

Whole School Science Topics Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Human body and Senses	Naming and describing materials	Properties and uses of materials	Animals (vertebrates)	Identifying plants and their parts	Revisit topic of animals (vertebrates)
	Seasonal Changes					
Year 2	Local habitats	Choosing materials	Changing materials	Growing up (animals and humans)	Growing seeds and bulbs	Growing healthy plants
Year 3	Rocks, soils and fossils	Light and shadows	Forces, friction and magnets	Movement and nutrition for the human body	Flowering plants and plant growth	Flowering plants life cycle
Year 4	Changes of state	Human impact on the environment	Electricity: circuits	Digestion and food chains	Sound	Classification of plants and animals
Year 5	Forces and mechanisms	Properties and uses of materials	Earth and space	Plant and animal life cycles	Separating mixtures and changing materials	Human growth
Year 6	Classification of living things	Human circulation	What light does	Body health	Electricity:changing circuits	Evolution and inheritance

Year 1

Scientific Skills

Key Stage 1 National Curriculum Statements	In Year 1 lessons children...
Asking simple questions and recognising that they can be answered in different ways	<ul style="list-style-type: none"> • Ask questions about what they notice and observe in the world around them • Show curiosity about similarities and differences between living things and materials • Use what they have noticed or observed to answer questions
Observing closely, using simple equipment	<ul style="list-style-type: none"> • Make observations using all their senses, using context-specific vocabulary to describe them • Use magnifiers to look more closely • Make comparisons
Performing simple tests	<ul style="list-style-type: none"> • Follow simple instructions to carry out simple comparative tests • Use practical resources provided, including water droppers
Identifying and classifying	<ul style="list-style-type: none"> • Use sorting hoops to group materials and objects using their own and given criteria • Use simple ID sheets to identify living things
Gathering and recording data to help in answering questions	<ul style="list-style-type: none"> • Gather first-hand data from a variety of sources • Record their observations in words and labelled pictures (drawn and photos); simple prepared tables and pictograms; block and paper strip bar charts
Using their observations and ideas to suggest answers to questions	<ul style="list-style-type: none"> • Use simple scientific language to describe their observations and answer questions • Use their data to recognise and rank differences

Seasonal changes topic taught across the year.

Key Vocabulary: seasons, nest, insect, fruit

Challenge vocabulary: bud, berry, seed, observe

Prior Knowledge: To notice the similarities and differences in relation to places, objects, materials and living things. To talk about features of their own immediate environment. To make observations of animals and plants and explain why some things occur and talk about changes.

Trips/visitors: Local area walk

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Human body and senses	Naming and describing materials	Properties and uses of materials	Animals (vertebrates)	Identifying plants and their parts	Revisit topic of Animals (Vertebrates)
Area of science	Biology	Chemistry	Chemistry	Biology	Biology	Biology
Prior Knowledge	Exploration of the natural world around them	To explore the movement of sand, water and other materials using a variety of equipment such as funnels, sieves and colanders. To choose clothing to suit the day's weather conditions. To explore materials that could be used to build animal and human homes. About changes to some materials, for example, ice	To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock and recognise when they have been used to make objects.	To explore the natural world around them, making observations and drawing pictures of animals	To explore the natural world around them, making observations and drawing pictures of plants. About seasonal changes and plants' names in their locality.	

