



Investigating

We strive to provide a high-quality science education that develops understanding of the world through the scientific disciplines of biology, chemistry and physics. Pupils will be immersed in key scientific vocabulary which supports the acquisition of scientific knowledge and understanding.

"Somewhere, something incredible is waiting to be known" Carl Sagan, an astronomer and astrophysicist

Collaboration with our community, within classrooms and enrichment opportunities, support pupils to develop their science capital which enables them to make links between their learning and the world in which we live. Pupils develop confidence to talk about scientific concepts and remedy misconceptions.

Pupils are curious and investigations provide opportunities for them to explain what is happening, use appropriate scientific vocabulary and share their ideas. We aim to equip them with skills to work scientifically by mapping out disciplinary. knowledge to ensure progression.





Our fantastic outdoor environment provides opportunities for practical science, giving them experience of collecting and analysing data in the real world. With a focus on the Sustainable Development Goals, pupils are aware of the global challenges we face and learn how to achieve a better, more sustainable future. They learn to respect living organisms and the natural environment.

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Our curriculum equips pupils with the knowledge, skills and understanding to be able to analyse data, ask further questions, challenge ideas and think critically about evidence they gather.



Science is a core part of the curriculum but there are also clear links between other subjects and science. These allow pupils to see science embedded into daily life as well as in other times and places.

Science: Progression of Knowledge & Skills



Reception

Our	Our science teaching is structured around:								
 ✓ At the start of a unit: Pre-assessment activities ✓ Every lesson: Retrieval practice ✓ At the end of each unit: A big question 									
✓ E	very les	son: Retrieval practice		√	✓ At the end of each unit: A big question				
Area of		Big Question	Big idea	Кеу	Enquiry type				
science				Vocabulary					
	Our senses	How do we use our senses to understand the world around us?	Our senses help us to understand the world	See Hear Touch Smell Taste	Identify, classify and group: Sort images of people according to their characteristic Identify and name parts of the body Identify items using their senses				
Biology	Do living things change or stay the same?		Researching using secondary sources: Learn how animals from a different habitat are cared for Learn about how we can protect animals in our in our local area Pattern seeking: Look for mini-beasts and plants in different areas of the school grounds Observation over time: How have we changed as we have grown?						
	Keeping healthy	Why do we eat and exercise?	All living things need energy and grow	Fruit Vegetables Diary Meat Healthy Unhealthy Exercise	Research using secondary sources: Find out information from visitors (dentist/nurse etc)Identify, classify and group: Sort types of food (meat, fish, fruit, vegetable, dairy)Observation over time: Grow vegetablesResearching using secondary sources: Learn about where fruit and vegetables come from				
Chemistry	Everyday Materials	Are all materials the same?	There are different types of materials which can be used for different types of things	Wood Plastic Glass Metal Rock Water Freeze Melt	Observing over time: How does a snowman change as it melts? Comparative test: How quickly do ice cubes melt in different areas of the playground? Compare how a range of items move in different settings Identify, classify and group: Types of materials Research using secondary sources: Where does our rubbish go? Research the process of recycling.				
Physics	Seasonal changes	Is the weather the same every day?	Different seasons have different weather	Autumn Spring Summer Winter	Identify, classify and group Which clothes are suitable for each season? Observing over time: How does the natural world change with the seasons? Observe unexpected weather Researching using secondary sources: Find out about how animals behave in different seasons Find out about the weather and seasons				



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Area of science		Young Scientist	ts should be able to
	Our senses	 Name and provide examples of the 5 senses Explore different objects/materials using their senses 	Ask simple questions which begin with does/do, how and what/which e.g. What is a bud? How do the seasons change? Does it snow in the summer? Which materials are waterproof?
Biology	Living things and their habitats	 Ask questions about mini-beasts found in their environment Recognise some environments that are different to the one in which they live Begin to understand the need to respect and care for the natural environment and all living thigs 	 Predict what might happen Observe closely using simple equipment such as magnifying glasses including bug collectors and binoculars Explore and perform simple tests
	Keeping healthy	 Name some healthy and unhealthy foods Name different ways to keep fit and healthy Explain the difference between diary, meat and fruit/vegetables based on where some different foods come from Identify where different foods come from 	 There is an ability to sort and classify Use descriptive/scientific language to describe their observations Explain what has been observed using appropriate vocabulary Use observations to suggest reasons 'why' something has happened
Chemistry	Investigate where wood comes from Explore collections of materials with similar and/or different properties Talk about the differences between materials and changes they notice Explore natural materials, indoors and outside		Say what has been learned
Physics	Seasonal changes	 Explore the natural world around them. Describe what they see, hear and feel whilst outside Understand the effect of changing seasons on the natural world around them 	



