Science Curriculum Map

	Autumn		Spring		Summer	
Year 1	Seasonal Changes (6 Lessons to be taught across the year)	Human body and senses (5 Lessons)	Naming and Describing Materials (5 Lessons)	Properties and uses of Materials (4 Lessons)	Animals (Vertebrates) (5 Lessons)	Identifying plants and their parts (5 Lessons)
Year 1	Seasonal Changes (6 Lessons to be taught across the year)					
Year 2	Local Habitats (6 Lessons)	Choosing Materials (4 lessons)	Growing Up (animals and humans) (6 lessons)	Growing Seeds and Bulbs (5 lessons)	Changing Materials (4 lessons)	Growing Healthy Plants (5 lessons)
Year 3	Rocks, soils and fossils (6 lessons)	Light and Shadows (5 lessons)	Forces, friction and magnets (6 lessons)	Movement and nutrition for the human body (6 lessons)	Flowering pants and plant growth (5 lessons)	Flowering plants life cycle (5 lessons)
Year 4	Changes of State (8 lessons)	Electricity: circuits (5 lessons)	Human impact on the environment (5 lessons)	Digestion and Food Chains (6 lessons)	Sound (6 lessons)	Classification of plants and animals (5 lessons)
Year 5	Forces and Mechanisms (7 lessons)	Properties and uses of Materials (6 lessons)	Earth and Space (6 lessons)	Plant and Animal Life Cycles (7 lessons)	Separating Mixtures and Changing Materials (lesson 6)	Human Growth (lesson 4)
Year 6	Classification of Living Things (7 lessons)	Evolution and Inheritance (6 lessons)	What light does (6 lessons)	Human Circulation (5 lessons)	Electricity: changing circuits (5 Lessons)	Body Health (4 Lessons)

Physics	Biology	Chemistry

National Curricuum Objectives Year 1			
Plants	Animals, inc humans	Everyday Materials	Seasonal Changes
1) identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. 2) identify and describe the basic structure of a variety of common flowering plants, including trees.	3) identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 4) identify and name a variety of common animals that are carnivores, herbivores and omnivores 5) describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 6) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	7) distinguish between an object and the material from which it is made 8) identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock 9) describe the simple physical properties of a variety of everyday materials 10) compare and group together a variety of everyday materials on the basis of their simple physical properties	11) observe changes across the four seasons 12) observe and describe weather associated with the seasons and how day length varies.
National Curricuum Objectives Year 2			
Plants	Animals, inc humans	Uses of Everyday Materials	Living things and their habitats
1) observe and describe how seeds and bulbs grow into mature plants 2) find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	3) notice that animals, including humans, have offspring which grow into adults 4) find out about and describe the basic needs of animals, including humans, for survival (water, food and air) 5) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	6) identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses 7) find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	8) explore and compare the differences between things that are living, dead, and things that have never been alive 9) 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 10) identify and name a variety of plants and animals in their habitats, including microhabitats 11) 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.

Year 1							
Term	Module	NC obj	Lesson Sequence	Substantive Knowledge	Working Scientifically (Disciplinary Knowledge)		
Autumn 1	**Seasons** (6 Lessons to be taught across the year)	11, 12	1) Are all leaves the same? (September)	✓ To know that in the winter the weather becomes colder and the daylight hours shorter ✓ To know that deciduous leaves change colour in the autumn and fall to the ground ✓ To know evergreen trees do not drop their leaves ✓ To know that in spring the daylight hours increase and there are more flowering plants ✓ To know different types of birds are seen at different times of the year ✓ To know more insects are seen in the spring and summer ✓ To know that the sun is highest in the sky in the summer	➢ Asking simple questions and recognising that they can be answered in different ways ➢ Observing closely, using simple equipment ➢ Identifying and classifying	Tier 2 compare describe different match record (verb) similar weather	Tier 3 group identify observe berry bird bud deciduous evergreen flower fruit insect leaf (leaves) nest nut petal plant seasons seed tree
Autumn 2	**Human body and senses** (5 Lessons)	6	1) Is everybody's body the same? 2) How can we explore the world using our sense of touch? 3) What can we hear? 4) What smells do we like and dislike? 5) What differences can our tongues taste?	✓ To identify, name, draw and label the head, arms, hands, torso, legs and feet. ✓ To know the five senses of sight, hearing, touch, smell and taste. ✓ To know our eyes give us the capacity to see ✓ To know our nose gives us the capacity to smell ✓ To know that our tongue gives us the capacity to taste ✓ To know our ears give us the capacity to hear ✓ To know our hands and feet are our most commonly used body parts to explore touch	➢ Observing closely, using simple	Tier 2 texture	Tier 3 classify diagram group identify pattern rank brain hearing mammal sense sight smell taste torso touch

