



KS1 National Curriculum						
KS1 Working Scientifically. By the end of Year 2, children will be able to:		Year 1				
- Ask simple questions and recognise that they can be answered in different ways - Observe closely, using simple equipment and measurement - Perform simple tests - Identify and classify - Use their observations and ideas to suggest answers to questions - Gather and record data to help in answering questions - Use scientific language and read and spell age-appropriate scientific vocabulary - Begin to notice patterns and relationships		Physics	Chemistry	Biology		Biology
		Seasonal change	Everyday materials	Animals: Sensitive bodies	Animals: Comparing animals	Plants
		Year 2				
		Chemistry	Biology	Biology	Biology	Biology
		Uses of everyday materials	Living things and their habitats	Living things and microhabitats	Animals, including humans	Plants
		Making connections				

Lower KS2 National Curriculum Strands						
Lower KS2 Working Scientifically. By the end of Year 4, children will be able to:		Year 3				
- Make decisions, ask relevant questions and use different types of scientific enquiries to answer them - Set up simple practical enquiries, comparative and fair tests - Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - Gather, record, classify and present data in a variety of ways to help in answering questions - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables - Report on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - Identify differences, patterns, similarities or changes related to simple scientific ideas and processes - Use straightforward scientific evidence to answer questions to support their findings - Begin to look for naturally occurring patterns and relationships - Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations		Physics	Chemistry	Biology	Biology	Physics
		Light and shadow	Rocks and soils	Animals, including humans	Forces and magnets	Plant Reproduction
		Year 4				
		Physics	Biology	Biology	Chemistry	Physics
		Electricity	Animals, including humans	Living things and their habitats	States of matter	Sound
		Making connections				

Upper KS2 National Curriculum Strands

Upper KS2 Working Scientifically. By the end of Year 6, children will be able to:

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Use test results to make predictions to set up further comparative and fair tests
- Report and present findings from enquiries, including conclusions, causal relationships and explanations of the degree of trust in results, in oral and written forms such as displays and presentations
- Identify scientific evidence that has been used to support or refute ideas or arguments
- Explore and talk about their ideas; ask their own questions about scientific phenomena; and analyse functions, relationships and interactions more systematically
- Recognise that scientific ideas change and develop over time
- Draw conclusions based on their data and observations, use evidence to justify their ideas and use their scientific knowledge and understanding to explain their findings

Year 5

Physics

Chemistry

Chemistry

Biology

Biology

Earth in space

Forces

Mixtures and separation

Properties and change

Living things and their environment

Animals, including humans

Making connections

Year 6

Biology

Physics

Physics

Biology

Evolution and inheritance

Animals, including humans; circulatory system

Light and reflection

Electricity

Living things and their habitats

Making connections



Year 1 Science Overview						
Term	Autumn		Spring	Summer		
Overview	Seasons (taught across the year)	Everyday materials	Animals- sensitive bodies	Animals – comparing animals	Introduction to Plants	Making connections
Key Scientists	Dr Steve Lyons Holly Green	Charles Mackintosh Chester Greenwood William Addis	Chris Packham Ibn Sina (also known as Avicenna)	Jane Goodall	Dr.. Percy Julian	
Big Question	Why does the weather change?	Are all materials the same?	Are humans different to all other animals? Why?	What did Jane Goodall find out about chimps?	Do beans need water to grow?	Which materials make the best home for an animal?
Overview	Reflecting on their experiences, the children will learn about the four seasons and their associated weather, explore how seasonal changes affect trees, daylight hours and clothing and plan and present weather reports, considering the knowledge needed for the role.	Identifying and naming objects and the materials from which they are made, the children will compare and group materials by how they look and carry out tests to sort them based on unobservable properties.	The children will identify and name body parts and conduct practical activities with the senses to spot patterns and answer questions.	The children will compare and group animals based on similarities and differences in their characteristics, physical features and diets.	Venturing outside, the children will identify and name common wild and garden plants (including deciduous and evergreen trees), observe plant parts with magnifying glasses and name them, sort leaves by appearance, investigate whether beans need water to grow and identify edible plant parts.	The children will gather and record data to find out if taller trees have larger trunks and recap the features of different animal groups. They will build waterproof animal homes and sort birds by diet.
NC Content	- Observe changes across the four seasons - Observe and describe the weather associated with the seasons and how day length varies This unit runs throughout the year.	- Distinguish between an object and the material from which it is made - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock - Describe the simple physical properties of a variety of everyday materials - Compare and group together a variety of everyday materials based on their simple physical properties	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	- Identify and name a variety of common animals, including fish, amphibians, reptiles, birds and mammals - Identify and name a variety of common animals that are carnivores, herbivores and omnivores - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and	- 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 - Use their local environment throughout the year to explore and answer questions about plants growing in their habitat	- 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 - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - Identify and describe the basic structure of

				mammals, including pets)		a variety of common flowering plants, including trees
Science in Action	Learn about the role of a weather reporter and how information about the weather is useful in everyday life.		Learn about visual impairment and the importance of continued research in this area. Recognise how firefighters use their senses when doing their job	Learn about Jane Goodall's key findings when studying chimpanzees in the wild.	Recognise the benefits of scientific research into plants and learning about the work of Dr Percy Julian, who discovered how to make plant-based medicines.	Learn how a zoologist closely observes animal tracks in the wild to understand their behaviour.
Key Knowledge	- Name and order the 4 seasons: spring, summer, autumn and winter - Know it is unsafe to look directly at the Sun - Know the weather associated with the 4 seasons and how it changes (in the UK) - Know that day length varies across the 4 seasons, with fewer daylight hours in the winter and more in the summer	- Know that objects are items or things - Know that a material is what an object is made from - Know a variety of everyday materials, including wood, plastic, glass, metal, water and rock - Know that property refers to how a material can be described - Know that materials can be grouped based on their physical properties	- Know the key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth) - Know the 5 main senses: sight, smell, hearing, taste and touch - Know the skin is used for touch, the tongue is used for taste, the nose is used for smell, the eyes are used for sight and the ears are used for hearing	- Know a variety of common animals (including fish, amphibians, reptiles, birds and mammals) - Know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns, tusks and shell) - Know that a carnivore is an animal that eats other animals, and give some examples - Know that a herbivore is an animal that eats plants, and give some examples - Know that an omnivore is an animal that eats both animals and plants, and give some examples	- Know a variety of common plants and how they differ - Know that deciduous trees lose their leaves seasonally, but evergreen trees do not - Know the basic structure, including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches and stem, of a variety of common plants, including flowering plants and trees - Begin to understand how plants grow and change over time	- Know about a range of jobs and careers that use scientific knowledge and methods - Learn how a zoologist closely observes animal tracks in the wild to understand their behaviour
Key Vocabulary	Conclusion, data, deciduous tree, evergreen tree, pictogram, predict, record, season, sunrise, sunset, symbol,	Absorbent, data, fabric, glass, group, material, metal, object, opaque, plastic, property, rock, tough, transparent, waterproof, wood	Action, bitter, blind, body, compare, data, direction, distance, feeling, group, hearing, investigation, loud, obstacle, pattern, quiet, research, salty, sense, senses, sensitive, sight,	Amphibian, bird, block chart, body, carnivore, compare, data, diet, differences, feature, fish, group, herbivore, hunt, mammal, observe, omnivore, pet, record,	Data, deciduous, diagram, edible, evergreen, feature, fruit, flower, garden plants, grouping, growth, investigation, leaf, measure, observe, plant,	Amphibian, bird, carnivore, compare, data, diet, difference, feature, fish, group, herbivore, hunt, life cycle, mammal, material, measure, natural, object, omnivore,

