St Peter's CofE Primary School: Science Long Term Plan

We believe that all are made in the image of God. We seek to ensure that all are valued, valuable and empowered to be the best they can be. We learn from each other, developing our understanding of different cultures to ensure 'life in all its fullness', (John 10:10)
- the golden strand that runs through all our work.

How does our vision impact Science at St Peter's?

Our approach to science focuses on building a deep and connected understanding of the world through carefully sequenced knowledge across biology, chemistry and physics. We prioritise curiosity, enquiry and critical thinking, enabling pupils to ask questions, investigate ideas and draw conclusions using evidence. Through a clear progression of knowledge and vocabulary, pupils revisit and build upon prior learning, developing confidence and independence as scientists. In doing so, we foster a sense of responsibility and respect for the natural world and the impact humans have upon it.

Peace	Hope	Joy
Our science curriculum fosters peace by encouraging thoughtful discussion, collaboration and respect for different ideas, as pupils learn to listen, question and build understanding together.	Through science, pupils develop hope by exploring how knowledge and discovery can solve problems and shape a better future, empowering them to see their potential to make a positive difference.	Science inspires joy through curiosity, exploration and discovery, as pupils experience the excitement of finding things out and deepen their understanding of the world around them.

Science Whole School Curriculum Overview

Biology	Physics	Chemistry

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
EYFS	**Biology:** Animals and Plants **Chemistry:** Objects and Materials **Physics:** Light, Space, Electricity and Movement **Our Changing World:** The Local Environment					
Year 1	Seasons	Human Body and Senses	Naming and Describing Materials	Properties and Uses of Materials	Animals (Vertebrates)	Identifying Plants and their Parts
Year 2	Local Habitats	Choosing Materials	Growing Seeds and Bulbs	Growing Up (Animals and Humans)	Changing Materials	Growing Healthy Plants
Year 3	Rocks, Soils and Fossils	Light and Shadows	Forces: Friction and Magnets	Movement and Nutrition for the Human Body	Flowering Plants and Plant Growth	Flowering Plants: Life Cycles
Year 4	Changes of State	Electricity: Circuits	Human Impact on the Environment	Digestion and Food Chains	Sound	Classification of Plants and Animals
Year 5	Forces and Mechanisms	Properties and Uses of Materials	Earth and Space	Plant and Animal Life	Separating Mixtures and Changing Materials	Human Growth
Year 6	Classification of Living Things	Evolution and Inheritance	What light does	Human Circulation	Electricity: Changing Circuits	Body Health

EYFS Science Curriculum

Characteristics of Effective Learning:

Science within EYFS is planned and delivered through the Characteristics of Effective Teaching and Learning, as set out in the EYFS Statutory Framework (2021). Across the whole science curriculum, children are given opportunities to:

- play and explore by investigating materials, living things, forces and natural phenomena through first-hand experiences
- actively engage in sustained exploration, revisiting learning over time (e.g. seasonal change, growth and environmental observation)
- think critically by developing their own ideas, making connections and beginning to explain what they notice

These characteristics underpin all science learning and ensure that children learn through exploration, enquiry and sustained engagement.

EYFS Statutory Educational Programme: Understanding the World:

The EYFS science curriculum is rooted in the statutory area of Understanding the World, specifically The Natural World. Across the curriculum, children are systematically supported to:

- explore and make sense of the natural world, including plants, animals and their environments
- observe and describe materials and their properties through first-hand experience
- notice patterns, similarities and differences
- understand processes and changes over time, including growth, seasons and environmental change

Learning is designed so that children develop their understanding through direct experience, observation and talk, as required by the EYFS framework.

End of Year Expectations (Early Learning Goals):

The EYFS science curriculum supports children in meeting the Understanding the World: The Natural World Early Learning Goal. By the end of Reception, children will:

- explore the natural world around them, making observations of plants, animals and materials
- describe similarities and differences within the natural world
- understand and talk about processes and changes, including growth and seasonal change

Children will also demonstrate the Characteristics of Effective Learning through curiosity, sustained engagement and the ability to talk about what they have experienced and learned.

Term	Learning Questions	Background Knowledge and Possible Misconceptions	Key Vocabulary	Why This Why Now
Autumn Term 1	Biology: Animals and Plants What am I made of? (Links EYFS Curriculum 'Our Bodies')	The human body is made up of many parts, both small and large, which have a range of important functions. Keeping that body healthy by, for example, exercising, eating healthily, washing regularly and brushing teeth is essential. We only have one! **Children's misconceptions** They may think that we only have 5 senses. They may think that people from different parts of the world are different inside.	human body parts: arm ears eyes face fingers foot hand head leg mouth nose teeth toes	This activity introduces the big biology idea of the different human body systems. These are covered in detail in every year group of Snap Science from Year 1 to Year 6.
	Chemistry: Objects and Materials Who lives here? (Links EYFS Curriculum Our Homes)	Everything around us and that we use is made of some form of material. All materials come from animals or plants, are dissolved in the sea or are mined from the ground. Today some materials are artificially made in commercial chemical plants. Some of these materials are used as they are, and others are altered to make new, manufactured materials. Materials fall into two main categories, natural and manufactured. **Children's misconceptions:** They often think that 'material' only means fabric and that all plastic/wood etc. is the same.	animal homes, e.g. stable, nest, kennel human homes, e.g. house, flat, bungalow, tent, caravan materials to make homes, e.g. brick, wood, concrete, ice, sticks, mud, fabric parts of home, e.g. walls, roof, window, door	This activity introduces the big chemistry idea that there is an enormous range of materials in the world, all with different properties that make them suitable for different purposes. These are covered in detail in every year group from Year 1 to Year 6.
	Our Changing World: The Local Environment What is happening to the trees? (Autumn) (Links EYFS Curriculum Autumn/Senses)	Autumn is considered to take place across September, October and November (the meteorological months of autumn). Summer ends, from an astronomical point of view, around 21 September, the autumn equinox. **Children's misconceptions:** They may think that plants, including trees,	autumn deciduous leaves fruit, e.g. apple, pear, plum seed head, e.g. conker, acorn, sycamore key season winter	This learning takes place during the autumn term and introduces the big biology idea of seasonal change. The activity is linked to 'What is happening to the trees? (Spring)' and 'What is happening to the trees? (Summer)'. This prepares pupils for learning in Year 1 (Seasons).

		are dying as their leaves turn brown and fall to the ground during autumn.		
Autumn Term 2	Chemistry: Objects and Materials What melts? (Links EYFS Curriculum Autumn)	Changes of state occur as a result of heating or cooling. They affect the properties of a substance but not its chemical composition. Water is useful for teaching changes of state because it is familiar to children as ice, water and steam, but they need to understand that the same changes happen when other solids, liquids and gases are heated and cooled. Changes of state are reversible processes; for example, when ice is heated it melts but the resulting water will become ice again if sufficiently cooled. It is not necessary for children to use the words 'solid' and 'liquid' to describe the different states of materials, but it is important for them to recognise that they are different. **Children's misconceptions:** They may think that ice and liquid water (and water vapour) must be different materials, rather than changes of state of water.	chocolate freeze/freezing heat melt/melting warm/cool warmer/cooler water/ice	This learning introduces the big chemistry idea that some materials undergo a reversible change from solid to liquid when heated. This big idea of change of state is developed in Year 4 Module 'Changes in State'.
	Chemistry: Objects and Materials What happens when you mix it? (Links EYFS Curriculum Senses)	Materials behave in different ways when mixed together. Solids may dissolve when mixed with liquids, e.g. sugar, or not dissolve and remain as a suspension, e.g. powder paint. Solids may be mixed together, and a variety of equipment /methods used to separate out the component materials, e.g. rice and peas, sand and pasta, which can be separated using tweezers and/or sieves. **Children's misconceptions:** They often think: • that 'material' only	descriptive language, e.g. soft, slimy, hard, stiff dry materials, e.g. sand, sugar, rice, pasta, oil, water mix mixture wet	This introduces the big chemistry idea that some materials can be mixed together. This big idea of is developed in Year 5 Module 'Separating Mixtures and Changing Materials'.

		means fabric • that all plastic/wood etc. is the same.		
	Chemistry: Objects and Materials What goes through? (Links EYFS Curriculum Senses)	Materials behave in different ways when mixed together. Solids may dissolve when mixed with liquids, e.g. sugar, or not dissolve and remain as a suspension, e.g. powder paint. Solids may be mixed together and a variety of equipment /methods used to separate out the component materials, e.g. rice and peas, sand and pasta, which can be separated using tweezers and/or sieves. **Children's misconceptions:** They may think that material only means fabric.	comparative language, e.g. smaller/bigger/larger grains mix materials, e.g. flour, sand, sugar, rice mixture separate sieve	This learning introduces the big chemistry idea of separating materials. Links can be made to 'What happens when you mix it?'. This big idea of is developed in Year 5 Module 'Separating Mixtures and Changing Materials'.
	Chemistry: Objects and Materials How do you make a good bubble? (Links EYFS Curriculum Senses)	A bubble is a thin film of soapy water filled with air. Water molecules, the smallest unit of water, are attracted to each other by surface tension. Adding washing-up liquid lowers the surface tension, making the surface stretchy and more suitable for blowing bubbles. Adding glycerine makes stronger, longer lasting bubbles. Longer-lasting bubbles will be formed if the mixture is left overnight. Returning to the activity the following day may produce some interesting results. No matter what shape a bubble has initially, it will always become a sphere. **Children's misconceptions:** They may think that bubbles can only be round.	bubble comparative language, e.g. smaller, bigger, longer, higher descriptive language, e.g. float, burst, pop materials mixture mix	This further develops the big chemistry idea about materials mixing together and links to learning in 'What happens when you mix it?'. This big idea of is developed in Year 5 Module 'Separating Mixtures and Changing Materials'.
	Physics: Light, Space, Electricity and Movement What happens at night?	We only see objects when light from a light source is reflected off the object and into our eyes. If there is no light source, it is completely dark and we cannot see. At night, even though it	dark darkness daytime light nighttime stars the Moon the Sun	This learning provides a starting point for developing the big physics ideas about light, dark, night and how we see, which are explored in more detail in Year 3 'Light and Shadows'. It

	(Links EYFS Curriculum Celebrations-light)	may be 'dark', there are still some sources of light in most places where children will be. Therefore, they often think that they can see in the dark. Light sources include the Sun, a flame, a lamp or other electrical device such as a computer and a TV. The Moon, our eyes or shiny objects are not light sources, but are good reflectors of light. If there is no light and it is truly dark, children will not be able to see the items in their hand. However, it is likely that there will be a small amount of light that allows them to see objects that reflect light well, such as shiny or white objects, without the light source. **Children's misconceptions:** They often think: • that light is only found in bright places • that shiny objects are light sources • that they will be able to see in a dark place 'when my eyes get used to it' • that the Moon is a light source.		builds on children's own experiences of nighttime, including their bedtime routines and their knowledge of what and who comes out at night.
Spring Term 3	Chemistry: Objects and Materials Which hat is best to wear today? (Links EYFS Curriculum Winter)	A variety of different materials are used to make hats. Hats have a range of purposes, e.g. sun hats to protect the face from the sun, hard hat to protect a builder from falling masonry. Their suitability to their purpose depends on the properties of the materials concerned, whether they are, e.g. strong, waterproof, insulated, and the structure of the hat itself. **Children's misconceptions:** They may think that 'material' only means fabric.	cap, hood material suitable types of hat, e.g. hard hat, helmet weather, e.g. rain/y, sun/ny, cold, wind/y	This learning links to 'Who lives here?', building on the big chemistry idea that materials have different properties and that choices about how they are used are based on these properties. These are covered in detail in every year group from Year 1 to Year 6.

	Our Changing World: The Local Environment What is the weather like today? (Links EYFS Curriculum Winter)	Weather in this country can vary enormously in any one season (or within any day) and children need to be made aware that. For example, rain can happen in any season and in warm or cold weather, while snow is associated with very cold weather, but can happen (given the right conditions) across the seasons. **Children's misconceptions:** They often think that particular weather only happens in certain seasons, e.g. it is only sunny or hot in summer.	cold freeze frozen season temperature weather, e.g. cloud/y, rain/y, snow/y, fog/gy, wind/y, storm/y winter	This learning takes place in the winter and develops the big biology idea of seasonal change. It is linked to learning later in the year- 'What is the weather like today? (summer)'.
Spring Term 4	Biology: Animals and Plants What is inside an egg? (Links EYFS Curriculum Spring)	Numerous animals reproduce by laying eggs, rather than producing live young. This includes all amphibians, insects, fish and birds, and most reptiles. A female sea turtle lays her eggs by burying them in the sand on a nesting beach, usually in the tropics. She then returns to the sea. Six to eight weeks later the hatchlings emerge from the eggs and make their way to the sea. The hatchlings can spend up to a decade in open waters before returning to the coast. Depending on the species, it can be ten to fifty years before adult female sea turtles migrate to the area where they were born to lay their eggs. They lay several times during a nesting season and then every two to four years over their lifetime. Scientists think that sea turtles could have a life span of up to 100 years. **Children's misconceptions:** They may think: • that all animals lay eggs • that the young animal is fully formed inside an egg and just waiting to hatch.	adult chick / duckling egg hatch hatchling turtle young	Close links can be made with learning later in the year 'Who are my parents?', where some of the same animals can be looked at again in the context of parent and child of the same species. This introduces the big biology idea of life cycles and the scientific skill of observing change over time. These are covered in detail in every year group from Year 1 to Year 6.

	Our Changing World: The Local Environment What is happening to the trees? (Links EYFS Curriculum Spring)	Spring is considered to take place across March, April and May (the meteorological months of spring). Winter ends, from an astronomical point of view, around 21 March, the spring equinox. Bees are important to the pollination process and help trees to produce fruit. It is sufficient at this stage simply to observe that bees are seen around and on flowers in late spring and summer and to know that bees do an important job helping the fruit grow later in the year. **Children's misconceptions:** They often think: • that all young animals are born in spring • that trees without leaves in early spring are dead • that plants only flower in spring and summer.	autumn blossom buds deciduous insect season spring winter	This activity takes place during the spring term and develops the big biology idea of seasonal change. This learning is linked to prior learning 'What is happening to the trees? (Autumn)' and learning later in the year 'What is happening to the trees? (Summer)'. This prepares pupils for learning in Year 1 (Seasons).
	Physics: Light, space, electricity and movement What is the sky? (Links EYFS Curriculum Transport)	When objects move through air, the air pushes against them and slows them down. Objects with greater surface area create more air resistance because they have to push more air out of the way. Unlike most other forces, the effect of air resistance increases as the speed of the object increases, because faster objects crash through the air more violently. When things fall through the air, the weight does not affect the time taken to fall if the surface area is the same. **Children's misconceptions:** They often think that heavy things fall faster than light things.	aeroplane fall/falling float fly/flying sky	This learning explores things that children might see in the sky and introduces the big physics ideas of flight and falling. This prepares children for learning about forces in Years 3 and 5. This activity may prompt ideas correctly linked to outer space, including rockets, astronauts, comets and planets. These can be explored in later learning 'What is the Moon?'.
	Physics: Light, space, electricity and movement	A force is a push, pull or twist that can make an object start moving, speed up, slow down, stop or change	descriptive and comparative language, e.g. fast/faster,	This launches the big physics idea that nothing moves without a force acting upon it. The force will always be a

	What makes it move? (Links EYFS Curriculum Transport)	direction. It takes a larger force to push or pull an object across a surface such as carpet than across ice. This is because the surface material is resisting the movement. This is a force known as friction. **Children's misconceptions:** They may think that an object will only move if they push or pull it.	slow/slower/slowly, quick/quicker/quickly, further/less far force move pull push	push or a pull. These ideas are built on in the Year 3 Module 'The power of forces' and Year 5 Module 'Feel the force'. Children do not need to use the term 'force'. This activity is a good starting point for learning later in the year- 'How does my toy work?' and 'What floats?'.
	Physics: Light, space, electricity and movement How does my toy work? (Links EYFS Curriculum Transport)	A force is a push, pull or twist that can make an object start moving, speed up, slow down, stop or change direction. It takes a larger force to push or pull an object across a surface such as carpet than across ice. This is because the surface material is resisting the movement. This is a force known as friction **Children's misconceptions:** They may think that an object will only move if they push or pull it.	descriptive and comparative language, e.g. forwards, backwards, up/down, fast/slow force move pull push twist	This builds on prior learning 'What makes it move?' where children explored the big physics idea that a push or a pull is required to make something move. In this activity they will also use the word 'twist' to describe a particular type of rotational push. These ideas are built on in the Year 3 Module 'The power of forces' and Year 5 Module 'Feel the force'. Children do not need to use the term 'force'.
	Biology: Animals and Plants Who are my parents? (Links EYFS Curriculum Farms)	All animals have offspring. Sometimes the offspring closely resemble their parents and sometimes they are very different and undergo a metamorphic change, such as a caterpillar into a butterfly. **Children's misconceptions:** They may think that all young animals start life as miniatures of their adult parents. This is not true of animals that go through metamorphosis, e.g. frog, butterfly. They may not recognise animals which lay eggs as animals.	adult animal female infant male names of young animals: calf, puppy, foal, lamb, kid, joey parent young	This will introduce the big ideas about growth, reproduction and variation that children will meet in KS1 and KS2.
Summer Term 5	Our Changing World: The local environment What can I grow for my dinner?	Children learn that plants grow and change over time. They begin to understand that plants need care- such as water, soil and sunlight- to grow. Through hands-on experiences,	flower leaf plant potato root seed stem vegetable	It introduces the big biology idea of plant life cycles, which is revisited in Years 1-6.

	(Links EYFS Curriculum Growing)	children observe what happens when seeds are planted and start to notice simple changes, such as shoots, leaves and flowers appearing. They learn to talk about what they see, using simple vocabulary like root, stem, leaf and flower. Children also begin to understand that food comes from plants, and that fruits and vegetables are grown before we eat them. They explore how these foods can be prepared and which choices are healthy. **Children's misconceptions:** They often think: • that big plants grow from big seeds and big bulbs • that fruits and vegetables come from the supermarket • that plants grow at night or when we are not watching them.		
	Biology: Animals and Plants What does an earthworm do? (Links EYFS Curriculum Minibeasts)	Earthworms are invertebrates and have a tube-like segmented body. They are an important food for other animals, including birds, and play an important part in maintaining the structure of soils. **Children's misconceptions:** They often think: • that worms can regenerate if cut in half • that invertebrates and other 'minibeasts' are not animals.	animal earthworm saddle segments soil	The big biology ideas of classification based on observable features and interdependence, which are developed through KS1 and KS2, are introduced here.
	Biology: Animals and Plants Is all of a plant green? (Links EYFS Curriculum Growing)	Plants, both those found in planted areas and wild plants, vary hugely, with leaves and flowers of different size, shape, colour, texture, arrangement and so on. They have similar simple parts arranged in different ways, e.g. contrast the petals of a pansy and a daffodil, the leaves of a holly and horse chestnut tree.	flower leaf petal root seed stem	This introduces the big biology idea of plant structure and function. Children's interests in plants and growing them may lead to further exploration and investigation, and this would link well with learning later in the year 'What can I grow for my dinner?'