Our science teaching is structured around:								
🗸 At th	e start of a	unit: Pre-assessment act	ivities	✓ During the	✓ During the unit: A rich task			
🗸 Every	/ lesson: Re	etrieval practice		🗸 At the end	✓ At the end of each unit: A big question			
Area o	f science	Big Question	Big idea	Key Vocabulary	Enquiry type			
	blants	Are all plants the same?	Living things on Earth come in a variety of different forms	Deciduous Evergreen Blossom Petal Stem	Identify, classify and group: Types of wild and garden plants including deciduous and evergreen trees Basic structure of a variety of common flowering plants, including trees Research using secondary sources: British plants			
iology				Trunk Roots	Observation over time: Observing a tree throughout the year Observe a trail (woodland) to identify how plants change through the year Comparative tests: Which tree has the biggest leaves?			
ä	Animals including humans	Are animals (including humans) all the same?	Animals need food they can break down which comes either directly by eating plants or by eating other animals	Mammal Amphibian Inset Reptile Carnivore Herbivore Omnivore	Identify, classify and group: Types of animals based on physical structure and what they eat Use secondary sources of information: Endangered animals Use secondary sources to name animals seen in local environment (e.g. magpie, blackbird). Grouping and classifying things: Identify and classify animals into groups based on different criteria Pattern seeking: Similarities and differences between animals			
Chemistry	Everyday materials	Can we change the shape of a material? How can materials be reused? What is the best material to use?	All objects are made of one or more materials There are various ways of bring about change in materials e.g. movement (pushing or pulling) and heating	Float/sink Strong Bendy/stiff Waterproof Squash Liquid See through Mix Melt	Identify, classify and group: Properties of materials including materials that can be recycled Research using secondary sources: Research secondary sources to find out about reduce, reuse and recycle. Comparative test: Test objects made of different materials to see how effective they are e.g. waterproofness, absorbency, elasticity Which materials are best to wrap presents? (Sustainability focus) Observation over time: Observe the change of a wipe and toilet paper in water. Link this to the environmental issue of wipes.			
Physics	Seasonal changes	How does the weather change?	The weather changes with the seasons	Seasons Sunrise Sunset Day length Weather	Observing changes over a period of time: Monitoring the weather over time by regularly collecting data Observe unexpected weather How does a puddle change over time? Pattern seeking: Weather in different seasons, length of daylight and plants. At the end of the year, look for patterns in evidence. Identify, classify and group: items relating to weather and seasons			



