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Science Curriculum

Led by: Sam James

'Why do we teach science in our school?	How is Science sequenced within our school?	What will our children learn?
• We teach Science to enable children to become confident, excited and inquiry led Scientists • We want our children to understand how vital Science is for understanding the world in which they live. • To ask questions and develop their ideas through investigative learning • To allow children the opportunity to become creative and critical thinkers • To understand that Science is an everyday phenomenon that is always changing and adapting	• There are five knowledge enquiries that the children learn throughout the year: Identifying, classifying and grouping, research, observing over time, comparative and fair testing and pattern seeking • Children will have the opportunity to apply the knowledge through investigations • We use Kapow Science to help sequence our learning with a focus on working scientifically, science in action and scientific knowledge and understanding. • Children will have between 4-5 knowledge domains to learn	• Children will be exposed to specific scientific vocabulary • Children will learn about different influential scientists in scientific studies • Children will learn how to effectively plan an investigation • Children will learn how to record results in a creative and critical way • Across the key stage, children will learn about animals, their habitats and human health • Children will learn how to conclude and evaluate an investigation

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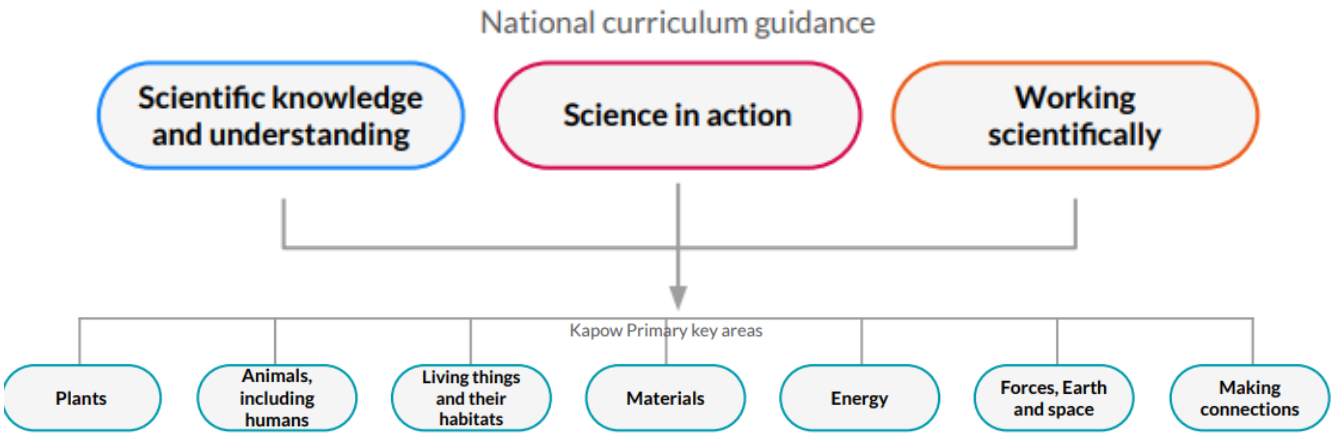
Concept Map for Science



Working Scientifically			
Posing Questions		Recording (diagrams)	
Planning		Recording (tables)	
Predicting		Grouping and classifying	
Observing (qualitative data)		Graphing	
Measuring (quantitative data)		Analysing and drawing conclusions	
Researching		Evaluating	

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Progression of knowledge

Plants

		EYFS: Reception Our beautiful planet	Year 1 Introduction to plants	Year 2 Plant growth	Year 3 Plant reproduction
Scientific knowledge and understanding	Plant structure and function	To know the name for the basic plant parts (leaves, flowers, stem and roots.) To know the names of some familiar flowering plants (e.g. daisy, rose, sunflower, daffodil).*	To know a variety of common plants, and how they differ. To know that deciduous trees lose their leaves seasonally, but evergreen trees do not. To know the basic structure (including leaves, flowers (blossom), fruit, roots, bulb, seed, trunk, branches, stem) of a variety of common plants, including flowering plants and trees.		To understand the functions of the basic parts of a plant and the relationship between structure and function. To know that water is transported within a plant from the root, through the stem, to the leaves.
	Plant growth and needs	To know plants are alive. To know that seeds need water to grow.	To begin to understand how plants grow and change over time.	To know that seeds and bulbs grow into seedlings by producing roots and shoots. To know that seedlings grow into mature plants by developing parts such as roots, stems, leaves and flowers. To know that seeds need water and warmth to germinate. To know that plants need water, light and a suitable temperature for growth and health.	To know that plants need water, light, air, nutrients and a suitable temperature for growth and health. To understand that the needs for growth and health vary from plant to plant.
	Plant life cycle	To know that seeds grow into plants if taken care of.			To know the life cycle of a plant from seed to mature plant. To know that flowers are the reproductive organ of a plant. To know that the process of pollination is the transfer of pollen to the female (part of the) flower. To know that the process of seed formation is the growth of a seed after pollination.. To know some different methods of seed dispersal and the benefits of each.

