SCIENCE CYCLE B
To be taught 1.5 hours (KS1) and 2 hours (KS2) weekly

	AUTUMN	SPRING	SUMMER
EYFS	**Working scientifically:** to feel confident to answer simple questions about observable properties of objects and people, animals and plants around them; to compare objects in their environment and talk about similarities and differences; to ask questions about the world around them and seek to find their own answers. **Plants:** to know what a plant is; to know what a flower is; to know where you see plants; to describe different plants and flowers. **Animals including humans:** to know what an animal is; to recognise and name a variety of different animals; to know the names of different body parts of humans and animals they have experience of. **Everyday materials:** to recognise that different everyday objects are made from different materials; to describe how different objects look and feel. **Seasonal change:** to know about different types of weather; to observe changes in trees and plants as the seasons progress.		
	• Can you describe the change in living things? • Can you describe the changes you see in Autumn? • Can you name the seasons?	• Can you comment on observations you have made in the change in living things? (changes in the leaves, weather and seasons) • Can you explain what nocturnal animals are and give examples?Can you explain different environments and habitats? • Can you observe and comment on the change in living things? (changes in the leaves, weather and seasons) • Can you explore the world around you and see how it changes as we enter Summer? • Do you have curiosity to touch, smell and hear the natural world around you through hands-on experiences?	• Can you observe life cycles (chicks and plants) through observations, first hand experiences and non-fiction texts? • Can you list the changes you have made yourself and your developmental changes (height, motor skills etc)? • Can you comment on the change in living things (changes in the leaves, weather and seasons)? • Can you make healthy food choices and do you understand where your food comes from? • Do you understand how different materials can be waterproof, float, magnetic (floating, sinking, boat building, metallic, non-metallic objects)?

YEAR 1/2	ANIMALS INCLULDING HUMANS Y1 **BIOLOGY** **Big Question: How can animals be grouped? Can I name parts of the human body?**	ANIMALS INCLUDING HUMANS Y2 **BIOLOGY** **Big Question: How can living things stay healthy? What do living things need to survive?**	PLANTS Y1 **BIOLOGY** **Big Question: Can I name and group common plants and trees and name their parts?**
	PRIOR LEARNING: EYFS what development changes have the children experienced; nocturnal animals NEXT STEPS: Living things and their habitats Y2; living things and their habitats Y6	PRIOR LEARNING: EYFS making healthy food choices and understanding where their food comes from; how we can look after the natural world around us; Y1/2 Animals including humans Y1 NEXT STEPS: Animals including humans Y3; Living things and their habitats Y5; Animals including humans Y6	PRIOR LEARNING: EYFS plants and exploring food; gardening; changes in living things – changes in leaves over seasons NEXT STEPS: Plants Y2; Living things and their habitats Y2; Plants Y3
	NOTE • pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat • they should understand how to take care of animals taken from their local environment and the need to return them safely after study	**NOTE** • They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs. • The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult.	**NOTES** • Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. Where possible, they should observe the growth of flowers and vegetables that they have planted. • They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem).
	WORKING SCIENTIFICALLY • using their observations to compare and contrast animals at first hand or through	**WORKING SCIENTIFICALLY** • observing, through video or first-hand observation and measurement, how different animals, including humans, grow	**WORKING SCIENTIFICALLY** • observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants

	videos and photographs, describing how they identify and group them • grouping animals according to what they eat • and using their senses to compare different textures, sounds and smells	• asking questions about what things animals need for survival and what humans need to stay healthy • and suggesting ways to find answers to their questions	• describing how they were able to identify and group them, • drawing diagrams showing the parts of different plants including trees. • pupils might keep records of how plants have changed over time, for example, the leaves falling off trees and buds opening • and compare and contrast what they have found out about different plants.
	VOCABULARY: common animals (fish, amphibians, reptiles, birds, mammals, pets), omnivores (meat and plants, badger, human, bear, chicken), carnivores (meat, cat, dog, lion, tiger, fox, shark, killer, whale, eagle, hawk, snake, tyrannosaurus rex), herbivores (plants, cows, horses, mice, elephants, deer), senses (tongue, taste, nose, smell, eyes, vision, skin, touch, ears, hearing), head, arms, elbows, leg, knees, face, ears, eyes, hair, mouth, teeth	**VOCABULARY:** common animals (fish, amphibians, reptiles, birds, mammals, pets), omnivores (meat and plants, badger, human, bear, chicken), carnivores (meat, cat, dog, lion, tiger, fox, shark, killer, whale, eagle, hawk, snake, tyrannosaurus rex), herbivores (plants, cows, horses, mice, elephants, deer), senses (tongue, taste, nose, smell, eyes, vision, skin, touch, ears, hearing), head, arms, elbows, leg, knees, face, ears, eyes, hair, mouth, teeth	**VOCABULARY:** common plants (wild plants, garden plants, deciduous, evergreen), tree (trunk, branches, leaf, root), plant (leaves, bud, flowers, blossom, petals, root, stem), fruit, vegetables, bulb, seed
	POSSIBLE SCIENTISTS TO RESEARCH: Miller Hutchinson (first electric hearing aid) Tanesha Allen (Zoologist studying badgers)	**POSSIBLE SCIENTISTS TO RESEARCH:** Florence Nightingale (founder of modern nursing) Dr Kelly Blacklock (Vet)	**POSSIBLE SCIENTISTS TO RESEARCH:** Maria Sibylla Merian (illustrator)
	NATIONAL OBJECTIVES Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (including those that are kept as pets) Identify and name a variety of common animals that are carnivores, herbivores and omnivores	**ENQUIRY QUESTIONS:** 1. **Do animals including humans have offspring which grow into adults?** (NC Objective: Notice that animals, including humans, have offspring which grow into adults) 2. **What are the basic needs that animals need for survival?** (NC Objective: Find out about	**ENQUIRY QUESTIONS:** 1. **What are the parts of a plant?** (NC Objective: Identify and describe the basic structure of a variety of common flowering plants, including trees) 2. **Can you name a variety of garden and wild plants?** (NC Objective: Identify and name a

	Identify and name a variety of common animals that are carnivores, herbivores and omnivores) Identify and name a variety of common animals that are carnivores, herbivores and omnivores) 1. **Can I describe and compare the structure of common animals?** (NC Objective: Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 2. **What are the names of the basic parts of the human body? Please note that this is also covered in detail in the PSHE objectives in the Autumn term** (NC Objective: Identify, name, draw and label basic parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes; and say which part of the body is associated with each sense)	and describe the basic needs of animals, including humans, for survival (water, food and air)) 3. **What are the basic needs that humans need for survival?** (NC Objective: Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)) 4. **Why is exercise important?** (NC Objective: Describe the importance for humans of exercise, eating the right amounts of different types of food (nutrition), and hygiene) 5. **Why is hygiene important?** (NC Objective: Describe the importance for humans of exercise, eating the right amounts of different types of food (nutrition), and hygiene) 6. **Why do we need to eat the right amounts of different types of food?** (NC Objective: Describe the importance for humans of exercise, eating the right amounts of different types of food (nutrition), and hygiene)	variety of common wild and garden plants, including deciduous and evergreen trees) 3. **Can you name a variety of trees?** (NC Objective: Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees) 4. **Can you name a variety of fruit and vegetable plants?** (NC Objective: Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees) **PLANTS Y2** **BIOLOGY** BIG QUESTION: What do plants need to grow? Can I explain the life cycle of a plant? PRIOR LEARNING: Plants Y1 NEXT STEPS: Living things and their habitats Y2; Plants Y3 **NOTES** • Pupils should use the local environment throughout the year to observe how plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants. • Note: seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them.

			WORKING SCIENTIFICALLY • observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb • or observing similar plants at different stages of growth • setting up a comparative test to show that plants need light and water to stay healthy
			VOCABULARY: common plants (wild plants, garden plants, deciduous, evergreen), tree (trunk, branches, leaf, root), plant (leaves, bud, flowers, blossom, petals, root, stem), fruit, vegetables, bulb, seed
			POSSIBLE SCIENTISTS TO RESEARCH: Maria Sibylla Merian (illustrator)
			ENQUIRY QUESTIONS: 1. **What do plants need to grow?** *(NC Objective: find out and describe how plants need water, light and a suitable temperature to grow and stay healthy)* 2. **What's inside a seed?** *(NC Objective: observe and describe how seeds and bulbs grow into mature plants)* 3. **What is the life cycle of a plant?** *(NC Objective: observe and describe how seeds and bulbs grow into mature plants)* 4. **What do plants need to stay healthy?** *(NC Objective: find out and describe how plants need water, light and a suitable temperature to grow and stay healthy)* 5. **How do plants grow in hot, cold or dry places?** *(NC Objective: find out and describe*