Area of science		Year 1 Scientists should be able to						
	Plants	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.		Ask simple questions which begin with does/do, how and what/which e.g. What is a bud? How do the seasons change? Does it snow in the summer? Which materials are waterproof?				
Biology	sui	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.		different ways				
	huma	Identify and name a variety of common animals that are carnivores, herbivores and omnivores.		Predict an outcome of an enquiry				
	mals and	Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including nets)		Observe closely using simple equipment such as magnifying glasses including bug collectors and binoculars				
	Ani	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		Use discrete data to perform comparative tests to gather data e.g. set up a test to see which material for mopping up water?				
Ą	terials	Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including		Know if the test has been successful				
Chemist	yday ma	wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials		Gather data in line with Year 1 measurement curriculum (non-standard units)				
	Ever	Compare and group together a variety of everyday materials on the basis of their simple physical properties.		Use drawings and simple tables to record results				
Physics	easonal changes	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.		Explain what has been observed using appropriate vocabulary Use observations to suggest reasons 'why' something has happened Say what has been learned				
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Our science teaching is structured around:							
✓ At the start of a unit: Pre-assessment activities ✓ During the unit: A rich task							
✓ Every lesson: Retrieval practice					✓ At the end of each unit: A big question		
Ar	ea of	Big Question	Big idea	Key Vocabulary	Enquiry type		
sci	ience						
Biology	ving things and their habitats	Why do animals live in different places? How do living things obtain their food?	All living things need food as their source of energy as well as air, water and certain temperature conditions Living things are distinguished from non-living things by their ability to move, grow,	Micro habitats Living Dead Food chains	Pattern-seeking: What conditions do woodlice prefer?Identify, group and classify: Sort habitat cards and try to match the animals andplants that live in themSort things that are living, dead and that have never been aliveClassify minibeasts found in the environment based on physical structureObservation over time: Explore animals and plants in micro-habitats throughout theyearResearch using secondary sources: Research how to support bees and marine		
	i.		reproduce and react to certain stimuli		habitats which are under threat such as glitter litter Research what animals eat		
	Plants	How can living things stay healthy?	Living things are special collections of matter that use energy and grow	Shelter Seeds Bulb Growth Temperature	 Comparative testing: Investigating water, light and temperature on plant growth Observation over time: Observe changes in selected plants and trees Plant seeds and bulbs and observe changes Pattern seeking and observation over time: Do bigger seeds grow into bigger plants Research using secondary sources: Look at packets to decide how to plant and care for seeds e.g. How much water do they need? Do they need shade/full sun? 		
	Animals including humans	Is all food good for us? Do all animals start off small?	Living things produce offspring of the same kind, but offspring are not identical with each other or with their parents	Offspring Life cycle Survival Food types Hygiene	Identify, classify and group: Put foods into categories: fats, carbohydrates and proteins Which offspring belongs to which animal? Observation over time: Observe a life cycle (e.g. caterpillars, chicks, farm animals). Observe how their body changes before, during and after exercise. Comparative test: Distance and spray marks on paper (to represent sneezing) Research using secondary sources: Research adult animals and their young.		
Chemistry	Everyday Materials	How do we choose materials? Can you really make a chocolate teapot?	All matter (stuff) in the universe is made up of tiny building blocks. The arrangement of these building blocks determines the properties of materials	Flexible Transparent Magnetic Suitable Unsuitable Properties	Comparative testing: Test materials for difference uses e.g. Which material can you use to make an aeroplane? Which fabric would you use for curtains? Which materials are best for Cinderella's mop? Research using secondary sources: Research secondary sources to find out about the 6Rs: Rethink, Refuse, Reduce, Reuse, Recycle and Repair. Pattern seeking: How does the amount of water affect the strength of a kitchen towel?		



Area of		Year 2 Scientists should be able to								
9	science									
	nd their s	Explore and compare the differences between things that are living, dead, and things that have never been alive. 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		Ask questions beginning with would, why and where e.g. why are these seeds shaped as they are? Would plants go in the dark? Where do snails live?						
Biology	g things a habitat	of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including microhabitats.		Discuss ways in which their questions could be answered e.g. through research, observations or simple tests						
	Living	Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.		Predict outcomes and suggest reasons Close observations are made independently considering						
	lants	Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.		which equipment would be most useful Use microscopes						
	٩			Suggest and perform comparative tests						
	s B S	Notice that animals, including humans, have offspring, which grow into adults. Find out about and describe the basic needs of animals, including humans, for		Understand the meaning of discrete data						
	Animal includir human	survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		Independently classify and group things according to a given criteria or justifying reasons why it is grouped in this way						
۲۷	iterials	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.		Gather data in line with Year 2 measurement (standard units) and statistics curriculum (tally charts, pictograms, block charts) as well as labelled diagrams						
Chemistr	eryday Ma	changed by squashing, bending, twisting and stretching. Find out about people who have developed useful new materials e.g. John Dunlop, Charles Macintosh or John McAdam		Draw conclusions from observations, measurements and scientific knowledge						
	Ev			Independently suggest answers to questions based on what they have found out						