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Progression of knowledge

Animals, including humans

		EYFS: Reception Animal adventures	Year 1 Sensitive bodies Comparing animals	Year 2 Life cycles and health	Year 3 Movement and nutrition
Scientific knowledge and understanding	Animal growth	To know the names of familiar animals (e.g. farm animals, pets and animals seen in storybooks.)	To know a variety of common animals (including fish, amphibians, reptiles, birds and mammals).	To understand how living things change, and that animals have offspring that grow into adults. To know which offspring comes from which parent animal. To know the stages in some animal life cycles.	
	Animal structure and function	To know the main body parts of common animals (number of legs, wings, fur, tail). To know that animals, including humans use their senses to explore the world.	To know the main body parts of common animals (arms, legs, wings, tails, fins, head, trunk, horns/tusks, shell) To know key parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth). To know the five main senses: sight, smell, hearing, taste and touch. To know that 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.		To know that animals can be grouped based on the presence of a skeleton. To know that the skeleton in humans and some animals is used for movement, protection and support. To know that the muscular system in humans and some animals works with the skeleton for movement. To know the main bones in the body.
	Health and nutrition	To know that animals need food.	To know that a carnivore is an animal that eats other animals and give some examples. To know that a herbivore is an animal that eats only plants and give some examples. To know that an omnivore is an animal that eats both animals and plants, and to give some examples.	To know that animals, including humans, need water, food and air to survive. To understand the importance of exercise, a balanced diet and hygiene for humans.	To know that animals, including humans, need the right types and amount of nutrition. To understand that humans cannot make their own food and therefore eat to get the nutrition needed To know the main nutrient groups (carbohydrates, protein, fats, fibre, vitamins, minerals and water) and their simple functions. To know that a balanced diet should include all nutrient groups. To describe the diets of different animals.

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Progression of knowledge

Animals, including humans

		Year 4 Digestion and food	Year 5 Human timeline	Year 6 Circulation and health
Scientific knowledge and understanding	Animal growth		To describe the human life cycle, including the stages of growth and development (baby, toddler, child, teenager, adult, elderly). To describe changes that occur during puberty (in boys and girls). To know that gestation periods vary across mammals.	
	Animal structure and function	To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions. To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions.		To know the main parts of the human circulatory system (heart, blood vessels and blood). To know that the heart pumps blood around the body. To know that the blood vessels transport blood around the body. To know that the blood transports vital substances around the body, including oxygen and nutrients. To understand the relationships between different organ systems.
	Health and nutrition	To know that teeth can be damaged, including the effect of sugary and acidic food. To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly. To describe the teeth of carnivores and herbivores, and understand why they are different. To know that predators hunt for their food and prey are the animals being hunted. To know that producers make their own food. To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on.		To understand the impact of diet, exercise, drugs and lifestyle on the way a body functions. To know that the heart rate is the number of beats per minute. To know that exercise increases heart rate.