	temperature, thermometer, weather		smell, sour, sweet, taste, touch.	reptile, research, scientist, similarities, tally	prediction, roots, research, seed, shoot, stem, trunk, wild plants	pattern, predict, property, reptile, season, similarity, test, trunk, waterproof, weather.
Key Skills	• Explore the world around them and raise their own simple questions • Suggest what might happen, often justifying with personal experience • Use their senses to describe, in simple terms, what they notice or what has changed • Gather specific information from one simplified, specified source • Use a prepared table to record tally frequency • Represent data using pictograms • Use their results to answer simple questions	• Respond to questions on how to answer questions • Begin to recognise whether a planned test is fair • With support, decide if suggested observations are suitable • Suggest what might happen, often justifying with personal experience • Use their senses to describe, in simple terms, what they notice or what has changed • Use a prepared table to record results, including simple observations • Group based on visible characteristics • Use their results to answer simple questions • Begin to recognise when results or observations do not match their predictions	• Recognise there are different types of enquiry • Use their senses to describe what they notice or what has changed • Use non-standard units to measure and compare • Draw and label simple diagrams • Use a prepared table to record results, including numbers and simple observations • Group based on visible characteristics • Use their results to answer simple questions	• Recognise there are different types of enquiry • With support, decide if suggested observations are suitable • Use their senses to describe, in simple terms, what they notice or what has changed • Gather specific information from one simplified, specified source • Draw and label simple diagrams • Group based on visible characteristics • Represent data using pictograms and block charts • Use their results to answer simple questions • Respond to suggestions on how to answer questions	• Explore the world around them and raise their own simple questions • Recognise there are different types of enquiry • Respond to suggestions on how to answer questions • With support, decide if suggested observations are suitable • Order a simple method • Suggest what might happen, often justifying with personal experience • Use their senses to describe, in simple terms, what they notice and what has changed • Use non-standard units to measure and compare • Gather specific information from one simplified, specified source • Draw and label simple diagrams • Use a prepared table to record results, including numbers and simple observations • Group based on visible characteristics	• Consolidation of skills from Y1 units

					• Use their results to answer simple questions • Begin to recognise when results or observations do not match their predictions	
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THE STOKE POGES SCHOOL

Science Long Term Plan

Year 2 Science Overview						
Term	Autumn		Spring		Summer	
Overview	Uses of everyday materials	Living things and their habitats	Living things and microhabitats	Animals, including humans (life cycles and health)	Plant growth	Making connections
Key Scientists	Dr Alex King John McAdams	Rachel Carson Liz Bonnin	Rachel Carson Liz Bonnin	Elizabeth Garrett Anderson Florence Nightingale	George Washington Carver	Stephanie Kwolek
Big Question	Would rubber be a good material to make a classroom table with?	Why don't we find polar bears in the rainforest?	What does a botanist do?	How can I keep my body healthy as it changes?	What do plants need to survive?	Which materials are suitable for making homemade plant pots?
Overview	The children will recognise that materials are suitable for specific purposes and understand their properties. They will explore how actions such as stretching and bending affect the shape of solid objects and compare the suitability of materials by carrying out tests and recording data.	Considering the life processes that all living things have in common, the children will classify objects into alive, was once alive or has never been alive. They will name plants and animals in a range of habitats and recognise how living things depend on each other. They will create food chains to show the sequence in which living things eat each other.	Building on their knowledge of habitats, the children will discover what minibeasts need to survive. They will learn that scientists use a range of skills to answer questions and plan and carry out an experiment to find out the conditions woodlice prefer.	Studying the life cycles of various animals, the children will learn what animals need to survive, observe changes over time, collect and record data on their peers, develop measurement skills and consider how scientific knowledge supports healthy choices.	Carrying out comparative tests, the children will discover the conditions required for seed germination. They will use rulers to measure stem height and record data in a results table. Through practical investigation, they will learn that plants need water, light and a suitable temperature to grow and stay healthy.	The children will identify ways to reduce, reuse and recycle and draw on their knowledge of properties to invent unusual and creative uses for old objects. They will discover that some natural materials are derived from plants and look at the processes involved in making paper. Using their observational skills, they will conduct simple tests to choose the most suitable material.
NC Content	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	- 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	Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and	- Notice that animals, including humans, have offspring which grow into adults - Find out about and describe the basic needs of animals, including humans,	- Observe and describe how seeds and bulbs grow into mature plants - Find out and describe how plants need water, light and a suitable temperature	Explore and compare the differences between things that are living, dead, and things that have never been alive.

	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other - Identify and name a variety of plants and animals in their habitats, including micro-habitats - Describe how humans obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including micro-habitats	for survival (water, food and air) Describe the importance of humans and exercise, eating the right amount of different types of food, and hygiene	to grow and stay healthy	- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. - Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
Science in Action	Learn about the harmful effects of certain materials and how to take responsibility for protecting the environment.		Learn about the role of a botanist, including the importance of identification and classification when studying plants.	Learn how to look after personal hygiene by washing themselves and their clothes. Investigate the benefits of exercise on health and wellbeing.	Recognise that certain job roles rely on understanding healthy plant growth. Explore the impact of humans on plants in the environment.	Learn about the material Kevlar, invented by American chemist, Stephanie Kwolek. Recognise that certain job roles require an understanding of materials and their properties.
Key Knowledge	- Know that objects are made from materials that suit their uses - Know that one material can be used for a range of purposes - Know that different materials can be used for the same purpose - Know a push or pull must be applied to change the shape of a solid object - Know solid objects can be stretched, twisted, bent or stretched - Know different objects may take different	- Begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition - Know the difference between things that are living, dead, and things that have never been alive, using some of the life processes - Know a variety of plants and animals and describe some differences - Name a variety of habitats, including	- Know a variety of plants and animals and describe some differences - Know that a habitat is the environment where an animal or plant lives/grows, because it provides what they need to survive - Know that a microhabitat is a very small habitat (e.g. under stones, logs or leaf litter) - Know that living things depend upon	- Know that baby, toddler, child, teenager and adult are human life cycle stages - Know there are differences in the life cycles of different animals - Know humans grow as they age - Know the basic survival needs of animals are air, water and food - Know that personal hygiene prevents the spread of germs	- Know seeds and bulbs grow into seedlings by producing roots and shoots - Know seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers - Know seeds need water and warmth to germinate - Know plants need water, light and a suitable temperature for growth and health	- Know about famous scientists throughout history - Know about the work of modern-day scientists - Learn about the material Kevlar, invented by American scientist, Stephanie Kwolek. Recognise that certain job roles, such as engineers and builders, require an understanding of materials and their properties.