				✓ To know that humans are all the same generally but vary in their skin, hair, eye colour, shoe size and fingerprints for example.			
	Seasons (6 Lessons to be taught across the year)	11, 12	2) Which animals share our space? (autumn) 3) Do all trees shed their leaves? (early winter)				
Spring 1	**Naming and Describing Materials** (5 Lessons)	7, 8	1) What material is this? Part 1 2) What material is this? Part 2 3) Is all paper the same? 4) Is all fabric the same? 5) How can we group objects made of different materials?	✓ To know everything around us is made from materials ✓ To know some materials are natural ✓ To know some materials are manufactured – made by changing natural source materials ✓ To know that objects can be made from different materials ✓ To identify items made from wood, plastic, metal, glass, water and rock ✓ Materials should be used carefully and can often be reused or recycled. ✓ Objects can be sorted according to their source material	➢ Observing closely, using simple equipment ➢ Performing simple tests ➢ Using their observations and ideas to suggest answers to questions	Tier 2 compare describe different record similar sort suitable use	Tier 3 observe magnifier test absorb absorbent manufactured material previously taught natural property recycle reuse transparent classify group
Spring 2	**Properties and uses of Materials** (4 Lessons)	7, 9, 10	1) Can the same object be made from different materials? 2) What properties do materials have? 3) Does it bend or stretch? 4) Do all materials get wet?	✓ To know objects can be made from more than one material, including recycled materials. ✓ To know materials have physical properties that make them useful for different purposes	➢ 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	Tier 2 compare different describe record similar sort suitable use	Tier 3 bar chart test bend flexible opaque rigid waterproof previously taught group observe absorb/absorbent manufactured material natural property recycle reuse transparent
	Seasons (6 Lessons to be	11, 12	4) Are all flowers the same? (spring)				

	taught across the year)		5) Which birds visit our bird feeder? (spring)				
Summer 1	**Seasons** (6 Lessons to be taught across the year)	11, 12	6) How has our space changed over the year? (early summer)				
	Animals (Vertebrates) (5 Lessons)	3, 4, 5	1) Who's who is the animal (vertebrate) world? 2) What's so special about birds? 3) What makes an amphibian an amphibian? 4) Do fish have fingers? 5) Are humans mammals?	To know:- ✓ vertebrates are animals with a backbone ✓ the five vertebrate groups – mammals, amphibians, reptiles, birds, fish ✓ features of reptiles: eggs, claws, teeth, scaly skin, living on land. ✓ features of birds: eggs, feathers, beaks, claws, wings ✓ features of amphibians: eggs, water and land living, changes to them as they grow ✓ features of fish: water living, scales, gills, teeth, fins, eggs ✓ features of mammals: hair or fur, give birth to live young, produce milk, nurture offspring, look like a younger version of parent, range of movement ✓ animals can be grouped by what they eat: carnivores, herbivores, omnivores	➢ Observing closely, using simple equipment ➢ Using their observations and ideas to suggest answers to questions	Tier 2 feature structure	Tier 3 adult amphibian carnivore diet fish herbivore mammal omnivore reptile vertebrate previously taught classify group (verb) Identify bird

Summer 2	**Identifying plants and their parts** (5 Lessons)	1, 2	1) What wild and garden plants can we find around our school? 2) What parts of a plant grow above the ground? 3) What parts of a plant grow under the ground? 4) Why are trees plants? 5) What are the similarities and differences between plants that have flowers?	To know:- ✓ The names of the parts of a flowering plant that grow above the ground are stem, leaf and flower. ✓ Roots grow under the ground and different plants have different roots. ✓ Some trees are flowering plants which have roots, stems, leaves and flowers. ✓ There are differences between deciduous and evergreen trees. ✓ There are similarities and differences between flowering plants.	➢ Observing closely, using simple equipment ➢ Identifying and Classifying	Tier 2 different compare describe similar texture	Tier 3 bark roots stem trunk previously taught classify group (verb) identify observe deciduous evergreen flower leaf plant (noun)