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Progression of knowledge

Living things and their habitats

		EYFS: Reception Animal adventures	Year 2 Habitats Microhabitats	Year 4 Classification and changing habitats
Scientific knowledge and understanding	Characteristics of living things	To know that animals and plants move, grow and feed. To know the difference between things that are living and things that are non-living. To know that some animals hibernate or store food in winter.*	To begin to understand some of the life processes, including movement, reproduction, sensitivity, growth, excretion and nutrition. To know the difference between things that are living, dead, and things that have never been alive, using some of the life processes.	To know that living things can be grouped in different ways. To know that a classification key can be used to group and identify plants and animals. To know that vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone. To know that plants can be grouped into flowering or non-flowering varieties. To know that flowering plants include grasses and non-flowering plants includes ferns and mosses. To know that there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. To know that invertebrate groups include snails, slugs, worms, spiders and insects.
	Variation and inheritance	To know the names of familiar animals (e.g. farm animals, pets and animals seen in storybooks.)* To know the names of some familiar flowering plants (e.g. daisy, rose, sunflower, daffodil).*	To know a variety of plants and animals and describe some differences.	
	Habitats and interdependence	To know that plants and animals live in a range of different places. To name some different places where animals live on the school site.	To name a variety of habitats, including woodland, ocean, rainforest and seashore. To know that a habitat is the environment where an animal or plant lives/ grows, because it provides what they need to survive. To know that a micro-habitat is a very small habitat (e.g. stones, logs and leaf litter). To know that living things depend upon each other (e.g. for food, shelter.) To understand that a food chain can be used to show how animals obtain food from eating either plants and/or other animals.	To know that habitats can change throughout the year and this can be dangerous for living things. To know that humans can have both a positive and negative impact on the environment.

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Progression of knowledge

Living things and their habitats

		Year 5 Life cycles and reproduction	Year 6 Classifying big and small Evolution and inheritance
Scientific knowledge and understanding	Characteristics of living things		To know that 'organism' is a term used to refer to an individual living thing. To know that micro-organisms are incredibly small and cannot usually be seen by the naked eye. To know the characteristics of the different groups of vertebrates and commonly found invertebrates.
	Variation and inheritance	To know that a life cycle shows the changes an animal or plant goes through until the reproduction of a new generation when the cycle starts again. To know that all living things must reproduce for the species to survive. To know that sexual reproduction requires two parents, whereas asexual reproduction only requires one parent. To know that there are different processes plants and animals use to reproduce (asexual and sexual reproduction).	To know that living things have changed over time. To know that fossils provide us with information about living things that inhabited the Earth millions of years ago. To know that characteristics are passed from parents to their offspring, but that all offspring vary from their parents. To know that over time, variation in offspring can affect animals' chances of survival in particular environments.
	Habitats and interdependence		To know that animals and plants have adapted to suit their environment over many millions of years and that this process can be called evolution.

Progression of knowledge

Materials

		EYFS: Reception I am a scientist	Year 1 Everyday materials	Year 2 Uses of everyday materials	Year 3 Rocks and soil
Scientific knowledge and understanding	Identifying and naming		To know that objects are items or things. To know that a material is what an object is made from. To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.		To know that rocks can be grouped based on their appearance or properties, (e.g. colour, texture, hardness, permeability.) To know that rocks may contain grains, crystals or fossils. To know that grains and crystals appear differently and can be used to classify rocks. To know that soils are made from rocks and dead matter.
	Properties and uses	To know objects float or sink.	To know that property refers to how a material can be described. To describe the physical properties of a variety of everyday materials. To understand that materials can be grouped based on their physical properties.	To know why objects are made from particular materials and to give examples of their suitability. To know that one material can be used for a range of purposes (and to give examples.) To know that different materials can be used for the same purpose (and to give examples.) To know why certain materials are unsuitable for particular objects.	To understand the relationship between the properties of rocks and their uses.
	Change	To know some objects move when pushed or pulled. To know some objects freeze or melt.		To know that a push or pull must be applied to change the shape of a solid object. To know that solid objects can be squashed, bent, twisted or stretched. To know that different solid objects may take a different amount of force to change shape.	To know that fossils can form from the remains of living things. To know that rocks can change over time (e.g. erosion, weathering).

