



Year 5 – Animals, including humans

Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Identify the key stages of a mammal's life cycle	Describe the changes as humans develop to old age	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	foetus dependent adolescent puberty reproduce	Scissors, handout (on thin card), pen and pencils, split pins.
Explore the gestation periods of mammals	Describe the changes as humans develop to old age	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	gestation pregnant duration extreme breeding	Sticky notes, scissors, pens/pencils, computers/tablets for research.
Learn about foetal development	Describe the changes as humans develop to old age	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	womb umbilical cord embryo trimester midwife	Pencil, graph paper, ruler, coloured pencils.
Investigate the hand span of different aged children	Describe the changes as humans develop to old age	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	growth spurt childhood motor skills milk teeth constant	Ruler, tape measure, pens/pencils, paper.
Learn about the changes experienced during puberty	Describe the changes as humans develop to old age	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	adolescence puberty hormones mood swing develop	Large paper/wallpaper, sticky tape, pens/pencils.
Describe the changes humans may experience during adulthood and old age	Describe the changes as humans develop to old age	Identifying scientific evidence that has been used to support or refute ideas or arguments	lifestyle keratin elasticity cataracts neurodegenerative	Pens, pencils, computers/tablets.



Year 5 – Properties of materials

Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Exploring properties of materials	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	conductive magnetic durable transparent versatile	10 sample pieces of material - wood, paper, card, plastic, string, wool, rubber, different metals, clay, pen and pencils, electrical equipment to make circuits (with a bulb), magnets, torch.
Explore thermal conductors and thermal insulators	Compare and group together everyday materials based on evidence from comparative and fair tests, including their conductivity of heat Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	thermal conduction molecules degrees Celsius (°C) insulator	Paper cups, a variety of materials to wrap up the cup, for instance, cling film, foil, paper, felt, cotton, sticky tape, thermometer, warm water, stopwatch.
Explore the hardness of materials	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	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	hardness force iron steel stone	Granite tile, ceramic tile, hardwood, softwood, slate, different stones, plastic, metal, card, coin and nail.
Discover materials that become soluble in water	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	dissolve solute insoluble soluble solvent	A range of substances to test if they dissolve, for instance, sand, sugar, salt, flour, wax candles, coffee, jam, butter, chalk, jelly, pepper, measuring spoon, beakers/cup, water.
Investigate the solubility of materials	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution	Using test results to make predictions to set up further comparative and fair tests	solute solvent solution substance saturation	A variety of solutes (salt, sugar, jelly, coffee), beakers, water.
Explore how mixtures could be separated by filtering, sieving, evaporating or magnets	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	pure substance mixture filtering sieving evaporation	Sand, sawdust, gravel, metal nuts, marbles, flour, beakers or containers, filter paper, sieve, colander, magnets.



Year 6 – Electricity

Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Describe the parts of an electric circuit	Use recognised symbols when representing a simple circuit in a diagram	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	symbol circuit circuit diagram battery wires	Series circuit equipment including bulbs, wires, switches, buzzers, cells etc, pen, pencil, ruler.
Explore voltage and its effect on an electrical circuit	Associate the brightness of a bulb or the volume of a buzzer with the number and voltage of cells used in the circuit	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	electricity current voltage voltmeter brightness	Series circuit equipment - including cells and voltmeters, high voltage bulbs, batteries and wires, pen, pencil, ruler.
Apply knowledge to identify and correct problems in a circuit	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	blown resistor variable resistor LED dimmer switch	Laptops/iPads with circuit builder, (alternatively electrical components - wires, batteries, bulbs, resistors, voltage meter etc), pens, pencil, ruler.
Investigate what affects the output of a circuit	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Using test results to make predictions to set up further comparative and fair tests	output variable fair test control test systematically	Series circuit equipment including bulbs, wires, switches, buzzers, cells etc, pen, pencil, ruler.
Build a set of traffic lights	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment with increasing accuracy and precision, taking repeat readings when appropriate	synchronised traffic light signal sensor timer-based	For each set of traffic lights: stiff card, wires and crocodile clips, 1.5V LEDs (green, red and yellow) - caution as higher voltages may break the LEDs, 2x 1.5V batteries, paperclips, tin foil, drawing pins, split pins, pen, pencil, ruler.
Apply knowledge of conductors and insulators	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	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	closed electric circuit indicating conductor insulator resistor	Example electric circuit games, 1 thick corrugated cardboard base approximately 25 cm x 25 cm (to be prepared in advance), pencil, battery holder and cells (Ideally zinc chloride), switch, bulb holder & bulb rated for the same voltage as the battery, 2x resistor, buzzer rated for the same voltage as the battery, 6 crocodile leads, wire for the loop, conductive metal for the loop, Insulating material for handle, timer/stopwatch.