			how plants need water, light and a suitable temperature to grow and stay healthy)
YEAR 3/4	**ELECTRICITY Y4** **PHYSICS** **BIG QUESTION: Can we control electricity?**	**LIVING THINGS AND THEIR HABITATS Y4** **BIOLOGY** **BIG QUESTIONS: Are living things in danger?**	**PLANTS Y3** **BIOLOGY** **BIG QUESTION: Can living things live forever?**
	PRIOR LEARNING: EYFS NEXT STEPS: Electricity Y6	PRIOR LEARNING: Plants Y1; Animals including humans Y1; Living things and their habitats Y2 NEXT STEPS: Living things and their habitats Y5; Living things and their habitats Y6	PRIOR LEARNING: Plants Y2 NEXT STEPS: Living things and their habitats Y5; Biology KS3
	NOTE • Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. • Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. • pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. • Pupils should be taught about precautions for working safely with electricity	**NOTE** • Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. • They should identify how the habitat changes throughout the year. • Pupils should explore possible ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. • Pupils could begin to put vertebrate animals into groups, for example: fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. • plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, for example ferns and mosses.	**NOTE** • Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. • Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens

		Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation	
	WORKING SCIENTIFICALLY • observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit	**WORKING SCIENTIFICALLY** • using and making simple guides or keys to explore and identify local plants and animals • making a guide to local living things • raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched	**WORKING SCIENTIFICALLY** • comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser • discovering how seeds are formed by observing the different stages of plant life cycles over a period of time • looking for patterns in the structure of fruits that relate to how the seeds are dispersed • they might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers
	VOCABULARY: applicances, electricity, electrical circuit, cell, wire, bulb, buzzer, danger, electrical safety, sign, insulators (wood, rubber, plastic, glass), conductors (metal, water), switch (open, closed)	**VOCABULARY:** environment, plants (flowering, grasses, non-flowering, mosses, ferns), animals, vertebrate (fish, amphibians, reptiles, birds, mammals), invertebrate (snails, slugs, worms, spiders, insects), human impact, positive (nature reserves, ecologically planned parks, garden ponds), negative (population, development, litter, deforestation)	**VOCABULARY:** tree (deciduous, evergreen, trunk, branches, leaf, root), plant (leaf, root, leaves, bud, flowers, blossom, petals, root, stem), fruit, vegetables, bulb, seed, water, light, suitable, temperature, grow, healthy, germination, reproduction, function (nutrition, support, requirements (light, growth, air, water, nutrients, needs, fertiliser), life cycle (pollination, seed formation, seed dispersal
	POSSIBLE SCIENTISTS TO RESEARCH: Thomas Edison (inventor of light bulb) Lewis Howard Latimer (invented street lighting)	**POSSIBLE SCIENTISTS TO RESEARCH:** Jacques Cousteau (oceanographer) Liz Bonnin (TV presenter and conservationist)	**POSSIBLE SCIENTISTS TO RESEARCH:** Jan Ingenhousz (discovered photosynthesis)

			Dr Kelsey Byers (expert on how flower smells work)
	ENQUIRY QUESTIONS: 1. **Which common appliances run on electricity?** *(NC Objective: identify common appliances that run on electricity)* 2. **What are the basic parts of a simple series electrical circuit?** *(NC Objective: construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers)* 3. **How do you create a simple device using your circuit? How can my circuit be drawn on paper as a picture diagram?** *(NC Objective: construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers)* 4. **What will my circuit need to look like for a lamp to light up or not?** *(NC Objective: identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery)* 5. **What purpose does a switch have? What affect does a switch have to a bulb in a circuit?** *(NC Objective: recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit)* 6. **What is a conductor? What is an insulator? Why do metals make good conductors?** *(NC*	**ENQUIRY QUESTIONS:** 1. **How many ways can living things be grouped?** *(NC Objective: recognise that living things can be grouped in a variety of ways)* 2. **How can we group a wide selection of living things (animals, flowering plants, and non-flowering plants)?** *(NC Objective: recognise that living things can be grouped in a variety of ways)* 3. **How can we use classification keys to help group, identify and name a variety of living things in our environment?** *(NC Objective: explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment)* 4. **How can we put vertebrates into groups?** *(NC Objective: explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment)* 5. **How can environments change over time? How can these changes be dangerous to living things?** *(NC Objective: recognise that environments can change and that this can sometimes pose dangers to living things)* 6. **What do we know about the positive effects of nature reserves and garden ponds? What do we know about the negative effects of litter and deforestation?** *(NC Objective: recognise that environments can change and*	**ENQUIRY QUESTIONS:** 1. **What are the functions of different parts of flowering plants?** *(NC Objective: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers)* 2. **How do we know that every part of the plant has a job to do?** *(NC Objective: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers)* 3. **What questions could we answer about how plants receive nutrition, are supported and reproduce?** *(NC Objective: identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers)* 4. **What do plants need for life and growth? How are these different from plant to plant?** *(NC Objective: 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)* 5. **How is water transported within plants?** *(NC Objective: investigate the way in which water is transported within plants* 6. **What part do flowers play in the life cycle of flowering plants? What do we know about pollination, seed formation and seed dispersal?** *(NC Objective: explore the part*