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Progression of knowledge

Materials

		Year 4 States of matter	Year 5 Mixtures and separation Properties and changes
Scientific knowledge and understanding	Identifying and naming	To know that all substances around us can exist as solids, liquids and gases.	
	Properties and uses	To know that a property of a solid is that it keeps its shape unless a force is applied to it. To know that a property of a liquid can flow freely and take on the shape of a container. To know that a property of a gas does not have a fixed shape and can escape from an unsealed container.	To describe a broader range of materials and their properties, including hardness, solubility, transparency, conductivity and response to magnets.
	Change	To know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). To know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). To know that water can exist as a solid, a liquid or a gas. To know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. To know that water flows around the world in a continuous process called the water cycle. To know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour. To 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. To know that the rate of evaporation increases as temperature rises.	To know that some substances will dissolve in a liquid to form a solution. To know the factors that affect the time taken to dissolve, including temperature and stirring. To understand that dissolving, mixing and changes of state are reversible changes. To know that some liquids and solids can be separated using sieving, filtering and evaporation and to describe these processes. To understand that some changes result in the formation of new materials and that these are usually irreversible. (e.g. burning, rusting, the action of acid on bicarbonate of soda.)

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Progression of knowledge

Energy

Light

		EYFS: Reception I am a scientist	Year 3 Light and shadows	Year 6 Light and reflection
Scientific knowledge and understanding	Sources	To know day is light because the sun is in the sky. To know night is dark because the sun is not in the sky.	To know that light travels from a source (e.g. the Sun, light bulbs and torches). To know that light is needed to see things and that dark is the absence of light. To know that light from the Sun can be dangerous and how to protect their eyes.	To know that light travels in a straight line from a light source. To understand that luminous objects are seen as a result of light directly entering the eye, whereas non-luminous objects reflect light into the eye.
	Transfer	To know that shadows are created when something blocks the light.	To know that all materials reflect light. To know that shadows are formed when the light from a light source is blocked by an opaque object.	To know that shiny surfaces reflect light uniformly. To know that when light is reflected off a surface, its direction changes. To know that mirrors and periscopes work using reflection of light on smooth surfaces. To understand why shadows have the same shape as the objects that cast them as a result of light travelling in straight lines. To understand relationships between light sources, objects and shadows.
	Factors affecting energy		To know that shadows change as a result of different factors: - Changing the position of the light source. - Changing the distances between the light source, object and surface. To know that shadows change position and length throughout the day as the Sun changes position in the sky.	To understand how and why the distance between the object and the screen affects the size of the shadow. To understand how the angle of a reflected ray is affected by the angle of the incoming ray on a smooth surface.

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Progression of knowledge

Energy

		Sound	
		EYFS: Reception I am a scientist	**Year 4** Sound and vibrations
Scientific knowledge and understanding	Sources		To understand that sound is a result of vibrations.
	Transfer		To know that vibrations from sounds travel through mediums to the ear. To 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. To know that different materials provide different amounts of insulation against sound.
	Factors affecting energy	To know about differences in sounds.	To know a variety of ways to change the pitch or volume of a sound. To know that quicker vibrations cause higher-pitched sounds and slower vibrations cause lower-pitched sounds. To know that stronger vibrations cause louder sounds and weaker vibrations cause quieter sounds. To know that sounds get fainter as the distance from the sound source increases.

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Progression of knowledge

Energy

Electricity

		Year 4 Electricity and circuits	Year 6 Circuits, batteries and switches
Scientific knowledge and understanding	Sources	To know that all electrical appliances need a power source, including batteries or mains electricity. To know that an electrical circuit needs a complete path for the electrical charge to flow through. To know the main components in a simple series circuit. To know the precautions for working safely with electricity.	To know a wider variety of components in a series circuit (including buzzer and motor). To know the conventions used to draw circuit diagrams, including the recognised symbols for common components and using straight lines.
	Transfer	To know that some materials allow electrical charge to pass through them quickly and these are known as electrical conductors (e.g. metals). To 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). To know that metals are used for cables and wires because they are good conductors of electricity. To know that plastic is used to cover cables and wires because it is a good insulator.	
	Factors affecting energy	To understand that an open switch breaks a series circuit so the components will be off. To understand that a closed switch completes a series circuit so the components will be on. To understand the relationship between bulb brightness and the number of bulbs in a circuit.	To know that the voltage of a circuit can be changed and how this affects bulb brightness (or buzzer volume).