		Children's misconceptions: They may identify wild plants, growing in the wrong place, as weeds. They may not recognise trees or grass as types of plant.		Plants are also covered in detail in every year group of Snap Science from Year 1 to Year 6.
	Biology: Animals and Plants Who has striped? (Links EYFS Curriculum Jungles)	The main focus of this activity is on stripes that help to camouflage animals within their natural environment; however, some stripes, e.g. those on a badger or wasp, indicate their danger zones (teeth, sting) to warn off potential prey and other predators. **Children's misconceptions:** They often think: • animals are furry and have four legs • a bee is not an animal because it is an insect.	camouflage habitat pattern stripes	This will introduce the big biology ideas of habitat and adaptation that they will meet in KS2.
Summer Term 6	Physics: Light, space, electricity and movement What is the moon? (Links EYFS Curriculum Space)	The Moon is in the sky and can be seen at different times. It can appear to change shape over time and that its surface is rocky, with bumps and craters. The Moon is not a light source but can be seen because it reflects light. Astronauts are people who travel into space using rockets and that the Moon is far away from Earth. Space is a very different environment from Earth, where people need special equipment to live and travel. **Children's misconceptions:** They often think: • that the Moon is a light source • that the Moon is made 'of cheese' • that the Moon appears only at night • the Sun is turned off at night • that the Sun goes behind the clouds at night.	astronaut rocket space the Moon's surface, e.g. dry, rocky, rocks, craters	This learning follows on from prior learning earlier in the year- 'What happens at night?' and 'What is in the sky?'. This learning introduces the big physics ideas about Earth and space that are covered in Year 5.

	Physics: Light, space, electricity and movement What floats? (Links EYFS Curriculum Summer-RLNI)	Some objects float on water and stay on the surface, while others sink to the bottom. Whether something floats or sinks can depend on what it is made from, as well as its size and shape. Objects do not always behave in the way you expect, and that changing the shape of an object can affect whether it floats. Different materials and objects behave in different ways when placed in water. **Children's misconceptions:** They often think: • that heavy things always sink (regardless of their shape) • that all light objects float • that objects made of the same material will always float or sink.	float positional language, e.g. up, down, bottom, top, middle, above, below sink surface	The big physics idea that some objects float on the surface of water and that some objects sink are introduced.
	Our Changing World: The Local Environment What is happening to the trees? (Links EYFS Curriculum Summer)	Summer is considered to take place across June, July and August (the meteorological months of summer). Spring ends, from an astronomical point of view, around June 21st, the summer solstice when daylight hours are at their longest. **Children's misconceptions:** They may think that plants only flower in spring and summer. That when it is hotter, it is because the Sun is closer.	buds deciduous flowers fruit season summer	This learning takes place during the summer term and develops the big biology idea of seasonal change. It links to prior learning earlier in the year- 'What is happening to the trees? (autumn)' and 'What is happening to the trees? (spring)'. This prepares pupils for learning in Year 1 (Seasons).
	Our Changing World: The Local Environment What is the weather like today? (Links EYFS Curriculum Summer)	Summer is considered to take place in June, July and August. Weather in this country can vary enormously in any one season (or within any day) and children need to be made aware that. For example, rain can happen in any season and in warm or cold weather, while snow is associated with very cold weather, but can happen (given the right conditions) across the seasons.	cool/er shade season shadow summer Sun sunny warm/er hot/ter weather	This learning takes place in the summer and develops the big biology idea of seasonal change. It is linked to earlier learning 'What is the weather like today? (winter)'. This prepares pupils for learning in Year 1 (Seasons).

		Children's misconceptions: They often think that particular weather only happens in certain seasons, e.g. it is only sunny or hot in summer.		

Year 1 Science Curriculum

Term	National Curriculum Expectations	Key Learning Questions	Associated Substantive Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 1 **Seasons**	**In this module, children will learn to:** - observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies **Working Scientifically:** - observing closely, [using simple equipment] - identifying and classifying - gathering and recording data to help in answering questions	*This Biology module is taught across the year, so that children can observe the impact of the changing seasons on the world around them. Over the year they collate a 'My Seasons Diary'. Children will look closely at one space within their school grounds and return to it regularly throughout the year in order to see what has changed. On each visit there is a different focus, to help them to identify common natural events that happen across the year. The lessons are created to be taught entirely outdoors.* **- Are all leaves the same? (Autumn)** **- Which animals share our space? (autumn)** - Do all trees shed their leaves? (early winter) - Are all flowers the same? (Spring)	- There are different types of weather (rain, sun, wind, fog, snow, cloud). In the summer the sun seems higher in the sky than in the winter. There are four seasons across the year. Each season has its own weather patterns and natural events, which happen each year. - Leaves vary in colour, texture and shape. Leaves can be used to help identify plants. - Different animals have different habitats. In autumn the weather becomes colder, leaves change colour, daylight hours become shorter. - Deciduous leaves change colour in the autumn and fall to the ground. Evergreen trees do not drop their leaves. Winter is the season that comes after autumn. It has the coldest weather of the year. It is less easy to see insects and mammals in winter. - Flowers vary by shape and colour. Different	**Tier 2 Vocabulary:** - compare: to notice how things are the same or different - describe: to use words to tell someone else what something is like; - different: not the same - match: to find another something the same - record (verb): to draw or write what you observed or measured - similar: not exactly the same but very alike - weather: the conditions at a particular time, for example sunny, rainy, windy or snowy **Tier 3 Vocabulary:** - group: to place objects, materials or living things into sets - identify: to know and say what something is, the process of naming something - observe: to look carefully at something, to notice what it is like or how it has changed - berry: a fleshy fruit containing many seeds - bird: an animal that has feathers and lays eggs with hard shells - bud: a growth on a plant that develops into a new leaf, flower or shoot - deciduous: plants which shed their leaves once a year - evergreen: plants which appear to have leaves all year round - flower: the part of a plant which is often coloured other than green - fruit: the part of a plant where seeds develop - insect: small six-legged animal with body in three parts and often with wings - leaf (plural leaves): flat part of the plant which are attached to the stem.	**Children have previously learnt:** - to notice similarities and differences in relation to places, objects, materials and living things - to talk about features of their own immediate environment - to make observations of animals and plants and explain why some things occur and talk about changes (EYFS framework; ELG Understanding the World). **This prepares children for later learning:** - year 2 Biology – Living things and their habitats

		- Which birds visit our bird feeders? (Spring) - How has our space changed over the year? (early summer)	plants flower at different times of the year. There are more flowering plants in the spring and summer. In spring the temperature and the number of daylight hours begin to increase, plants begin to grow and hibernating animals emerge. - There are signs of animals in every school grounds. Different types of birds can be seen at different times of the year. Most insects can be seen in the spring and summer. - Summer is the warmest season of the year. The sun is highest in the sky in the summer. Many flowering plants produce fruits in the summer. Common natural events can be matched to the seasons. For example, leaf buds and blossoms with spring; fruit formation with summer; leaf drop with autumn and animal hibernation with winter. *Children in Year 1 do not need to learn that the Earth's tilt causes the seasons. However, they should be made aware of the apparent position*	- nest: a structure made by an animal for laying eggs and sheltering its young - nut: a dry fruit with a hard shell - petal: the thin coloured or white parts of a plant which form the flower - plant: a living thing that grows in the ground and usually has leaves, stems, and roots - seasons: the four periods into which a year can be divided - seed: a plant part from which a new plant grows - tree: a tall plant that has a hard trunk, branches, and leaves	

			of the sun in the sky and the difference in day length between winter and summer.		
Autumn Term 2 **Human Body and Senses**	**In this module, children will learn to:** - identify, name, draw and label basic parts of the human body and say which part of the body is associated with each sense. **Working Scientifically:** - asking simple questions and recognising that they can be answered in different ways - observing closely, using simple equipment - identifying and classifying - gathering and recording data to help in answering questions	**Seasons Lesson: Do all trees shed their leaves? (early winter)** - Is everyone's body the same? - How can we explore the world using our sense of touch? - What can we hear? - What smells do we like and dislike? - What differences can our tongues taste?	- Humans are mammals and vertebrates. The main parts of the human body are head, arms and hands, torso, and legs and feet. We also have five basic senses which help us to make sense of the world around us. One of these is sight and our eyes give us the capacity to see. Although humans are all the same generally, they vary in, for example, their skin, hair, eye colour, shoe size and fingerprint. - Touch is another human sense which helps us to stay safe. Hands and feet are the most commonly used parts of the body to touch and explore the world around us, but other parts can be used too. - Our ears are the part of our body that hears, and this is another human sense. - The nose is the part of the human body	**Tier 2 Vocabulary:** - texture: how a surface or material feels **Tier 3 Vocabulary:** - classify: to group objects, materials and living things according to similarities in appearance or properties - diagram: a drawing that shows the parts of something or how the parts work together - group: to place (verb) objects, materials or living things into sets - identify: to know and say what something is - pattern: something that happens or appears in a regular and repeated way - rank: to put things in an order - brain: the part of the body which controls thinking and movement - hearing: the sense which enables us to notice sounds - mammal: a warm-blooded animal that is covered in hair or fur. The female gives birth to live young and feeds her babies on milk from her own body - sense: how the body perceives outside changes - sight: the sense which enables us to see - smell: the sense which enables us to notice aromas - taste: the sense which enables us to notice flavours - torso: the central part core of the human body - touch: the sense which enable us to notice what something it feels like	**Human body and senses is a Biology topic building on children's experiences in Early Years.** **Children have previously learnt:** - exploration of the natural world around them (EYFS Framework; ELG The Natural World) - using their senses to observe seasonal change (Year 1 Biology – Seasonal changes) **This prepares children for later learning:** - other human body systems and parts of the human body: skeletal (Year 3 and 4 - Animals including humans - light (Year 3 Physics – Light) and sound (Year 4 Physics – Sound)

			associated with smell, another human sense. - The human sense of taste uses the tongue to detect the flavour of what is in our mouths and can help us decide if we like a food or not. This sense is looked at last in the conceptual order because it is a way to connect other senses together. Taste is supported by the senses of smell, touch and sight.		
Spring Term 3 **<u>Naming and Describing Materials</u>**	**In this module, children will learn to:** - 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 **Working Scientifically:** - observing closely, using simple equipment - performing simple tests - using their observations and ideas to suggest answers to questions	- What material is this? (Part 1 and Part 2) - Is all paper the same? - Is all fabric the same? - How can we group objects made of different materials?	- Everything around us is made from materials. Some materials are natural materials, naturally sourced materials that are used without modification. Some materials are manufactured materials, made by changing naturally sourced materials. Different materials have different properties. Materials should be used carefully and can often be reused or recycled. - Paper is a manufactured material made from wood, which is a natural material. Different types of paper have different properties	**<u>Tier 2 Vocabulary:</u>** - compare: estimate, measure or note the similarity or difference between items - describe: to use words to tell someone else what something is like - different: not the same - record: to draw or write what you observed or measured - similar: not identical but very alike - sort: to arrange things in a particular way - suitable: right for the purpose - use: purpose of something *Adjectives to describe children's sensory explorations of materials' physical properties* **<u>Tier 3 Vocabulary</u>** - observe: to look carefully at something, to notice what it is like or how it has changed. Can involve all senses, not just sight - magnifier: a piece of equipment that makes things look bigger when you look through it - test: to carry out a science enquiry to find something out - absorb/absorbent: to take in fluid	**<u>Children have previously learnt:</u>** - to explore the movement of sand, water and other materials using a variety of equipment such as funnels, sieves and colanders - to choose clothing to suit the day's weather conditions - to explore materials that could be used to build animal and human homes - about changes to some materials, for example, ice and chocolate. **<u>This prepares children for later learning:</u>** - about the observable properties of everyday

			and uses. Some paper can be recycled. - Fabric is a manufactured material which can be made wholly or partly from different source materials and therefore there are different types of fabric with different properties. Different types of fabric have different properties and uses. Fabrics can be made from recycled materials and should be reused or recycled whenever possible. - Objects can be sorted according to their source material, and as natural and manufactured. Objects can be made from more than one material.	- manufactured: a material that has been made into another material by humans - material: the substance something is made of - natural: found in nature; not made by humans - property: what a material is like - recycle: to turn waste materials into new materials and objects - reuse: to use a material or object again - transparent: a material that you can see through **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - classify: to group objects, material and living things according to similarities in appearance or properties - group: to place objects, materials or living things into sets	materials (Year 1 Chemistry – Everyday materials) - about the suitability of a variety of everyday materials for particular uses (Year 2 Chemistry – Uses of everyday materials) - recognising how the shapes of some solid objects can be changed by squashing, bending, twisting and stretching (Year 2 Chemistry –Uses of everyday materials) - distinguishing between things that are living, once living and never lived (Year 2 Biology – Living things and their habitats) - about rocks (Year 3 Chemistry – Rocks) - solids, liquids and gases, and changes of state (Year 4 Chemistry – States of matter).
Spring Term 4 **<u>Properties and Uses of Materials</u>**	**In this module, children will learn to:** - distinguish between an object and the material from which it is made - describe the simple physical properties of a variety of everyday materials - compare and group together a variety of everyday materials on the basis of their simple physical properties	**Seasons Lesson:** **- Are all flowers the same? (Spring)** **- Which birds visit our bird feeders? (Spring)** - Can the same object be made from different materials? - What properties do materials have?	- Objects are made from one or more materials. Objects can be sorted in various ways, including by type of material or function/purpose. Materials should be used carefully, can often be reused and some can be recycled. - Materials have physical properties that make them useful for different purposes.	**<u>Tier 2 Vocabulary:</u>** - compare: to notice how things are the same or different - different: not the same - describe: to use words to tell someone else what something is like - record: to draw or write what you observed or measured - similar: not identical but very alike - sort: to arrange things in a particular way - suitable: right for the purpose - use: purpose of something *Adjectives and comparatives to describe properties of materials.*	**<u>Children have previously learnt:</u>** - to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock and recognise when they have been used to make objects (Year1 Biology – Everyday materials).

	Working Scientifically: - observing closely, [using simple equipment] - performing simple tests - using their observations and ideas to suggest answers to questions - gathering and recording data to help in answering questions	- Does it bend or stretch? - Do all materials get wet?	- Some materials can be bent or stretched, making them useful for particular purposes. - Some materials are absorbent, 'soaking up' liquid on contact and some materials are waterproof, making them useful for particular purposes.	**Tier 3 Vocabulary** - bar chart: a way to show measurement or amount by using bars of different heights - test: to carry out a science enquiry to find something out - bend: to move from a straight to a curved shape - flexible: able to bend easily without breaking - opaque: (a material that) you cannot see through - rigid: unable to bend - waterproof: does not let water pass through it **Children will use the following previously learnt Tier 3 vocabulary:** - group: to place objects, materials or living things into sets - observe: to look carefully at something, to notice what it is like or how it has changed - absorb/absorbent: to take in fluid - manufactured: a material that has been made into another material by humans - material: the substance something is made of - natural: found in nature; not made by humans -property: what a material is like - recycle: to turn waste materials into new materials and objects - reuse: to use a material or object again - transparent: (a material that) you can see through	**This prepares children for later learning:** - about the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (Year 2 Chemistry – Uses of everyday materials) - recognising how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching (Year 2 Chemistry – Uses of everyday materials) - about rocks (Year 3 Chemistry – Rocks), liquids and gases, and changes of state (Year 4 Chemistry – States of matter).
Summer Term 5 **Animals (Vertebrates)**	**In this module, children will learn to:** - 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	- Who's who in the animal (vertebrate) world? - What's so special about birds? - What makes and amphibian and amphibian? - Do fish have fingers?	- There are five vertebrate groups in the animal kingdom: mammals, amphibians, reptiles, birds and fish. Reptiles are one of these, and the things that make them distinct are: eggs, claws, teeth, scaly skin and living on land.	**Tier 2 Vocabulary:** - feature: something that makes a thing special or different - structure: the way that the parts of something are joined together **Tier 3 Vocabulary:** - adult: grown up animal - amphibian: animal, that lives in water or on land but must return to the water to reproduce - carnivore: an animal that only eats other animals	**Children have previously learnt:** - to explore the natural world around them, making observations and drawing pictures of animals (EYFS framework; ELG The Natural World). **This prepares children for later learning:**

	- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) **Working Scientifically:** - observing closely, using simple equipment - using their observations and ideas to suggest answers to questions	- Are humans mammals?	- Birds are vertebrates and the things that make them distinct are: eggs, beaks, claws, wings and feathers. - Amphibians are vertebrates and the things that make them distinct are: eggs, living on land and in water and their diet changing with their stage of life. - Fish are vertebrates and the things that make them distinct are: they lay eggs, they have gills to help them breathe underwater, they have fins and a tail to help them swim, and most fish have scales to protect them. - Mammals are vertebrates and humans are mammals too. The things that make mammals distinct are: hair or fur covering their bodies, giving birth to live young, producing milk for offspring, nurturing offspring, looking like a younger version of their parent and having a range of movement. All vertebrates are either mammals, amphibians, reptiles, birds or fish, but what they eat crosses those groupings. Carnivores,	- diet: the kind of food an animal usually eats - fish: animal that lives in water and has gills and fins - herbivore: an animal that only eats plants - mammal: animal that is covered in hair or fur. The female gives birth to live young and feeds her babies on milk from her own body - omnivore: an animal that eats both plants and other animals - reptile: an animal which has dry, scaly skin and lays eggs on land - vertebrate: an animal that has an internal backbone **Children will use the following previously learnt Tier 3 Vocabulary:** - classify: to group objects according to similarities in appearance or properties - group (verb): to place objects, materials or living things into sets - identify: to know and say what something is - bird: animal that has feathers and lays eggs with hard shells *Some commonly used words have specific scientific usage in this module, for example, diet. Ensure children know and understand this.*	- identifying and naming animals in their habitats (Year 2 Biology – Living things and their habitats) - classifying vertebrates and invertebrates (Year 4 Biology – Living things and their habitats).

			herbivores and omnivores are another way of grouping animals. *Children may be interested in animals that are not vertebrates and these interests should be valued. The focus in Year 1 is on vertebrate groups. Other animals, including invertebrates, are addressed in subsequent year groups.*		
Summer Term 6 **<u>Identifying Plants and their Parts</u>**	**In this module, children will learn to:** - 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 **Working Scientifically:** - observing closely, using simple equipment - identifying and classifying	- What wild and garden plants can we find around our school? - What parts of a plant grow above the ground? - What part of a plant grows under the ground? - Why are trees plants? - What are the similarities and differences between plants that have flowers?	- Wild and garden plants can be found around the school and locality, including flowering plants, and these can be identified and named. - The names of the parts of a flowering plant that grow above the ground are the stem, leaf, and flower. - Roots grow under the ground and different plants have different roots. - Trees are plants which have roots, stems, leaves and most have flowers. There are differences between deciduous and evergreen trees. - There are similarities and differences	**<u>Tier 2 Vocabulary</u>** accurately: - different: not the same - compare: to notice how things are the same or different - describe: to use words to tell someone what something is like - similar: not identical but very alike -texture: how a surface or material feels *Children will also use adjectives to describe their sensory explorations of plants and their different parts: their colour, shape, size, texture and smell.* **<u>Tier 3 Vocabulary:</u>** - bark: the covering of the trunk - roots: the part of the plant which grows under the ground - stem: the part of the plant which grows above the ground and which holds the leaves and flowers - trunk: the stem of a tree **<u>Children will use the following previously learnt Tier 3 vocabulary:</u>** - classify: to group objects according to similarities in appearance or properties	This module is best taught in late spring or early summer when there are plenty of plants in flower. **<u>Children have previously learnt:</u>** - to explore the natural world around them, making observations and drawing pictures of plants (EYFS framework; ELG The Natural World) - about seasonal changes and plants' names in their locality (Year 1 Biology – Seasonal changes) **<u>This prepares children for later learning:</u>** - process and conditions of growth of

			between flowering plants. *There is no need to grow plants in Year 1. The focus should be on gaining a wide knowledge of plants growing locally and the differences and similarities between their stems, roots, leaves and flowers. The fruit of a plant does not need to be a teaching point but may be observed by children. Teaching in subsequent year groups will address the functions of plant parts, fruits and conditions for growth.*	- group (verb): to place objects, materials or living things into sets - identify: to know and say what something is - observe: to look carefully at something, to notice what it is like or how it has changed - deciduous: plants which shed their leaves once a year - evergreen: plants which appear to have leaves all year round - flower: the part of the plant which is often coloured other than green and grows above the ground - leaf: a flat part of the plant which is attached to the stem - plant (noun): a living thing that grows in the ground and usually has leaves, stems, and roots	plants (Year 2 Biology – Plants). **Foundational Knowledge:** The topic of plants is revisited in every subsequent year group in the National Curriculum and the learning from this module is the foundation for this.