		and chocolate.				
Key vocabulary	Sense, sight, smell, taste, touch, hearing	Material, natural, transparent, absorbent	Waterproof, rigid, opaque, flexible, bend	Amphibian, fish, mammal, reptile, bird, carnivore, herbivore, omnivore	Bark, roots, stem, trunk, flower, leaf (leaves)	Review previous vocabulary
Challenge vocabulary	Texture, torso, diagram	Property, manufactured, suitable	Similar, compare, describe, different	Vertebrate, classify, identify	Evergreen, deciduous,	Review previous vocabulary
Lesson 1	Are all leaves the same? (Seasonal Changes)	Which animals share our space? (Seasonal Changes)	How can we group objects made of different materials?	Which birds visit our bird feeders? (Seasonal changes)	What wild and garden plants can we find around school?	What is the difference between an amphibian and reptile?
Enquiry type	Observing over time Identifying and classifying	Observing over time Identifying and classifying	Identifying and classifying Comparative testing	Observing over time Identifying and classifying	Identifying and classifying	
Lesson 2	Is everybody's body the same?	What material is this? (Part 1)	Can the same object be made from different materials?	Who's who in the animal (vertebrate) world?	What parts of a plant grow above the ground?	What do I eat?
Enquiry type		Identifying and classifying				
Lesson 3	How can we explore the world using our sense of touch?	What material is this? (Part 2)	What properties do materials have?	What's so special about birds?	What parts of a plant grow under the ground?	Which type of animal am I?
Enquiry type		Identifying and classifying				
Lesson 4	What can we hear?	Do all trees shed their leaves? (Seasonal Changes)	Does it bend or stretch?	What makes an amphibian an amphibian?	Why are trees plants?	Transition Focus on scientific skills, specifically the use of equipment.
Enquiry type	Identifying and classifying	Observing over time Identifying and classifying	Comparative testing			
Lesson 5	What smells do we like and dislike?	Is all paper the same?	Do all materials get wet?	Do fish have fingers?	What are the similarities and differences between plants that have flowers?	
Enquiry type		Comparative testing	Comparative testing			
Lesson 6	What differences can our tongues taste?	Is all fabric the same?	Are all flowers the same? (Seasonal changes)	Are humans mammals?	How has our space changed over the year? (seasonal changes)	
Enquiry type		Identifying and classifying Comparative testing	Observing over time Identifying and classifying		Observing over time Identifying and classifying	
TAPs science investigation	Body parts	Ways to test transparency	Floating and sinking	Animal classification	Leaf look plant structure	Seasonal change
TAPs focus	Evaluate	Record	Set up an enquiry	Interpret and report	Observe and measure	Ask questions and plan enquiry
Trips/visitors		Local walk		Farm visit/animals to come into school reptiles	School grounds walk with Mr Erlam.	

Year 2

Scientific Skills

Key Stage 1 National Curriculum Statements	In Year 2 lessons children...
Asking simple questions and recognising that they can be answered in different ways	<ul style="list-style-type: none"> Ask questions about how things are similar and different, materials' suitability and how things change. Begin to recognise that there are different ways to answer scientific questions, including naming things, sorting them and comparing them.
Observing closely, using simple equipment	<ul style="list-style-type: none"> Make more systematic observations of features and changes. Take measurements using non-standard units (string, blocks) and then cm. Learn that a thermometer is used to measure temperature.
Performing simple tests	<ul style="list-style-type: none"> Learn to only change one thing in a comparative test to make sure it is fair. Begin to plan simple tests independently. Learn how to set up an observation over time enquiry. Predict a result using prior experience and knowledge.
Identifying and classifying	<ul style="list-style-type: none"> Select their own sorting criteria. Use observable features to classify living things using ID cards.
Gathering and recording data to help in answering questions	<ul style="list-style-type: none"> Use prepared tables to classify living things and materials. Construct simple bar charts using templates. Add labels to diagrams.
Using their observations and ideas to suggest answers to questions	<ul style="list-style-type: none"> Identify patterns in their data. Use data collected in enquiries to inform their answers to questions. Begin to develop explanations based on evidence collected and previous experience and knowledge.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Local habitats	Choosing materials	Changing materials	Growing up (animals and humans)	Growing seeds and bulbs	Growing healthy plants
Area of science	Biology	Chemistry	Chemistry	Biology	Biology	Biology
Prior Knowledge	About a variety of common wild and garden plants, their names and structure. About a variety of fish, amphibians, reptiles, birds and mammals, their names and structure. To observe changes across the four seasons.	To explore differences they notice between materials and how they can be changed. To identify, describe and compare a variety of everyday materials, such as wood, plastic, glass, metal, water and rock, and their physical properties.	To identify a range of everyday materials and compare their suitability for certain uses.	About exploration of the natural world around them, making observations and drawing pictures of animals. About animal classification and structure. About parts of the human body.	To name and identify a variety of common plants, and to describe a plant's structure using the terms roots, stems/trunks, leaves and flowers.	The names and parts of a variety of different plants, including trees. That seeds and bulbs grow into mature plants, and the conditions required for seeds to germinate. How habitats provide the correct conditions for a plant's survival.
Key vocabulary	Feed, move, alive, dead, consumer, producer	Suitable, use, fit for purpose, compare, bounce	Push, pull, invent,	Birth, healthy, hygienic, life cycle	Bulb, seedling, mature	Temperature, soil, light
Challenge vocabulary	Decomposer, shelter, survive	Durable, elasticity	Stiff, squash, stretch, twist	Invertebrate, vertebrate	germinate/germination	Conditions, thermometer