	amounts of force to change shape	woodland, ocean, rainforest and coastal - Know that a habitat is the environment where an animal or plant lives/grows because it provides what they need to survive - Know that living things depend upon each other (e.g. for food and shelter) - Understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals	each other (e.g. for food, shelter)	- Know washing our hands and changing clothes are ways to keep clean - Know exercise can improve performance and well-being - Know the 5 food groups are carbohydrates, fruits and veg, dairy and alternatives, protein and oils and spreads - Know humans require a balanced diet to stay healthy		
Key Vocabulary	Bent, block graph, elastic, fabric, flexible, glass, material, metal, object, plastic, property, pull, push, record, rock, squash, stretch, suitable, twist, wood	Alive, analyse, camouflage, carnivore, classify, coastal, dead, depend, diet, energy, excretion, food chain, growth, habitat, herbivore, life process, mammal, movement, nutrition, ocean, omnivore, predator, prey, producer, rainforest, reproduction, sensitivity, shelter, woodland.	Botanist, camouflage, characteristics, classification key, classify, comparative/fair test, conclusion, criteria, data, food chain, identify, invertebrate, method, microhabitat, minibeast, research, results, species, survey, tally, test	Adults, air, baby, basic needs, butterfly, child, carbohydrates, caterpillar, dairy, egg, exercise, fitness, food, frog, froglet, fruit, germs, growth, health, height, hygiene, lamb, life cycle, live young, measure, offspring, oils, proteins, pupa, sheep, spawn, spreads, stage, survive, tadpole, teenager, toddler, vegetables, water.	Bulb, comparative test, conclusion, condition, diagram, energy, flower, germinate, growth, leaf, life cycle, measure, nutrient, observe, plant, shoot, seed, seedling, seed coat, stem, wilt	Alive, dead, fabric, flexible, germinate, growth, invention, life processes, material, plastic, property, results, seed, suitable, test, waterproof, wood
Key Skills	- Recognise there are different types of enquiry - Use non-standard units to measure and compare - Use a prepared table to record results, including numbers - Group based on visible characteristics - Represent data using pictograms and block graphs	- Explore the world around them and raise their own simple questions - Recognise there are different types of enquiry - Gather specific information from one simplified, specified source - Use a prepared table to record results, including simple observations - Group based on visible characteristics	- Explore the world around them and raise their own simple questions - Recognise there are different types of enquiry - Respond to suggestions on how to answer questions - With support, decide if suggested observations are suitable	- Recognise there are different types of enquiry - Begin to use standard units and read simple scales to measure and compare - Begin to use simple measuring equipment to make approximate measurements - Gather specific information from one	- Explore the world around them and raise their own simple questions - Recognise there are different types of enquiry - Respond to suggestions on how to answer questions - Begin to recognise whether a planned test is fair - With support, decide if suggested	Consolidation of skills from Y2 units

	• Use their results to answer simple questions		• Order a simple method • Suggest what might happen, often justifying with personal experience • Use their senses to describe, in simple terms, what they notice or what has changed • Gather specific information from one simplified, specified source • Record results using simple observations and tally frequency • Organise questions to create a simple classification key • Use results to answer simple questions • Begin to recognise when results or observations do not match their predictions	simplified, specified source • Use a prepared table to record results, including numbers • Use their results to answer simple questions	observations are suitable • Suggest what might happen, often justifying it with personal experience • Use their senses to describe what they notice or what has changed • Begin to use standard units and read simple scales to measure and compare • Begin to use simple measuring equipment to make approximate measurements • Draw and label simple diagrams	
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Year 3 Science Overview						
Term	Autumn		Spring		Summer	
Overview	Light and shadows	Rocks and soil	Animals, including humans	Forces and magnets	Plant reproduction	Making connections
Key Scientists	Jutus Von Liebig	Mary Anning	Marie Curie	Michael Faraday	Joseph Banks David Douglas	
Big Question	Why do shadows change size?	Are all rocks formed in the same way?	Do all animals have skeletons?	Are all metals attracted to magnets?	How do plants transport water?	Does hand span affect grip strength?
Overview	Identifying light sources, the children will learn that light is needed to see, explore how its absence causes darkness, investigate reflection and shadow formation and create shadow puppets to explore how light can be used in the arts.	Observing the appearance and physical properties of rocks, the children will compare and group different rock samples. They will learn about how fossils are formed and record soil drainage rates in a bar chart.	Studying the human skeleton, the children will identify key bones and explore how muscle changes result in movement. They will learn about how the body uses energy, what constitutes a balanced diet in humans and how research contributes to nutritionists' expertise.	By investigating motion on different surfaces, the children will learn about friction and compare its uses and disadvantages. They will broaden their experience in working scientifically as they investigate contact and non-contact forces. The children will explore the properties of different magnets and apply this to understanding their uses.	The children will explain how plants reproduce in the context of the life cycle of a flowering plant. They will gather data on plant growth and investigate the structure and function of the parts of a flowering plant.	The children will explore the relationship between hand span and grip strength through scientific enquiry. They will apply their understanding of friction to make predictions, plan and carry out an enquiry.
NC Content	- Recognise that they need light 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 ways that the size of shadows changes	- Compare and group together different kinds of rock based on their appearance and simple physical properties - Describe in simple terms how fossils are formed when things that have lived are trapped within rock - Recognise that soils are made from rocks and organic matter	- Identify that animals, including humans, need the right types and amounts 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	- 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	- 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 - Know that plants make their own food	Consolidation of Y3 units

				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	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	
Science in Action	- Look at how different scientists formed conclusions about light and how collaborative work can either support or refute these ideas. - Explore different jobs that consider light and shade and how light and shadows are used for entertainment in the arts.	Explore the work of Mary Anning and modern-day palaeontologists. Use the fossil record to make suggestions about the past.	Explore scientific advances and how research has contributed to changes in prosthetics.	Explore the uses of friction and magnets in everyday life and industry.		Look at how different materials are used to design gloves for different purposes depending on the amount of friction required.
Key Knowledge	- Know light travels from a source (e.g. the Sun, light bulbs and torches) - Know light is needed to see things and that dark is the absence of light - Know that light from the Sun can be dangerous and how to protect their eyes - Know that all materials reflect light - Know shadows form when the light from a light source is blocked by an opaque object - Know shadows change as a result of changing the position of the light source and changing the distances between the light source, object and surface - Know shadows change position and length throughout the day as	- Know that rocks can be grouped based on their appearance or properties (e.g. colour, texture, hardness and permeability) - Know that rocks may contain grains, crystals or fossils - Know that grains and crystals appear differently and can be used to classify rocks - Know that soils are made from rocks and dead matter - Know the relationship between the properties of rocks and their uses - Know that fossils can form from the remains of living things - Know that rocks can change over time (e.g. erosion and weathering)	- Know that animals can be grouped based on the presence of a skeleton - Know that the skeleton in humans and some animals is used for movement, protection and support - Know that the muscular system in humans and some animals works with the skeleton for movement - Know the main bones in the body - Know animals, including humans, need the right types and amounts of nutrition - Know humans cannot make their own food and, therefore, eat to get the nutrition needed	- Know examples of contact and non-contact forces - Know some forces are a result of contact between 2 surfaces, but some forces can act at a distance (e.g. magnetism) - Know magnets have a north and south pole - Know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other - Know some different examples of magnets, including bar, horseshoe, button and ring - Know some uses of magnets - Know friction is a contact force that acts	- Know the functions of the basic parts of a plant and the relationship between structure and function - Know that water is transported within a plant from the root, through the stem, to the leaves - Know plants need water, light, air, nutrients and a suitable temperature for growth and health - Know that the needs for growth and health vary from plant to plant - Know the life cycle of a plant from seed to mature plant - Know that flowers are the reproductive organs of a plant - Know pollination is the transfer of pollen to	Consolidation of the knowledge in Y3 units