Our science teaching is structured around:								
At the start of a unit: Pre-assessment activities				✓ During the unit: A rich task				
✓ Every lesson: Retrieval practice				✓ At the end of each unit: A big question				
Are	ea of	Big Question	Big idea	Key Vo	cabulary	Enquiry type		
sci	ence							
siology	Plants	Do all plants need exactly the same things?	Plants have different structures that serve different functions in growth, survival and reproduction	Seed dispersal Species Pollination Seed formation Photosynthesis Pollen Germination		Observation over time: What happens to celery/white carnations when it is left in a glass of coloured water?Annual cycle of plantsResearch using secondary sources: Research how parts of the plant help it function Identifying, grouping and classifying: Types of seeds, parts of a plant (not reproduction) Comparative test: Compare different types of mature plants in different conditions. Link their findings to the impact of climate change. UK plants flowering a month earlier due to climate change University of Cambridge Pattern seeking: Seed shapes lined to seed dispersal		
B	Animals incl humans	Do all animals depend on plants for their survival?	All living things need food as their source of energy as well as air, water and certain temperature conditions	Producer Consumer Prey Predator Movement Joints	Endoskeleton Exoskeleton	Research using secondary sources: Research a predator and how climate change can affect food chains Look at food packaging to identify the amount of nutrients in different food items Identifying, grouping and classifying: Grouping animals into herbivore, carnivore, omnivore Classify prey, predator, consumer and producer Pattern seeking: Pupils to generate questions for investigation e.g. Do healthy drinks have less sugar? Do people with longer legs run faster?		
Chemist	Rocks	Why are there different rocks?	There are many different kinds of rock with different compositions and properties	Igneous Density Sedimentary Minerals	Metamorphic Permeability Durability	Identifying, grouping and classifying: Use ID key to name each of the rocks in a collection Comparative test: Test hardness, durability and permeability Researching using secondary sources: What are the 3 types of rock? What is a geologist and what do they do?		
hysics	Light	What is the dark?	Light energy travels in straight lines and doesn't pass through some objects There are patterns in the position of the Sun seen at different times of the day	Light source Absence of light Transparent Translucent Opaque		Observation over time: Observing the shadow of an item throughout the day Identifying, grouping and classifying: Classify materials (transparent, translucent or opaque) Classify sources of light (man-made and natural) Fair tests: How does the number the layers of transparent plastic affect how much light can pass through? (Use a light meter) Pattern Seeking: UV radiation in different spots using UV beads e.g. direct sunlight, glass, sun cream, single lay of dark clothing, a single layer of white clothing, brimmed hat https://urbanscience.eu/uk/learning-modules/in-the-shade/		
Phys	Forces and magnets	What can magnets do? How do forces affect how things move?	Changing the movement of an object requires a net force to be acting on it Objects can affect other objects at a distance	Attract Repel Poles Magnetic Newton	Force (direct and indirect) Gravity Friction	Comparative testing: Test how objects move on different surfaces Pattern seeking: Does the size and shape of a magnet affect how strong it is? Identifying, grouping and classifying: Which materials are magnetic? Secondary sources: How does a compass work?		



Area of science		Year 3 Scientists should be able to					
gy	Plants	 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, 		Ask relevant questions related to prior knowledge Understand that science investigations begin with a question An awareness that there are different ways of asking scientific questions which result in different types of anguiries			
Biolo	Animals including humans	 Including pollination, seed formation and seed dispersal. Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 		Make a prediction which has a plausible reason Set up comparative tests and fair tests Make careful and accurate observations including the use of standard units taking into account mathematical knowledge up to			
Chemistry	Rocks	 Name and classify types of rocks based on its physical properties and appearance Devise tests to explore properties of rocks and use data to rank the rocks Describe the rock cycle 		Year 3 (read time, add and subtract length, mass and capacity) With support use drawings, labelled diagrams, bar charts and tables to record findings			
	Light	 Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. 		Recognise why it is important to collect data in order to answer a question Draw simple conclusions from the data collected With prompts, report findings from investigations in a range of ways			
Physics	Forces and magnets	 Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. 		Evaluate process using straightforward scientific evidence to support findings			