Lesson 1	Are the things I find alive, have never been alive or once were alive?	Is that a good choice of material?	How can I change the shape of an object?	How do animals change as they grow?	How do plants grow and change over time?	How can we care for our plants?
Enquiry type			Identifying and classifying	Observing over time	Observing over time	
Lesson 2	What lives in my tree?	What ball bounces highest?	What properties allow a material to be changed?	What do animals need to survive?	How are seeds and bulbs different?	Do mature plants need light?
Enquiry type	Identifying and classifying	Comparative testing	Identifying and classifying		Identifying and classifying	Comparative testing
Lesson 3	What animals live in this woody habitat?	Which materials are good for a toddler's play dungarees?	Which material is fit for purpose?	How can we sort food into groups?	What do seeds need to germinate?	Does temperature affect the growth of mature plants?
Enquiry type	Identifying and classifying	Comparative testing	Identifying and classifying	Identifying and classifying	Comparative testing	Pattern seeking
Lesson 4	What animals live in this grassy habitat?	Who develops new materials?	What can pushes and pulls do?	How can humans stay clean?	How tall will they grow?	Do mature plants need water?
Enquiry type	Identifying and classifying				Pattern seeking	Comparative testing
Lesson 5	What do animals that live in the woods eat?			How can humans stay active?	What have we learnt about how a seed germinates?	What have we learnt about what mature plants need to grow healthily?
Enquiry type					Observing over time	
Lesson 6	What do animals that live in the pond eat?			How do humans stay healthy?		
Enquiry type	Identifying and classifying					
TAPs science investigation	Animal home build	Materials hunt		Handspan	Plant growth	Daisies in a footprint
TAPs focus	Ask questions and Plan Enquiry	Record	Interpret and report	Evaluate	Observe and measure	Set up enquiry
Trips/visitors	Heaton Park pond visit				Garden centre either visit or visitor Farmer?	

Year 3

Scientific Skills

Lower Key Stage 2 National Curriculum Statements	In Year 3 lessons children...
Asking relevant questions and using different types of scientific enquires to answer them.	<ul style="list-style-type: none"> • Suggest questions they could investigate • Learn the names of different types of enquiry • State what science they did to answer the question
Setting up simple practical enquiries, comparative (and fair) tests.	<ul style="list-style-type: none"> • Plan observing over time enquiries, making some decisions about what observations and/or measurements they will need to make and when • Plan simple comparative tests, making some decisions about what to change and what to measure • Make some decisions about which practical resources to use
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers,	<ul style="list-style-type: none"> • Learn to use a data logger or light meter app, stopwatch, weighing scales (digitalO, rulers • Make observations using a digital microscope • Use standard units for measurements • Make systematic and careful observations
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	<ul style="list-style-type: none"> • Gather evidence from a range of sources including first hand observation and experimental data, and secondary sources of information, to answer scientific questions • Use tally charts
Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	<ul style="list-style-type: none"> • Construct tables • Draw labelled diagrams with jets • Construct simple food chains • Use scientific language in writing and orally • Make some decisions about how to record observations
Reporting on findings from enquiries, including oral and written explanations, displays or presentation of results and conclusions.	<ul style="list-style-type: none"> • Use different ways to report enquiry findings: posters, writing explanatory sentences, labelled diagrams, oral presentation, drama
Using results to draw simple conclusions, make predictions for new values, suggest improvements (and raise further questions).	<ul style="list-style-type: none"> • Use prior knowledge or data collected in lessons to predict outcomes of tests. • Use evidence collect in a range of methods and their current knowledge to formulate simple conclusions • Begin to evaluate effectiveness of tests
Identify differences, similarities (or changes) related to simple scientific ideas and processes.	<ul style="list-style-type: none"> • Identify differences and similarities they have observed in data they have collected at first hand or from secondary sources, and relate them to simple scientific ideas and processes they have learned about
Using straightforward scientific evidence to answer questions or to support their findings.	<ul style="list-style-type: none"> • Refer to own data when answering questions