	Objective: recognise some common conductors and insulators, and associate metals with being good conductors)	*that this can sometimes pose dangers to living things)*	*that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal)*
		ANIMALS INCLUDING HUMANS (Y4) **BIOLOGY** BIG QUESTION: What do our bodies do with the food that we eat?	**FORCES AND MAGNETS (Y3)** **PHYSICS** BIG QUESTION: What can magnets do?
		PRIOR LEARNING: Animals including humans Y1; Animals including humans Y2; Animals including humans Y3 NEXT STEPS: Animals including humans Y6;	PRIOR LEARNING: Uses of everyday materials Y2 NEXT STEPS: Forces Y5; Physics KS3
		NOTE Pupils should be introduced to the main body parts associated with the digestive system, for example: mouth, tongue, teeth, oesophagus, stomach, and small and large intestine, and explore questions that help them to understand their special functions	**NOTE** • Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). • They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe).
		WORKING SCIENTIFICALLY • comparing the teeth of carnivores and herbivores and suggesting reasons for differences • finding out what damages teeth and how to look after them • draw and discuss their ideas about the digestive system and compare them with models or images	**WORKING SCIENTIFICALLY** • comparing how different things move and grouping them • raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions • exploring the strengths of different magnets and finding a fair way to compare them • sorting materials into those that are magnetic and those that are not

			• looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another • identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets
		VOCABULARY: nutrition, nutrients, carbohydrates, protein, fats, fibre, water, vitamins, minerals, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic, skeleton, vertebrate, invertebrate, contract, relax, muscles, ball joint, socket joint, hinge joint, sliding joint	**VOCABULARY:** force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, North, South
		POSSIBLE SCIENTISTS TO RESEARCH: William Beaumont (digestive system) Washington and Lucius Sheffield (toothpaste tube)	**POSSIBLE SCIENTISTS TO RESEARCH:** William Gilbert (theory of magnetism) Eric Laithwaite (Maglev train)
		ENQUIRY QUESTIONS: **1. What are the basic parts of the digestive system in humans?** *(NC Objectives: describe the simple functions of the basic parts of the digestive system in humans)* **2. What are the functions of these basic parts?** *(NC Objectives: describe the simple functions of the basic parts of the digestive system in humans)* **3. What are the different types of human teeth?** *(NC Objectives: identify the different types of teeth in humans and their simple functions)*	**ENQUIRY QUESTIONS:** 1. **How do different surfaces affect how things move?** *(NC Objective: compare how things move on different surfaces)* 2. **Do magnetic forces need contact between two objects in order to act?** *(NC Objective: notice that some forces need contact between 2 objects, but magnetic forces can act at a distance)* 3. **How do magnets attract or repel each other? Why do magnets attract some materials and not others?** *(NC Objective: observe how magnets attract or repel each other and attract some materials and not others)*

		4. What are the functions of the different types of human teeth? *(NC Objectives: identify the different types of teeth in humans and their simple functions)* **5. How are food chains created?** *(NC Objectives: construct and interpret a variety of food chains, identifying producers, predators and prey)* **6. What are producers, predators and prey?** *(NC Objectives: construct and interpret a variety of food chains, identifying producers, predators and prey)*	4. **How do different types of magnets behave?** *(NC Objective: observe how magnets attract or repel each other and attract some materials and not others)* 5. **Can everyday materials be grouped together according to whether they are magnetic or not?** *(NC Objective: compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials)* 6. **What are magnetic poles? How can we predict whether two magnets will attract or repel each other?** *(NC Objective: describe magnets as having 2 poles; predict whether 2 magnets will attract or repel each other, depending on which poles are facing)*
YEAR 5/6	**ELECTRICITY (Y6)** **PHYSICS** BIG QUESTION: Can we vary the effects of electricity?	**LIGHT (Y6)** **PHYSICS** BIG QUESTION: How do we see?	**EARTH AND SPACE (Y5)** **PHYSICS** BIG QUESTION: Sun, Earth and Moon: What is moving?
	PRIOR LEARNING: Electricity Y4 NEXT STEPS: Physics KS3	PRIOR LEARNING: Light Y3; Properties and changes of materials Y5 NEXT STEPS: Physics KS3	PRIOR LEARNING: Seasonal changes Y1 NEXT STEPS: Physics KS3
	NOTE • Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.	**NOTE** • Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection, and shadows. • They should talk about what happens and make predictions.	**NOTE** • Pupils should be introduced to a model of the sun and Earth that enables them to explain day and night. • Pupils should learn that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars,