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Progression of knowledge

Forces, Earth and space

		EYFS: Reception Changing seasons	Year 1 Seasonal changes	Year 5 Earth and space
Scientific knowledge and understanding	Key facts	To know that some trees change in the four seasons. To know some signs of each season (leaves on the ground, cold weather, daffodils growing and sunny weather.) To know that some animals hibernate or store food in winter.*	To know the name and order of the four seasons; spring, summer, autumn and winter. To know that it is unsafe to look directly at the Sun.	To know that the Sun is a star at the centre of our solar system. To know that the Sun, Earth and Moon are approximately spherical bodies. To know the names, order and relative positions of the planets and other main celestial bodies. To know that a moon is a celestial body that orbits a planet and give examples of moons that orbit other planets.
	Forces in motion	To know that the weather changes throughout the year. To know and compare weather types (rain, sun, snow, wind).	To know weather associated with the four seasons and how it changes (in the UK). To understand that day length varies across the four seasons, with fewer daylight hours in the winter and more in the summer.	To know that the Earth and other planets orbit around the Sun. To know that the tilt of the Earth and its orbit around the Sun causes the seasons. To know that the Moon orbits around the Earth. To understand how the Earth's rotation causes day and night and the apparent movement of the Sun across the sky.
	Factors affecting forces			

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Progression of knowledge

Forces, Earth and space

		Year 3 Forces and magnets	Year 5 Unbalanced forces
Scientific knowledge and understanding	Key facts	To know some examples of contact and non-contact forces. To know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism). To know the North and South poles of a magnet. To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. To know some different examples of magnets, including bar, horseshoe, button and ring, To know some uses of magnets.	To know that gravity is a non-contact force that pulls objects together. To know that air resistance and water resistance are both types of friction.
	Forces in motion	To know that friction is a contact force that acts between two surfaces to slow an object down. To know that magnetism is a non-contact force that affects objects containing magnetic metal. To understand that the opposite poles of a magnet attract one another and like poles repel one another.	To know that unsupported objects fall towards the Earth because of gravity. To know that friction, air resistance and water resistance act in the opposite direction to a moving object. To know that when forces are imbalanced, the speed, shape or direction of an object changes. To know that when forces are balanced the speed, shape or direction of an object stays the same. To know that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.
	Factors affecting forces	To know that rougher surfaces have more friction between them than smoother surfaces. To understand that the strength of different magnets may vary.	To know that rougher surfaces have more friction between them than smoother surfaces and how that may affect movement. To know that the larger the surface area of an object the greater the air or water resistance it creates.

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Progression of skills

Working scientifically

	EYFS: Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Posing questions	Asking questions about the natural world with support.	Exploring the world around them and raising their own simple questions. Recognising there are different types of enquiry (ways to answer a question). Responding to suggestions on how to answer questions.		Beginning to raise further questions during the enquiry process. Considering what makes a testable question. Beginning to recognise that there are different types of enquiry and that they are suitable for different questions. Beginning to make suggestions about how different questions could be answered.		Raising questions throughout the enquiry process. Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification.	
Planning	Beginning to share ideas and suggestions, when working practically.	Beginning to recognise whether a test is fair. Deciding if suggested observations are suitable, with support. Ordering a simple method.		Beginning to select from options which variables will be changed, measured and controlled. Beginning to suggest what observations to make and how long to make them for. Planning a simple method, verbally and in writing. Beginning to write a simple method in numbered steps. Selecting and beginning to decide what simple equipment might be used to aid observations and measurements.		Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. Writing a method including detail about how to ensure control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices.	
Predicting	Beginning to make guesses about what might happen.	Suggesting what might happen, often justifying with personal experience.		Making predictions about what they think will happen by: • Using scientific knowledge and/or personal experience to explain their prediction (because…) • Beginning to consider cause and effect when making predictions, where appropriate. • Predicting a trend by considering how the changing variable will affect the measured variable. (The smoother the surface, the longer the distance the car will travel)		Making increasingly scientific predictions by: • Using previous scientific knowledge and evidence to inform their predictions. • Using scientific language to describe a potential outcome or explain why they think something will happen. • Making links between topics to evidence a prediction.	