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Forces, friction and magnets	Light and shadows	Rocks, soils and fossils	Movement and nutrition for the human body	Flowering plants and plant growth	Flowering plants life cycle
Area of science	Physics	Physics	Chemistry	Biology	Biology	Biology
Prior Knowledge	That the shape of an object can be changed by squashing, bending, twisting and stretching.	That light can be seen by the eyes. That materials can be transparent or opaque.	To identify and name a variety of everyday materials and their properties. To recognise how a material's properties make it suitable for	About the basic parts of the human body and their senses. About the basic needs of animals, including humans, for survival. About the importance for humans	To describe a plant's basic structure, using the terms roots, stems/trunks, leaves, flowers. That seeds need water to germinate and that most do not need light. That	To identify and describe the functions of some parts of a flowering plant: roots, stem/trunk and leaves. That plants need air, light, water, nutrients and room to grow.

			particular purposes.	of exercise and eating the right amounts of different types of food.	mature plants need water, light and a suitable temperature to grow and stay healthy.	
Key vocabulary	Force, pole, magnetic, attract, repel, magnet	Light source, darkness, reflect, opaque, transparent, translucent	Layer, structure, drain, fossil, sediment, rock	Carbohydrate, fat, fibre, mineral, nutrient, protein, vitamin, sugar, skeleton	Adapted, function, transport, space	Carpel, ovary, ovule, pollen, sepal, stamen, pollination, seed dispersal
Challenge vocabulary	Pendulum, classification	Ultraviolet, lux,	Crystalline, palaeontologist, weathering	Exoskeleton, tendon, muscle, calcium	Capture, anchor	Burr, nectar, ripe
Lesson 1	What makes it move?	What do we need to see?	How are rocks different and what rock is this?	What nutrition do we get from our food?	What do leaves do?	What is inside a flower?
Enquiry type					Comparative and fair testing	
Lesson 2	How long does a top spin on different surfaces?	Which object is the most reflective?	What are rocks used for?	Which nutrients are in school dinners?	What do roots and stems do?	What is animal pollination?
Enquiry type	Comparative and fair testing	Comparative and fair testing	Comparative and fair testing		Observing over time	
Lesson 3	How well can an object slide on different surfaces?	How are shadows made?	How are soils different?	What is in a human skeleton?	What are the functions of the parts of a flowering plant?	What is wind pollination?
Enquiry type	Comparative and fair testing	Comparative and fair testing			Comparative and fair testing	
Lesson 4	How do magnets affect each other?	Is my shadow like me?	Which soils hold water?	How do muscles help humans to move?	What happens if plants do not have enough space?	What are fruits?
Enquiry type			Comparative and fair testing		Comparative and fair testing	
Lesson 5	Which materials are magnetic?	How can we change the size of a shadow?	What is this fossil?	How are vertebrate and invertebrate bodies supported?	How are plants different?	How are seeds dispersed?
Enquiry type		Comparative and fair testing	Research		Research	
Lesson 6	How strong are magnets?		Who was Mary Anning and how did she become a palaeontologist?	Are all vertebrate skeletons the same?		
Enquiry type	Pattern seeking					
TAPs science investigation	What is the strongest magnet?	Can everything make a shadow?	Rock reports	Investigating skeletons	How much water do plants need?	
TAPs focus	Set up enquiry	Record	Interpret and report	Ask questions and plan enquiry	Observe and measure	Evaluate
Trips/visitors		MOSI (book at least a half term in advance)	Manchester Museum (link with Ancient Egypt visit Move to spring 1)	PE coach or a nutritionist in (Talk to EBW for contact)	School grounds	School grounds