Year 2 Science Curriculum

Term	National Curriculum Expectations	Key Learning Questions	Associated Substantive Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 1 **Local Habitats**	**In this module, children will learn to:** - explore and compare the differences between things that are living, dead, and things that have never been alive - identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds 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 animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **Working Scientifically:** - observing closely, using simple equipment - using their observations and ideas to suggest answers to questions	- Are the things I find alive, have never been alive or once were alive? - What lives in my tree? - What animals live in this woody habitat? - What animals live in this grassy habitat? - What do animals that live in the woods eat? - What do animals that live in the pond eat?	-All things are either alive, have never been alive or once were alive. Living things include plants (including seeds) and animals. Things that were once alive include dead animals and plants, and parts of plants and animals that are no longer attached, for example, leaves and twigs, shells, fur, hair and feathers. Things made of rock, metal and plastic have never been alive. - A habitat provides the basic needs of the animals and plants in it – shelter, food and water. There are different types of habitat. Animals and plants live in a habitat to which they are suited, which means that animals have features that help them move and find food in that habitat, and plants have features that help them to grow well there. - Different living things are suited to live in different parts of a woody habitat, for example, in the leaf	**Tier 2 Vocabulary** - compare: to notice how things are the same or different - feed: to eat food - move: to change place or position - record: to draw or write what you observed or measured **Tier 3 Vocabulary:** - order: to place objects in a sequence or pattern - alive: living, not dead - breathe: to draw air into the body and let it out - consumer: a living thing which has to eat other animals or plants to gain its food - dead: no longer alive - decay: to rot - decomposer: a living thing that breaks down dead plants, animals or waste - depend: to strongly need and receive help from an outside source in order to live - food chain: a series of living things where each one is food for the next - - habitat: a place where an animal or plant finds the things it needs to live and grow - never been alive: has never been a living thing, or part of one - once alive: was once a living thing, or part of one, but is now dead - producer: a living thing, such as a plant, which makes its own food - shelter: something that provides cover or protection - survive: to stay alive **Children will use the following previously learnt Tier 3 vocabulary:** - identify: to know and say what something is - observe: to look carefully at something, to notice	Local habitats is a Biology topic building on children's learning and experiences in the Early Years Foundation Stage and Year 1. **Children have previously learnt:** - about a variety of common wild and garden plants, their names and structure (Year 1 Biology – Plants) - about a variety of fish, amphibians, reptiles, birds and mammals, their names and structure (Year 1 Biology – Animals, including humans) - to observe changes across the four seasons (Year 1 Biology – Seasonal changes). **This prepares children for later learning:** - how to identify, group and classify living things (Year 4 Biology – Living things and their habitats) - how to construct food chains and identify predators and prey (Year 4 Biology – Animals, including humans).

	- identifying and classifying		litter, on the bark of trees, on the leaves. - Different living things are suited to live in different parts of a grassy habitat, for example, deep down in the grass, in short or long grass, on top of the grass or on flowers. - Animals obtain their food from plants and other animals. Plants and animals in a woodland habitat depend on each other for food. This can be shown in a food chain. All food chains begin with a plant. - Animals obtain their food from plants and other animals. Plants and animals in a pond habitat depend on each other for food. This can be shown in a food chain.	what it is like or how it has changed; can involve all senses, not just sight - pattern: something that happens or appears in a regular and repeated way - insect: small six-legged animal with body in three parts and often with wings - omnivore: an animal that eats both plants and other animals	
Autumn Term 2 **Choosing Materials**	**In this module, children will learn to:** - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses **Working Scientifically:** - asking simple questions and	Is that a good choice of material? Which ball bounces highest? Which materials are good for a toddler's play dungarees? Who develops new materials?	- Certain materials are suitable to be used to make different objects. Some materials may not be suitable to make an object. Materials have properties, such as being waterproof, transparent or flexible. Properties of materials can make them useful for a purpose.	**Tier 2 Vocabulary** - compare: to notice how things are the same or different - design: to make or draw plans for something new - discover: to find unexpectedly or as a result of an enquiry - fit for purpose: well suited for its use - invent: to create or design something that has not existed before - record: to draw or write what you observed or measured - suitable: right for the purpose - use: the purpose for which a material is chosen	**Children have previously learnt:** - to explore the differences they notice between materials and how they can be changed (EYFS framework; ELG The Natural World) - to identify, describe and compare a variety of everyday materials, such as wood, plastic, glass, metal, water and

	recognising that they can be answered in different ways - performing simple tests - identifying and classifying - using their observations and ideas to suggest answers to questions - gathering and recording data to help in answering questions		- An object can be made from various materials. Objects can be tested and sorted according to their properties of the materials they are made from. Some materials are more suitable for particular uses. - Different types of fabric have different characteristics and uses. Fabrics can be tested and sorted according to their properties. Some fabrics are more durable than others. - Inventors discover new uses for existing materials and create new materials. Inventors design objects using their knowledge of the properties of materials.	Children will also use adjectives and comparatives to describe properties of materials. **Tier 3 Vocabulary:** comparative test: a science enquiry to compare different materials or events - enquiry: a method scientists use to collect evidence to answer questions - fair: when everything is kept the same except the thing that is being compared - measure: to use equipment to find out the exact size or weight of something - bouncy/bounciness: an adjective used to describe something that springs back or up after hitting something - durable: able to withstand wear, pressure or damage - elastic/elasticity: able to stretch, bend or twist without breaking and then return to original form **Children will use the following previously learnt Tier 3 vocabulary:** - bar chart: a way to show measurement or amount by using bars of different heights - observe/observation: to look carefully at something, to notice what it is like or how it has changed; can involve all senses not just sight - rank: to put things in an order - test: to carry out a science enquiry to find something out - absorb/absorbent: to take in fluid - flexible: able to bend easily without breaking - - material: the substance something is made of - opaque: an adjective used to describe a material you can't see through - property: what a material is like - rigid: unable to bend - transparent: an adjective used to describe a material that you can see through - waterproof: does not let water pass through it	rock, and their physical properties (Year 1 Chemistry – Everyday materials). **This prepares children for later learning:** - how squashing, bending, twisting and stretching can change the shape of solid objects (Year 2 Chemistry – Uses of everyday materials) - about different kinds of rocks and their properties (Year 3 Chemistry – Rocks) - about solids, liquids, gases and changes of state (Year 4 Chemistry — States of matter).

Spring Term 3 **Growing Seeds and Bulbs**	**In this module, children will learn to:** - observe and describe how seeds and bulbs grow into mature plants **Working Scientifically:** - observing closely, using simple equipment - performing simple tests - identifying and classifying - gathering and recording data to help in answering questions	- How do plants grow and change over time? - How are seeds and bulbs different? - What do seeds need to germinate? - How tall will they grow? - What have we learnt about how a seed germinates?	- When a seed starts to sprout and grow, this is called germination. Many plants grow from seeds into mature plants. - Mature plants can grow from either seeds or bulbs. There are differences between seeds and bulbs. - Seeds need certain conditions to germinate. Tests can be set up to determine whether seeds require water and light. - Seeds come in a variety of sizes. The size of the seed does not determine the height of the mature plant that grows from it. - When a seed germinates, its seed coat splits and the roots, stems and leaves grow from it. Seeds need certain conditions to germinate. All seeds require water, and most do not need light.	**Tier 2 Vocabulary** - compare: to notice how things are the same or different - describe: to use words to tell someone else what something is like - record: to draw or write what you observed or measured **Tier 3 Vocabulary:** - accurate: an adjective used to describe a measurement or observation that is exact - comparative test: a science enquiry to compare two materials or events - effect: a change which is the result of something - enquiry: a method scientists use to collect evidence to answer questions - explain/explanation: to give reasons for what you have done or found out - fair: when everything is kept the same except the things that are being compared - observing over time: a science enquiry where observations are made over a fixed period of time - bulb: a rounded structure which acts as a food store; a new plant will sprout and grow from it - conditions: factors that affect a living thing -germinate/germination: when a seed starts to grow - mature: has completed its development -seedling: a young plant **Children will use the following previously learnt Tier 3 vocabulary:** - bar chart: a way to show measurement or amount by using bars of different heights - group: to place objects, materials or living things into sets - identify: to know and say what something is - observe: to look carefully at something, to notice what it is like or how it has changed; can involve all senses not just sight - pattern: something that happens or appears in a regular and repeated way - rank: to put things in an order	Local habitats is a Biology topic building on children's learning and experiences in the Early Years Foundation Stage and Year 1. **Children have previously learnt:** - about a variety of common wild and garden plants, their names and structure (Year 1 Biology – Plants) - about a variety of fish, amphibians, reptiles, birds and mammals, their names and structure (Year 1 Biology – Animals, including humans) - to observe changes across the four seasons (Year 1 Biology – Seasonal changes). **This prepares children for later learning:** - how to identify, group and classify living things (Year 4 Biology – Living things and their habitats) - how to construct food chains and identify predators and prey (Year 4 Biology – Animals, including humans).

				- test: to carry out a science enquiry to find something out - flower: the part of a plant which is often coloured other than green and grows above the ground - leaf: a flat part of a plant which is attached to the stem - roots: the part of a plant which grows under the ground - seed: a plant part from which a new plant grows -stem: the part of a plant which grows above the ground and which holds the leaves and flowers	
Spring Term 4 **Growing Up (Animals and Humans)**	**In this module, children will learn to:** **-** notice that animals, including humans, have offspring which grow into adults - find out about and describe the basic needs of animals, including humans, for survival (water, food and air) - describe the importance for humans of [exercise,] eating the right amounts of different types of food, [and hygiene] - describe the importance for humans of [exercise, eating the right amounts of different types of food, and] hygiene - describe the importance for humans of exercise, [eating the right amounts of different types of food, and hygiene]	- How do animals change as they grow? - What do animals need to survive? - How can we sort food into groups? -How can humans stay clean? - How can humans stay active? - How do humans stay healthy?	- Animals grow and change throughout their lives; this is referred to as a life cycle. There are five vertebrate groups (studied in Year 1) in the animal kingdom – amphibians, birds, reptiles, fish and mammals – which all have different life cycles to each other but, in the main, are born looking like a small version of the adult of their species, with the exception of amphibians. Insects are one of the many invertebrate groups, and they go through changes to a greater extent, including pupa and chrysalis stages. - All animals need food, water and air for survival. Important needs for young humans are also love, medical care and toys.	**Tier 2 Vocabulary** - record: to draw or write what you observed or measured **Tier 3 Vocabulary:**- accurate: an adjective used to describe a measurement or observation that is exact - comparative test: a science enquiry to compare two materials or events - effect: a change which is the result of something - enquiry: a method scientists use to collect evidence to answer questions - explain/explanation: to give reasons for what you have done or found out - fair: when everything is kept the same except the things that are being compared - observing over time: a science enquiry where observations are made over a fixed period of time - bulb: a rounded structure which acts as a food store; a new plant will sprout and grow from it - conditions: factors that affect a living thing - germinate/germination: when a seed starts to grow - mature: has completed its development - seedling: a young plant **Children will use the following previously learnt Tier 3 vocabulary:** - bar chart: a way to show measurement or amount by using bars of different heights - group: to place objects, materials or living things into sets	Growing seeds and bulbs is a Biology topic building on children's learning and experiences in the Early Years Foundation Stage and Year 1. **Children have previously learnt:** - to name and identify a variety of common plants, and to describe a plant's structure using the terms 'roots', 'stems'/'trunks', 'leaves' and 'flowers' (Year 1 Biology – Plants). **This prepares children for later learning:** - about the conditions that mature plants require for healthy growth (Year 2 Biology – Plants) - about the functions of different parts of flowering plants, the requirements of plants

	Working Scientifically: - identifying and classifying - using their observations and ideas to suggest answers to questions		- Food is one of the key needs for survival of all animals. Humans need to eat different types of food each day. This is represented by the Eatwell plate. - Keeping clean and hygienic is crucial for humans to stay healthy. This includes regular dental, hair, hand and whole-body hygiene activities. - Young people should have at least 60 minutes of physical activity per day, including all physical activity such as playing at break times, walking to and from school and taking part in PE lessons and other organised sport. Good mental health is supported by regular physical activity and movement. - A combination of varied and balanced diet, regular appropriate hygienic activity and at least 60 minutes per day of physical activity will lead to a healthy human at this age.	- identify: to know and say what something is - observe: to look carefully at something, to notice what it is like or how it has changed; can involve all senses not just sight - pattern: something that happens or appears in a regular and repeated way - rank: to put things in an order - test: to carry out a science enquiry to find something out -flower: the part of a plant which is often coloured other than green and grows above the ground - leaf: a flat part of a plant which is attached to the stem - roots: the part of a plant which grows under the ground - seed: a plant part from which a new plant grows - stem: the part of a plant which grows above the ground and which holds the leaves and flowers	for life and growth, and the way in which water is transported within plants (Year 3 Biology – Plants).
Summer Term 5 **Changing Materials**	**In this module, children will learn to:** - find out how the shapes of solid objects made from some materials can be	- How can I change the shape of an object? - What properties allow a material to be changed?	- Materials have properties which may include being: flexible, rigid, stretchy, squashy, elastic, stiff. Squashing, bending, stretching and	**Tier 2 Vocabulary** - action: a thing that is done which usually results in a change -discover/discovery: to find unexpectedly or as a result of an enquiry - fit for purpose: well suited for its use	Changing materials is a Chemistry topic building on children's learning and experiences in Year 1 and the previous Year 2 Materials module.

	changed by squashing, bending, twisting and stretching **Working Scientifically:** - asking simple questions and recognising that they can be answered in different ways - performing simple tests - identifying and classifying - using their observations and ideas to suggest answers to questions - gathering and recording data to help in answering questions	- Which materials is fit for purpose? - What can pushes and pulls do?	twisting can change the shape of some materials. - Objects can be tested and sorted according to the properties of the materials from which they are made. Different properties allow the shapes of materials to be changed in different ways. - Objects are made from materials with properties that make them fit for purpose. - Different actions, such as a push or a pull, can be used to change the shape of a material and/or an object.	- invent/inventor: to create or design something that has not existed before - pull: (verb) to move toward/(noun) a move toward - push: (verb) to move away/(noun) a move away - suitable: right for the purpose -use: the purpose for which a material is chosen **Tier 3 Vocabulary:**- - elastic/elasticity: able to stretch, bend or twist without breaking and then return to original form - squashy/squash: can be crushed or squeezed, keeping the same volume, so that it becomes flat or out of shape - stiff: cannot be stretched or squashed - stretchy/stretch: can be made longer or wider, keeping the same volume, without breaking or tearing - twist: to move something out of shape with a turning motion **Children will use the following previously learnt Tier 3 vocabulary:** - test: to carry out a science enquiry to find something out - bend: to move from a straight to a curved shape - flexible: able to bend easily without breaking - material: the substance something is made of - property: what a material is like - rigid: unable to bend	**Children have previously learnt:** - to identify a range of everyday materials and compare their suitability for certain uses (Year 2 Chemistry – Uses of everyday materials). **This prepares children for later learning:** - about forces (Year 3 Physics – Forces and magnets).
Summer Term 6 **Growing Healthy Plants**	**In this module, children will learn to:** - find out and describe how plants need water, light and a suitable temperature to grow and stay healthy **Working Scientifically:** - performing simple tests - using their observations and ideas	- How can we care for our plants? - Do mature plants need light? - Does temperature affect the growth of mature plants? - Do mature plants need water? - What have we learnt about what mature plants need to grow healthy?	- Seeds germinate into seedlings and then grow into mature plants. Like animals, mature plants need certain conditions so that they grow healthily. - Comparative tests can be set up to determine whether mature plants (including grass) require light to grow healthily. - To determine how fast	**Tier 2 Vocabulary:** - compare: to notice how things are the same or different - describe: to use words to tell someone else what something is like -record: to draw or write what you observed or measured **Tier 3 Vocabulary:** - comparative test: a science enquiry to compare different materials or events - enquiry: a method scientists use to collect information to answer questions - explain/explanation: to give reasons for what you	Growing healthy plants is a Biology topic building on children's learning and experiences in the previous Year 2 Plants module. **Children have previously learnt:** - the names and parts of a variety of different plants, including trees

	to suggest answers to questions - gathering and recording data to help in answering questions		a plant is growing, its height can be measured and compared with another plant of the same type. Some plants have features which help them to live in hot conditions while others can live in cold conditions. - The stems and leaves of mature plants which have not been watered for some time will be droopy. If they have not been watered for a long time the plant may be dead and the leaves will be brown and feel crispy. - Mature plants need light and water to grow healthily.	have done or found out -measure/measurement: to use equipment to find out the exact size or weight of something - pattern seeking: an enquiry looking for a pattern between two things - predict/prediction: to say what you think will happen - results: the findings from an enquiry -temperature: a measure of how hot or cold something is - thermometer: a piece of equipment used to measure temperature - bulb: a rounded structure which acts as a food store; a new plant will sprout and grow from it - conditions: factors that affect a living thing -germinate/germination: when a seed starts to grow - healthy: well - light: produced by a light source and makes it possible for the eye to see things - mature: has completed its development - seedling: a young plant - soil: the top layer of the Earth's surface; a mixture of bits of rock and remains of living things that have died **<u>Children will use the following previously learnt Tier 3 vocabulary:</u>** - leaf: a flat part of a plant which is attached to a stem - roots: the part of a plant which grows under the ground - seed: a plant part from which a new plant grows - stem: the part of a plant which grows above the ground and which holds the leaves and flowers *Some commonly used words have specific scientific usage in this module, for example, healthy. Ensure children know and understand this.*	(Year 1 Biology – Plants) - that seeds and bulbs grow into mature plants, and the conditions required for seeds to germinate (Year 2 Biology – Plants) - how habitats provide the correct conditions for a plant's survival (Year 2 Biology – Living things and their habitats). **<u>This prepares children for later learning:</u>** - about the life cycle of flowering plants (Year 3 Biology – Plants) - about the function of different parts of flowering plants (Year 3 Biology – Plants - about other conditions required for mature plant growth such as air and nutrients (Year 3 Biology – Plants).