Ou	Our science teaching is structured around:							
V .	At the s	start of a unit: Pre-as	sessment activities	ne unit: A rich task				
✓	Every le	esson: Retrieval pract	tice	nd of each unit: A big question				
Ar	ea of	Big Question	Big Idea	Key Vo	cabulary	Enquiry Type		
Sc	ience							
Biology	Living things and their habitats	Living things: what's the same? What's different?	Living things on Earth come in a huge variety of different forms that are all related because they all came from the same starting point 4.5 billion years ago.	Human impact Deforestation Nature reserves Extinction	Endangered Classification keys Migrate Hibernate	Using secondary sources: Research global environmental issues and their impact on living things Identify, classify and group: Classify living things using a classification key Introduce branching databases/dichotomous keys Observation over time: Observe living things in their local environment at different times of the year		
	Animals inc humans	What do our bodies do with the food we eat?	The different kinds of life have evolved over millions of generations into different forms in order to survive in the environments in which they live	Digestion Absorption Muscles Protection	Incisors Canines Enzyme	Identify, classify and group: How can we organise teeth? Classify what animals eat by looking at their teeth. Pattern seeking: Are foods that ae high in energy high in sugar? Research using secondary sources: Parts of the digestive system		
iistry	States of matter	Is water always wet?	At room temperature, some substances are in a solid, liquid or gas state. The state of many substances can be changed by heating or cool them. The amount of matter does not change.	Gases Particles State Evaporate Condense	Condensation Celsius Fahrenheit Precipitation	Identify, classify and group: Solid, liquid and gasComparative test: Viscosity of liquidsDo all liquids have the same rate of evaporation?Observation over time: How does the level of water change when left on the windowsill?Research using secondary sources: Research saving water and water pollution in the water cycle		
Cherr	Rocks	How can we know things about a dinosaur when they have been extinct for 65 million years?	Much of the solid surface of the Earth is covered by soil, which is a mixture of pieces of rock and remains of organisms. We know about extinct animals through fossils.	Sediment Peat Dead Matter Filter	Retention Fossilisation Mary Anning	Research using secondary sources: Who was Mary Anning and what did she discover? How are fossils formed? Soil pollution – sustainability ideas in agriculture https://www.biovision.ch/en/news/soils-carry-our-lives/ Comparative test: Test water retention of soils Observation over time: Observe how soil separates into different layers in water		
lysics	Sound	How can we make different sounds?	Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it (sound is one form of energy).	Pitch Volume Instrument Amplitude	Frequency Ear drum Vibration Mediums	Research using secondary sources: Research the impact of sound pollution on both human and animal life https://urbanscience.eu/documents/modules/sounds-in-the-city.pdf Pattern seeking: Pitch of sound and instruments such as glass bottles with different amounts of water, xylophone, recorder Fair test: Volume and distance away from sound		
d	Electrici	Can we control electricity?	Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it	Conductor Insulator Circuit Cell	Switch Wire Lamp Appliance	Identify, classify and group: Sort conductors and insulators Research using secondary sources: Research alternatives to traditional battery components as a way of addressing environmental problems		