Year 4

Scientific Skills

Lower Key Stage 2 National Curriculum Statements	In Year 4 lessons children...
Asking relevant questions and using different types of scientific enquires to answer them.	<ul style="list-style-type: none"> Decide how to gather evidence to answer a scientific question Use a range of question stems Answer questions posed by the teacher identifying the type of enquiry they have used to answer the question
Setting up simple practical enquiries, comparative (and fair) tests.	<ul style="list-style-type: none"> Use the terms variable and control variable Use a fair test planner to identify variables to change, measure and keep the same to answer a question Plan and carry out a fair test Plan and carry out a comparative test Follow instructions to carry out a pattern seeking enquiry
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers,	<ul style="list-style-type: none"> Learn to use a thermometer Use standard units for measurements Use senses to make detailed observations
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	<ul style="list-style-type: none"> Become more systematic and accurate in data collection
Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	<ul style="list-style-type: none"> Learn to use branching keys Learn to draw a bar chart, labelling axes and choosing a scale with suitable intervals Use (non-standard) symbols to represent an electrical circuit Sequence flow charts Learn to use Venn and Carroll diagrams Make detailed observational drawing
Reporting on findings from enquiries, including oral and written explanations, displays or presentation of results and conclusions.	<ul style="list-style-type: none"> Begin to make choices about how to report enquiry findings Use appropriate scientific vocabulary consistently and accurately
Using results to draw simple conclusions, make predictions for new values, suggest improvements (and raise further questions).	<ul style="list-style-type: none"> Identify a simple pattern between two data sets Use test results to propose solutions to problems
Identify differences, similarities (or changes) related to simple scientific ideas and processes.	<ul style="list-style-type: none"> Use evidence to generate comparative statements Begin to identify causal relationships Use simple models to represent scientific processes
Using straightforward scientific evidence to answer questions or to support their findings.	<ul style="list-style-type: none"> Use data they have collected to answer questions Use scientific knowledge from secondary sources to answer questions

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Changes of state	Human impact on the environment	Electricity: circuits	Digestion and food chains	Sound	Classification of plants and animals
Area of science	Chemistry	Biology	Physics	Biology	Physics	Biology
Prior Knowledge	About suitability of a variety of everyday materials for particular uses, based upon their properties. How temperature can be measured using a	That materials are chosen for particular uses based on their properties.	About the feeding relationships of animals in a habitat and how to show them in a food chain. To understand the difference between things	That animals need to eat to stay alive. That a balanced diet keeps animals, including humans, healthy. That the feeding	That we hear sounds with our ears. To classify materials as solids, liquids or gases.	About animal classification and structure. To identify and name common wild and garden plants and deciduous and evergreen trees.