Year 3 Science Curriculum

Term	National Curriculum Expectations	Key Learning Questions	Associated Substantive Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 1 **Rocks, Soils and Fossils**	**In this module, children will learn to:** - - compare and group together different kinds of rocks on the basis of 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 **Working Scientifically:** - setting up simple practical enquiries, comparative [and fair] tests - making systematic and careful observations [and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers] - recording findings using simple scientific language, drawings,	- How are rocks different and what rock is this? - What are rocks used for? - How are soils different? - Which soils hold water? - What is this fossil? - Who was Mary Anning and how did she become a palaeontologist?	- Rocks can be compared according to their appearance and simple properties. - Specific properties of different rocks make them useful for different purposes. Rocks change over time depending on their physical properties. - Soils are made from rocks and organic material. - Specific properties of different soils affect whether or not they absorb and hold water. - Some rocks contain fossils. Fossils are formed when living things are trapped within rock. - Human knowledge of the living world has been developed through the lives and work of fossil scientists such as Mary Anning.	**Tier 2 Vocabulary:** - appearance: how something looks - compare: to estimate, measure or note the similarity or difference between items - drain: to remove water or other liquid from a container or area - flood: to cover or fill with a flow of water - layer: a band of material which is different to the ones above and below it - similar: not identical but very alike - structure: the way that the parts of something are joined together - texture: how a surface or material feels **Tier 3 Vocabulary:** - evidence: information, from observations and measurements, that supports or disproves ideas - identifying and classifying: an enquiry to identify or test for features to distinguish between different things - microscope: an instrument that is used to magnify small objects - crystal/crystalline: a material that has flat surfaces which form geometric shapes - erosion: the process of wearing away materials by water, wind or ice - fossil: the preserved remains or trace of any once-living thing - hardness: how resistant a material is to scratching (not how easily it breaks) - organic: made from the remains of living things - palaeontologist: someone who studies fossils - remains: left over parts of an animal or plant - rock: naturally occurring material, part of the Earth's surface - sediment: small pieces of rock which fall to the bottom of oceans and lakes - weathering: the effects of weather, breaking down the surface of rocks over time	**Children have previously learnt:** - to identify and name a variety of everyday materials and their properties (Year 1 Chemistry – Everyday materials) - to recognise how a material's properties make it suitable for particular purposes (Year 2 Chemistry – Uses of everyday materials). **This prepares children for later learning:** - about solids, liquids and gases (Year 4 Chemistry – States of matter) - about how fossils provide information about living things from the past (Year 6 Biology – Evolution and inheritance).

	labelled diagrams, keys, [bar charts] and tables - reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - identifying differences, similarities or changes related to simple scientific ideas and processes - using straightforward scientific evidence to answer questions or to support their findings			*Children will encounter the names of a variety of rocks, soils and fossils in the context of this module. For example, rocks – limestone, chalk, granite, slate, marble, sandstone, pumice; soils – clay, sandy, silty, peaty, chalky, loamy; fossils – trilobite, starfish, sea urchin, ammonite.* **Children will use the following previously learnt Tier 3 vocabulary:** - comparative test: a science enquiry to compare two materials or events - enquiry: a method scientists use to collect evidence to answer questions - identify: to know and say what something is - observe/observation: to use senses or instruments to obtain data - test: to carry out a science enquiry to find something out - absorb/absorbent: to take in fluid - durable: able to resist wear, pressure or damage - material: the substance something is made of - property: a characteristic of a material - soil: the top layer of the Earth's surface; a mixture of bits of rock and remains of living things that have died - waterproof: does not let water pass through it	
Autumn Term 2 **Light and Shadows**	**In this module, children will learn to:** - recognise that they need light in order to see things and that dark is the absence of light - notice that light is reflected from surfaces - recognise that light from the sun can be dangerous and that there are ways to protect their eyes - recognise that shadows are formed	***Note that Key Question 4 needs a two-part lesson split between a short activity carried out at the start of the day, when the Sun is still quite low in the sky, and the main lesson later. It requires a sunny day.*** - What do we need to see?	**-** Light comes from light sources. Dark is the absence of light. Nothing can be seen if there is no light. Objects are easier to see when there is more light. - Shiny objects are those with surfaces that are good at reflecting light. When there is less light, more reflective materials are easier to see than less reflective ones.	**Tier 2 Vocabulary:** - absence/absent (as in absence of light): not there - artificial: not found in nature; made by humans - block: stop; not allow to pass through - similar: not identical but very alike - surface: the outside or top of something **Tier 3 Vocabulary:** - conclude/conclusion: to draw together evidence to find patterns and answers - comparative test: a science enquiry to compare different materials or events - data: information (observations and measurements) collected during an enquiry	**Children have previously learnt:** - that light is seen by the eyes (Year 1 Biology – Senses) - that materials can be transparent (see-through) or opaque (Year 1 Chemistry – Properties of materials). **This prepares children for later learning:** - using observations of shadows to track the

	when the light from a light source is blocked by an opaque object - find patterns in the way that the size of shadows change **Working Scientifically:** - using straightforward scientific evidence to answer questions [or to support their findings] - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including [thermometers and] data loggers - reporting on findings from enquiries, including oral and written explanations, [displays or presentations of results and conclusions] - identifying differences, similarities or changes related to simple scientific ideas [and processes] - using results to draw simple conclusions, [make predictions for new values, suggest improvements and raise further questions]	- Which object is the most reflective? - How are shadows made? - Is my shadow like me? - How can we change the size of a shadow?	- Shadows are formed when light is blocked. Opaque materials are those that block all the light so objects made from opaque materials cast the darkest shadows. - Shadows are the same shape as the objects that cast them. There are similarities and differences between the object and the shadow. Light from the sun can be dangerous so we need to protect our eyes. Opaque materials block sunlight and so can protect our skin. - The size of a shadow can be changed by moving the light source, changing either its height (for an object standing on and casting its shadow onto a surface) or distance from the object (for a shadow cast on a screen).	- data logger: a device using sensors to make measurements, including of light - evidence: information, from observations and measurements, that supports or disproves ideas - explain/explanation: giving reasons, from scientific knowledge, for observations and conclusions - identifying and classifying: an enquiry to identify or test for features to distinguish between different things - measure/ measurement: using equipment to find the size of something on a numbered scale - observe/observation: using senses or instruments to obtain data - pattern: a relationship between two sets of data - predict/prediction: use what you already know to try to work out what will happen - bright: giving out a lot of light or having high light levels - dark/darkness: the absence of light - data logger: a device using sensors to make measurements, including of light - dim: giving out a little light or having low light levels - light: produced by a light source and makes things visible - light source: something, natural or artificial, that produces its own light - lux: the unit used to measure light intensity, abbreviated as lx - opaque: the property of blocking light by absorbing or reflecting all of the light that falls on it - reflect: to send back light - reflective: reflecting back a lot of the light that falls on it, making it shiny in appearance - sensor: a device that detects and responds to certain changes in the environment - shadow: a darker area where some or all of the light has been blocked by an object - Sun: the source of sunlight - sunlight: the combination of visible and invisible forms of light (e.g. ultraviolet) produced by the Sun	apparent movement of the Sun across the sky (Year 5 Physics – Earth and space) - how light travels, including the properties of shadows, and how we see objects (Year 6 Physics – Light). ***As children will learn about light travelling in straight lines and make measurements of shadows changing in Upper Key Stage 2, the focus in this module is on making observations of shadows and investigating what happens when light shines on materials with different properties. They do not need to be introduced to drawing light rays using scientific conventions.***

				- translucent: the property of blocking or scattering some light so that not all of it passes through and there is no clear view of what lies behind it - transparent: the property of allowing almost all light that falls on it to pass through, enabling a clear view of what lies behind it - ultraviolet: a type of light, found in sunlight and not detectable by our eyes, which is harmful to our eyes and skin. Abbreviated as UV **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - enquiry: a method scientists use to collect evidence to answer questions - measure/ measurement: using equipment to find the size of something on a numbered scale - observe/observation: using senses or instruments to obtain data - pattern: a relationship between two sets of data - predict/prediction: use what you already know to try to work out what will happen *Some commonly used words have specific scientific usage in this module, for example dark and darkness are used to mean the absence of light not the darkness experienced at night when there is still a low level of natural or artificial light; light is used as a noun not as an adjective linked to colour, brightness or mass; block is used as a verb not as a noun e.g. block of wood or a block of flats. Ensure children know and understand this.*	
Spring Term 3 **<u>Forces, Friction and Magnets</u>**	**In this module, children will learn to:** - compare how things move on different surfaces - notice that some forces need contact between two objects,	- What makes it move? - How long does a top spin on different surfaces? - How well can an object slide on different surfaces?	- A force is a push or pull that can make something move. - The surface on which a spinning top is moving affects how long it spins for.	**<u>Tier 2 Vocabulary:</u>** - contact: touching - pendulum: a weight hanging from a fixed point which swings backwards and forwards - pull/pulling: (verb) to move toward/(noun) a move toward - push/pushing: (verb) to move away/(noun) a move toward - rough: uneven, not smooth	**<u>Children have previously learnt:</u>** - that the shape of an object can be changed by squashing, bending, twisting and stretching (Year 2 Chemistry – Uses of everyday materials).

	but magnetic forces can act at a distance - observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - describe magnets as having two poles - predict whether two magnets will attract or repel each other, depending on which poles are facing **Working Scientifically:** - setting up simple practical enquiries, comparative [and fair] tests - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, [using a range of equipment, including thermometers and data loggers] - recording findings using [simple scientific language,] drawings, labelled diagrams, [keys, bar charts, and tables]	- How do magnets affect each other? - Which materials are magnetic? - How strong are the magnets?	- The surface on which an object rests affects how it slides. - Magnets have a north and a south pole. Unlike poles attract and like poles repel each other. - Some metals are attracted to a magnet and are known as 'magnetic'. Other materials are not. - The strength of magnets varies and can be tested using the idea that magnetic forces act at a distance. ***Children do not need to use the word 'friction' as this will be introduced in Year 5. The focus in Lessons 2 and 3 is on how the texture of a surface affects how easy or hard it is to move an object across a surface.***	- slide: to slip - smooth: flat and even, not rough - surface: the outside or top of something - texture: how a surface or material feels **Tier 3 Vocabulary:** - stopwatch: a piece of equipment used to measure time passing - value: a number or measurement - attract: to draw something closer - contact force: where the object providing the force is touching (in contact with) the object it is moving - force: a push or pull - like poles: the same poles, i.e. north and north or south and south - magnet: an object that can pull certain types of metals towards it - magnetic: able to be attracted by a magnet - non- contact force: where the force moves something without touching it - north/south pole: the two points in a magnet where the magnetic force is strongest - repel: to push something away **Children will use the following previously learnt Tier 3 Vocabulary:** - classify/classification: to organise things into scientific groups - comparative test: an enquiry to compare materials or events. - data: information (observations and measurements) collected during an enquiry - diagram: a drawing that shows the parts of something or how the parts work together - enquiry: a method scientists use to collect evidence to answer questions - evidence: information, from observations and measurements that supports or disproves ideas -measure/ measurement: using equipment to find the size of something on a numbered scale - pattern: a relationship between two sets of data	**This prepares children for later learning:** - about friction, water resistance and air resistance and the forces involved in simple mechanisms (Year 5 Physics – Forces) - how magnetism can be used to separate magnetic materials from a mixture (Year 5 Chemistry – Properties and changes of materials).

	- using results to draw simple conclusions, make predictions for new values, suggest improvements [and raise further questions] - identifying differences, similarities [or changes] related to simple scientific ideas and processes - using straightforward scientific evidence to answer questions or to support their findings			- predict/prediction: using what you already know to try to work out what will happen - test: to carry out a science enquiry to find something out - material: the substance something is made of ***Some commonly used words have specific scientific usage in this module, for example, pole, which the children may associate with flag poles. They may be familiar with associating the north and south poles with the Arctic and Antarctic, not the poles on a magnet. Ensure children know and understand this.***	
Spring Term 4 **<u>Movement and Nutrition for the Human Body</u>**	**In this module, children will learn to:** - identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat - identify that humans and some other animals have skeletons and muscles for support, protection and movement **Working Scientifically:** - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - recording findings using simple scientific language, drawings, labelled diagrams,	- What nutrition do we get from our food? - Which nutrients are in school midday meals? - What is in a human skeleton? - How do muscles help humans to move? - How are vertebrate and invertebrate bodies supported? - How are human skeletons different to other vertebrates?	- The different types of food we eat contain different nutrients. These are useful for our bodies in different ways. - Different types of food in the meals we eat contain different nutrients. A healthy diet contains a balance of different nutrients. - All our bones have different names. Some of these bones protect our soft internal organs. - Muscles work in pairs to move the bones in our skeleton. Other bones provide support so that our body can remain upright. Our joints allow us to twist and bend so that our bodies can move. - Vertebrate bodies are supported by an internal bony skeleton including	**<u>Tier 2 Vocabulary:</u>** - balanced: all parts in the correct amounts - contract: to make smaller by drawing together - diagram: a drawing that shows the parts of something or how the parts work together - internal: inside - key: a guide to what the symbols or colours in a diagram represent - protect: to keep safe from harm - support: to keep upright and bear weight - system: a group of things or parts that work together **<u>Tier 3 Vocabulary:</u>** - data: information (observations and measurements) collected during an enquiry - evidence: information, from observations and measurements that supports or disproves ideas - investigate: to find out more about a process or object by measuring or observing it - sequence: an arrangement of numbers or processes in a particular order - calcium: a mineral the body needs to build and maintain strong bones - carbohydrate: a nutrient which is the body's major source of energy - cartilage: a tough, white tissue that forms part of the skeleton of humans and other animals	**<u>Children have previously learnt:</u>** - about the basic parts of the human body and their senses. (Year 1 Biology – Animals, including humans) - about the basic needs of animals, including humans, for survival (Year 2 Biology – Animals, including humans) - about the importance for humans of exercise and eating the right amounts of different types of food (Year 2 Biology – Animals, including humans). **<u>This prepares children for later learning:</u>** - about the functions of the basic parts of the digestive system in humans and the

	[keys, bar charts, and tables] - identifying differences, similarities [or changes] related to simple scientific ideas and processes		a spine (made of many vertebrae). Invertebrates have no bony skeleton. Some invertebrates have an exoskeleton to provide protection and support. Some invertebrates have a hydrostatic skeleton to support their bodies. - The human bony skeleton has the same basic structure as all vertebrates: a spine, a skull with an opening jaw, hips and shoulder joints and four limbs. Humans' two 'front limbs' are arms whereas other vertebrates have fins, wings or legs. Humans walk upright on two legs whereas other animals use all four limbs to move around.	- energy (in context of food and nutrition): the power to be active - exoskeleton: an external supporting structure for a living thing - fat: a nutrient which is a source of energy for the body, produced from animals or plants - fibre: (also called roughage) parts of plant-based food that can't be broken down and help with digestion - fluid: a material that flows easily and takes the shape of the container that holds it: a liquid or gas - heart: the organ in the chest of vertebrates which pumps blood around the body - invertebrate: an animal that has no internal backbone - joint: a part of the skeleton where two or more bones meet which can bend or twist - mineral: a substance needed by the body for good health e.g. calcium - nutrient: a substance that is essential for life and health - organ: body part performing a function - protein: a food type which is needed for muscle repair and growth - ribs: bones originating from the spine which surround the heart and lungs in the chest - skull: the framework of bone that surrounds the brain - spinal cord: a bundle of nerves running from the brain to the rest of the body through the spine - spine: a series of small bones which surround the spinal column and hold up the body - sugar: a type of carbohydrate - tendon: a band of tough white tissue that connects a muscle with a bone or other body part - vitamin: a nutrient required by the body to grow, function and repair - X-ray: a beam of high-energy radiation that is able to pass through many kinds of solid material **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>**	different types of teeth in Year 4. ***The topic Animals, including humans is revisited in every subsequent year group in the National Curriculum.***

				- classify: to organise things into scientific groups - conclude/conclusion: to draw together evidence to find patterns and answers - enquiry: a method scientists use to collect evidence to answer questions - identify: to know and say what something is - measure: to use equipment to find the size of something on a numbered scale - observe: to use senses or instruments to obtain information - brain: an organ contained within the skull of all vertebrates. It controls the body's movements and activities and is the centre of thought, memory and feeling - amphibian: an animal that lives in water or on land but must return to the water to reproduce - bird: an animal that has feathers and lays eggs with hard shells - diet: the kind of food an animal usually eats - fish: an animal that lives in water and has gills and fins - invertebrate: an animal that has no internal backbone - mammal: an animal that is covered in hair or fur; the female gives birth to live young and feeds her babies on milk from her own body - reptile: an animal that has dry, scaly skin and lays eggs on land - vertebrate: an animal that has an internal backbone for support ***Some commonly used words have specific scientific usage in this module, for 'diet' is the kind of food an animal habitually eats rather than what you eat to lose weight. Ensure children know and understand this.***	
Summer Term 5 **<u>Flowering Plants and</u>**	**In this module, children will learn to:** - identify and describe the functions of different parts of flowering plants:	- What do leaves do? - What do roots and stems do?	**-** Leaves capture sunlight. The energy from the sunlight is used to produce the plant's food. Some of this food	**<u>Tier 2 Vocabulary:</u>** - compare: to estimate, measure or note the similarity or difference between items - compete: when two or more living things both require something which is in limited supply	**<u>Children have previously learnt:</u>** - to describe a plant's basic structure, using the terms roots, stems/trunks, leaves

Plant Growth	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 **Working Scientifically:** - Asking relevant questions and using different types of scientific enquiries to answer them - setting up simple practical enquiries, comparative and fair tests - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - using results to [draw simple conclusions,]	- What are the functions of the parts of a flowering plant? - What happens if plants do not have enough space? - How are plants different?	is used to make the plant grow. - Roots anchor the plant into the soil. Roots absorb water and minerals from the soil. This water is transported to the leaves and flowers via small tubes in the stem. The stem also provides support for the plant and holds the leaves and flowers up. - Leaves have tiny little holes in them which allow air into the plant. The energy from the sunlight is used to turn air and water into the plant's food. - When plants are overcrowded, they compete with each other for sunlight, water and nutrients. Plants which are able to get more sunlight, water and nutrients will grow faster and bigger than the others. - Different plants live in different habitats. Different plants have different-shaped leaves, stems and roots, and the parts can have different functions depending on the conditions in that particular habitat. Plants are adapted to the	- feature: a distinctive characteristic of a living or non-living thing - function: the purpose of something - space: the area or volume between, inside or around objects - transport: to move something about. **Tier 3 Vocabulary:** - investigate: to find out more about a process or object by measuring or observing it - research: to find information - adaptation: a feature of a living thing which helps it survive in a particular habitat - adapted: suited to survive in a particular habitat - anchor (verb): to hold something down - capture: to catch and hold - nutrient: a substance that is essential for life and health **Children will use the following previously learnt Tier 3 Vocabulary:** - comparative test: an enquiry which identifies how two variables are linked - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - enquiry: a method scientists use to collect evidence to answer questions - identify: the process of naming something - measure: to use equipment to find the size or weight of something on a numbered scale - observe: to use senses or instruments to obtain data observing over time: an enquiry where observations are made over a fixed period of time - predict/prediction: to use what you already know to suggest what might happen in an enquiry - consumer: a living thing which has to eat other animals or plants to gain its food - flower: the part of the plant which produces seeds - food chain: a series of living things where each one is food for the next	and flowers (Year 1 Biology – Plants) - that seeds need water to germinate and that most do not need light (Year 2 Biology – Plants) - that mature plants need water, light and a suitable temperature to grow and stay healthy (Year 2 Biology – Plants). **This prepares children for later learning:** - about the life cycle of flowering plants (Year 3 Biology – Plants).

	make predictions for new values, [suggest improvements and raise further questions] - identifying differences, similarities [or changes] related to simple scientific ideas and processes		habitat in which they live.	- habitat: a place where an animal or plant finds the things it needs to live and grow - producer: a living thing, such as a plant, which makes its own food - roots: the part of the plant which anchors into the soil and absorbs water and nutrients - seed: a plant part from which a new plant germinates and grows - stem: the part of the plant which keeps it upright and transports water from the roots to the rest of the plant - sunlight: the combination of visible and invisible forms of light (e.g. ultraviolet) produced by the Sun ***Some commonly used words have specific scientific usage in this module, for example, anchor, capture and space. Ensure children know and understand this.***	
Summer Term 6 **Flowering Plants Life Cycle**	**In this module, children will learn to:** - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal **Working Scientifically:** - Asking relevant questions and using different types of scientific enquiries to answer them - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - recording findings using simple scientific	- What is inside a flower? - What is animal pollination? - What is wind pollution? - What are fruits? - How are seeds dispersed?	- The flower produces the plant's seeds. A flower has: a female part (called the carpel) which includes the ovary, which contains ovules; male parts (called stamens) which produce pollen; petals which surround the male and female parts; and sepals which cover the flower when it is in bud. - Pollination is when the pollen from one flower is transferred to another flower. Animals, called pollinators, can transfer the pollen. - Some flowers' pollen is transferred from one plant to another using the wind.	**Tier 2 Vocabulary:** - compete: when two or more living things both require something which is in limited supply - formation: how something is produced - invent: to create or design (something that has not existed before) - savoury: not sweet - scar: a blemish on the skin of fruit or an animal, produced as part of the healing process - similar: not identical but very alike - structure: the way that the parts of something are joined together **Tier 3 Vocabulary:** - burr: a type of fruit (seed pod) which has hooks on the outside - carpel: the female reproductive part of a flower - dispersal: the movement of seeds away from the plant that produced them - nectar: a sugary, sweet substance produced by the flower - nutrient: a substance that is essential for life and health - ovary: the part of the carpel which contains ovules	**Children have previously learnt:** - to identify and describe the functions of some parts of a flowering plant: roots, stem/trunk and leaves (Year 3 Biology – Plants) - that plants need air, light, water, nutrients and room to grow (Year 3 Biology – Plants). **This prepares children for later learning:** - about reproduction in plants (Year 5 Biology – Living things and their habitats).