Area of			Year 4 Scientists should be able to		
science			fear 4 Scientists should be able to		
	eir		Can use classification keys to identify unknown plants and animals e. flowering and non-		Questions are beginning to be improved in
	d th	_	flowering plants		order to clarify exactly what is being
ology	s an tats		Explore and identify local plants and animals		investigated
	hing habi		can give examples of now an environment may change both naturally and due to numan		Identify new questions raised from data
	ng ti I		Can present their learning about changes to the environment in different ways e.g. campaign		to use to answer their question e.g. secondary
iole	Livi		video persuasive letter		research fair test grouping and sorting
8			Describe the simple functions of the basic parts of the digestive system in humans.		Make a prediction which has a plausible reason
	als ng ns		Identify the different types of teeth in humans and their simple functions.		Amend predictions according to findings
	ima Iudi ima		Construct and interpret a variety of food chains, identifying producers, predators and prey.		Plan and conduct investigations independently
	An inc hu				to produce evidence to answer a question
					Identify some variables in a fair test
	er		Compare and group materials together, according to whether they are solids, liquids or		Set up a fair test using continuous data
	States of matt		gases.		identifying a variable that can be changed and
≥			observe that some materials change state when they are neared or cooled, and measure or research the temperature at which this happens in degrees Calsius (°C)		measured
nist			Identify the part played by evaporation and condensation in the water cycle and associate		Make careful and accurate observations
nem			the rate of evanoration with temperature		including the use of standard units taking into
Ċ			Describe in simple terms how fossils are formed when things that have lived are trapped	-	account mathematical knowledge up to Year 4
	Rocks		within rock.		Accurately read scales on a range of
			Recognise that soils are made from rocks and organic matter.		thermometers and know that there are two
			Identify how sounds are made, associating some of them with something vibrating.		main scales used to measure temperature
			Recognise that vibrations from sounds travel through a medium to the ear.		Suggest appropriate ways in which to gather,
	pun		Find patterns between the pitch of a sound and features of the object that produced it.		record and classify
	So		Find patterns between the volume of a sound and the strength of the vibrations that		Present continuous data on a line graph e.g. to
		_	produced it.		show the temperature of a melting material
			Recognise that sounds get fainter as the distance from the sound source increases.		changes with time
s			Construct a simple series electrical size i identifuing and naming its basis parts, including		similarities and differences to draw simple
/sic			colls wires bulbs switches and buzzers		conclusions and answer questions
۲h		П	Identify whether or not a lamp will light in a simple series circuit based on whether or not		With help, recognise the limitations of the
	ity		the lamp is part of a complete loop with a battery.		evidence.
	ctric		Recognise that a switch opens and closes a circuit and associate this with whether or not a		Suggest how to improve the test.
	Elec		lamp lights in a simple series circuit.		
			Recognise some common conductors and insulators, and associate metals with being good		
			conductors.		
		N.	B. Children should be given only one component at a time to add to circuits. Children in Year 4		
		do	not need to use standard symbols for electrical components, as this is taught in Year 6.		

Science: Progression of Knowledge & Skills



Our	Our science teaching is structured around:							
√ A	t the s	tart of a unit: Pre-a	assessment activities		During the unit: A rich task			
✓ E	very le	esson: Retrieval pra			At the end of each unit: A big question			
Are	ea of	Big Question	Big idea	Key Vo	ocabulary	Enquiry type		
SCI	ence							
Biology	Living things	Do all plants and animals reproduce in the same way?	Envirgence Perturbation Station matter that make copies of themselves Style Metamorphosis One of the results of sexual reproduction is that offspring are never exactly like their parents Asexual Stigma Stigma		Stamen Metamorphosis Reproduction	Identify, classify and group: Compare this collection of animals based on similarities and differences in their life cycleDissect a flower and identify and group the reproductive parts of the plant Identify similarities and differences between insects and amphibiansResearching using secondary sources: What are the differences between the lifecycle of an insect and the life cycle of a mammal?Pattern Seeking: Pupils to generate questions such as do larger mammals have longer gestation periods? Do larger animals live longer? Do smaller animals lay more eggs?		
	Animals including	Do all lifecycles look the same?	All living things will at some stage carry out the life processes of respiration, reproduction, feeding, excretion, growth and developments and will eventually die	Foetus Embryo Womb Gestation	Puberty Development Adolescent Fertilised	 Fair test: How does age affect a human's reaction time? Create a reaction game and generate data from across the school including staff Pattern seeking: Is there a relationship between a mammal's size and its gestation period? Researching using secondary sources: How does poverty impact development? 		
Chemistry	Materials	How can we separate a mixture of water, iron filings, salt and sand? How can we change materials reversibly and irrepressibly?	Matter can change if the arrangement of their building blocks changes. (In this case, dissolving, breaks the bonds between building blocks.)	Solution Conductivity Acid Thermal Soluble/Insoluble Irreversible/Reversible		 Identify, classify and group: 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. Comparative test: Thermal conductors and insulators Observation over time: Separation through evaporation – place in different places to show that heat or wind contributes to rate of evaporation / cover container with film (water may be lost because seal was not watertight). Fair test: Temperature of water and time it takes for a sugar cube to dissolve Filtration of sand – initial mass of sand, send mass of sand (discrepancies may occur between the difference masses of sand because not all the water has evaporated). Research using secondary sources: Pollutants produced by chemical changes 		
Earth Science	Earth and space	Sun, Earth and Moon: what is moving?	The Earth rotates on an axis lying north to south and this motion makes it appear that the Sun, Moon and stars are moving round the Earth. Rotation causes day and night and the axis varies day length and seasons	Rotation Weight/Mass Celestial Geocentric Orbit Heliocentric Solar system		Observation over time: How does the phases of the moon change over time? Pattern seeking: Is there a pattern between the size of a planet and the time it takes to travel around the Sun? Researching using secondary sources: How have our ideas about the solar system changed over time?		
Physics	Forces	How and why do objects move?	A force acting on an object is not perceived directly but is detected by its effect on the object's motion or shape	Gravity Air resistance Water resistance Levers Gears	Pulleys Friction Mechanisms	Comparative test: Which item takes the longest to fall? Straw rockets – no cone, small cone, large cone, square, rectangle and number of fins. Fair test: How does the surface area of a parachute affect the time it takes to fall on the ground? Does mass (g) affect friction (N)?		