	the Sun changes position in the sky		- Know there are nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) with their own functions in the body - Know that a balanced diet should include all nutrient groups - Know animals have different diets	between 2 surfaces to slow an object down - Know magnetism is a non-contact force that affects objects containing magnetic metal - Know that the opposite poles of a magnet attract one another and like poles repel one another - Know rough surfaces have more friction between them than smoother surfaces - Know that the strength of different magnets may vary	the female (part of the) flower - Know that the process of seed formation is the growth of a seed after pollination - Know different methods of seed dispersal and the benefits of each	
Key Vocabulary	Cast a shadow, dangerous, light source, luminous, non-luminous, opaque, protect, reflect, reflection, reflective (shiny), shadow, shadow puppet, translucent, transparent.	Absorbency, acid rain, bone, clay, clay soil, crystal, earthworm, era, fossil, fossil record, grain, hard, hardness, impermeable, igneous rock, imprint, lava, loam soil, magma, metamorphic rock, mineral, molten rock, organic matter, palaeontologist, peaty soil, permeable, rate, rock, sandy, sandy soil, sediment, sedimentary, sedimentation, silt, soft, soil	Balanced diet, bone, carbohydrate, conclude, diet, endoskeleton, energy, exoskeleton, fat, fibre, invertebrate, joint, measure, mineral, movement, muscle, nutrient, pelvis, protection, protein, ribs, skeleton, skull, spine, support, vertebrate, vitamin, water.	Attract, contact force, electromagnet, force, friction, magnet, magnetic material, magnetism, non-contact force, non-magnetic material, north pole, repel, south pole.	Absorb, air, animal dispersal, carrying, conclude, disperse, dropping, eating, evaluate, female, flower, fruit, germination, improve, leaves, male, nutrients, petal, pollen, pollination, roots, soil, seed, seed formation, shaking, space, stem/trunk, sunlight, support, testable, transport, water, water dispersal, wind dispersal.	
Key Skills	- Begin to raise further questions during the enquiry process - Consider what makes a testable question - Begin to recognise that there are different types of enquiry and that they are suitable for different questions - Make predictions about what they think will happen by using scientific knowledge	- Use senses to describe, in more detail and with simple scientific vocabulary, what they have noticed or what has changed - Gather specific information from a source - Begin to draw more scientific diagrams by: drawing in 2D to produce simple line diagrams; label with	- Use standard units to measure and compare - Use measuring equipment with increasing accuracy - Read scales with unmarked intervals between numbers - Gather specific information from a variety of sources - Use a prepared table to record results	- Begin to select from options which variables will be changed, measured and controlled - Suggest what observations to make and how long to make them for - Plan a simple method, verbally and in writing	- Begin to raise further questions during the enquiry process - Consider what makes a testable question - Begin to recognise that there are different types of enquiry and that they are suitable for different questions - Begin to make suggestions about how different	Consolidation of skills in Y3 units

	and/or personal experience to explain their prediction • Use their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed • Use standard units to measure and compare • Use measuring equipment with increasing accuracy • Read scales with unmarked intervals between numbers • Use a prepared table to record results, including more detailed observations • Use tables with more than 2 columns • Identify and add headings to tables • Begin to design simple results tables • Group based on visible characteristics and measurable properties • Read the value of bars with greater accuracy • Write a conclusion to summarise findings using simple scientific vocabulary • Begin to suggest how one variable may have affected another • Begin to quote results as evidence of relationships • Identify data that does not fit a pattern • Recognise when results or observations do not match their predictions • Begin to use identified patterns to predict new values or trends	more scientific vocabulary • Group based on visible characteristics and measurable properties • Represent data using bar charts • Begin to quote results as evidence of relationships • Begin to use identified patterns to predict new values or trends	including more detailed observations • Group based on visible characteristics and measurable properties • Write a conclusion to summarise findings using simple scientific vocabulary • Begin to identify new questions that would further the enquiry	• Gather specific information from a variety of sources • Begin to draw more scientific diagrams by labelling with more scientific vocabulary and using arrows • Represent data using bar charts • Write a conclusion to summarise findings using simple scientific vocabulary • Begin to suggest how one variable may have affected another • Begin to quote results as evidence of relationships	questions could be answered • Begin to suggest what observations to make and how long to make them for • Make predictions about what they think will happen • Use their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed • Use standard units to measure and compare • Use measuring equipment with increasing accuracy • Read scales with unmarked intervals between numbers • Use a prepared table to record results, including more detailed observations • Use tables with more than 2 columns • Identify and add headings to tables • Begin to design simple results tables • Group based on visible characteristics and measurable properties • Read the value of bars with greater accuracy • Write a conclusion to summarise findings using simple scientific vocabulary • Identify the data that does not fit a pattern • Begin to suggest how one variable may have affected another	
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	• Begin to identify steps in the method that need changing and suggest improvements • Begin to identify which variables were difficult to control and suggest how to better control them • Begin to identify new questions that would further the enquiry				• Begin to identify steps in the method that need changing and suggest improvements • Begin to identify which variables were difficult to control and suggest how to better control them	
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Year 4 Science Overview						
Term	Autumn		Spring		Summer	
Overview	Electricity	Animals, including humans	Living things and their habitats	States of matter	Sound and vibrations	Making connections
Key Scientists	Thomas Edison Joseph Swan	Ivan Pavlov Washington and Lucius Sheffield	Cindy Looy Joean Beauchamp	Joseph Priestly Anders Celsius Daniel Fahrenheit	Alexander Graham Bell	
Big Question	Does electricity flow easily through all objects?	What happens to our food when we eat it?	Why do some species become endangered?	Does ice always melt at the same speed?	How do instruments make different sounds?	How does the flow of liquid compare?
Overview	Exploring appliances in the school that use electricity, the children will learn how to work with electricity safely and build circuits. They will investigate electrical conductors and insulators and explore the relationship between the number of cells and bulb brightness. Real scenarios and historical discoveries will inform them about scientific progression and home safety.	Using models, the children will describe the function of key organs in the digestive system. They will identify the types of human teeth and investigate factors that impact our dental health. They will compare human teeth to other animals and take on the role of a naturalist investigating animal faeces for clues about diet, digestion and dentition.	The children will explore different ways living things can be grouped and make classification keys. They will study ways that habitats may change over time and understand that humans can have both positive and negative effects on their surroundings.	Investigating the properties of solids, liquids and gases, the children will learn about the states of matter, explore changes of state through relatable examples, explain water cycle changes and study how temperature affects the rate of evaporation.	Exploring different ways of producing sounds, the children will learn about the relationship between vibrations and what they hear. They will explore how pitch and volume can be altered and how sounds can be insulated using different materials.	The children will explore the relationship between viscosity and the flow of liquids through experiments, data analysis and drawing conclusions. They will apply their understanding of states of matter to make predictions and plan and carry out an enquiry.
NC Content	- Identify common appliances that run on electricity - Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers - Identify whether or not a lamp will light in a simple series circuit, based on whether or not a lamp is part of a complete loop with a battery - Recognise that a switch opens and closes a	- Describe the simple functions of the basic parts of the digestive system in humans - Identify the different types of teeth in humans and their simple functions	- Recognise that living things can be grouped in a variety of ways - Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - Recognise that environments can change and that this can sometimes pose dangers to living things	- Explore a variety of everyday materials and develop simple descriptions of the states of matter - Compare and group materials together, according to whether they are solids, liquids or gases - Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius	- Identify how sounds are made, associating some of them with something vibrating - Recognise that vibrations from sound travel through a medium to the ear - Find patterns between the pitch of a sound and the features of the object that produces it - Find patterns between the volume of a sound and the strength of the vibrations that produced it	Consolidation of Y4 units