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Progression of skills

Working scientifically

	EYFS: Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observing (qualitative data)	Commenting on what they see and hear in the natural world.	Using their senses to describe, in simple terms, what they notice or what has changed.		Using their senses to describe, in more detail and with simple scientific vocabulary, what they notice or what has changed.		Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed.	
Measuring (quantitative data)	N/A	Using non-standard units to measure and compare. Beginning to use standard units and read simple scales to measure and compare. Beginning to use simple measuring equipment to make approximate measurements.		Using standard units to measure and compare. Using measuring equipment with increasing accuracy. Reading scales with unmarked intervals between numbers.		Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers.	
Researching	Recognising that information can be found online and in books.	Gathering specific information from one simplified, specified source.		Gathering specific information from a variety of sources.		Gathering answers to open-ended questions from a variety of sources.	
Recording (diagrams)	Drawing and labelling pictures of plants and animals.	Drawing and labelling simple diagrams.		Beginning to draw more scientific diagrams by: • Using some standard symbols. • Drawing in 2D to produce simple line diagrams. • Labelling with more scientific vocabulary.		Drawing 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.	
Recording (tables)	Recognising that tables can be used to record information.	Using a prepared table to record results including: • Numbers. • Simple observations. • Tally frequency.		Using a prepared table to record results including more detailed observations. Using tables with more than two columns. Identifying and adding headings to tables. Beginning to design simple results tables.		Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average.	
Grouping and classifying	Grouping objects, plants and animals with support.	Grouping based on visible characteristics. Organising questions to create a simple classification key.		Grouping based on visible characteristics and measurable properties. Populating a pre-prepared branching and number key. Choosing appropriate questions for classification keys.		Grouping in a broader range of contexts. Organising the layout of number and branching keys. Formulating appropriate questions for classification keys.	

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Progression of skills

Working scientifically

	EYFS: Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Graphing	N/A	Representing data using pictograms and block graphs.		Representing data using bar charts. Drawing bars with greater accuracy. Reading the value of bars with greater accuracy.		Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy.	
Analysing and drawing conclusions	Describing their discoveries when working practically.	Using their results to answer simple questions. Beginning to recognise when results or observations do not match their predictions.		Writing a conclusion to summarise findings using simple scientific vocabulary. Beginning to suggest how one variable may have affected another. Beginning to quote results as evidence of relationships. Identifying data that does not fit a pattern (anomalous data). Recognising when results or observations do not match their predictions. Beginning to use identified patterns to predict new values or trends.		Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends.	
Evaluating	N/A	N/A		Beginning to identify steps in the method that need changing and suggest improvements. Beginning to identify which variables were difficult to control and suggesting how to better control them. Commenting on the degree of trust by reflecting on: • Results that do not fit a pattern (anomalies). • The quality of results (accurate measurements and maintaining control variables). Beginning to identify new questions that would further the enquiry.		Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better. Commenting on the degree of trust by also reflecting on: • Accuracy (human error with equipment). • Reliability (repeating results). • Sources of information (e.g. websites, books). Posing new questions in response to the data that would extend the enquiry. Deciding what data to collect to further test direct relationships.	

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Progression of knowledge

Science in Action

EYFS: Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To know some different job roles.	To know about famous scientists throughout history. To know about a range of jobs and careers that use scientific knowledge and methods. To know about the work of modern-day scientists. To know about science in the news and recent discoveries. To know there are spiritual, moral, social and cultural links with Science.					
			To know about the methods and equipment used by scientists throughout history and how these have led to modern methods. To know how scientific knowledge has changed over time, leading to the current understanding of Science. To know about current scientific research and what it aims to achieve in the future. To know that collaboration and peer reviewing is essential for effective scientific progress.		
					To know how scientific evidence is used to support or refute ideas or arguments. To know that mistakes can lead to new discoveries.	