Year 5 - Living things and their habitats

Lesson Intention	National Curriculum Reference	Scientific	Rocket Words	Resources
Understand the life process of a plant	Describe the life process of reproduction in some plants and animals	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	reproduction asexual fertilisation tuber genes	Class presentation, rooting powder, pots, a healthy plant (strawberry, tomato, basil or chilli) and soil.
Understand the life cycles of mammals	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations	pouch mammary glands placental mammal monotreme mammal marsupial	Class presentation and mammal types sorting cards.
Compare the life cycles of insects and amphibians	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations	metamorphosis caterpillar amphibian larva pupa	Class presentation and split pins.
Understand the life cycle of birds and reptiles	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations	egg fledgling egg tooth hatch embryo	Class presentation, eggs and toothpicks.
Know about the life and work of Jane Goodall and David Attenborough	Describe the life process of reproduction in some plants and animals	Reporting and presenting findings from enquiries - including conclusions, causal relationships and explanations of and a degree of trust in results - in oral and written forms such as displays and other presentations	documentary naturalist primatologist endangered natural sciences	Class presentation and research devices (laptops/iPads).
Research and present the life cycle of a creature	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	Identifying scientific evidence that has been used to support or refute ideas or arguments	living organism reproduction life cycle vertebrate warm-blooded	Class presentation and research devices (laptops/iPads)



Year 5 – Changes of materials

Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Use evaporation to recover the solute from a solution	Describe how to recover a substance from a solution	Reporting and presenting findings from enquiries, including conclusions	pure substance solute solvent solution evaporate	1 large clear bottle filled with pure water labelled "A", 1 large clear bottle filled with salt water labelled "B" (30g of table salt in 150 ml of water), teaspoons, small containers such as foil cake cases to place liquid in, labels, access to an oven (200 °C for 20 minutes will evaporate 3 teaspoons of water and leave salt) or a warm place.
Recognise and describe reversible changes	Demonstrate that dissolving, mixing and changes of state are reversible changes	Reporting and presenting findings from enquiries, including conclusions, in oral and written forms	reversible mixture physical change melting evaporate	Some chocolate that has been melted into a different shape, small toys frozen in some ice, sugar dissolved in water in a bottle, rice and sugar mixed together in a jar. Optional - to reverse changes: heat source and mould to re-melt chocolate and ice and evaporate water, sieve.
Observe chemical reactions and describe how we know new materials are made	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	irreversible chemical change compare effervescence product	Water, fizzing tablet (such as berroca or alka seltzer), vinegar, bicarbonate of soda, candle, matches, red cabbage indicator*, soapy water, water, milk, small bottles for liquids, small containers (small aluminium pie cases work well).
Investigate rusting reactions	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible	Planning different types of scientific enquiry to answer questions, including recognising and controlling variables where necessary	fair test variable control variable corrosion rusting	Small iron nails, test tubes or other small containers, water, salty water, other liquids (lemon juice, cola etc) oil, paint or petroleum jelly.
Investigate burning reactions	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.	Identifying scientific evidence that has been used to support or refute ideas or arguments	combustion fuel oxygen extinguish smother	Tea light, matches, beaker, vinegar, bicarbonate of soda.
Investigate chemical reactions - acids and bicarbonate of soda	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 the action of acid on bicarbonate of soda	Using test results to make predictions to set up further comparative and fair tests	reaction predict acid bicarbonate of soda carbon dioxide	Bicarbonate of soda, container with lid such as plastic egg or film canister, small containers to test substances in (test tubes or small foil containers), liquids (water, vinegar, cola, lemon juice), plastic spoons, pipettes .



Year 6 – Light

Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources
Explore how light travels	Recognise that light appears to travel in straight lines	Record data and results of increasing complexity using scientific diagrams and labels Identifying scientific evidence that has been used to support or refute ideas or arguments	light eye light source symbol scientific diagram	Torch, cardboard tube/a section of hosepipe/paper, card, hole punch, pen, pencil.
Explore reflection	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	reflected prediction fair test variable table	Torch, white card, mirror, tin foil, jumper/cardigan, carrier bag (try to choose materials which are similar in colour), pen, pencil.
Explore reflection and explain how it can be used to help us see	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	Identifying scientific evidence that has been used to support or refute ideas or arguments	periscope angle mirror line of sight utilise	Torch, cereal box, mirrors, scissors, sticky tape, ruler, pencil.
Investigate how shadows can change	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	shadow block opaque transparent translucent	Multilink, board marker, whiteboard, torch, ruler, pen, pencil.
Investigate how we can show why shadows have the same shape as the object that casts them	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations	plan sun shade real life problem rotate direction	Modelling clay, torch, cocktail sticks, materials for making a screen, pen, pencil, ruler.
Investigate how we see objects	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	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	optical phenomena disperse spectrum refraction	Water, washing up liquid, straw, glass container, salt, bowl, paper, red, green and blue pens, coloured filters, pencil.