	circuit and associate this with whether or not a lamp lights in a simple series circuit Recognise some common conductors and insulators, and associate metals with good conductors				Recognise that sounds get fainter as the distance from the sound source increases	
Science in Action	- Explore how multiple scientists have contributed to an invention. - Suggest why new inventions will change safety advice.	- Observe human anatomy in the past and ethical dilemmas - Explore real observation methods by scientists and the evidence collected - Determine why scientists need to work collaboratively and evaluate experiments - Explore the work of naturalists and the evidence they use to study animals	- Research how conservation issues are affecting the planet and what can be done to address them - Explore the role of taxonomists and how they create classification keys	Research how climate change affects the water cycle and the work of climate change scientists.	- Research how whales and dolphins communicate underwater to prove that sound travels faster and farther in liquids than gases - Explore the safe decibel range and jobs that require ear protection or soundproofing	Look at the work of pharmacologists in designing medicines and how viscosity affects how quickly they can be absorbed into the blood
Key Knowledge	- Know that all electrical appliances need a power source, including batteries or mains electricity - Know that an electrical circuit needs a complete path for the electrical charge to flow through - Know the main components in a series circuit - Know the precautions for working safely with electricity - Know that some materials allow electric charge to pass through them quickly, and these are known as electrical conductors (e.g. metals)	- Know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions - Know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions - Know that teeth can be damaged, including the effects of sugary and acidic food - Know that it is important to brush teeth twice a day, make good food	- Know that living things can be grouped in different ways - Know that a classification key can be used to group and identify plants and animals - Know that vertebrates are animals that have a backbone, and invertebrates are animals that do not have a backbone - Know that plants can be grouped into flowering or non-flowering varieties - Know that flowering plants include grasses and non-flowering plants include ferns and mosses	- Know that all substances around us can exist as solids, liquids and gases - Know that a property of a solid is that it keeps its shape unless a force is applied to it - Know that a property of a liquid is that it can flow freely and take the shape of a container - Know that a property of a gas is that it does not have a fixed shape and can escape from an unsealed container - Know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating)	- Know sound is a result of vibrations - Know that vibrations from sounds travel through mediums to the ear - Know that an insulating material reduces the amount of vibrations that pass through it and this can be used to protect the ears from damaging sounds - Know that different materials provide different amounts of insulation against sound - Know a variety of ways to change the pitch or volume of a sound	Consolidation of knowledge in Y4 units

	- Know that some materials do not allow electrical charge to pass through them easily, and these are known as electrical insulators (e.g wood and plastic) - Know that metals are used for cables and wires because they are good conductors of electricity - Know that plastic is used to cover cables and wires because it is a good insulator - Know that an open switch breaks a series circuit so the components will be off - Know that a closed switch completes a series circuit so the components will be on - Know the relationship between bulb brightness and the number of bulbs in a circuit	choices and visit the dentist regularly - Describe the teeth of carnivores and herbivores, and understand why they are different - Know that predators hunt for their food and prey are the animals being hunted - Know that producers make their own food - Know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on	- Know there are 5 main vertebrate groups: birds, mammals, reptiles, amphibians and fish - Know invertebrate groups include: snails, slugs, worms, spiders and insects - Know habitats can change throughout the year, which can be dangerous for living things - Know humans can have both a positive and negative impact on the environment	- Know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing) - Know that water can exist as a solid, a liquid and a gas - Know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius - Know that water flows around the world in a continuous process called the water cycle - Know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour - Know that in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation - Know that the rate of evaporation increases as temperature rises	- Know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds - Know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds - Know sounds get fainter as the distance from the sound source increases	
Key Vocabulary	Ammeter, appliance, battery, bulb, buzzer, cell, circuit, component, electrical conductor, electrical insulator, electricity, hazard, mains, material, motor, power source, precaution, property, safety, series circuit, switch, wire	Absorb, canine, carnivore, digest, faeces, food chain, herbivore, incisor, large intestine, molar, mouth, oesophagus, omnivore, predator, premolar, prey, producer, saliva, small intestine, stomach.	Carroll diagram, classification key, classify, conservation, conservationist, deforestation, earthquake, endangered, flood, flowering plants, human impact, invertebrate, observe, nature reserve, non-flowering plants, pollution, seasonal changes, taxonomist, uprooted, vertebrate, Venn diagram, waterlogged, wildfire	Boiling point, climate change, compress, condensation, condensing, condensing point, drought, evaporating, evaporation rate, flood, force, freezing, freezing point, gas, gaseous, liquid, matter, melting, melting point, precipitation, rate, solid, state, steam, temperature, thermometer, the water cycle, volume, water vapour	Air, decibels (dB), decibel meter, ear, eardrum, ear protectors, gas, hertz (Hz), high pitch, insulator of sound, liquid, loud, low pitch, matter, medium, musical instrument, pitch, quiet, solid, sound, sound proofing, vibration, volume	