	language, drawings, labelled diagrams, [keys, bar charts, and tables] - identifying differences, similarities or changes related to simple scientific ideas and processes		- After pollination, a fruit develops from the flower. The ovary swells up and becomes the fruit. Fruits contain at least one seed. - Seeds are moved away from the plant that produced them, and this is called seed dispersal. They are moved away so they do not compete for space, sunlight, water and nutrients. Seeds are dispersed in a number of ways. The structure of the seedpod (fruit) and seed is related to the method of dispersal. Seeds are dispersed by wind, water, animals eating fruit, seeds becoming attached to an animal, and through explosions of a seedpod (fruit).	- ovule: the part of the plant where the seed begins to grow - pollen: fine yellow powder made by the male part of the plant - pollination: when pollen is moved from one flower to another - pollinator: an animal which carries out pollination - ripe: an adjective used to describe a mature fruit whose seeds are developed - scent: a smell produced by a flower - sepal: the part of a flower which provides protection when it is in bud - stamen: the male reproductive part of a flower **<u>Children will use the following previously learnt Tier 3 vocabulary:</u>** - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - observe/observation: to use senses or instruments to obtain data - flower: the part of a plant which produces seeds - fruit: a swollen plant ovary which contains a seed(s); germinate/germination: when a seed starts to grow - insect: a small six-legged animal with body in three parts and often with wings - petal: the part of the flower which protects the flower's insides - seed: a plant part from which a new plant germinates and grows ***Some commonly used words have specific scientific usage in this module, for example fruit, ripe. Ensure children know and understand this.***	

Term	National Curriculum Expectations	Key Learning Questions	Associated Substantive Knowledge	Key Vocabulary	Why This Why Now

Autumn Term 1 **Changes of State**	**In this module, children will learn to:** - 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 (°C) - identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature **Working Scientifically:** - setting up simple practical enquiries, comparative and fair tests - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - gathering, recording, classifying and presenting data in a variety of ways to help	- Is this material a liquid or a solid? - How is temperature measured? - What difference does temperature make to how quickly the ice blocks melt? - What are melting and freezing? - Are spaces really empty? - What is evaporation and how does it help to get things dry? - Where did the water come from? - Where does the rain come from?	- A solid holds its shape. Liquids can be poured and will spread out. Both solids and liquids have a fixed volume. - A thermometer is used to measure temperature. The unit of measurement we use for temperature is degrees Celsius. Ice is a solid. Water is a liquid. Water will freeze at zero degrees Celsius. When ice changes state to water, it melts. When water changes state to ice, it freezes. - Ice melts faster as the temperature increases. - Freezing/solidifying is when a liquid changes state into a solid. The temperature at which this happens is called the freezing point. Melting is when a solid changes state into a liquid. The temperature at which this happens is called the melting point. Different materials freeze/melt at different temperatures. Melting and freezing are reversible processes. - Air is a gas. Gases have substance (take up space) and have weight. Gases change in shape and volume to fill the space they are in.	**Tier 2 Vocabulary:** - cool: to reduce the temperature - empty: having nothing inside - flow: continuous movement - heat: to increase the temperature - horizontal: a straight line viewed left to right - space: the area or volume between, inside or around objects - vertical: a straight line viewed top to bottom **Tier 3 Vocabulary:** - control variable: a variable that is kept the same - degree Celsius (°C): a unit of temperature - fair test: an enquiry to find out how changing one variable affects something else - interval: the distance between two readings - model: something to show how a system or process works - scale: a set of numbered marks made at evenly spaced points - variable: something that can be changed, measured or observed in an enquiry - volume: how much space an object or material takes up - air: the invisible gas surrounding the Earth - boil: to change from liquid to gas, when the liquid is heated to a specific temperature known as its boiling point; occurs throughout the liquid - boiling point: the temperature at which a liquid turns into a gas - bubble: a ball of gas within a liquid - carbon dioxide: a gas in the air - change of state: moving between solid, liquid and gas as a result of heating or cooling - cloud: a visible group of small droplets of water or ice floating in air - compress: to make something smaller by squeezing it - condense/condensation: to change from gas to liquid - evaporate/evaporation: to change from liquid to gas; occurs at the surface of the liquid	**Children have previously learnt:** - about suitability of a variety of everyday materials for particular uses, based upon their properties (Year 2 Chemistry – Uses of everyday materials) - how temperature can be measured using a thermometer (Year 2 Biology – Plants). **This prepares children for later learning:** - about dissolving, solutions, separating mixtures, filtering, sieving and evaporating and reversible and irreversible changes (Year 5 Chemistry – Properties and changes of materials).

	in answering questions - recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - identifying differences, similarities or changes related to simple scientific ideas and processes - using straightforward scientific evidence to answer questions or to support their findings		- When water changes state from a liquid into a gas, it becomes water vapour. This process is called evaporation. Liquids other than water evaporate too. Some liquids evaporate more quickly than others. Steam is the invisible gas produced by boiling water. The temperature at which a liquid changes into a gas is called the boiling point. Different liquids have different boiling points. - When water vapour changes state from a gas into a liquid, it becomes water. This process is called condensation. - The Earth's water can be a liquid (water), a gas (vapour) or a solid (ice). Water in the environment evaporates into the air then the warm air cools as it rises, leading to condensation and the formation of clouds. Water droplets in the clouds fall as rain (or as snow or hail if cooled below freezing point). The water returns to the sea via streams and rivers to continue the water cycle.	- expand: to change in shape and volume to fill a space - freeze: to change from liquid to solid, due to cooling (used at lower temperatures) - freezing point: the temperature at which a liquid becomes a solid -gas: a state of a material where it changes in shape and volume to fill the space it is in; gases flow - granule/granular: a small piece or grain - heat-sensitive: responsive to changes in temperature - helium: a gas that is lighter than air and doesn't have any colour, taste or smell - ice: water in a solid, frozen state - liquid: a state of a material where it flows freely and takes the shape of its container - melt: to change from a solid state to a liquid state - melting point: the temperature at which a solid becomes a liquid - oxygen: a gas in the air which most living things need to survive - powder: fine, loose grains that are made when a solid material has been ground/crushed - rain: drops of water which fall to Earth when clouds become saturated with water droplets - snow: water in clouds that is frozen and falls to Earth as crystals - solid: a state of material which retains its shape unless a force is applied to it; solids have a constant volume - solidify: to change from liquid to solid, due to cooling (used at higher temperatures) - steam: water in a gas state - viscous: having a thick, sticky consistency - water vapour: water in a gas state; slightly cooler than steam and appears as a mist or fog **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - bar chart: a diagram which displays information (data) by using rectangular bars of different heights - classify: to organise things into scientific groups	

				- data: information (observations and measurements) collected during an enquiry - data logger: a device using sensors to make measurements, including sound, light and temperature - enquiry: a method scientists use to collect evidence to answer questions - evidence: information, from observations and measurements, that supports or disproves ideas - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - identifying and classifying: an enquiry to identify or test for features to distinguish between different things - measure/measurement: to use equipment to find the size or weight of something on a numbered scale - observe/observation: to use senses or instruments to obtain data - observing over time: an enquiry where observations are made over a fixed period of time - pattern: a relationship between variables - sensor: a device that detects and responds to certain changes in the environment - temperature: a measure of how hot or cold something is, measured in degrees Celsius - thermometer: a piece of equipment used to measure temperature - weight: a measure of how heavy an object is - flexible: able to bend easily without breaking - material: the substance something is made of - opaque: the property of blocking light by absorbing or reflecting all of the light - property: a characteristic of a material - transparent: the property of allowing almost all light that falls on it to pass through, enabling a clear view of what lies behind it *Some commonly used words have specific scientific usage in this module, for example, flow,*	

				freezing, rain, snow, steam, solid and volume. *Ensure children know and understand this.*	

Autumn Term 2 **<u>Electricity: Circuits</u>**	**In this module, children will learn to:** - 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 the lamp is part of a complete loop with a battery - recognise that a switch opens and closes a 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 being good conductors **Working Scientifically:** - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - recording findings using [simple scientific language,] drawings, [labelled diagrams,	- What makes an appliance work? - How can you light the bulb? - What does a switch do? - Why doesn't the circuit work? - Which materials conduct electricity?	- Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. - An electrical circuit consists of a cell or battery connected to a component using wires. - A switch can be added to a circuit to turn a component on and off. - If there is a break in the circuit, a loose connection or a short circuit, the circuit will not work. - Metals are good electrical conductors. Non-metals are generally electrical insulators, except for graphite (pencil lead), human tissue and water. *Alongside the National Curriculum objectives, it is important that children build their understanding of sustainable use of electricity. They should learn that some methods of generating electricity are damaging for the environment and therefore we should try to limit our use of electricity.*	**<u>Tier 2 Vocabulary:</u>** - appliance: a piece of equipment designed to do a particular job - complete: having no gaps - device: a piece of equipment designed to do a particular job - flow: continuous movement - function: the purpose of something - manual: an adjective used to describe an object that is worked by hand - plug: a device that is used to connect an electrical device to a power source - socket: the device where plugs connect to a power source - wire: a thin piece of metal, with a layer of plastic around it, that carries the electricity around a circuit **<u>Tier 3 Vocabulary:</u>** - Carroll diagram: a chart used to classify objects using two or more criteria - refute: to use evidence to show that a statement is incorrect - support: to use evidence to show that a statement is correct - Venn diagram: a diagram where circles are used to group things - battery: a component that can be used to provide electricity - bulb: a device that requires electricity to light up - buzzer: a component that makes a sound - cell: the scientific name for a single battery - circuit: the circular arrangement of components required to enable electricity to flow - closed circuit: a circuit that creates a complete loop, so the electricity can flow - connection points: the places on electrical components where wires can be attached - electrical appliance: an object that needs electricity to do its job - electrical component: an object making up part of a circuit - electrical conductor: a material that allows	Electricity: circuits is a Physics topic **<u>Children have previously learnt:</u>** - - that materials are chosen for particular uses based on their properties (Year 2 Chemistry – Uses of everyday materials). - **<u>This prepares children for later learning:</u>** - adapting circuits by varying components and recording these circuits using circuit diagrams with standard symbols (Year 6 Physics – Electricity). *As children will learn to use the standard symbols in Year 6, the focus in this module is using symbols designed by the class. They do not need to be introduced to the standard symbols. In this module they should make simple circuits with one component, for example, a lamp, buzzer or motor.*

	keys, bar charts, and tables] - using results to [draw simple conclusions,] make predictions for new values, suggest improvements [and raise further questions] - identifying differences, similarities or changes related to simple scientific ideas and processes			electricity to flow through it - electrical insulator: a material that does not allow electricity to flow through it - electricity: what is required to make an electrical appliance work - mains: electricity that can be used by plugging an electrical device into a socket - motor: a component that has a part that turns - open circuit: a circuit that does not create a complete loop, so the electricity cannot flow - switch: a component that turns another component on or off, by opening or closing a circuit, controlling whether the electricity can flow or not **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - classify: to organise things into scientific groups - diagram: a drawing that shows the parts of something or how the parts work together - enquiry: a method scientists use to collect evidence to answer questions - test: to carry out a science enquiry to find something out - material: the substance something is made of *Some commonly used words have specific scientific usage in this module, for example, cell, circuit, mains, switch, wire. Ensure children know and understand this.*	

Spring Term 3 **<u>Human Impact on the Environment</u>**	**In this module, children will learn to:** **-** recognise that environments can change and that this can sometimes pose dangers to living things **Working Scientifically:** **-** setting up simple practical enquiries, comparative [and fair] tests - recording findings using simple scientific language, drawings, labelled diagrams, [keys, bar charts,] and tables - using results to draw simple conclusions, [make predictions for new values, suggest improvements and raise further questions] - identifying differences, similarities [or changes] related to simple scientific ideas and processes	- What is the impact of litter in our school? - How do materials change over time? - How do microplastics get into the food chain? - How can we prevent microplastics from getting into our seas and oceans? - How can we clean up birds affected by an oil spill?	- Litter is things that have been thrown away and that are lying on the ground. Some waste materials can be processed so that they can be reused. Littering is something that humans do, and litter can be harmful to wildlife. - Decomposition is when dead plants and animals break down into very small pieces that can be used to help other living things grow. Worms, bacteria and fungi help the remains of living things decompose. Materials made from things that never lived, including plastics and glass, cannot decompose; they are not biodegradable. - Pollution is the introduction of non-biodegradable materials into the environment. Microplastics are tiny pieces of non-biodegradable plastic waste which get into the soil through waste water and sewage. Worms accidentally eat microplastics and the microplastics then pass up the food chain. - Sea and oceans are	**<u>Tier 2 Vocabulary:</u>** - compare: to estimate, measure or note the similarity or difference between items - litter: things that have been thrown away and that are lying on the ground **<u>Tier 3 Vocabulary:</u>** - evaluate: to consider how well something has been done - variable: something that can be changed, measured or observed in an enquiry - biodegradable: an adjective used to describe a material that breaks down or decays naturally through the action of micro-organisms - compost: a mixture of decaying organic matter, used for fertilising soil - decompose: the process where bacteria and worms break down natural materials into tiny pieces that help new plants grow - environment: the natural world of land, sea, air, plants and animals - filter: to use a special tool or process to separate materials - fungi: a group of living things including mould, mushrooms and yeast - micro-organism: any living thing too small to be viewed by the unaided eye - organism: a living thing - pollution: the introduction of harmful, non-biodegradable materials into the environment **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - classify: to organise things into scientific groups - comparative test: a science enquiry to compare different materials or events - enquiry: a method scientists use to collect evidence to answer questions - investigate: to find out more about a process or object by measuring or observing it - measure/measurement: to use equipment to find the size or weight of something on a numbered	Human impact on the environment is a Biology topic. **<u>Children have previously learnt:</u>** - about the feeding relationships of animals in a habitat and how to show them in a food chain (Year 2 Biology – Living things and their habitats) - to understand the difference between things that are alive, were once alive and never lived (Year 2 Biology – Living things and their habitats) - that plants gain nutrients from soil which help them grow healthily (Year 3 Biology – Plants) - what soil is made of (Year 3 Chemistry – Rocks) - that some materials can be recycled (Year 2 Chemistry – Uses of everyday materials). **<u>This prepares children for later learning:</u>** - about animal life cycles (Year 5 Biology – Living things and their habitats) - about how materials decompose (Year 5 Chemistry – Properties

			polluted with plastics which are entering the food chain. Some microplastics could be prevented from entering the water system using filters. Scientists are developing ways to prevent microplastics from escaping into our sewage. - Oil from oil spills at sea damages birds' feathers. Wildlife vets use detergents to clean oil from bird feathers.	scale - observe/observation: to use senses or instruments to obtain data - observing over time: an enquiry where observations are made over a fixed period of time - rank: to put things in an order - decay: the rotting of once-lived things through the action of bacteria and fungi - decomposer: a living thing that breaks down things that once lived - food chain: a series of living things where each one is food for the next - habitat: a natural environment where an animal or plant finds the things it needs to live and grow - organic: made from the remains of living things - recycle: to turn waste materials into new materials and objects - soil: the top layer of the Earth's surface; a mixture of bits of rock and remains of living things that have died	and changes of materials) - about adaptation (Year 6 Biology – Evolution and inheritance).

Spring Term 4 **Digestion and Food Chains**	**In this module, children will learn to:** **Working Scientifically:**	- Where does all the food we eat go? - What teeth do humans have? - What do teeth do in the digestive system? - What happens to food after we put it in our mouths? - What do animals eat? - What do animal teeth tell us?	- The digestive system is the parts of the body that work together to break down food into nutrients and get rid of waste. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestine, large intestine, rectum and anus. - Humans have different types of teeth: incisors, canines and molars. - Teeth have different shapes to break up different foods. Incisors are used for cutting food, canines for tearing and molars for grinding. - Food is chemically broken down in the stomach and small intestine, where it is absorbed into the blood. The large intestine absorbs any remaining water and the rectum stores poo. - A food chain shows how energy and nutrients pass from one living thing to another as they eat or get eaten by each other. A producer (a plant) makes the food using water, air and the energy of the sun. This is passed to the consumer (a herbivore) that eats it. It is then passed to any	**Tier 2 Vocabulary:** - contract: to make smaller by drawing together - flow: continuous movement - function: the purpose of something - grind: to make something smaller or smoother by rubbing, crushing or wearing it down - key (legend): a guide to what the symbols or colours in a diagram represent **Tier 3 Vocabulary:** - model: something to show how a system or process works - anus: the muscle which is relaxed in order to release poo - canine: a curved, pointed tooth - chemicals: tiny substances that all materials are made of; they each have specific properties - constipation: having hard, dry poo that is difficult to pass - decompose: the process where bacteria and worms, break down natural materials into tiny pieces that help new plants grow - diarrhoea: liquid poo - digestion: the process of breaking down food into smaller parts so the body can use it for energy and growth - extinct: a type of animal that no longer exists - food web: a network of food chains - incisor: a sharp front tooth - jaw: the bone in which teeth grow - large intestine: a wider tube leading from the small intestine; this is where water is absorbed into the blood - mechanical: parts moving together - milk teeth: the first set of teeth - molar: a large, flat tooth - oesophagus: the tube connecting the mouth to the stomach - predator: an animal that hunts or catches other animals to eat - prey: an animal that is hunted, killed and eaten by another animal	**Children have previously learnt:** - that animals need to eat to stay alive (Year 2 Biology – Animals, including humans) - that a balanced diet keeps animals, including humans, healthy (Year 3 Biology – Animals, including humans) - that the feeding relationships of animals can be shown as a food chain (Year 2 Biology – Living things and their habitats) - about the way animals are interdependent in ecosystems (Year 4 Biology – Living things and their habitats). **This prepares children for later learning:** - about the circulatory system and how it links to the digestive system (Year 6 Biology – Animals including humans) - about adaptation and evolution (Year 6 Biology – Evolution and inheritance).

			animal (a carnivore) that eats the consumer. - Animals have teeth appropriate to the food they eat. Carnivores have sharp slicing teeth for eating meat. Herbivores have flat-topped teeth for crushing plant matter.	- rectum: the part of the large intestine where poo is stored - saliva: a liquid in the mouth that helps us to swallow and aids digestion - small intestine: a long tube connecting the stomach to the large intestine; this is where nutrients are absorbed into the blood - stomach: the organ that receives food that has been swallowed and begins to digest it - vomit: partly digested food ejected from the stomach *Some commonly used words have specific scientific usage in this module, for example producer, consumer, food, diet. Ensure children know and understand this.* **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - classify: to organise things into scientific groups - diagram: a drawing that shows the parts of something or how the parts work together - enquiry: a method scientists use to collect evidence to answer questions - evaluate: to consider how well something has been done - evidence: information, from observations and measurements, that supports or disproves ideas - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - identify: to know and say what something is - identifying and classifying: an enquiry to identify or test for features to distinguish between different things - investigate: to find out more about a process or object by measuring or observing it - observe/observation: to use senses or instruments to obtain data - research: to find information - sequence: an arrangement of numbers or processes in a particular order	