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What are the big concepts and when are they taught?	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	Forces & magnets	Rocks	Animals (Nutrition & Skeleton/Muscles)	Light	Plants	Plants
Enquiry Skills	Identifying, Classifying and Grouping, Research, Observing Over Time, Comparative and Fair Testing, Pattern Seeking					
Working Scientifically Skill	Asking Questions, Observing, Measuring, Gathering and Recording, Comparative and Fair Testing, Presenting, Interpreting, Concluding, Predicting, Evaluating					
Year 4	Electricity	States of Matter	Living Things (Classifying Living Things & Habitats)	Sound	Animals (Digestion & Teeth)	Animals (Digestion & Teeth)
Enquiry Skills	Identifying, Classifying and Grouping, Research, Observing Over Time, Comparative and Fair Testing, Pattern Seeking					
Working Scientifically Skill	Asking Questions, Observing, Measuring, Gathering and Recording, Comparative and Fair Testing, Presenting, Interpreting, Concluding, Predicting, Evaluating					
Year 5	Properties & changes of material	Forces	Living Things (Life Cycles)	Animals (Growing Up & Puberty)	Space	Space
Enquiry Skills	Identifying, Classifying and Grouping, Research, Observing Over Time, Comparative and Fair Testing, Pattern Seeking					
Working Scientifically Skill	Asking Questions, Observing, Measuring, Gathering and Recording, Comparative and Fair Testing, Presenting, Interpreting, Concluding, Predicting, Evaluating					
Year 6	Livings Things (Classifying Living Things)	Light	Evolution & Inheritance	Evolution & Inheritance	Electricity	Animals (Circulation & Impacts on the Human Body)
Enquiry Skills	Identifying, Classifying and Grouping, Research, Observing Over Time, Comparative and Fair Testing, Pattern Seeking					
Working Scientifically Skill	Asking Questions, Observing, Measuring, Gathering and Recording, Comparative and Fair Testing, Presenting, Interpreting, Concluding, Predicting, Evaluating					

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Science Curriculum

Led by: Sam James

<table>
<tr><td colspan="2">Year 3</td></tr>
<tr><td>Autumn 1 – Forces and Magnets</td><td>Autumn 2 - Rocks</td></tr>
<tr><td>Sticky Knowledge

A. I can identify examples of pushes, pulls and twists
B. I can define a force including describing, naming and classifying contact and non-contact forces
C. I can describe the relationship between friction and the roughness of a surface
D. I can identify examples of when friction is useful and when it is not
E. I can predict attraction and repulsion between like and opposite poles
F. I can identify examples of magnetic and non-magnetic materials
G. I can describe some examples of the uses of magnets.
Working Scientifically Skills:
1) I can use arrows and scientific vocabulary to show the direction of a contact force
2) I can use evidence to support conclusions
3) I can identify a variable to change, to measure and to control
4) I can classify materials based on whether they are magnetic or not</td><td>Sticky Knowledge

A. I can define the term rock.
B. I can describe the appearance of different rocks, identifying both crystals and grains.
C. I ca group rocks by their absorbency, hardness and reaction to acid rain (vinegar).
D. I can list the different factors that break down rocks.
E. I can describe fossil formation and identify fossils in rocks.
F. I can describe the work of a palaeontologist.
G. I can name, describe and compare some different categories of soil.
H. I can list some of the benefits of earthworms to the soil.
I. I can identify and describe the comparative size and weight of the layers in a sedimentation jar.
Working Scientifically Skills:
1) I can begin to select what simple equipment might be used to aid observations and measurements.
2) I can group based on visible characteristics and measurable properties.
3) I can research and present information using a single source.
4) I can use a model of the fossil record to determine the relative age of a fossil, to suggest how a living thing has changed over time and to suggest what living things were around in a certain era.
5) I can represent data using bar charts.
6) I can begin to draw more scientific diagrams using some standard symbols, drawing in 2D to produce simple line diagrams and labelling with more scientific vocabulary</td></tr>
<tr><td>Spring 1</td><td>Spring 2</td></tr>
<tr><td>•</td><td>•</td></tr>
<tr><td colspan="2">Summer 1 & Summer 2</td></tr>
</table>

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Year 4	
Autumn 1 - Electricity	Autumn 2 – States of Matter
Sticky Knowledge A. I can recall a range of electrical appliances and classify them as mains or battery powered. B. I can identify symbols for bulb, battery, motor, open and closed switches. C. I can identify a simple circuit and a series circuit. D. I can explain how to test if a circuit works and identify when simple electric circuits will work. E. I can predict whether a circuit will work based on whether the switch is open or closed. F. I can describe a material that is a good electrical conductor and a good electrical insulator. G. I know that metals are good electrical conductors and plastics are good electrical insulators. H. I can explain that adding another bulb to a series circuit will make the bulbs dimmer as less energy is transferred. I. I can give examples of different ways to say safe around electrical circuits. **Working Scientifically** 1. I can draw a table and correctly complete it by classifying electrical appliances. 2. I can identify and draw electric circuit symbols and use these to draw a complete circuit. 3. I can write the method for an investigation that considers equipment and safety. 4. I can pose questions relating to bulbs in a circuit. • I can explain why a question is a good question to test.	**Sticky Knowledge** A. I can identify the states of solids, liquids and gases using their properties. B. I can describe melting, freezing, condensing and evaporating. C. I can describe the different stages of the water cycle. D. I can describe how temperature affects the rate of evaporation and, therefore, the water cycle. **Working Scientifically** 1. I can ask relevant questions. 2. I can use results to draw simple conclusions. 3. I can use thermometers to take accurate measurements. 4. I can make predictions for new values. 5. I can record findings using labelled diagrams. 6. I can Research using more than one source.