Key Skills	- Consider what makes a testable question - Begin to recognise that there are different types of enquiry and that they are suitable for different questions - Begin to make suggestions about how different questions could be answered - Plan a simple method, verbally and in writing - Begin to write a simple method in numbered steps - Select and begin to decide what simple equipment might be used to aid observations and measurements - Make predictions about what they think will happen by predicting a trend by considering how the changing variable will affect the measured variable - Use their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed - Begin to draw scientific diagrams that are 2D and simple line diagrams - Use a prepared table to record results including more detailed observations - Use tables with more than 2 columns - Identify and add headings to tables - Begin to design simple results tables	- Begin to select from options which variables will be changed, measured and controlled - Begin to design simple results tables - Group based on visible characteristics and measurable properties - Begin to suggest how one variable may have affected another - Begin to use identified patterns to predict new values or trends - Begin to identify which variables were difficult to control and suggest how to better control them - Comment on the degree of trust by reflecting on the quality of results (accurate measurements and maintaining control variables)	- Use their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed - Record data in Carroll and Venn diagrams - Use a prepared table to record results, including more detailed observations - Use tables with more than 2 columns - Group based on visible characteristics and measurable properties - Populate a pre-prepared branching and number key - Choose appropriate questions for classification keys - Gather specific information from a variety of sources.	- Consider what makes a testable question - Use standard units to measure and compare - Use measuring equipment with increasing accuracy - Draw in 2D to produce simple line diagrams - Label diagrams with more scientific vocabulary - Gather specific information from a variety of sources - Begin to use identified patterns to predict new values or trends - Write a conclusion to summarise findings using simple scientific vocabulary	- Suggest what observations to make and how long to make them for - Observe closely how different instruments create a sound - Research how cetaceans communicate underwater - Present results using a bar chart - Design simple results tables - Identify when results or observations do not match predictions	Consolidation of skills in Y4 units
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	• Group based on visible characteristics and measurable properties • Write a conclusion to summarise findings using simple scientific vocabulary • Begin to suggest how one variable may have affected another • Begin to use identified patterns to predict new values or trends					
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Year 5 Science Overview						
Term	Autumn		Spring		Summer	
Overview	Earth in Space	Unbalanced Forces	Mixtures and separation	Properties and change	Living things: Life cycles and reproduction	Human timeline (3 weeks)
						Making connections (3 weeks)
Key Scientists	Nicolaus Copernicus Katherine Johnson Neil Armstrong	Sir Isaac Newton Galileo Galilei	Spencer Silver Ruth Benerito	Spencer Silver Ruth Benerito	Mangala Mani Sir David Attenborough	Professor Robert Wilson
Big Question	How does the moon appear to change shape?	How do parachutes work?	How can I separate a range of mixtures?	Can I make a gas using a solid and a liquid?	How does pollination take place?	What happens to our bodies during puberty?
						Does the size of an asteroid affect the diameter of its impact crater?
Overview	Exploring the movement of celestial bodies in the Solar System, the children will learn about the Earth, other planets and the Moon, discover how the Earth's rotation causes night and day, understand how sundials work and investigate satellite uses and the issue of space junk.	Building on their knowledge of contact and non-contact forces, the children will explore gravity, friction, air resistance and water resistance, consider the effects of unbalanced forces, plan investigations and test ideas using models to create the most effective pulley system.	The children will explore different types of mixtures and the different methods that can be used to separate them. They will dissolve a range of substances, identify different solutions and investigate how temperature affects the time taken to dissolve. They will design and create a water filter, sieve soil and evaporate solutions.	Broadening their experience of the properties of materials, the children will investigate hardness, transparency and conductivity and consider how these properties influence the uses of materials. They will explore reversible changes, including dissolving and changes of state. They will compare these to irreversible changes, including rusting, burning and mixing vinegar and bicarbonate of soda.	The children will compare the life cycles of plants, mammals, birds, amphibians and insects. They will investigate asexual reproduction in plants and compare sexual and asexual reproduction.	Studying human development and changes, the children will identify key stages and consider what data may help determine if a child is growing normally. They will describe how puberty affects girls and boys and produce graphs to compare how gestation periods vary across different mammals.
						The children will explore the relationship between the size of model asteroids and the diameter of the impact crater they create through experiments, data analysis, and drawing conclusions.

NC Content	- 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 the 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	- Explain that unsupported objects fall towards Earth because of the force of gravity acting between the Earth and the falling object - Identify the effects of air 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	- 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 - Demonstrate that dissolving, mixing and changes of state are reversible changes	- Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets - Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic - 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	- Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird - Describe the life process of reproduction in some plants and animals - Find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals	- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - Describe the life processes of reproduction in some plants and animals - Describe the changes as humans develop into old age
Science in Action	- Consider the evidence used by Ptolemy and Copernicus in developing the geocentric and heliocentric models of the Solar System, respectively - Use satellite data on climate change to make predictions about future temperature changes - Explore the problems with space junk and design a device to clear it	- Explore the evidence used by Galileo and Newton that contributed towards the theory of gravity - Consider how air and water resistance inform aerodynamic design - Discover how friction applies to braking systems	Identify real world examples of mixtures and how and why separation techniques are used to separate them, including some jobs that may use them	- Link the properties of materials to their real-world uses - Use properties of materials to inform product design - Link the conditions that cause rusting to methods of prevention	- Look at the work of biologists studying amphibians and how they are affected by climate change. Use their work to develop their own experiments - Discover how gardeners and farmers use asexual reproduction in plants to their advantage to propagate their best plants	

Key Knowledge	- Know the Sun is a star at the centre of our Solar System - Know the Sun, Earth and Moon are approximately spherical bodies - Know the names, order and relative positions of the planets and other main celestial bodies - Know a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets - Know the Earth and other planets orbit around the sun - Know that the tilt of the Earth and its orbit around the Sun cause the seasons - Know the Moon orbits around the Earth - Know how the Earth's rotation causes day and night and the apparent movement of the Sun across the sky	- Know gravity is a non-contact force that pulls objects together - Know that air resistance and water resistance are both types of friction - Know that unsupported objects fall towards the Earth because of gravity - Know that friction, air resistance and water resistance act in the opposite direction of a moving object - Know that when forces are unbalanced, the speed, shape or direction of an object changes - Know that when forces are balanced, the speed, shape or direction of an object stays the same - Know some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect - Know rougher surfaces have more friction between them than smooth surfaces and how that may affect movement - Know the larger the surface area of an object, the greater the air or water resistance it creates	- Know some substances will dissolve in a liquid to form a solution - Know the factors that affect the time taken to dissolve, including temperature and stirring - Know some liquids and solids can be separated using sieving, filtering and evaporation, and to describe these processes	- Describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets - Know that dissolving, mixing and changes of state are reversible changes - Know some changes result in the formation of new materials, which are usually irreversible (e.g. burning, rusting, the action of acid on bicarbonate of soda)	- Know a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation, when the cycle starts again - Know all living things must reproduce for the species to survive - Know that sexual reproduction requires 2 parents, whereas asexual reproduction only requires 1 parent - Know there are different processes plants and animals use to reproduce (asexual and sexual reproduction)	- Know how to describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly) - Know how to describe changes that occur during puberty (in boys and girls) - Know that gestation periods vary across mammals <u>Making connections</u> - Consolidation of knowledge from Y5 units
Key Vocabulary	Artificial satellite, axis, calibrate, celestial bodies, climate change, day, daytime, data, Earth, elliptical, face, first quarter moon, force, full moon, gnomon, gravity,	Aerodynamics, air resistance, amplify, balanced, contact force, distance, effort, force, friction, gear, gravity, lever, load, machine, mass, matter, non-contact force, pivot,	Control variable, crystallising, dissolving, evaporation, filtering, insoluble, mixture, particle, sieve, sieving, soluble, solution, variable	Burning, change of state, circumference, condensing, conductor, dissolve, electrical conductivity, evaporating, freezing, hard, hardness, insulator, irreversible	Adolescence, adult, amphibian, asexual reproduction, bird, birth, bulb, carnivore, characteristic, chrysalis, cocoon, conclusion, cuttings, egg, estimating,	Adolescence, adolescent, adult, adulthood, child, childhood, foetus, gestation period, hormones, infant, life cycle, newborn, old age,