	thermometer.		that are alive, were once alive and never lived. That plants gain nutrients from soil which help them grow healthily. What soil is made of. That some materials can be recycled.	relationships of animals can be shown as a food chain. About the way animals are interdependent in ecosystems.		About animal (vertebrate and invertebrate) classification. About animal stages of life. To notice differences between seed and bulb plant growth. About classification of rocks. About how vertebrate and invertebrate bodies are supported.
Key vocabulary	Solid, liquid, gas, evaporate, condense, change of state, freeze	Environment, pollution, litter, decompose	Battery, cell, wire, switch, buzzer, bulb, circuit	Intestine, oesophagus, stomach, anus, molar, canine, incisor, predator, prey	Pitch, volume, vibrate	Segment, organism, cold-blooded, warm-blooded
Challenge vocabulary	Degree celsius, granule, viscous	Biodegradable, micro-organism, fungi	Appliance, conductor, insulator	Mechanical, chemical, saliva	Decibel	Arachnid, crustacean, mollusc, myriapod, annelid
Lesson 1	Is this material a liquid or a solid?	Where does the rain come from?	What makes an appliance work?	Where does all the food we eat go?	How are sounds made?	How are living things classified?
Enquiry type						
Lesson 2	How is temperature measured? What difference does temperature make to how quickly the ice block melts?	What is the impact of litter in our school?	How can you light the bulb?	What teeth do humans have?	How do sounds reach our ears?	How are vertebrates classified?
Enquiry type	Observing over time Comparative and fair testing				Comparative and fair testing	Research
Lesson 3	What are melting and freezing?	How do materials change over time?	What does a switch do?	What do teeth do in the digestive system?	How can we change the volume of a sound?	How are invertebrates classified?
Enquiry type	Observing over time	Observing over time			Comparative and fair testing	
Lesson 4	Are spaces really empty?	How do micro-plastics get into the food chain?	Why doesn't the circuit work?	What happens to food after we put it in our mouths?	How does the volume of a sound change as we move away from the source?	Can you use a branching key?
Enquiry type					Comparative and fair testing	
Lesson 5	What is evaporation and how does it help to get things dry?	How can we prevent micro-plastics from getting into our seas and oceans?	What materials conduct electricity?	What do animals eat?	How can we change the pitch of a sound?	What is this living thing?
Enquiry type	Comparative and fair testing	Comparative and fair testing			Comparative and fair testing	
Lesson 6	Where did the water come from?	How can we clean up birds affected by an oil spill?		What do animal teeth tell us?	What affects the pitch of a plucked note?	

Enquiry type		Comparative and fair testing		Research		
TAPs science investigation	Drying materials		Circuit products	Teeth (eggs) in liquid	Investigating pitch	Local survey of living things
TAPs focus	Set up enquiry		Observe and measure	Evaluate	Ask questions and plan enquiry	Record
Trips/visitors		Little pick around school (secondary)	Electrician visitor	Dentist	Audiologists	Chester Zoo

Year 5

Scientific Skills

Upper Key Stage 2 National Curriculum Statements	In Year 5 lessons children...
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	<ul style="list-style-type: none"> Identify independent and dependent variables and use these to generate fair and comparative test questions Identify the important variables to control when carrying out a comparative or fair test Research secondary sources to find answers to questions Justify selection of enquiry type
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	<ul style="list-style-type: none"> Learn to use a force meter Measure liquids accurately using measuring cylinders Make decisions about whether repeat readings are required to get accurate data
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	<ul style="list-style-type: none"> Create tables to collect data Draw and label line graphs, scatter graphs and bar charts with the variables on the correct axis, choose a suitable scale with equal intervals and plot data correctly Draw labelled diagrams of mechanisms and structures
Using test results to make predictions to set up further comparative and fair tests.	<ul style="list-style-type: none"> Use test results gathered or knowledge acquired to make predictions Pose further questions
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 presentations.	<ul style="list-style-type: none"> Use data gathered to identify causal relationships Explain how to increase the accuracy and precision of measurements Use key vocabulary accurately and consistently Make decisions about salient and relevant data to present Recognise that there are many different ways to report findings: scales, charts, reports, annotated diagrams, graphs, charts, inventor's notebooks, multimedia presentations such as website pages and television advertisements Draw valid conclusions from data collected
Identifying scientific evidence that has been used to support or refute ideas or arguments.	<ul style="list-style-type: none"> Draw upon test data to construct an explanation Use observations and test data to provide evidence to support or refute ideas or arguments

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Forces and mechanisms	Properties and uses of materials	Earth and space	Plant and animal life cycles	Separating mixtures and changing materials	Human growth
Area of science	Physics	Chemistry	Physics	Biology	Chemistry	Biology
Prior Knowledge	How things move on different surfaces. That magnets attract magnetic materials, and that they have two poles which attract or repel each other. That some forces need contact between two objects, but magnetic forces can act at a distance.	About the properties of solids, liquids and gases, including how heating and cooling can cause a change of state; evaporation and condensation and the part played in the water cycle; how a thermometer works and how it can be used to measure temperature. About which materials are electrical conductors and electrical insulators. About magnets.	How day length varies with the seasons. That the Sun and star are light sources and the Moon is not. How shadows are formed and can be changed.	That animals have offspring which grow into adults. That flowers play an important part in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	To compare and group materials according to whether they are solids, liquids, or gases. To recognise how temperature changes may cause materials to change state. About the processes of evaporation and condensation in the water cycle. About pollution. To compare and group	Humans over time and like other mammals have a life cycle. Different animal groups have very different life cycles.

