list-style-type: none"> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<ul style="list-style-type: none"> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<ul style="list-style-type: none"> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<ul style="list-style-type: none"> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>	<ul style="list-style-type: none"> <li>Identifying scientific evidence that has been used to support or refute ideas or arguments.</li> </ul>
<b>Enquiry</b>	Grouping and classifying Research Changes over time		Pattern seeking Fair test	Fair test	
<b>Scientist</b>	Charles Darwin (Theory of Evolution by Natural Selection)	Carl Linnaeus (Identifying, Naming and Classifying Organisms)	Percy Shaw (The Cats Eye)	Alessandro Volta (Electrical Battery)	David Attenborough (Naturalist and Nature Documentary Broadcaster)
<b>Vocabulary</b>	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence,	Variation Organisms Populations. Classification Characteristics Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation. Classify, compare, bacteria, microorganism, organism, invertebrates, vertebrates, Linnaean.	Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent. Reflect Absorb Emitted Scattered Refraction	Electricity, neutrons, protons, electrons, nucleus, atom, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, conductor.	Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant
<b>Sticky Knowledge</b>	<ul style="list-style-type: none"> <li>Life cycles have evolved to help organisms survive to adulthood.</li> <li>Over time the characteristics that are most suited to the environment become increasingly common. NB: The following could be duplicated in Year 6 Living things and their habitats.</li> <li>Organisms best suited to their environment are more likely to survive long enough to reproduce. Organisms are best adapted to reproduce are more likely to do so.</li> <li>Organisms reproduce and offspring have similar characteristic patterns.</li> <li>Variation exists within a population (and between offspring of some plants)</li> <li>Competition exists for resources and mates</li> </ul>	<ul style="list-style-type: none"> <li>Variation exists within a population (and between offspring of some plants) – NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance.</li> <li>Organisms best suited to their environment are more likely to survive long enough to reproduce.</li> <li>Organisms are best adapted to reproduce are more likely to do so.</li> <li>Organisms reproduce and offspring have similar characteristic patterns.</li> <li>Competition exists for resources and mates.</li> </ul>	<ul style="list-style-type: none"> <li>Animals see light sources when light travels from the source into their eyes.</li> <li>Animals see objects when light is reflected off that object and enters their eyes.</li> <li>Light reflects off all objects (unless they are black). Non-shiny surfaces scatter the light, so we do not see the beam.</li> <li>Light travels in straight lines.</li> </ul>	<ul style="list-style-type: none"> <li>Batteries are a store of energy. This energy pushes electricity round the circuit. When the battery's energy is gone it stops pushing. Voltage measures the 'push.'</li> <li>The greater the current flowing through a device the harder it works.</li> <li>Current is how much electricity is flowing round a circuit.</li> <li>When current flows through wires heat is released. The greater the current, the more heat is released.</li> </ul>	<ul style="list-style-type: none"> <li>Different animals mature at different rates and live to different ages.</li> <li>Some organisms reproduce sexually where offspring inherit information from both parents.</li> <li>Some organisms reproduce asexually by making a copy of a single parent.</li> <li>Environmental change can affect how well an organism is suited to its environment.</li> </ul> <p>Different types of organisms have different lifecycles.</p>
<b>Key questions</b>	<ul style="list-style-type: none"> <li>Why are we all different?</li> <li>What is variation, and why is it important?</li> <li>How did life begin on Earth?</li> <li>How do we change?</li> <li>What is evolution?</li> <li>What evidence is there for evolution?</li> <li>How does evolution happen? What reasons do animals become extinct?</li> <li>Polar Bears' habitat is rapidly changing, what possible futures do</li> </ul>	<ul style="list-style-type: none"> <li>Why do we need to classify living things?</li> <li>How do we classify?</li> <li>What are the difficulties with classification? (penguins, whales, platypus)</li> <li>How do animals change over time?</li> <li>Why does variation exist?</li> <li>What happens if animals of different species breed? (hybrids)</li> <li>What happens to house plants outside?</li> </ul>	<ul style="list-style-type: none"> <li>How does the size of an object affect the size of a shadow?</li> <li>How does the distance between the light and the object change the size of a shadow?</li> <li>How does the distance between the object and the size of the screen affect the size of a shadow?</li> <li>How would a solar eclipse be different if: - The moon was a different size? - The earth span faster or slower? - The sun was larger or smaller? - If the</li> </ul>	<ul style="list-style-type: none"> <li>Do all batteries push as hard as each other?</li> <li>What is electricity?</li> <li>How does the voltage of a batters affect how much current is pushed? How does the length of time I leave the current flowing for affect the brightness of the bulb?</li> <li>How does number of bulbs affect the brightness of a bulb?</li> <li>Are all types of wires as good as conducting electricity?</li> </ul>	<ul style="list-style-type: none"> <li>What is a life cycle? What types of life cycles are there?</li> <li>Are life cycles the same?</li> <li>Do plants reproduce in the same ways as us?</li> </ul> <p>How do plants spread their seeds?</p>