	horizon, Jupiter, last quarter moon, Mars, Mercury, midday, moon, natural satellite, Neptune, new moon, night, phase, planet, Pluto, orbit, reflect, rotate, Saturn, season, shadow, Solar System, space, space junk, spherical, star, summer, sundial, sunrise, sunset, table, tilt, Uranus, Venus, winter, year	pulley, streamlining, surface area, unbalanced, water resistance		change, light intensity, light meter, melting, mixture, opaque, property, reversible change, rust, rusting, soft, states of matter, trustworthy, thermal conductivity, translucent, transparency, transparent	extrapolating, fertilisation, fledgling, flowering stage, four-legged tadpole, four-stage life cycle, frog, froglet, germination stage, gestation, gills, hatch, hatchling, herbivore, incubation, infancy, insect, juvenile, larva, life cycle, line graph, line of best fit, lungs, mammal, mating, metamorphosis, nest, nestling, new born, nymph, offspring, ovule, pollen, pollination, predict, pupa, reproduction, seed dispersal, seed, sexual reproduction, species, tadpole, tuber	period (menstruation), puberty, toddler
Key Skills	- Raise questions throughout the enquiry process - Identify testable questions - Select the most appropriate enquiry method to answer questions and give justification - Draw scientific diagrams by: using a wider range of standard symbols, drawing with increasing accuracy, labelling with a broader range of scientific vocabulary, annotating diagrams to explain concepts and convey opinions - Suggest headings to tables, including units - Design results tables with increasing independence, with consideration of	- Suggest which variables will be changed, measured and controlled - Make and explain decisions about what observations to make and how long to make them for - Write a method that includes details about how to ensure control variables are kept the same - Write a method that considers reliability by planning repeated readings - Suggest the most appropriate equipment to make observations and measurements and justify their choices - Use standard units to measure and compare with increasing precision (decimals) - Read a wider variety of scales with unmarked	- Gather answers to open-ended questions from a variety of sources - Label with a broader range of scientific vocabulary - Annotate diagrams to explain concepts and convey opinions - Select the most appropriate enquiry method to answer questions and give justification - Use their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed - Suggest which variable will be changed, measured and controlled - Make and explain decisions about what observations to	- Write a method including details about how to ensure control variables are kept the same - Make increasingly scientific predictions - Use standard units to measure and compare with increasing precision (decimals) - Suggest headings to tables, including units - Design results tables with increasing independence, with consideration of variables where applicable - Write a conclusion to summarise findings using increasingly complex scientific vocabulary - Identify which variables were difficult to control and suggest how to better control them	- Raise questions throughout the enquiry process - Identify testable questions - Suggest which variables will be changed, measured and controlled - Make and explain decisions about what observations to make and how long to make them for - Use their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed - Use standard units to measure and compare with increasing precision (decimals) - Gather answers to open-ended questions from a variety of sources	- Represent data by using line graphs and scatter graphs - Plot points with greater accuracy - Read the value of plotted points with greater accuracy - Write a conclusion to summarise findings using increasingly complex scientific vocabulary - Suggest, with increasing independence, how one variable may have affected another - Quote relevant data as evidence of relationships - Use identified patterns to predict new values or trends - Comment on the degree of trust by also reflecting on the sources of

	variables where applicable • Use identified patterns to predict new values or trends	intervals between numbers • Draw scientific diagrams • Use tables with columns that allow for repeat readings • Suggest headings to tables, including units • Design results tables with increasing independence • Calculate the mean average • Represent data using line graphs and scatter graphs • Plot points with greater accuracy • Read the value of plotted points with greater accuracy • Write a conclusion to summarise findings • Suggest, with increasing independence, how one variable may have affected another • Quote relevant data as evidence of relationships • Identify anomalies in repeat data and exclude data where appropriate • Use repeated patterns to predict new values or trends • Identify steps in the method that need changing • Identify which variables were difficult to control and suggest how to control them better • Comment on the degree of trust	make and how long to make them for	• Comment on the degree of trust	• Represent data by using line graphs and scatter graphs • Plot points with greater accuracy • Read the value of plotted points with greater accuracy • Suggest, with increasing independence, how one variable may have affected another • Quote relevant data as evidence of relationships • Use identified patterns to predict new values or trends	information (e.g. websites, books) • Decide what data to collect to further test direct relationships <u>Making connections</u> Consolidation of skills in Y5 units
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Year 6 Science Overview						
Term	Autumn		Spring		Summer	
Overview	Evolution and inheritance	Animals, including humans: circulatory system	Light and reflection	Electricity	Living things and their habitats	Making connections
Key Scientists	Charles Darwin Alfred Russell Wallace	Leonardo Da Vinci Dr Katherine Dibb Sir Richard Doll	Thomas Edison Ibn al-Haytham Percey Shaw	Alessandro Volta Edith Clarke Thomas Edison	Carl Linnaeus	
Big Question	Why do different species of the same animal look different?	Is our heart rate always the same? What can affect it?	Why can I hear around corners but not see around corners?	Is it possible to change how loud a buzzer is?	How and why do we classify living things?	Are some sunglasses better than others?
Overview	Studying patterns in humans and other species, the children will learn about characteristics that are inherited and those that are environmental. Through the eyes of Darwin and Wallace, they will understand how observations lead to theories. By modelling finches' variation and natural selection, they will begin to explain how species evolve and the role of fossil evidence that supports the theory.	Studying the human circulatory system, the children will learn about the role of the heart, blood and blood vessels and use models to demonstrate their function. They will explore how lifestyle choices affect our health and use secondary sources to advise patients. They will devise their own investigation to look at the relationship between exercise and heart rate, applying their knowledge of variables and then analysing secondary data to understand fitness better.	Proving that light travels in a straight line, the children will explain observations of reflection and shadows, how our eyes allow us to see, how mirrors can be used in various ways, and investigate factors affecting the size of shadows and the laws of reflection.	Revisiting electrical circuits, the children will learn to draw conventional circuit diagrams and use models to explain current, resistance and voltage. They will compare different batteries and relate this to the effects on bulb brightness. They will apply their knowledge of switches and electrical circuits to design and produce their own practical devices.	Broadening their knowledge of grouping vertebrates, invertebrates, plants and micro-organisms by shared characteristics, the children will learn about Carl Linnaeus's development of the Linnaean and binomial classification systems and use branching and number keys to sort and identify organisms.	Exploring sun safety, the children will investigate the efficacy of different sunglasses. They will devise enquiries to test the light and UV transmission of the lenses to form a conclusion about which sunglasses are best. They will summarise their findings through presentations and advertisements.
NC Content	- 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	- 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	- 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 our eyes - Explain that we see things because light travels from light sources to our eyes or	- Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in 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	- Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals - Give reasons for classifying plants and	Consolidation of Y6 units