Area of science		Year 5 Scientists should be able to							
ogy	Living things	 Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. 	 Plan and set up an investigation Understand the difference between comparative (discrete data) and fair tests (continuous data) Know what variables are in a given enquiry and isolate them 						
Biolo	Animals including humans	 Describe the changes that occur during human gestation Identify and explain physical and mental changes that occur from birth to old age Understand the changes that happen during puberty 	 Use all measurements set out in Year 5 mathematics which includes converting different units of metric measure Use scientific instruments accurately e.g. thermometer, rain gauge, spring scales, lux meter 						
Chemistry	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. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. 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 and the action of acid on bicarbonate of soda. 	 Record and present data in a range of ways including diagrams, labels, classification keys, tables, scatter graphs and bar and line graphs Use data generated to help make sense of the investigation Use information gleaned from investigations to make predictions for further comparative and fair tests Create new investigations which take into account what has been learned previously Present information using IT such as power-point and iMovie Use written methods to report findings and include diagrams where appropriate 						
Physics	Earth and space	 Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	 Orally present findings to other students in the class Clear about what has been found Evaluate investigation and suggest how to improve the test, with reasons (repeatability and reproducibility). Identify causal relationships Aware that the outcome from an enquiry needs to be 						
Physics	Forces	 Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect 	 supported with scientific knowledge and state whether the evidence supports or refutes an argument or theory Give an example of something that has been focused on e.g. how much easier it is the lift a heavy object using pulleys using scientific theories to support this theory 						



Our science teaching is structured around:										
✓ A	t the s	tart of a unit: Pre-	-assessment activities	✓ During the unit: A rich task						
✓ E	very le	sson: Retrieval pr	actice	✓ At the end of each unit: A big question						
Area of		Big Question	Big idea	Key Vocabulary	Enquiry type					
science		-	-							
Biology	Living things and their habitats	Living things: what is the same? What is different?	Although some living things do not appear to be active, all will at some stage carry out the life processes of respiration, reproduction, feeding, excretion, growth and developments and will eventually die	micro-organisms characteristics crustaceans vertebrates arthropods invertebrates mollusc virus bacteria	Identify, classify and group: Use a classification key for vertebrates/invertebrates or microorganisms Use a classification treeObserving changes over time: What happens to a piece of bread if you leave it on the windowsill for two seeks?Fair test: How does the temperature affect the amount of gas produced by yeast?Secondary sources: What do different types of microorganisms do? Are they all harmful?					
	Animals including	How do choices affect how our bodies work?	The circulatory system takes material needed by cells to all parts of the body and removes waste	circulatory system blood vessels vein artery oxygenated deoxygenated	Fair test: How does the length of time we exercise for affect our heart rate? Pattern seeking: Calories in snacks and time taken to burn Secondary sources: Drugs / lifestyle and impact on health Identify, classify and group: Organs that make up the circulatory system					
	Evolution and inheritance	Part 1: Why do animals look the way they do? Part 2: What is evolution, how does it happen and how do scientists know?	The different kinds of life, animals, plants and microorganisms, have evolved over millions of generations into different forms in order to survive in the environments in which they live	adaptioninheritanceDNAspeciesevolutionvariationextinctnatural selection	Pattern seeking: Size and shape of bird's beak and the food it will eatComparative test: Most common eye colourHow do polar bears keep warm?Peppered moth – colour and size of moth. Number recovered: number hidden.Observation over time: Skeleton changes over time – apes, humans and NeanderthalsResearching using secondary sources: Charles Darwin, Barbara McClintock					
Physics	Light	How can we hear what we cannot we see?	Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.	light rays straight lines reflect spectrum absorb	Fair test & pattern seeking: Size of shadow and distance from light source Identify, classify and group: Primary and secondary sources of light Research using secondary sources: Light pollution and the impact on animals such as turtles					
	Electricity	Can we vary the effects of electricity?	Energy, which cannot be created or destroyed, comes in many different forms and tends to move away from objects that have lots of it.	voltage buzzer components series circuit circuit diagram symbols cell	 Pattern seeking: Temperature of light build and the time it is on for. Is this the same for LEDs? Fair test: Amount of batteries and brightness of light Research using secondary sources: Electricity production and sustainable alternatives 					