		About human impact on the environment and what happens to different materials when they are thrown away. Stages of human growth.			everyday materials on the basis of their properties and give reasons for the particular uses of materials.	
Key vocabulary	Air resistance, gears, gravity, lever, mechanism, pulley	Thermal conductor, thermal insulator, wear and tear, fragile, brittle, viscosity	Axis, moon, orbit, rotate, solar system, star, planet	Anther, filament, larva, gestation, metamorphosis, reproduction, asexual	Dissolve, filter, insoluble, reversible, irreversible, reaction, separate, soluble	
Challenge vocabulary	Fulcrum, pivot, Newton (N)	Ductile, malleability		Propagation, thorax, propagation	Solution, saturated, contamination	
Lesson 1	What is the friction between different surfaces?	How can we compare and group materials?	What's in space?	How do flowering plants produce seeds? Do all plants have the same number of reproductive parts?	How can we separate mixtures?	How do newborn babies turn into teenagers?
Enquiry type			Research	Identifying and classifying		Research
Lesson 2	Why do objects fall at different speeds?	Which materials did the builders use when constructing our school and why?	How do the planets move?	How can we grow more plants without using seeds?	What happens when we mix liquids and solids?	How do girls become women?
Enquiry type		Identifying and classifying			Identifying and classifying	
Lesson 3	How does the size of the canopy affect the time it takes a parachute to fall?	Which liquid is the thickest?	How does the position of the Sun in the sky change?	How do birds change over their lifetime?	What makes a difference to how fast sugar or salt dissolves?	How do boys become men?
Enquiry type		Comparative and fair testing	Observing over time		Comparative and fair testing	
Lesson 4	Does the shape of an object affect its movement in a liquid?	Who invents things?	What causes day and night?	Do all mammals have the same gestation period?	How can we clean up contaminated water?	What is the human life cycle?
Enquiry type				Pattern seeking	Research	
Lesson 5	How can we lift a heavy load?	Can the same container keep cold things cold and hot things hot?	How does the Moon move?	How do amphibians change throughout their life cycle?	What makes a change non-reversible?	
Enquiry type						
Lesson 6	How does the length of the lever affect the force needed to lift the load?	Which materials are absorbent, permeable or waterproof?	What patterns can we find in data about the planets?	Do all insects go through the same life cycle?	How much gas can be produced by a non-reversible change?	
Enquiry type	Comparative and fair testing		Pattern seeking	Observing over time	Comparative and fair testing	
TAPs science investigation	Paper planes	Thermal insulation layers	Space craters	Life cycles research	Forensic powders	Human growth survey

TAPs focus	Ask questions and plan enquiry	Set up enquiry	Record	Interpret and report	Evaluate	Observe and measure
Trips/visitors	Female engineer visit?		Observatory visit		Science in secondary	

Year 6

Scientific Skills

Upper Key Stage 2 National Curriculum Statements	In Year 6 lessons children...
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	<ul style="list-style-type: none"> • Make planning decisions about where and how to collect information (recognising and controlling variables, deciding what observation or measurements to make over time and for how long, using suitable samples to identify patterns) • Recognise how secondary sources can be used to answer questions that cannot be answered through practical work • Ask and write enquiry questions
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	<ul style="list-style-type: none"> • Construct data collection tables • Select measuring equipment to give the most precise results including force meters with a suitable scale, ruler or tape measure • Make decisions about whether further research (secondary sources) is required
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	<ul style="list-style-type: none"> • Construct and use a range of ways to record and sort data • Create branching keys with four or more items • Draw circuit diagrams using recognised symbols
Using test results to make predictions to set up further comparative and fair tests.	<ul style="list-style-type: none"> • Recognise when further tests and observations are needed to answer questions
Reporting and presenting findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and presentations.	<ul style="list-style-type: none"> • Analyse scatter graphs • Recognise that in a pattern seeking enquiry it is important to have as much data as possible • Use scientific language to communicate findings from a range of enquired in written, oral, dramatic and multimedia presentations • Use and evaluate models to represent systems and processes • Evaluate methods used, control of variables, precision of measurements, credibility of secondary sources • Justify trust in data
Identifying scientific evidence that has been used to support or refute ideas or arguments.	<ul style="list-style-type: none"> • Evaluate limitations of data collected or from secondary sources • Explain why scientists do not always agree • Differentiate between fact and opinion