	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	Describe how nutrients and water are transported within animals, including humans	from the light source 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 - Extend their experience of light by looking at a range of phenomena, including: rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur)	Use recognised symbols when representing a simple circuit in a diagram	animals based on specific characteristics - Know that broad groups, such as micro-organisms, plants and animals can be subdivided - Be able to classify animals into commonly found vertebrates and invertebrates	
Science in Action	- Consider evidence that can be used to argue scientifically about a theory - Explore different kinds of evidence that can lead to the same conclusion - Understand the role of peer review and choices in sources to improve the degree of trust in a conclusion - Explore different jobs that look at changes to species over time, including naturalists like Darwin or Wallace and palaeontologists like Anning.	- Consider how health advice has changed over time and how some of the health information we have now requires further research (e.g. vaping) - Explore what modern stethoscopes are used for and how the design has evolved - Consider how understanding of the circulatory system has changed by looking at changing opinions of scientists, and collaborative evidence is fundamental to our current knowledge and understanding	- Consider evidence that can be used to argue scientifically about a theory - Discuss the purpose and ethics of historical experiments and the conclusions drawn from the results - Discover how scientific principles can be used for artwork, communication or decoration - Explore different jobs and inventions that depend on reflection	- Consider the importance of using standardised symbols by those working with electricity, such as electricians - Explain how electrical switches can be used to protect users of hazardous electrical appliances - Use scientific knowledge to devise an appliance to solve a problem	- Describe the work of Carl Linnaeus in developing the Linnaean and binomial systems - Understand that modern science has added to and refined the Linnaean system	- Look at how scientific enquiries can provide the data to support advertising claims - Consider how using different methods and collaborating on data can provide a greater degree of trust in results
Key Knowledge	- Know that living things have changed over time - Know that fossils provide information about living things	- Know the main parts of the human circulatory system - Know that the heart pumps blood around the body	- Know that light travels in a straight line from a light source - Know luminous objects are seen as a result of light directly entering	- Know a variety of components in a series circuit (including a buzzer and a motor) - Know conventions are used to draw circuit	- Know that 'organism' is a term used to refer to an individual living thing - Know that micro-organisms are	Consolidation of knowledge in Y6 units

	that inhabited the Earth millions of years ago - Know that characteristics are passed from parents to their offspring, but all offspring vary from their parents - Know that over time, variation in offspring can affect animals' chances of survival in particular environments - Know animals and plants have adapted to suit their environment over many millions of years, and this process can be called evolution	- Know that blood vessels transport blood around the body - Know that blood transports vital substances around the body, including oxygen and nutrients - Know the relationship between different organ systems - Know the impact of diet, exercise, drugs and lifestyle on the way a body functions - Know the heart rate is the number of beats per minute - Know exercise increases heart rate	the eye, whereas non-luminous objects reflect light into the eye - Know shiny surfaces reflect light uniformly - Know that when light is reflected off a surface, its direction changes - Know that mirrors and periscopes work using reflection of light on smooth surfaces - Know shadows have the same shape as the objects that cast them as a result of light travelling in straight lines - Know there are relationships between light sources, objects and shadows - Know that the angle of the reflected ray is affected by the angle of the incoming ray on a smooth surface	diagrams, including the recognised symbols for common components and use straight lines Know the voltage of a circuit can be changed, and this affects bulb brightness (or buzzer volume)	incredibly small and cannot usually be seen by the naked eye Know the characteristics of the different groups of vertebrates and commonly found invertebrates	
Key Vocabulary	Adaptation, ancestor, characteristic, competition, environmental, evidence, evolution, extinct, fossil, gene, habitat, inherit, natural selection, offspring, peer review, population, reproduce, scientific theory, selective breeding, species, specimen, survival, survival of the fittest, variation	Balanced diet, blood, bloodstream, blood vessels, carbon dioxide, circulatory system, diet, drug, exercise, fitness, health, heart, heart rate, lifestyle, lungs, mass, nutrient, oxygen, pulse, pump, rate, resting heart rate, transport, water	Cast, incoming ray, light ray, light source, luminous, mirror, non-luminous, opaque, periscope, pupil, ray diagram, reflected ray, reflective, shadow, straight	Ammeter, appliance, battery, bulb, buzzer, cell, circuit, circuit diagram, component, current, electricity, motor, power source, resistance, switch, voltage, voltmeter, wire	Amphibian, binomial system, bird, characteristic, classify, classification key, cold-blooded, conifer, exoskeleton, fern, fish, flowering plant, insect, invertebrate, life process, Linnaean system, mammal, micro-organism, microscopic, moss, organism, reptile, snail, spider, vertebrate, warm-blooded, worm	
Key Skills	- Raise questions throughout the enquiry process - Select the most appropriate enquiry method to answer	- Suggest which variables will be changed, measured and controlled - Make and explain decisions about what observations to make	- Suggest which variables will be changed, measured and controlled - Write a method including detail about how to ensure control	- Suggest which variables will be changed, measured and controlled - Write a method including detail about how to ensure control	- Group in a broader range of contexts - Organise the layout of number and branching keys	Consolidation of skills in Y6 units

	questions and give justification • Suggest which variables will be changed, measured and controlled • Use their senses to describe what is noticed or what has changed • Use tables with columns that allow for repeat readings • Calculate the mean average • Group in a broader range of contexts • Suggest, with increasing independence, how one variable may have affected another • Quote relevant data as evidence of relationships • Identify anomalies in repeated data and exclude results where appropriate • Compare individual, class and/or model data to the prediction and recognise when they do not match • Identify steps in the method that need changing and suggest improvements • Identify which variables were difficult to control and suggest how to control them better • Comment on the degrees of trust by reflecting on accuracy and reliability • Pose new questions in response to the	and how long to make them for • Write a method including detail about how to ensure control variables are kept the same • Write a method that considers reliability by planning repeated readings • Suggest the most appropriate equipment to make observations and measurements and justify their choices • Make increasingly scientific predictions • Use their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed • Use standard units to measure and compare with increasing precision (decimals) • Read a wider variety of scales with unmarked intervals between numbers • Gather answers to questions from a variety of sources • Use tables with columns that allow for repeat readings • Suggest headings to tables, including units • Design results tables with increasing independence, with consideration of variables where applicable	variables are kept the same • Use their senses to describe what is noticed or what has changed • Use standard units to measure and compare with increasing precision (decimals) • Read a wider variety of scales with unmarked intervals between numbers • Draw scientific diagrams with increasing accuracy • Use tables with columns that allow for repeat readings • Calculate the mean average • Represent data by using line graphs and scatter graphs • Plot points with greater accuracy • Read the value of plotted points with greater accuracy • Write a conclusion to summarise findings using increasingly complex scientific vocabulary • Suggest, with increasing independence, how one variable may have affected another • Identify anomalies in repeat data • Use identified patterns to predict new values or trends • Identify steps in the method that need changing and suggest improvements	variables are kept the same • Write a method that considers reliability by planning repeated readings • Suggest the most appropriate equipment to make observations and measurements and justify their choices • Use previous scientific knowledge and evidence to inform their predictions • Use scientific language to describe a potential outcome or explain why they think something will happen • Use their senses to describe what is noticed or what has changed • Use standard units to measure and compare with increasing precision (decimals) • Read a wider variety of scales with unmarked intervals between numbers • Drawing scientific diagrams with increasing accuracy • Use tables with columns that allow for repeat readings • Calculate the mean average • Suggest, with increasing independence, how one variable may have affected another • Identify anomalies in repeated data • Quote relevant data as evidence of relationships	• Formulate appropriate questions for classification keys	
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	data that would extend the enquiry	• Calculate the mean average • Represent data by using line graphs and scatter graphs • Plot points with greater accuracy • Read the value of plotted points with greater accuracy • Recognise naturally occurring patterns and relationships, changes over time and relevant secondary data • Write a conclusion to summarise findings • Identify anomalies in repeated data • Use identified patterns to predict new values or trends • Comment on the degree of trust	• Identify which variables were difficult to control and suggest how to control them better • Comment on the degree of trust by reflecting on accuracy and reliability	• Identify anomalies in repeat data • Use identified patterns to predict new values or trends • Identify steps in the method that need changing and suggest improvements • Identify which variables were difficult to control and suggest how to control them better		
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