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Spring 1	Spring 2
•	•
Summer 1 & Summer 2	
•	

Year 5	
Autumn 1 – Properties and Changes of Materials	Autumn 2 – Forces – Unbalanced Forces
Sticky Knowledge A. I can determine the hardness of different materials and link this to their uses. B. I can determine the transparency of different materials and link this to their uses. C. I can determine the thermal and electrical conductivity of different materials and link this to their uses. D. I can demonstrate reversible and irreversible changes. E. I can identify and describe reversible and irreversible changes. **Working Scientifically:** 1. I can plan and draw a table of results. 2. I can write a detailed, organised and easy to follow method. 3. I can write a prediction using what I already know to support me. 4. I can analyse observations about rusting and use them to write a conclusion. 5. I can measure accurately.	**Sticky Knowledge** A. I can describe gravity and its effects. B. I can describe the relationship between mass and gravity. C. I can describe air resistance and its effects. D. I can describe friction and its effects. E. I can describe water resistance and its effects. F. I can describe the relationship between surface area and air and water resistance. G. I can explain how to make an object aerodynamic or streamlined. H. I can describe the effects of levers, pulleys and simple machines on movement. **Working Scientifically:** 1. I can analyse predictions, data and anomalies to write a conclusion. 2. I can plan a fair test to investigate air resistance. 3. I can write a method. 4. I can evaluate a method and judge the degree of trust. 5. I can design a results table. 6. I can calculate the mean average from repeat data. 7. I can draw and annotate a diagram. 8. I can draw an accurate line graph.

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Spring 1	Spring 2
•	
Summer 1 & Summer 2	
•	

Year 6 –	
Autumn 1 - Living Things – Classifying Living Things	Autumn 2 - Light
Sticky Knowledge A. I can define the term 'organism'. B. I can describe the work of Carl Linnaeus. C. I can explain and name the seven life processes of all living things. D. I can define the terms 'vertebrate' and 'invertebrate'. E. I can describe the characteristics of fish, amphibians, reptiles, birds and mammals F. I can compare the characteristics of different vertebrates and invertebrates. G. I can name the plant groups H. I can describe the characteristics of flowering plants, ferns, mosses and conifers. I. I can define the term 'micro-organism' and name some examples. Working Scientifically 1) I can use a classification key to group and identify organisms. 2 I can make a simple classification key	**Sticky Knowledge** A. I can compare sources of light and explain how the eye is protected from light. B. I can describe how light travels and how we see luminous and non-luminous objects. C. I can recall factors that affect the size of a shadow and describe how the distance between an object and the surface its shadow is cast on affects the size of the shadow. D. I can use ray diagrams to explain why shadows change size and why the shape of a shadow matches the object that was cast. E. I can recall what happens to light when it reaches a smooth mirror surface. F. I can identify the incoming and reflected rays and describe the relationship between their angles. G. I can use mirrors to make a working periscope and explain how a periscope works using ray diagrams. H. I can recall a range of uses of mirrors and reflection, describe how a mirror reflects light in different situations and explain how light is reflected using knowledge of light and reflection. **Working Scientifically:** 1. I can make observations about the properties of light.

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	2. I can use my observations as evidence to support conclusions about light. 3. I can draw ray diagrams. 4. I can pose testable questions in response to observations. 5. I can record my measurements as a line graph. 6. I can use my line graph to extrapolate data and make predictions about missing values. 7. I can recall various jobs or inventions that use mirrors and reflection.
Spring 1 & Spring 2	
•	
Summer 1	Summer 2
•	•