Area of science		Year 6 Scientists should be able to							
	Living things and their habitats	 Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 	 Decide which type of test they will do based on the type of data collected (continuous or discrete) Understand the difference between dependent and independent variables Justify why the variable has been isolated in the investigation 						
Biology	Animals including humans	 Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. 	 Use all measurements set out in Year 6 mathematics which includes capacity, mass, ratio and proportion Choose appropriate scientific instruments for particular investigations e.g. spring scales, lux meter, thermometer Take repeated readings where necessary (finding the average) and understand the importance of doing this Decide how best to record and present their data based on 						
	Evolution and inheritance	 Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. 	 becket how best to record and present their data based on their investigation and justify their reasons why Confidently use data generated to explain the possible reasons for the results Make accurate predictions for further tests by referring back to the results from previous investigations Create new investigations based on their previous findings 						
Physics	Light	 Recognise that light appears to travel in straight lines. 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. 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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. 	 rationalising why they think this is the next step Present information using IT such as PowerPoint and iMovie Use diagrams when necessary Confidently present findings orally in front of the class and compare findings with other students Explain about what has been found through the investigation and compare this to other enquiries 						
	Electricity	 Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the 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. Use recognised symbols when representing a simple circuit in a diagram. N.B. Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably. 	 Evaluate investigation considering the degree in which results should be trusted (repeatability and reproducibility) Explain causal relationships suggesting reasons why based on scientific knowledge Make conclusions based scientific theories and decide whether the results from an investigation support or refute an argument or theory Explain reasons why evidence could contradict scientific knowledge 						

Science: Progression of Knowledge & Skills



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2				
5)/50	Plants									
EYFS	Seasonal Changes									
	Senses	Seasonal changes	Everyday Materials	Keeping healthy	Living things and their habitats	Growing up Everyday materials				
Year 1	Plants									
	Animals, including humans									
	Seasonal changes									
	Seasonal changes Animals, including humans (parts of the human body)	Everyday materials	Use of everyday materials	Animals including humans (animal statements)	Plants Seasonal changes	Everyday materials				
Year 2	Living things and their habitats									
	Plants (growing seeds and bulbs outside)									
				Plants	Everyday materials	Everyday materials				
	Animals including	Living things and	Living things and	Animals including	(properties and uses	(changing shapes of				
	numans	their habitat	their nabitat	humans (offspring)	of materials)	materials)				
Year 3	Plants (gathering evidence of the life cycle)									
	Rocks (types of rocks and their properties)	Animals including humans	Forces and Magnets		Plants	Light				
Year 4	Living things and their habitats (naming and identifying living things in the local environment)									
	Electricity	States of Matter	Sound	Rocks (fossils and soils) Living things and their habitats	Animals including humans (teeth and digestion)	Living things and their habitats				
Year 5	Living things and their habitats	Forces	Properties of materials	Earth and Space	Changes of Materials	Animals including humans				
Year 6	Animals including humans	Light	Electricity Living things and their habitats		Evolution and inheritance					