				- carnivore: an animal which only eats other animals (meat) - consumer: a living thing which has to eat other animals or plants to gain its food - depend: to rely on something from an outside source in order to live - diet: the kind of food an animal usually eats - energy: the power to be active (in context of food and nutrition) - food chain: a series of living things where each one is food for the next - fossil: the preserved remains or trace of any once-living thing - habitat: a natural environment where an animal or plant finds the things it needs to live and grow - herbivore: an animal that only eats plants - nutrient: a substance that is essential for life and health - omnivore: an animal that eats both plants and other animals - palaeontologist: someone who studies fossils - producer: a living thing, such as a plant, which makes its own food	

Summer Term 5 **Sound**	**In this module, children will learn to:** - identify how sounds are made, associating some of them with something vibrating - recognise that vibrations from sounds travel through a medium to the ear - find patterns between the pitch of a sound and features of the object that produced it - find patterns between the volume of a sound and the strength of the vibrations that produced it - recognise that sounds get fainter as the distance from the sound source increases **Working Scientifically:** - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including [thermometers and] data loggers - reporting on findings from enquiries, including oral and written explanations, [displays or presentations of	- How are sounds made? - How do sounds reach our ears? - How can we change the volume of a sound? - How does the volume of a sound change as we move away from the source? - How can we change the pitch of a sound? - What affects the pitch of a plucked note?	- Sounds are made by something vibrating – this is the source. Different sources make different sounds. - Vibrations travel from the source through a material (a solid, liquid or gas) to the ear so that we can hear them. - Sounds can be quiet or loud. Volume depends on the size of the vibrations. - Sounds get fainter as the distance from the sound source increases. - Sounds can be high or low in pitch. Pitch depends on the speed of the vibrations. Generally, the larger the object vibrating, the slower the vibrations and the lower the pitch. - The pitch of a note played on a stringed instrument depends on the length, thickness and tautness of the vibrating string. *Do not introduce the idea of particles to explain how sounds move in different materials. Rather, focus on children observing that sounds (vibrations) need a material to move through and the*	**Tier 2 Vocabulary:** - communicate: to share information - compare: to estimate, measure or note the similarity or difference between items - pluck: to pull and release the strings of a musical instrument - taut: tightly pulled or stretched - travel: to move from one place to another **Tier 3 Vocabulary:** - evaluate: to consider how well something has been done - fair test: an enquiry to find out how changing one variable affects something else - refute: to use evidence to show that a statement is incorrect - support: to use evidence to show that a statement is correct - variable: something that can be changed, measured or observed in an enquiry - air: the invisible gas surrounding the Earth - decibel: the unit of measurement for sound, abbreviated as dB - gas: a state of a material where it changes in shape and volume to fill the space it is in; gases flow - liquid: a state of a material where it flows freely and takes the shape of its container - pitch: how high or low a sound is; in music, what note it is - solid: a state of a material which retains its shape unless a force is applied to it; solids have a constant volume - sound: vibrations that can be detected by the ear - sound source: an object creating a sound by vibrating - vibrate/vibration: to move backwards and forwards at high speed without changing location - volume: the loudness of a sound **Children will use the following previously learnt Tier 3 Vocabulary:**	Sound is a Physics topic. **Children have previously learnt:** - that we hear sounds with our ears (Year 1 Biology – Animals, including humans) - to classify materials as solids, liquids or gases (Year 4 Chemistry – States of matter). **This prepares children for later learning:** - sound as a wave with speed and frequency (Key Stage 3 Physics – Sound waves). *Sound is included only once in the National Curriculum for Key Stages 1 and 2, but links to work on materials and states of matter in Key Stage 2 and should be discussed in the context of learning about light in Year 3 and Year 5, comparing similarities and differences between light and sound.*

	results] and conclusions - using results to draw simple conclusions, make predictions for new values, [suggest improvements and raise further questions] - identifying differences, similarities or changes related to simple scientific ideas and processes		*differences in volume when sounds (vibrations) move through different materials. This module does not require understanding of the structure of the ear.*	- accurate: an adjective used to describe a measurement or observation that is exact - comparative test: a science enquiry to compare different materials or events - conclude/conclusion: to draw together evidence to find patterns and answers - data: information (observations and measurements) collected during an enquiry - data logger: a device using sensors to make measurements, including sound, light and temperature - diagram: a drawing that shows the parts of something or how the parts work together - enquiry: a method scientists use to collect evidence to answer questions - evidence: information, from observations and measurements, that supports or disproves ideas - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - fair: when everything is kept the same except the thing that is being compared - measure/measurement: to use equipment to find the size or weight of something on a numbered scale - observe/observation: to use senses or instruments to obtain data - pattern: a relationship between variables - predict/prediction: to use what you already know to suggest what might happen in an enquiry - sensor: a device that detects and responds to certain changes in the environment - material: the substance something is made of *To avoid confusion, we recommend you refer to the material the sound is moving through, rather than using the National Curriculum language of 'medium'. Using 'loud' and 'quiet' for volume rather than 'high' and 'low' will help to avoid confusion with pitch.* *Some commonly used words have specific scientific usage in this module, for example,*	

				'volume' is used in maths as a measure of the space an object occupies, and 'high' and 'low' are used to describe pitch. Ensure children know and understand this.	
Summer Term 6 **Classification of Plants and Animals**	**In this module, children will learn to:** - 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 **Working Scientifically:** - recording findings using simple scientific language, [drawings, labelled diagrams,] keys, [bar charts, and tables] - identifying differences, similarities [or changes] related to simple scientific ideas and processes	- How are living things classified? - How are vertebrates classified? - How are invertebrates classified? - Can you use a branching key? - What is this living things?	- Living things are classified into five groups. Animals and plants are two of the groups. - Vertebrates are classified into five main groups: fish, amphibians, reptiles, mammals and birds. Vertebrates have an internal backbone for support. - Invertebrates are classified into three main groups: arthropods, molluscs and annelids. Arthropods are subdivided into insects, arachnids, crustaceans and myriapods. Invertebrates have no internal backbone. - A branching key is a common way to structure identification charts and uses a series of yes/no questions to split the group into subgroups until individual living things can be identified and named. - Using branching keys can help us to identify and name familiar and unfamiliar living things.	**Tier 2 Vocabulary:** - characteristic: a feature that is typical of a particular living thing or material - feature: a distinctive characteristic of a living or non-living thing - internal: inside - observable: can be seen or measured - segment: a part of something that has been divided into sections **Tier 3 Vocabulary:** - branching key: a way of sorting a small number of items using yes/no questions - annelid: an invertebrate group with segmented bodies, no legs, no antennae, usually have bristles, although these may be too small to see - arachnid: an invertebrate group with eight jointed legs, no wings and two body parts: head and abdomen - cold-blooded: unable to regulate their own body temperature and so it changes with the surroundings - crustacean: an invertebrate group with ten or more pairs of jointed legs, no wings, three body parts (head, thorax and abdomen) protected by a harder outer shell, a segmented body and two pairs of antennae; most live in water - flowering plant: a plant that produces flowers and fruit - mollusc: an invertebrate group of soft-bodied animals with no legs, no segments, no wings, a muscular foot and most have tentacles and shells - myriapod: an invertebrate group of typically small animals with two body parts (head and abdomen, which has many segments), more than nine pairs of legs, with each segment having one or two pairs of legs, and one pair of antennae; they live on land	Classification of plants and animals is a Biology topic. **Children have previously learnt:** - about animal (vertebrate) classification and structure (Year 1 Biology – Animals, including humans) - to identify and name common wild and garden plants and deciduous and evergreen trees (Year 1 Biology – Plants) - about animal (vertebrate and invertebrate) classification (Year 2 Biology – Living things and their habitats) - about animal (vertebrate and invertebrate) stages of life (Year 2 Biology – Animals, including humans) - to notice differences between seed and bulb plant growth (Year 2 Biology – Plants) - about classification of rocks (Year 3 Chemistry – Rocks) - about how vertebrate

				- non-flowering plant: a plant that does not have a flowering stage of its life cycle - organism: a living thing - warm-blooded: having a body temperature that does not change whatever the surrounding temperature **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - classify: to organise things into scientific groups -identify: to know and say what something is - research: to find information - amphibian: an animal (vertebrate) that lives in water or on land but must return to the water to reproduce - bird: an animal (vertebrate) that has feathers and lays eggs with hard shells - deciduous: the group of plants containing trees which lose all of their leaves in the autumn - evergreen: the group of plants containing trees which appear to have leaves all year round - exoskeleton: an external supporting structure for the body of a living thing - fish: an animal (vertebrate) which lives in water and has gills and fins - flower: the part of the plant which produces seeds - insect: an invertebrate group of small animals with bodies divided into three parts, with three pairs of jointed legs, usually one or two pairs of wings and one pair of antennae - invertebrate: an animal that has no internal backbone - mammal: an animal (vertebrate) that is covered in hair or fur; the female gives birth to live young and feeds her babies on milk from her own body - reptile: a cold-blooded animal (vertebrate) which has dry, scaly skin and lays eggs on land - skeleton: a structure that provides support, shape and protection for the body of a living thing - vertebrate: an animal that has an internal backbone for support *Some commonly used words have specific*	and invertebrate bodies are supported (Year 3 Biology – Animals, including humans). **<u>This prepares children for later learning:</u>** - about differences in animal life cycles and life processes (Year 5 Biology – Living things and their habitats) - classification of living things (Year 6 Biology – Living things and their habitats).

				scientific usage in this module, for example, key and segment. Ensure children know and understand this.	

Year 5 Science Curriculum

Term	National Curriculum Expectations	Key Learning Questions	Associated Substantive Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 1 **Forces and Mechanisms**	**In this module, children will learn to:** - explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object - identify the effects of air resistance, water resistance and friction, that act between moving surfaces - recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect **Working Scientifically:** - planning different types of scientific enquiries to answer	- What is the friction between different surfaces? - Why do some objects fall faster than others? - How does the size of the canopy affect the time it takes a parachute to fall? - How does the number of pulleys affect the force needed to lift a load? - How does the length of the lever affect the force needed to lift a load? - How do gears work?	- Gravity is a force that pulls all objects towards the centre of the Earth. Air resistance is a force that slows down an object moving through air. The amount of air resistance depends on the surface area of the object. It is air resistance, not the object's weight, that affects how quickly an object falls. - This lesson consolidates the understanding that air resistance increases as the surface area of the object moving through the air gets larger. The precision of a measurement will depend on the equipment and method	**Tier 2 Vocabulary:** - anticlockwise: moving in the opposite direction to the hands on a clock - clockwise: moving in the same direction as the hands on a clock - system: a group of things or parts that work together **Tier 3 Vocabulary:** - accuracy: shows how close to the true answer readings are and is improved by taking repeat readings and keeping variables the same - dependent variable: the variable that is being measured - independent variable: the thing that is being changed - line graph: a type of chart that displays data points connected by a line - air resistance: a contact force acting on all objects that are moving through air, whether this is falling, moving along or rising - force meter: a piece of equipment that measures a force	**Children have previously learnt:** - how things move on different surfaces (Year 3 Physics – Forces and magnets) - that magnets attract magnetic materials, and that they have two poles which attract or repel each other (Year 3 Physics – Forces and magnets) - that some forces need contact between two objects, but magnetic forces can act at a distance (Year 3 Physics – Forces and magnets). **This prepares children for later learning:** - drawing force diagrams (Key Stage 3 Physics – Forces)

	questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - recording data and results of increasing complexity using scientific diagrams and labels, [classification keys, tables, scatter graphs, bar] and line graphs - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or arguments		used. The accuracy of readings shows how close they are to the true answer and is improved by taking repeat readings and keeping variables the same. - Water resistance is a force that slows down an object moving through water. The amount of water resistance depends on the shape of the object. - A pulley is a mechanism used for lifting heavy objects (the load) by applying a pulling force at one end of rope attached to the load which passes over a wheel. The more pulleys in the mechanism, the less pulling force is required to lift the load. - A lever is a long, rigid arm that rests on a pivot. A force is applied to one part of the lever to lift the load at another point on the lever. The longer the lever, the less force is required to lift the load. - A gear is a mechanism which consists of wheels with teeth that slot together. Gears change the direction of movement and the force	- friction: a contact force that makes it harder to move an object across a surface or slows down an object moving over a surface - fulcrum: the point about which a lever turns - gears: a simple mechanism, consisting of wheels that have teeth that slot together with the teeth on another gear - gravity: a non-contact force that pulls an object towards the centre of the Earth - impact: the force produced when two objects collide - lever: a simple mechanism, consisting of a rigid arm that turns about a fulcrum, which makes it easier to move a load - load: a heavy object that is being moved - magnetism: the force of a magnet to attract - mechanism: a device that makes it easier to move something - Newton (N): the unit of measurement of a force - oppose: to move in a direction that is the opposite direction to another movement - pivot: to turn - pulley: a mechanism used for lifting heavy objects by applying force at one end of a rope which passes over a wheel - water resistance: a contact force which slows down an object moving through water due to the water pushing back against the object as it moves **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - accurate: an adjective used to describe a measurement or observation that is exact - comparative test: an enquiry which identifies a relationship by changing an independent variable and observing a linked change in the dependent variable - conclude/conclusion: to draw together evidence to find patterns and answers - control variable: a variable that is kept the same to make the test fair	- about the turning effect of forces (Key Stage 3 Physics – Forces) - measuring forces (Key Stage 3 Physics – Forces). ***As children will learn more about measuring forces in Key Stage 3, they are just introduced to this in this module. They do not need to be introduced to drawing force diagrams. The difference between mass and weight is a difficult concept and should be avoided. Also avoid changing the weight of a falling object as the results this produces are often contrary to the science and reinforce the misconception that heavier objects fall more quickly.***

			required to make something move. Adjacent gears turn in opposite directions. Smaller gears turn faster than larger gears. A smaller force is needed to turn a smaller gear than a larger gear.	- enquiry: a method scientists use to collect evidence to answer questions - evaluate: to consider the results and method of an enquiry to judge how reliable the conclusion is - fair test: an enquiry which identifies a cause and effect relationship by measuring a change in an independent variable and a linked change in the dependent variable - precise: exact; the precision of a measurement will depend on the equipment and method used - predict/prediction: to use what you already know to try to work out what will happen in an enquiry - refute: to use evidence to show that a statement is incorrect - support: to use evidence to show that a statement is correct - variable: something that can be changed, measured or observed in an enquiry - contact force: where the object providing the force is touching (in contact with) the object it is moving - force: a push or pull - non-contact force: a force which acts on an object without coming physically in contact with it	
Autumn Term 2 **<u>Properties and Uses of Materials</u>**	**In this module, children will learn to:** - compare and group together everyday materials on the basis of their properties, including their hardness, [solubility], transparency, conductivity (electrical and thermal), and response to magnets - give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including	- How can we compare and group materials? - Which materials did the builders use when constructing our school and why? - Which liquid is the thickest? - Who invents things? - Can the same container keep cold things cold and hot things hot?	- Materials are used in many different ways and for particular purposes based on their properties. Materials can be fit-for-purpose. How materials may vary in form (e.g. plastics of different types) and why they are used for particular purposes. Weathering, wear and tear can occur over time and this will have an impact upon a material's fitness-for-purpose. - Liquids have properties which include having: [a	**<u>Tier 2 Vocabulary:</u>** - construction: the process of building - design: to make or draw plans for something new - disassemble: to take apart - dispose: to throw something away - flow: continuous movement - invent/invention: to create or design something new - leak: to allow liquid to escape - pour: to cause to flow in a steady stream - structure: the ways the parts of something are joined together **<u>Tier 3 Vocabulary:</u>** - criterion: a rule for evaluating or testing something - dependent variable: the variable that is being measured - independent variable: the variable that is being changed	**<u>Children have previously learnt:</u>** - about the properties of solids, liquids and gases, including how heating and cooling can cause a change of state; evaporation and condensation and the part played in the water cycle; how a thermometer works and how it can be used to measure temperature (Year 4 Chemistry – States of matter) - about which materials are electrical conductors and

	metals, wood and plastic **Working Scientifically:** - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or argument	- Which materials are absorbent, permeable or waterproof?	fixed weight, a fixed volume,] an ability to flow, a level of viscosity and they take on the shape of a container. Viscosity is the property of a liquid that describes how fast or slowly it will flow. The viscosity of a liquid describes how thick or thin it is. A liquid with high viscosity (thick) will flow slowly and a liquid with low viscosity (thin) will flow quickly. - Inventors discover new uses for materials and create new materials. Inventors design objects using their knowledge of the properties of materials. - A thermal insulator is a material that provides high resistance to heat flow. Examples include rubber, wool, wood, polystyrene/foam, plastics. A thermal conductor is a material that provides low resistance to heat flow. Examples include metals, such as aluminium, copper, steel, and iron. A thermal insulator keeps hot things hot and cold things cold. - Materials can be absorbent and can soak	- survey: to collect data - brittle: easily broken if pressure is applied - ductile: can be stretched or rolled until very thin - fragile: delicate; easily broken if not handled with care - impermeable: not allowing fluid to pass through - malleable/malleability: can be shaped when pressure is applied - permeable: allowing fluid to pass through it - thermal conductor: a material that transmits heat well - thermal insulator: a material that does not transmit heat well - viscosity/viscous: how fast or slowly a liquid will flow; how 'thick' or 'thin' a liquid is - wear and tear: deterioration of materials over time due to weathering or regular use **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - comparative test: an enquiry which identifies a relationship by changing an independent variable and observing a linked change in the dependent variable - control variable: a variable that is kept the same to make the test fair - data: information (observations and measurements) collected during an enquiry - evaluate: to consider the results and method of an enquiry to judge how reliable the conclusion is - observe/observation: to use senses or instruments to obtain data - predict/predicting: to use what you already know to try to work out what will happen - scale: a set of numbered marks made at evenly spaced points - variable: something that can be changed, measured or observed in an enquiry - absorb/absorbent: to take in something - compost: a mixture of decaying organic matter, used for fertilising soil	electrical insulators (Year 4 Physics – Electricity) - about magnets (Year 3 Physics – Forces and magnets) - about human impact on the environment and what happens to different materials when they are thrown away (Year 4 Biology – Human impact on the environment) - stages of human growth (Year 4 Biology – Human growth **<u>This prepares children for later learning:</u>** - about dissolving, solutions, separating mixtures, filtering, sieving and evaporating, reversible and irreversible changes (Year 5 Chemistry – Separating mixtures and changing materials).

			up and take in liquid. Some materials are permeable and let water pass through. Some materials are waterproof and do not let water pass through. The use of some materials can have an impact on the environment.	- decompose: the process where bacteria and worms break down natural materials into tiny pieces that help new plants grow - durable: able to withstand wear, pressure, or damage - elastic/elasticity: able to stretch easily without breaking and then return to original form - electrical conductor/insulator: a material that allows electricity to flow through it/does not allow electricity to flow through it - flexible/flexibility: able to bend easily without breaking - hard/hardness: how resistant a material is to scratching (not how easily it breaks) - liquid: a state of a material where it flows freely and takes the shape of its container - magnetic/non-magnetic: able to be attracted by a magnet/ not able to be attracted by a magnet - opaque: the property of blocking light - property: a characteristic of a material, what it is like - solid: a state of material which retains its shape unless a force is applied to it; solids have a constant volume - transparent/ transparency: the property of allowing almost all light that falls on it to pass through, enabling a clear view of what lies behind it - weathering: the effects of weather, breaking down the surface of rocks over time	
Spring Term 3 **<u>Earth and Space</u>**	**In this module, children will learn to:** - 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	- What's in space? - How do the planets move? - How does the position of the Sun in the sky change? - What causes day and night?	- The main bodies that are found in our solar system are the Sun, Moon, Earth and planets. They are all spherical. - The Earth orbits the Sun. The time it takes to complete one orbit is called a year. The other planets of our solar system also orbit the Sun at different	**<u>Tier 2 Vocabulary:</u>** - dawn: when light first appears in the sky before sunrise - diameter: the distance across the centre of a circle or sphere - dusk: the time after sunset when there is still some light in the sky - horizon: where the land and sky appear to meet - midday: 12 noon - spherical: shaped like a ball - sunrise: the time in the morning when the Sun is first seen	**<u>Children have previously learnt:</u>** - how day length varies with the seasons (Year 1 Biology – Seasonal changes) - that the Sun and stars are light sources and the Moon is not (Year 3 Physics – Light) - how shadows are formed and can be