	• They should learn how to represent a simple circuit in a diagram using recognised symbols. • Pupils are expected to learn only about series circuits, not parallel circuits. • Pupils should be taught to take the necessary precautions for working safely with electricity.		Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). • They should understand that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones). ***Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses.***
	WORKING SCIENTIFICALLY • systematically identifying the effect of changing one component at a time in a circuit • designing and making a set of traffic lights, a burglar alarm or some other useful circuit	**WORKING SCIENTIFICALLY** • deciding where to place rear-view mirrors on cars • designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works • investigate the relationship between light sources, objects and shadows by using shadow puppets • 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)	**WORKING SCIENTIFICALLY** • comparing the time of day at different places on the Earth through internet links and direct communication • creating simple models of the solar system • constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day • finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks
	VOCABULARY: voltage, brightness, volume, switches, danger, series circuit, working safely, sign, circuit diagram, bulb, buzzer, motor, recognised, symbol	**VOCABULARY:** light, travels, straight, reflect, reflection, light source, rainbow, filters, mirrors, periscope, object, shadows, opaque, translucent, transparent	**VOCABULARY:** Earth, Sun, Moon, moons, planets, stars, solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, rotate, day, night, Aristotle, Ptolemy, Galileo, Copernicus, Brahe, Alhazen, orbit, axis, spherical, heliocentric, geocentric, hemisphere, season, tilt

	POSSIBLE SCIENTISTS TO RESEARCH: Nicola Tesla (xrays, neon lights, robotics) Alessandro Volta (electric battery)	**POSSIBLE SCIENTISTS TO RESEARCH:** Euclid (discovered light travels in straight lines) Colin Webb (professor of Laser Physics)	**POSSIBLE SCIENTISTS TO RESEARCH:** Ptolemy (astronomer) Galileo Galilei (discovered Neptune) Stephen Hawking (developed Big Bang theory) Mae Jemison (first black woman in space)
	ENQUIRY QUESTIONS: **1. How can we use our work in Year 4 on circuits to answer questions about how different components work?** *(NC Objective: 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)* **2. How are components represented in a simple circuit diagram?** *(NC Objective: use recognised symbols when representing a simple circuit in a diagram)* **3. Does the number and voltage of cells used in a circuit determine the brightness of a lamp or the volume of a buzzer?** *(NC Objective: associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit)* **4. What could be the reason for the difference in brightness in bulbs; the difference in the loudness of buzzers?** *(NC Objective: associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit)* **5. What could be the reason for the difference in the on/off position of switches?** *(NC Objective: compare and give reasons for variations in how components function,*	**ENQUIRY QUESTIONS:** **1. How do we see things?** *(NC Objective: use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye; explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes)* **2. How do our eyes work?** *(NC Objective: explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes)* **3. How can light be reflected or refracted?** *(NC Objective: recognise that light appears to travel in straight lines)* **4. How does a prism change a ray of light?** *(NC Objective: recognise that light appears to travel in straight lines)* **5. How does light enable us to see colours?** use *(NC Objective: the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye)* **6. Why do shadows have the same shape as the objects that cast them?** *(NC Objective: use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them)*	**ENQUIRY QUESTIONS:** 1. **Which star is the centre of our solar system? How many planets are in our solar system?** *(NC Objective: describe the movement of the Earth and other planets relative to the sun in the solar system)* 2. **How does the Earth move relative to the Sun in the solar system? How do the other planets move relative to the Sun in the solar system?** *(NC Objective: describe the movement of the Earth and other planets relative to the sun in the solar system)* 3. **What is the moon? How does the Moon move relative to the Earth?** *(NC Objective: describe the movement of the moon relative to the Earth)* 4. **How do we know that the Sun, Earth and Moon are approximate spherical bodies?** *(NC Objective: describe the sun, Earth and moon as approximately spherical bodies)* 5. **How do we explain day and night and the Sun's apparent movement across the sky?** *(NC Objective: use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky)* 6. **How have ideas about the solar system developed? What are the main models that**