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Classification of living things	Human circulation	What light does	Body health	Electricity:changing circuits	Evolution and inheritance
Area of science	Biology	Biology	Physics	Biology	Physics	Biology
Prior Knowledge	About animal classification (vertebrates and invertebrates) and animal structure (vertebrates). To identify and name common wild and garden plants and evergreen and deciduous trees. About animal stages of life. About differences between seed and bulb plant growth. About classification of rocks. About classification of plants and animals using branching keys.	How the skeletal system moves our bodies and protects our organs whilst holding us upright. That the digestive system breaks down the food we eat into smaller pieces that our body can use for energy and growth, and that these travel in the bloodstream to the rest of the body.	That light comes from light sources and we need it to see. How a shadow is formed and can be changed. That shiny surfaces are more reflective than dull ones. That light from the sun can be dangerous and how to protect themselves.	To identify appliances that run on electricity. To construct simple circuits and to control them using a switch. That metals are electrical conductors, and most non-metals are electrical insulators.	That we need the right types and amount of nutrition in order to be healthy, and that our skeletons and muscles allow us to move and provide support and protection. About the main parts of the human circulatory system, and their functions.	About animal and plant features and adaptations and how they are classified. That the habitat of an animal or plant may change.

Key vocabulary	Taxonomy, mould, conifer, fern, spore	Veins, arteries, valves, blood	Light ray, reflection, block, travel	Voltage, volts	Heart rate, pulse, recovery	Inherited, natural selection, evolution, extinction
Challenge vocabulary	Protista, echinodermata, arthropod, monera	Atrium, ventricle, pulmonary artery, aorta	Independent variable, dependent variable	Standard symbol	Malnutrition, deficiency	Anomaly, variation
Lesson 1	How can we sort the mess?	What is blood made of?	How does light travel?	How can we make healthy food choices?	How do we light the lamp?	How are living things different?
Enquiry type		Research		Research		Pattern seeking
Lesson 2	What plants are there other than flowering plants?	What is the circulatory system and what does it do?	What can we change about a shadow?	What can happen if you don't eat a balanced diet?	How can we change a circuit?	How is an organism adapted to live in its habitat?
Enquiry type				Research	Comparative and fair testing	Research
Lesson 3	How can we classify animals?	What is the heart and what does it do?	What might affect the size of a shadow?	How does physical activity affect heart rate?	How can we change the brightness of a lamp?	How do an animal's adaptations help it to survive?
Enquiry type			Comparative and fair testing	Pattern seeking	Comparative and fair testing	
Lesson 4	What else is living besides animals and plants?	What are blood vessels and what do they do?	What affects the size of a shadow?	How do smoking or vaping affect your lung capacity?	How can we change how other components work?	What can fossils tell us?
Enquiry type	Observing over time	Research	Comparative and fair testing		Comparative and fair testing	
Lesson 5	How can we identify living things?	What did William and Harvey find out about the circulatory system?	How is light reflected?		How can we predict which circuit will have the brighter lamp?	How does evolution happen?
Enquiry type			Comparative and fair testing			
Lesson 6	What lives here? Where do these organisms fit in my key?		How do we see objects?			How did Wallace and Darwin come up with the idea of natural selection?
Enquiry type	Identifying and classifying					
TAPs science investigation	Invertebrate research	Human heart rate	Shadows investigation	Terrific tasters	Bulb brightness	Fossil habitats
TAPs focus	Interpret and report	Set up enquiry	Record	Observe and measure	Ask questions and plan enquiry	Evaluate
Trips/visitors		Heart dissection	Optician	Gym visit (MCA) or dance workshop		