	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 **Working Scientifically:** - recording data and results of increasing complexity using scientific diagrams and labels, [classification keys, tables,] scatter graphs, [bar and line graphs] - reporting and presenting findings from enquiries, including conclusions, [causal relationships] and explanations [of and degree of trust in results,] in oral and written forms [such as displays and other presentations] - identifying scientific evidence that has been used to support or refute ideas or arguments	- How does the Moon move? - What patterns can we find in data about planets?	distances and take different times to complete one orbit. - The Sun appears to move east to west in an arc across the sky from sunrise to sunset. Changes in shadows during the day can be explained by the changes in the position of the Sun. - The Earth rotates on its axis and this causes day and night, the apparent movement of the Sun across the sky and the changes in shadows observed in Lesson 3. - The Moon orbits the Earth every 28 days and rotates on its axis. ***Check and consolidation of conceptual learning from Lessons 1–5. Children may notice, but do not need to explain, the phases of the Moon. They do not need to learn about the tilt of the Earth causing seasonal changes; this will be taught in Key Stage 3.***	- sunset: the time in the evening when the Sun is no longer visible **<u>Tier 3 Vocabulary:</u>** - axis: an imaginary line that a body (e.g. a planet or moon) rotates around - moon: a natural satellite that orbits a planet - orbit: to move in a regular path around another object (verb); the path taken when orbiting (noun) - planet: a near-spherical body with a predictable orbit around a star - rotate: to spin or turn in a circle around a fixed point or axis - solar system: collective term for the Sun, the planets that orbit it, plus any moons and other natural bodies within it - star: a huge gas body that generates light and heat; some stars have been observed as having planets orbiting them; they are suns at the centre of their own solar systems - year: the length of time it takes a planet to complete one full orbit of its sun (its orbital period) **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - data: information (observations and measurements) collected during an enquiry - diagram: a drawing that represents what is happening rather than showing artistic detail - enquiry: a method scientists use to collect evidence to answer questions - evidence: information, from observations and measurements, that supports or disproves ideas - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - model: (noun) a representation of a phenomenon or explanation that is difficult to visualise - pattern: a relationship between variables - predict/prediction: to use what you already know to try to work out what will happen in an enquiry	changed (Year 3 Physics – Light). **<u>This prepares children for later learning:</u>** - about stars and galaxies, differences in gravitational force, and the Earth's tilt as the explanation for seasonal variations (Key Stage 3 Physics – Space physics) ***Earth and space is an area of knowledge that is only included once in the primary National Curriculum, but it links to learning about light and draws on children's everyday experiences of day and night and the night sky.***

				- support: to use evidence to show that a statement is correct - dark/darkness: the absence of light - light: is produced by a light source and makes things visible - light source: something, natural or artificial, that produces its own light - opaque: the property of blocking light by absorbing or reflecting all of the light that falls on it - shadow: a darker region where some or all of the light has been blocked by an object - Sun: the star at the centre of our solar system	
Spring Term 4 **Plants and Animal Life Cycles**	**In this module, children will learn to:** - describe the life process of reproduction in some plants [and animals] - describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird **Working Scientifically:** - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - recording data and results of increasing complexity using scientific diagrams and labels, [classification	- How do flowering plants produce seeds? - Do all plants have the same number of reproductive parts? - How can we grow more plants without using seeds? - How do birds change over their lifecycles? - Do all mammals have the same gestation period? - How do amphibians change throughout their lifecycle? - Do all insects go through the same lifecycle?	- All living things have a life cycle which includes growth and reproduction, eventually ending in death and decay. Flowers contain male sex organs called stamens and female sex organs called carpels. Pollen must be moved to a part of the carpel called the stigma for reproduction to take place. This process is called pollination. Seeds are the product of sexual reproduction. - Most flowering plants have flowers with both male and female parts – such as tulips, daisies and roses. Different flowers have different numbers of petals, stamens or carpels. - Asexual reproduction creates new plants that are identical to the parent. Bulbs, tubers,	**Tier 2 Vocabulary:** - dissect: to separate into pieces **Tier 3 Vocabulary:** - anther: the end of the stamen which produces pollen - asexual: when an organism can reproduce by itself - breeding: the mating of animals and the production of offspring - embryo: an animal in the early stages of development - filament: the stalk of a stamen - female: the sex that can bear offspring or produce eggs following fertilisation - fertilisation: the joining of a male reproductive cell with a female reproductive cell to produce a new organism - gestation: the time between egg fertilisation and birth - larva: immature form of an animal - male: the sex that can fertilise females - mate: animal reproduction - metamorphosis: when an animal changes from one form into another - ovary: the part of the carpel which contains ovules - ovule: the female part of the plant where the seed begins to grow - propagation: producing new plants without seeds	**Children have previously learnt:** - that animals have offspring which grow into adults (Year 2 Biology – Animals, including humans) - that flowers play an important part in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (Year 3 Biology – Plants). **This prepares children for later learning:** - about human growth (Year 5 Biology – Animals, including humans) - about evolution and inheritance (Year 6 Biology – Evolution and inheritance).

	keys, tables, scatter graphs, bar and line graphs]		runners and plantlets are new plants which grow from parts of existing plants. Gardeners may make more plants by taking cuttings, growing new plants from small parts of a parent plant. - Most animals reproduce sexually. This involves two parents a male and a female. The sperm from the male fertilises the female egg inside her body. Female birds lay eggs with hard shells. These may or may not be fertilised. - Mammals reproduce by sexual reproduction. The embryo grows inside the womb until it is time to be born. The female gives birth to their young and produces milk to feed their young. - Amphibians reproduce by sexual reproduction. The female's eggs are fertilised outside her body. The female lays many soft, jelly-covered eggs in water and the male immediately sprays a cloud of sperm over them. Amphibians spend the early stages of their lives in water using gills to breathe. Some amphibians go	- pupa: an insect in its inactive immature form between larva and adult - reproduction: the process by which living things make more of their own kind - seed dispersal: the movement of seeds away from the parent plant - stamen: the male reproductive part of the flower made up of a filament and an anther - stigma: the top of the carpel which takes in pollen - style: the part of the carpel that leads from the stigma to the ovary - thorax: middle part of an insect's body **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - pattern: a relationship between variables - amphibian: an animal (vertebrate) that lives in water or on land but must return to the water to reproduce - bird: an animal (vertebrate) that has feathers and lays eggs with hard shells - carpel: female reproductive part of a flowering plant, which contains an ovary, style and stigma - exoskeleton: an external supporting structure for the body of a living thing - flower: the part of a plant which produces seeds - insect: an invertebrate group of small animals with bodies divided into three parts, with three pairs of jointed legs, usually one or two pairs of wings and one pair of antennae - life cycle: the series of changes occurring in the life of an animal or plant - mammal: an animal (vertebrate) that is covered in hair or fur; the female gives birth to live young and feeds her babies on milk from her own body - organism: a living thing - pollen: fine yellow powder made by the male part of the plant - pollination: the movement of pollen from the anther to the stigma of another plant - pollinator: an animal which carries out pollination - vertebrate: an animal that has an internal backbone for support	

			through a process of metamorphosis. When fully mature, most amphibians develop lungs and are able to live both in water and on land. - Insects are small animals with a hard covering over their bodies, which is known as an exoskeleton. Insects have a body that is divided into three parts: head, thorax and abdomen. The majority of insects go through a process of complete metamorphosis. Some insects go through a process of incomplete metamorphosis.		
Summer Term 5 **Seperating Mixtures and Changing Materials**	**In this module, children will learn to:** - know that some materials 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	- How can we separate mixtures? - What happens when we mix liquids and solids? - What makes a difference to how fast sugar or salt disolves? - How can we clean up contaminated water? - What makes a change non-reversible? - How much gas can be produced by a non-reversible change?	- Solid, dry mixtures of materials can be separated by sieving. - Some solids dissolve in water while others do not. Materials that do not dissolve can be separated from a liquid by filtering. - Solids which dissolve do so faster in certain conditions and can be retrieved from a solution if the liquid is evaporated. - Filtering processes can be used to decontaminate polluted water and make it useful for a variety of purposes.	**Tier 2 Vocabulary:** - combine: to mix two or more materials together - flow chart: a diagram that represents a process - grade (of sieve): the size of hole in a sieve - inflate: fill (a balloon or other expandable structure) with air or gas - particle: a small piece of solid material - proportion: a part, share or number considered in comparative relation to a whole - puncture: make a hole in a material - recommendation: a suggestion or proposal as to the best course of action - room temperature: a standardised convention for the temperature of a room, 20 degrees Celsius - sieve: a piece of equipment with holes of different sizes used to separate solid materials with different size particles **Tier 3 Vocabulary:**	**Children have previously learnt:** - to compare and group materials according to whether they are solids, liquids, or gases (Year 4 Chemistry – States of matter) - to recognise how temperature changes may cause materials to change state (Year 4 Chemistry – States of matter) - about the processes of evaporation and condensation in the water cycle (Year 4 Chemistry – States of matter)

	- 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 **Working Scientifically:** - planning different types of scientific enquiries to answer questions, including recognising, and controlling variables, where necessary - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships, and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations		- Some changes of state are reversible, and others are non-reversible. - Non-reversible changes result in the formation of new materials, in this case carbon dioxide gas.	- contamination: when something clean gets mixed with something dirty, making it unclean or unsafe - dissolve: a solid breaks down and combines with a liquid forming a mixture - filter: to use a special tool or process to separate materials - insoluble: a material that does not dissolve in a liquid - non-reversible: (also called irreversible) a material change that cannot be reversed. New materials are produced as part of the change process - react/reaction: two or more materials mixed together change to produce new materials - reversible: a material change where all materials involved can be changed back to their original state - saturated: when no more solid can be dissolved into a liquid - separate: to take apart a mixture of dry or wet and dry materials - sieve: to separate solid materials from a mixture - soluble: a material that dissolves in liquid to form a solution - solution: a mixture containing solids that have dissolved in a liquid **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - accurate: an adjective used to describe a measurement or observation that is exact - comparative test: an enquiry which identifies a relationship by changing an independent variable and observing a linked change in the dependent variable - control variable: a variable that is kept the same to make the test fair - conclude/ conclusion: to draw together evidence to find patterns and answers - data: information (observations and measurements) collected during an enquiry - evidence: information, from observations and measurements that supports or disproves ideas	- about pollution (Year 4- Living things and their habitats - to compare and group everyday materials on the basis of their properties and give reasons for the particular uses of materials (Year 5 Chemistry – Properties and uses of materials). **<u>This prepares children for later learning:</u>** - about chemical reactions of different types.

				- explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - evaluate: to consider how well something has been done - fair test: an enquiry which identifies a cause and effect relationship by measuring a change in an independent variable and a linked change in the dependent variable - observe: to use senses or instruments to obtain data - pattern: a relationship between variables - predict/prediction: to use what you already know to try to work out what will happening an enquiry - secondary source: a document (or other source) that shares data or information from an enquiry carried out by someone else - variable: something that can be changed, measured or observed in an enquiry - condense: to change from gas to a liquid - carbon dioxide: a gas in the air - crystal/crystalline: a solid material that has flat surfaces which form geometric shapes - evaporate/ evaporation: the change from liquid to gas; a process used to remove liquid from a mixture leaving the solid behind - gas: a state of a material where it changes in shape and volume to fill the space it is in; gases flow - liquid: a state of a material where it flows freely and takes the shape of its container - solid: a state of material which retains its shape unless a force is applied to it; solids have a constant volume	
Summer Term 6 **Human Growth**	**In this module, children will learn to:** - describe changes as humans develop to old age **Working Scientifically:**	- How do newborn babies change into teenagers? - How do girls become women?	- From before they are born to puberty humans go through distinct periods of development: gestation, infancy, childhood. - The female body changes as it goes	**Tier 2 Vocabulary:** - - ageing: getting older - milestone: a significant event or achievement that marks an important point or stage in development - stage: a step in a sequence of events - system: a group of things or parts that work together	**Children have previously learnt:** - humans age over time and like other mammals have a life cycle. Different animal groups have very different life cycles. (Year 5 Biology –

	- reporting and presenting findings from enquiries, including [conclusions, causal relationships and explanations of and degree of trust in results, in oral and] written forms such as displays and other presentations	- How do boys become men? - What is the human life cycle?	through puberty - from about age 12. There is a fast period of growth and sexual organs develop. - The male body changes as it goes through puberty - from about age 12. There is a fast period of growth. - The human body changes as it gets older. The human life cycle has different stages: gestation, infancy, childhood, puberty, adulthood, ageing, death.	**Tier 3 Vocabulary:** - abdomen: the lower part of the human torso - Adam's apple: the visible lump in a man's throat caused by the voice box - breasts: the soft organs on female chest which produce milk after a baby is born - childhood: between ages 2 and 12 in the human life cycle - genitals: external human reproductive organs - gestation: the time between egg fertilisation and birth - infancy: between ages 0 and 2 in the human life cycle - menstruation/having a period: a monthly process where women's bodies release blood from the uterus out of the body through the vagina - newborn: a baby that has just been born - pregnancy: when a woman's body is growing a baby inside her uterus - puberty: the change from child to adult in the human life cycle - pubic hair: hair growing in the groin around the genitals - reproduction: the process by which living things make more of their own kind - sweat: liquid secreted by the skin - teenage: between ages 13-19 in the human life cycle - umbilical cord: the cord which connects a baby to the mother so it can receive oxygen and nutrients whilst growing in the uterus - uterus: the female reproductive organ in which a baby grows - vagina: the tube connecting the outer area of the female body (vulva) to the uterus **Children will use the following previously learnt Tier 3 Vocabulary:** - diagram: a drawing that represents what is happening rather than showing artistic detail - evidence: information, from observations and measurements, that supports or disproves ideas	Plant and animal life cycles). **This prepares children for later learning:** - about the human circulatory system and how diet, exercise and medicines can impact on human health. (Year 6 Biology – Animals including humans).

				- hygiene: being clean to stay healthy - large intestine: a wider tube leading from the small intestine; this is where water is absorbed into the blood - life cycle: the series of changes in the life of an animal or plant - mammal: an animal (vertebrate) that is covered in hair or fur; the female gives birth to live young and feeds her babies on milk from her own body - muscle: stretchy bands that work in pairs to make body parts move - organ: body part performing a function - oesophagus: a tube connecting the mouth to the stomach - small intestine: a long tube connecting the stomach to the large intestine; this is where nutrients are absorbed into the blood - stomach: the organ that receives food that has been swallowed and begins to digest it ***Some commonly used words have specific scientific usage in this module, for example, period, breaking (voice). Ensure children know and understand this.***	

Year 6 Science Curriculum

Term	National Curriculum Expectations	Key Learning Questions	Associated Substantive Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 1 **Classification of Living Things**	**In this module, children will learn to:** - 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 animals based on specific characteristics **Working Scientifically:** - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - recording data and	- How can we sort the mess? - What plants are there other than flowering plants? - How can we classify animals? - What else is living besides plants and animals? - How can we identify living things? - What lives here? - Where do these organisms fit in my key?	- Every living thing can be grouped, classified and identified. The process of classification begins with common observable characteristics. Classification is the process of grouping living things together based on how they look and how they're related to each other. - Ferns, mosses and conifers are plants that do not have flowers as part of their life cycle. - Animals are grouped as vertebrates and invertebrates. Vertebrates are then split into five smaller groups: mammals, birds, reptiles, amphibians and fish. Invertebrates are split	**Tier 2 Vocabulary:** - common: an adjective used to describe a characteristic that is shared - observable: can be seen or measured **Tier 3 Vocabulary in this module:** - arthropod: an invertebrate group that includes insects, arachnids, crustaceans and myriapods - cone: the hard 'egg-shaped' part of a conifer that opens and releases the seeds -conifer: a division of plants that do not have flowers as part of their life cycle -echinodermata: a class of invertebrates that have a calcium skeleton and tube feet operated by fluid pressure - fern: a division of plants that do not have flowers as part of their life cycle - flatworm: a class of invertebrates that have simple, flattened bodies with no blood vessels; for example, tapeworms - monera: a kingdom of living things that contains the simplest form of organisms (single-celled) - moss: a division of plants that do not have flowers as part of their life cycle - mould: a type of fungus that thrives in moist, damp conditions	This module should be taught at the start of the autumn term when there are still plenty of living things easily found within and close to the school grounds for first-hand classification and the creation of branching keys. The work created at the end of this module could be used by Year 4 children in their classification module at the end of the year (Module 6, Classification of plants and animals). **Children have previously learnt:** - about animal (vertebrate) classification and structure (Year 1

	results of increasing complexity using [scientific diagrams and labels,] classification keys, tables, [scatter graphs, bar and line graphs] - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations		into five smaller groups: arthropods, molluscs, annelids, flatworms and echinodermata. Arthropods are then split into four groups: insects, arachnids, crustaceans and myriapods. - Plants and animals are two of five kingdoms of living things. The three remaining kingdoms are fungi, protista and monera. - By asking a series of yes/no questions based on common observable characteristics, we can start to identify organisms and name them. - Knowing the names of the species that live in the local area and within the school grounds is important at this stage in the learning sequence. - The knowledge and experience gained in the previous six lessons will enable the successful creation of a branching key based on organisms in the locality.	- needle: a narrow, pointed leaf of a conifer - protista: a kingdom of living things that contains mostly single-celled organisms that do not fit into any other category; most are water-based and can move - spore: a seed-like cell that allows ferns and mosses to reproduce - taxonomy: a way of organising and classifying different living things **<u>Children will use the following previously learnt Tier 3 vocabulary:</u>** - branching key: a way of sorting a small number of items using yes/no questions - classify: to organise things into scientific groups - enquiry: a method scientists use to collect evidence to answer questions - identify: to know and say what something is - identifying and classifying: an enquiry to identify or test for features to distinguish between different things - observing over time: an enquiry where observations are made over a fixed period of time - amphibian: an animal (vertebrate) that lives in water or on land but must return to the water to reproduce - annelid: an invertebrate group with segmented bodies, no legs, no antennae, usually have bristles although these may be too small to see - arachnid: an invertebrate group with eight jointed legs, no wings and two body parts: head and abdomen - bird: an animal (vertebrate) that has feathers and lays eggs with hard shells - carpel: female part of a flowering plant, which contains an ovary, style and stigma - cold-blooded: unable to regulate their own body temperature and so it changes with the surroundings - crustacean: an invertebrate group with ten or more pairs of jointed legs, no wings, three body parts (head, thorax and abdomen) protected by a	Biology – Animals, including humans) - to identify and name common wild and garden plants and deciduous and evergreen trees (Year 1 Biology – Plants) - about animal (vertebrate and invertebrate) classification (Year 2 Biology – Living things and their habitats) - about animal (vertebrate and invertebrate) stages of life (Year 2 Biology – Animals, including humans) - about differences between seed and bulb plant growth (Year 2 Biology – Plants) - about classification of rocks (Year 3 Chemistry – Rocks) - about classification of plants (flowering and non-flowering) and animals (vertebrate and invertebrate), and the use of branching keys (Year 4 Biology – Living things and their habitats). **<u>This prepares children for later learning:</u>** - about differences between species (Key Stage 3 Biology –

				harder outer shell, a segmented body and two pairs of antennae; most live in water - fish: an animal (vertebrate) which lives in water and has gills and fins - flowering plant: a plant that produces flowers and fruit - fungi: the kingdom of living things that contains mould, mushrooms and yeast - insect: an invertebrate group of small animals with bodies divided into three parts, with three pairs of jointed legs, usually one or two pairs of wings and one pair of antennae -invertebrate: an animal that has no internal backbone - mammal: an animal (vertebrate) that is covered in hair or fur; the female gives birth to live young and feeds her babies on milk from her own body - mollusc: an invertebrate group of soft-bodied animals with no legs, no segments, no wings, a muscular foot and most have tentacles and shells - myriapod: an invertebrate group of typically small animals with two body parts (head and abdomen, which has many segments), more than nine pairs of legs, with each segment having one or two pairs of legs, and one pair of antennae; they live on land - organism: a living thing - reproduction: the process by which living things make more of their own kind - reptile: a cold-blooded animal (vertebrate) which has dry, scaly skin and lays eggs on land - species: a group of living things that can mate with one another but not with those of other groups - stamen: male part of a flowering plant made up of a filament and an anther, which makes pollen - vertebrate: an animal that has an internal backbone for support - warm-blooded: having a body temperature that does not change whatever the surrounding temperature *Some commonly used words have specific scientific usage in this module, for example key,*	Inheritance, chromosomes, DNA and genes).