	including the brightness of bulbs, the loudness of buzzers and the on/off position of switches) 6. **Can you draw and problem solve a simple circuit diagram?** *(NC Objective: use recognised symbols when representing a simple circuit in a diagram)*		**describe how the solar system works?** *(NC Objective: describe the movement of the Earth and other planets relative to the sun in the solar system)*
	EVOLUTION AND INHERITANCE (Y6) **BIOLOGY** BIG QUESTION: How do living things change over time and place?		**ANIMALS INCLUDING HUMANS (Y5)** **BIOLOGY** BIG QUESTION: How do our bodies change as we get older?
	PRIOR LEARNING: Living things and their habitats Y2; Animals including humans Y2; Plants Y3; Rocks Y3; Living things and their habitats Y4; Living things and their habitats Y5 NEXT STEPS: Biology KS3		PRIOR LEARNING: Animals including humans Y2 NEXT STEPS: Biology KS3
	NOTE • Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. • They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. • They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how		**NOTE** • Pupils should draw a timeline to indicate stages in the growth and development of humans. • They should learn about the changes experienced in puberty.

	giraffes' necks got longer, or the development of insulating fur on the arctic fox. • Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. • At this stage, pupils are not expected to understand how genes and chromosomes work.		
	WORKING SCIENTIFICALLY • observing and raising questions about local animals and how they are adapted to their environment • comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels • They might analyse the advantages and disadvantages of specific adaptations, such as being on 2 feet rather than 4, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers		**WORKING SCIENTIFICALLY** • researching the gestation periods of other animals and comparing them with humans • by finding out and recording the length and mass of a baby as it grows
	VOCABULARY: evolution, adaptation, inherited traits, adaptive traits, natural selection, inheritance, Charles Darwin, Alfred Wallace, Mary Anning, palaeontologist, DNA, genes, variation, parent, offspring, fossil, environment, habitat, fossilisation, plants, animals, living things, offspring, characteristics		**VOCABULARY:** puberty, life cycle, gestation, growth, reproduce, foetus, baby, fertilisation, toddler, child, teenager, adult, old age, life expectancy, adolescence, adulthood, childhood

	POSSIBLE SCIENTISTS TO RESEARCH: Mary Anning (Fossil hunter) Charles Darwin (theory of evolution) Alfred Wallace (theory of evolution)		**POSSIBLE SCIENTISTS TO RESEARCH:** Virginia Apgar (new born baby assessment) Robert Winston (TV presenter and professor)
	ENQUIRY QUESTIONS: 1. **Building on your work on fossils in Year 3/4, how have living things on Earth changed over time?** (*NC Objective: recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago)* 2. **What information do fossils give us about living things that inhabited the Earth millions of years ago?** *(NC Objective: recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years)* 3. **Why and how do we inherit characteristics from our parents?** *(NC Objective: recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents)* 4. **Why are we similar but not identical to our parents?** *(NC Objective: recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents)* 5. **Why does variation in offspring over time make animals more or less able to survive in particular environments?** *(NC Objective: identify how animals and plants are adapted*		**ENQUIRY QUESTIONS:** 1. **Can you compare the different gestation periods of some animals and humans?** *(NC Objective: describe the changes as humans develop to old age)* 2. **How does a human foetus develop?** *(NC Objective: describe the changes as humans develop to old age)* 3. **How do children develop as they grow older?** *(NC Objective: describe the changes as humans develop to old age)* 4. **What are the changes that occur during puberty? What are the differences in the bodies of men and women?** *(NC Objective: describe the changes as humans develop to old age)* 5. **What are the some of the difficulties faced with old age and how can these be treated?** *(NC Objective: describe the changes as humans develop to old age)* 6. **Can the stages of growth and development of humans be represented in a timeline?** *(NC Objective: describe the changes as humans develop to old age)*

	to suit their environment in different ways and that adaptation may lead to evolution) 6. **How do animals and plants adapt to suit their environment? How does this adaptation lead to evolution?** *(NC Objective: identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution)* 7. **Who was Mary Anning? How did Charles Darwin and Alfred Wallace develop their ideas on evolution?** *(NC Objective: Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution)*		