	<p>they face, and can we predict which is most likely?</p> <ul style="list-style-type: none"> <li>How did Darwin come up with the theory?</li> <li>Why was his theory not initially accepted?</li> </ul>	<ul style="list-style-type: none"> <li>What are microorganisms?</li> <li>How can we prevent the spread of disease?</li> <li>Why do animals and plants compete – and what for?</li> </ul>	<p>earth and moon where the same size but further away in the solar system?</p> <ul style="list-style-type: none"> <li>How does the amount of aluminium foil crumpled affect how much light is scattered?</li> <li>How does the amount of polishing affect how well a piece of metal scatters light?</li> <li>How perfect are our mirrors? Do some scatter light more than others?</li> <li>What happens to light when it is shone through water? How is this affected by putting glitter, salt or talc in the water?</li> <li>How does a periscope/microscope/telescope work?</li> </ul>	<ul style="list-style-type: none"> <li>Why are wires insulated in plastic? Does type of material make a difference?</li> <li>Does length of wire make a difference?</li> <li>Does the type of circuit affect how the components work/long the battery lasts?</li> <li>What renewable ways can we generate electricity?</li> <li>How does current affect heat? What are the dangers of a short circuit?</li> </ul>	
<b>Prior Learning</b>	<p><b>From Key Stages 1 &amp; 2, children should:</b></p> <ul style="list-style-type: none"> <li>Understand there is a variety of life on Earth</li> <li>Know that some animal's differences are important to their survival</li> <li>Know how animals and plants reproduce</li> <li>Know how fossils form over time</li> </ul>	<p><b>In Year 4, children should:</b></p> <ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways.</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose danger to living things.</li> </ul>	<p><b>In Year 3 children should:</b></p> <ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li> <li>Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the sizes of shadows change.</li> </ul>	<p><b>In Year 4, children should:</b></p> <ul style="list-style-type: none"> <li>Identify common appliances that run on electricity.</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li> <li>Identify whether a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery.</li> <li>Recognise that a switch opens and closes the circuit and associate this with whether a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.</li> <li>Know the difference between a conductor and an insulator, giving examples of each.</li> <li>Safety when using electricity.</li> </ul>	<ul style="list-style-type: none"> <li><b>In Year 4 children should:</b> Construct and interpret a variety of food chains, identifying producers, predators and prey</li> <li>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including micro habitats.</li> </ul>
<b>Future Learning</b>	<p><b>In Key Stage 3 children will learn about:</b></p> <ul style="list-style-type: none"> <li>heredity as the process by which genetic information is transmitted from one generation to the next</li> <li>the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation</li> </ul>	<p><b>In Key Stage 3 children will learn about:</b></p> <ul style="list-style-type: none"> <li>the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere</li> </ul>	<p><b>In Key Stage 3, children will learn about:</b></p> <ul style="list-style-type: none"> <li>the similarities and differences between light waves and waves in matter</li> <li>light waves travelling through a vacuum; speed of light</li> <li>the transmission of light through materials: absorption, diffuse</li> </ul>	<p><b>In Key Stage Three children will learn:</b></p> <ul style="list-style-type: none"> <li>Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge</li> <li>Potential difference measured in volts, battery and bulb ratings, resistance measured in ohms, as the ratio of potential difference (p.d.) to current</li> </ul>	<p><b>In Year 6:</b></p> <ul style="list-style-type: none"> <li>Classify living things into broad groups according to observable characteristics and based on similarities and differences.</li> <li>Give reasons for classifying plants and animals based on specific characteristics.</li> </ul>

	<ul style="list-style-type: none"> <li>the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection</li> <li>changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction</li> <li>the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.</li> </ul>	<ul style="list-style-type: none"> <li>the adaptations of leaves for photosynthesis.</li> <li>the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops</li> <li>the importance of plant reproduction through insect pollination in human food security</li> <li>how organisms affect, and are affected by, their environment, including the accumulation of toxic materials</li> </ul>	<p>scattering and specular reflection at a surface Science</p> <ul style="list-style-type: none"> <li>use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative), the human eye</li> <li>light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras</li> <li>colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.</li> </ul>	<ul style="list-style-type: none"> <li>Differences in resistance between conducting and insulating components (quantitative).</li> <li>Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects</li> <li>The idea of electric field, forces acting across the space between objects not in contact.</li> </ul>	
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