				needle, cone. Ensure children know and understand this.	
Autumn Term 2 **Evolution and Inheritance**	**In this module, children will learn to:** - recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago - recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents - identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution **Working Scientifically:** - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been	- How are living things different? - How is an organism adapted to live in its habitat? - How do an animals adaptations help it to survive? - What can fossils tell us? - How does evolution happen? - How did Wallace and Darwin come up with the idea of natural selection?	- A species is a group of organisms that can reproduce and have offspring which can also have offspring. There are differences between organisms from different species, and this is called variation. There are also differences between individuals within the same species, and this is also called variation. - Any feature of an organism which helps it to survive is called an adaptation. Organisms are adapted to live in specific habitats. - An animal's adaptations help it to survive in a specific habitat. A range of different adaptations help animals to survive. If a habitat changes, an animal's adaptations may no longer help it to survive. If all the animals of the same species die out, then the species becomes extinct. - Fossils provide evidence of organisms that lived millions of years ago. Some of the fossilised species	**Tier 2 Vocabulary:** **N/A** **Tier 3 Vocabulary:** - anomaly: an odd result which does not fit within a pattern of results - camouflage: the adaptation of the covering of an organism's body that helps it to blend in with the surroundings - evolution: the formation of a new species; through many gradual changes and over many millions of years, organisms develop from those that preceded them - extinction: the complete elimination of a species - inherited: when a characteristic is passed on from parents to offspring - migrate: to move from one place to another - natural selection: the mechanism which drives evolution (sometimes referred to as survival of the fittest) - offspring: the product of reproduction (babies, seeds) - variation: a difference between an animal or a plant **Children will use the following previously learnt Tier 3 Vocabulary:** - classify: to organise things into scientific groups - evidence: information, from observations and measurements, that supports or disproves ideas - explain/explanation: to give reasons, from scientific knowledge, for observations and conclusions - model: a representation of a phenomenon or explanation that it is difficult to visualise - adaptation: a feature of an organism which helps it to survive in a particular habitat - adapted: suited to survive in a particular habitat - fossil: the preserved remains or trace of any once-	This module builds upon all the Biology-based topics. Evolution is a unifying concept in Biology. Children's learning in previous years about the features of plants, animals and other organisms provides a platform for learning about adaptations and evolution. **Children have previously learnt:** - about animal and plant features and adaptations and how they are classified (all Biology topics) - that the habitat of an animal or a plant may change (Year 4 Biology – Living things and their habitats). **This prepares children for later learning:** - about genetics, differences between species and variation within species (Key Stage 3 Biology – Inheritance, chromosomes, DNA and genes).

	used to support or refute ideas or arguments		became extinct, while others evolved into new species. Scientists cannot be certain what an organism looked and behaved like from its fossil. Over millions of years, many organisms have changed. When one species develops into another the process is called evolution. - There is variety between individuals of the same species. Offspring are similar but not identical to their parents. The offspring are likely to have inherited these similarities from their parents. If a habitat changes, those organisms which are best suited to the new habitat are more likely to reproduce. Their offspring are more likely to have the survival adaptations of their parents. This process is called natural selection. - Natural selection is also referred to as survival of the fittest. A change in a habitat can cause a plant or animal species to evolve. Charles Darwin and Alfred Wallace both proposed a mechanism for evolution which is	living thing - habitat: the natural environment where an animal or plant finds the things it needs to live and grow - organism: a living thing - predator: an animal that hunts or catches other animals to eat - reproduction: the process by which living things make more of their own kind - species: a group of similar organisms which can reproduce and produce fertile offspring	

			called natural selection. They used observations from their travels to formulate their ideas.		
Spring Term 3 **<u>What light does</u>**	**In this module, children will learn to:** - recognise that light appears to travel in straight lines - explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes - use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them - 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 **Working Scientifically:** - identifying scientific evidence that has been used to support or refute ideas or arguments - planning different types of scientific enquiries to answer questions, including recognising and controlling variables	- How does light travel? - What can we change about a shadow? - What might affect the size of a shadow? - What affects the size of a shadow? - How is light reflected? - How do we see objects?	- Light appears to travel in straight lines. We can see a light source because some of the light from the source enters our eyes - Light travelling in straight lines can be used to explain why a shadow is the same shape as the object that casts it and how the shape of shadows can be changed. - The idea that light travels in straight lines can be used to explain what is observed when testing predictions about shadows. - The shape of a shadow and the pattern to how shadows change size when the relative positions of the light, object and screen are changed, can be explained by light travelling in straight lines. - Light is reflected from shiny surfaces in a predictable way because it travels in straight lines. - We can see objects because they reflect some of the light that	**<u>Tier 2 Vocabulary:</u>** - block: stop; not allow to pass through - travel: move from one place to another **<u>Tier 3 Vocabulary:</u>** - light ray: a way of showing light travelling from one place to another - reflection: an image of an object seen in a mirror or other reflective surface **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - conclude/conclusion: drawing together of evidence to find patterns and answers - control variable: a variable that is kept the same to make the test fair - data: information (observations and measurements) collected during an enquiry - dependent variable: the variable that is measured or observed - diagram: a drawing that represents what is happening rather than showing artistic detail - enquiry: a method scientists use to collect evidence to answer questions - evidence: information, from observations and measurements that supports or disproves ideas - explain/explanation: giving reasons, from scientific knowledge for observations and conclusions - fair test: an enquiry which identifies a cause and effect relationship by measuring a change in an independent variable and a linked change in the dependent variable - independent variable: a variable that is changed - measure/measurement: using equipment to find the size of something on a numbered scale - model: a representation of an phenomenon or explanation that it is difficult to visualise	**<u>Children have previously learnt:</u>** - that light comes from light sources and we need it to see (Year 3 Physics – Light) - how a shadow is formed and can be changed (Year 3 Physics – Light) - that shiny surfaces are more reflective than dull ones (Year 3 Physics – Light) - that light from the sun can be dangerous and how to protect themselves (Year 3 Physics – Light). **<u>This prepares children for later learning:</u>** - light waves and the speed of light (KS3 Physics – Light waves) - explanations for images in mirrors, pinhole camera, refraction, lenses focusing light, how the eye works (KS3 Physics – Light waves) - colours, different frequencies of light and prisms splitting white light (KS3 Physics – Light waves).

	where necessary - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations		falls onto them into our eyes. *Children do not need to measure or calculate angles when observing the reflection of light. They do not need to be taught about light changing direction (refraction) when it passes through a liquid, lens or prism, or the splitting of white light into the spectrum of colours as this is taught in Key Stage 3.*	- observe/observation: using senses or instruments to obtain data - pattern: a relationship between variables - predict/prediction: to use what you already know to try to work out what will happen - support: to use evidence to show that a statement is correct - variable: something that can be changed, measured or observed in an enquiry - dark/darkness: the absence of light - light: is produced by a light source and makes things visible - light source: something, natural or artificial, that produces its own light - opaque: the property of blocking light by absorbing or reflecting all of the light that falls on it -reflect: to be diverted back from a surface - reflective: reflecting back a lot of the light that falls on it making it shiny in appearance - shadow: a darker region where some or all of the light has been blocked by an object - transparent: the property of allowing almost all light that falls on it to pass through, enabling a clear view of what lies behind it - translucent: the property of blocking or scattering some light so that not all of it passes through and there is no clear view of what lies behind it	
Spring Term 4 **<u>Human Circulation</u>**	**In this module, children will learn to:** - identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood - describe the ways in which nutrients and water are transported within animals,	- What us blood made of? - What is the circulatory system and what does it do? - What is a heart and what does it do? - What are blood vessels and valves and what do they do? - What did William Harvey find out about the circulatory system?	- Blood carries oxygen, water, and the nutrients from food that are used for energy and growth, around the body. Blood is made up of plasma (a liquid in which blood cells and nutrients travel), red blood cells (which carry oxygen), white blood cells (which fight infection) and platelets (which help blood to clot around a	**<u>Tier 2 Vocabulary:</u>** - - circulate: to move around a closed system or area - contract: to make smaller by drawing together - flow: continuous movement - pump: to move fluid by squeezing it along a tube - system: a group of things or parts that work together - transport: to move something about **<u>Tier 3 Vocabulary:</u>**	**<u>Children have previously learnt:</u>** - how the skeletal system moves our bodies and protects our organs whilst holding us upright (Year 3 Biology – Animals, including humans) - that the digestive system breaks down the food we eat into smaller pieces that our body can use for energy and

	including humans **Working Scientifically:** - recording data and results of increasing complexity using scientific diagrams and labels, [classification keys, tables, scatter graphs, bar and line graphs] - reporting and presenting findings from enquiries, [including conclusions, causal relationships and explanations of and degree of trust in results,] in oral and written forms such as displays and other presentations		cut). - The human circulatory system pumps blood from the heart to the lungs, back to the heart and onto the rest of the body in a figure-of-eight system. Blood passes through each side of the heart separately in one circuit. - The heart is a muscle. It has two separate sides. The left side receives blood full of oxygen from the lungs and pumps it around the rest of the body, and the right side receives blood from the body that has had the oxygen used up and pumps it back to the lungs to receive a fresh supply of oxygen. - Arteries are blood vessels that carry oxygenated blood away from the heart. Veins carry deoxygenated blood from the rest of the body back to the heart. They have valves to stop the blood flowing backwards. - William Harvey was a scientist who discovered how the human circulatory system worked. Scientific ideas change as more evidence is found. Scientists do not	- aorta: the main artery from the heart to the rest of the body - arteries: blood vessels that carry blood away from the heart - atrium: the upper chamber on each side of the heart - blood: red liquid that flows through our bodies and brings oxygen and nutrients to all the different parts - blood vessels: tubes that carry blood around the body - capillaries: small blood vessels that carry blood through the tissues of the body - cell: a tiny unit of a living thing - deoxygenated blood: blood which is dark red in colour and has no oxygen in the red blood cells - hormone: a chemical in the body which causes growth, development or an action - oxygenated blood: blood which is bright red in colour and has oxygen in the red blood cells - plasma: the yellow liquid part of blood - platelets: tiny pieces in the blood which help clotting when we are cut - pulmonary artery: the blood vessel that carries deoxygenated blood from the heart to the lungs - pulse: the rhythmic bulge in an artery felt when blood is pumped through it - red blood cells: the cells which contain haemoglobin which can carry oxygen in our blood - valve: a flap that allows blood to pass through the heart or a vein in one direction only - veins: blood vessels that carry blood back to the heart - ventricle: the lower chamber on each side of the heart - white blood cells: cells in our blood which fight infection **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** - evaluate: to consider the results and method of an enquiry to judge how reliable the conclusion is	growth, and that these travel in the bloodstream to the rest of the body (Year 4 Biology – Animals, including humans). **<u>This prepares children for later learning:</u>** - about how physical activity keeps our heart healthy as it is a muscle, and how drugs (both medicinal and recreational) affect our health (Year 6 Biology – Animals including humans).

			always agree with each other.	- model: a representation of a phenomenon or explanation that it is difficult to visualise - secondary source: a document (or other source) that shares data or information from an enquiry carried out by someone else - amphibian: an animal (vertebrate) that lives in water or on land but must return to the water to reproduce - bird: an animal (vertebrate) that has feathers and lays eggs with hard shells - brain: an organ contained within the skull of all vertebrates; it controls the body's movements and activities and is the centre of thought, memory and feeling - breathe: to draw air into the lungs and let it out - carbon dioxide: a gas in the air - chemicals: tiny substances that all materials are made of; they each have specific properties - digestion: the process where food is broken down into nutrients which can be absorbed by the body - fish: an animal (vertebrate) which lives in water and has gills and fins - gas: a state of a material where it changes in shape and volume to fill the space it is in; gases flow - heart: the organ in the chest of vertebrates which pumps blood around the body - large intestine: a wider tube leading from the small intestine; this is where water is absorbed into the blood - lungs: the organs that are used for breathing; they allow oxygen to enter the blood - mammal: an animal (vertebrate) that is covered in hair or fur; the female gives birth to live young and feeds her babies on milk from her own body - mechanical: parts moving together - nutrient: a substance that is essential for life and health - organ: a body part performing a function - oxygen: a gas in the air which most living things need to survive - reptile: a cold-blooded animal (vertebrate) which has dry, scaly skin and lays eggs on land	

				- small intestine: a long tube connecting the stomach to the large intestine; this is where nutrients are absorbed into the blood - vertebrate: an animal that has an internal backbone for support	
Summer Term 5 **<u>Electricity and Changing Circuits</u>**	**In this module, children will learn to:** - associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches - use recognised symbols when representing a simple circuit in a diagram **Working Scientifically:** - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - recording data and results of increasing complexity using scientific diagrams and labels, [classification keys,] tables, [scatter graphs, bar and line graphs]	- How do we light the lamp? - How can we change a circuit? - How can we change the brightness of a lamp? - How can we change how other components work? - How can we predict which circuit will have the brighter lamp?	- - Circuits diagrams using standard symbols are used to record circuits. - Adding more cells to a circuit makes a lamp brighter. - A lamp gets brighter if the voltage in the circuit is increased. The lamp gets dimmer if thinner wires are used. - If the voltage is increased in a circuit, a buzzer makes a louder sound and a motor turns more quickly. - - When comparing two circuits it is possible to predict which circuit will have the brighter lamp by considering the voltage and the	**<u>Tier 2 Vocabulary:</u>** - fan: a device that blows or sucks air - flow: continuous movement - propellor: blades that are fitted to a motor **<u>Tier 3 Vocabulary:</u>** - standard symbol: an image used to represent an object that is recognised by people in different countries - voltage: the measurement of the size of the push sending electricity around a circuit - volts: the units for voltage **<u>Children will use the following previously learnt Tier 3 Vocabulary:</u>** comparative test: an enquiry which identifies a relationship by changing an independent variable and observing a linked change in the dependent variable - dependent variable: the variable that is being measured - diagram: a drawing that represents what is happening rather than showing artistic detail - evidence: information, from observations and measurements, that supports or disproves ideas - independent variable: the variable that is being changed - predict/prediction: to use what you already know to try to work out what will happen in an enquiry - refute: to use evidence to show that a statement is incorrect - support: to use evidence to show that a statement is correct - battery: a component that can be used to provide electricity - cell: the scientific name for a single battery - circuit: the circular arrangement of components	**<u>Children have previously learnt:</u>** - to identify appliances that run on electricity (Year 4 Physics – Electricity) - to construct simple circuits and to control them using a switch (Year 4 Physics – Electricity) - that metals are electrical conductors, and most non-metals are electrical insulators (Year 4 Physics – Electricity). **<u>This prepares children for later learning:</u>** - constructing parallel circuits (Key Stage 3 Physics – Current electricity) - measuring electric current and voltage in circuits (Key Stage 3 Physics – Current electricity) - understanding the differences in resistance with conducting and insulating components (Key Stage 3 Physics – Current electricity).

	- using test results to make predictions to set up further comparative [and fair] tests - identifying scientific evidence that has been used to support or refute ideas or arguments		number of lamps.	required to enable the electricity to flow - connection points: the places on electrical components where wires can be attached - electrical component: an object making up part of a circuit - electrical conductor: a material that allows electricity to flow through it - electrical insulator: a material that does not allow electricity to flow through it - electricity: what is required to make electrical components work - lux: the unit used to measure light intensity, abbreviated lx - switch: a component that turns another component on or off, by opening or closing a circuit, controlling whether the electricity can flow or not	*In this module, children will observe and describe the changes they see when they add more cells or lamps to a circuit, but they should not be asked to explain this, as the explanation requires knowledge covered in Key Stage 3.*
Summer Term 6 **Body Health**	**In this module, children will learn to:** recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function **Working Scientifically:** - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations - identifying scientific evidence that has been used to support or refute ideas or arguments	- How do we make healthy food choices? - What can happen if you don't eat a balanced diet? - How does a physical activity affect heart rate? - How does smoking or vaping affect your health?	- A healthy diet helps maintain or improve general health. It should be low in sugar, salt and fat while providing all of the energy we need to keep active and the nutrients we need to help us grow and keep healthy. - When people do not eat a balanced diet they are at risk of malnutrition. Malnutrition can result in unplanned weight loss, muscle loss or vitamin and mineral deficiencies. - Our pulse increases when we are active, to meet the increased need for oxygen in our muscles. Regular physical activity	**Tier 2 Vocabulary:** balanced: all parts in the correct amounts - deficiency: a lack of something essential - recovery: a return to a normal, healthy state **Tier 3 Vocabulary:** - arteries: blood vessels that carry blood away from the heart heart rate: the number of times the heart beats per minute - malnutrition: lack of adequate nutrition - pulse: the rhythmic bulge in an artery felt when blood is pumped through it - salt: a mineral that our bodies need in small amounts to function properly - veins: blood vessels that carry blood back to the heart **Children will use the following previously learnt Tier 3 Vocabulary:** - data: information (observations and measurements) collected during an enquiry - line graph: a type of chart that displays data points connected by straight lines	**Children have previously learnt:** - that we need the right types and amount of nutrition in order to be healthy, and that our skeletons and muscles allow us to move and provide support and protection (Year 3 Biology – Animals, including humans) - about the main parts of the human circulatory system, and their functions (Year 6 Biology – Animals including humans). **This prepares children for later learning:** - about the content and quantities of a healthy human diet and the

			prevents obesity, keeps heart, lungs and muscles healthy, increases flexibility and strength and helps to fight off infections. - Drugs are any substances that alter the way that the body works. Nicotine is a highly addictive drug that is found in cigarettes and vape products. Nicotine causes an increase in blood pressure, breathing and heart rate. The long-term effects of smoking can include lung diseases, heart disease and stroke. Vaping is considered less harmful than smoking, but it also has negative side effects.	- secondary source: a document (or other source) that shares data or information from an enquiry carried out by someone else - carbohydrate: a nutrient which is the body's major source of energy - chemicals: tiny substances that all materials are made of; they each have specific properties - fats: nutrients that are a source of energy for the body, produced from animals or plants - fibre: parts of plant-based food that can't be broken down and which help with digestion - lungs: the organs that are used for breathing; they allow oxygen to enter the blood - mineral: a substance needed to keep the body healthy - nutrient: a substance that is essential for life and health - oxygen: a gas in the air which most living things need to survive - protein: a nutrient which is needed for muscle repair and growth vitamin: a nutrient required by the body to grow, function and repair *Some commonly used words have specific scientific usage in this module, for example, 'diet' describes everything that someone eats, rather than what you eat to lose weight. Ensure children know and understand this.*	consequences of dietary imbalances (Key Stage 3 Biology – Nutrition and digestion) - about the structure and functions of the human skeleton and muscles (Key Stage 3 – The skeletal and muscular systems) - about the effects of recreational drugs (Key Stage 3 – Health).