Year 2							
Term	Module	NC obj	Lesson Sequence	Substantive Knowledge	Working Scientifically (Disciplinary Knowledge)		
Autumn 1	**Local Habitats** (6 Lessons)	8, 9, 10, 11	1) Are the things I find alive, have never been alive or once were alive? 2) What lives in my tree? 3) What animals live in this woody habitat? 4) What animals live in this grassy habitat? 5) What do animals that live in the wood eat? 6) What do animals that live in the pond eat?	To know:- ✓ and identify things that are living, dead and have never been alive (rock, metal, plastic) ✓ that living things live in a habitat suited to the needs ✓ a habitat provides shelter, food and water ✓ different animals live in different parts of a woody habitat ✓ different animals live in different parts of a grassy habitat ✓ animals in these different habitats eat plants and other animals and these are known as food chains	➢ Observing closely, using simple equipment ➢ Identifying and classifying ➢ Using their observations and ideas to suggest answers to questions	Tier 2 compare feed move record	Tier 3 previously taught order alive breathe consumer dead decay decomposer depend food chain habitat never been alive once alive producer shelter survive identify observe pattern insect omnivore

Autumn 2	**Choosing Materials** (4 lessons)	6	1) Is that a good choice of material? 2) Which ball bounces highest? 3) Which materials are good for a toddler's play dungarees? 4) Who develops new materials?	To know:- ✓ materials have properties ✓ some materials are more suitable for a particular use ✓ some properties of fabrics ✓ inventors create new materials and discover new uses for existing materials	➢ 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	Tier 2 compare design discover fit for purpose invent record suitable use	Tier 3 previously taught comparative test enquiry fair measure bouncy bounciness durable elastic elasticity bar chart observe observation rank test absorb absorbent flexible material opaque property rigid transparent waterproof
Spring 1	**Growing Up (animals and humans)** (6 lessons)	3,4, 5	1) How do animals change as they grow? 2) What do animals need to survive? 3) How can we sort food into groups? 4) How can humans stay clean? 5) How can humans stay active? 1) How do humans stay healthy?	To know:- ✓ Animals grow and change ✓ Animal need food, water and air to survive ✓ Humans need to eat food from the four main food groups each day:- fruit and veg; dairy; meat, fish, pulses and eggs; starchy foods inc bread, potatoes, pasta, rice ✓ Humans need to stay clean and hygienic to be healthy ✓ Regular physical activity is important for good health	➢ Identifying and classifying ➢ Using their observations and ideas to suggest answers to questions	Tier record	Tier 3 previously taught birth healthy hygiene hygienic invertebrate life cycle classify diagram group identify observe adult amphibian bird diet fish insect mammal reptile survive vertebrate

Spring 2	**Growing Seeds and Bulbs** (5 lessons)	1	2) How do plants grow and change over time? 3) How are seeds and bulbs different? 4) What do seeds need to germinate? 5) How tall will they grow? 6) What have we learnt about how a seed germinates?	To know:- ✓ Germination is when a seed starts to sprout and grow. ✓ Seeds need certain conditions to germinate. ✓ All require water, some require warmth, and most do not need light. ✓ Seeds come in a variety of sizes. ✓ The size of the seed does not determine how tall the mature plant that grows from it will be. Mature plants can grow from either seeds or bulbs.	➢ Observing closely, using simple equipment ➢ Performing simple tests ➢ Identifying and classifying ➢ Gathering and recording data to help in answering questions	Tier compare describe record	Tier 3 previously taught accurate comparative test effect enquiry explain/ explanation fair observing over time bulb conditions germinate germination mature seedling bar chart observe group identify pattern rank test flower leaf roots seed stem
Summer 1	**Changing Materials** (4 lessons)	7	1) How can I change the shape of an object? 2) What properties allow a material to be changed? 3) Which material is fit for purpose? 4) What can pushes and pulls do?	To know:- ✓ Squashing, bending, stretching and twisting can change the shape of some materials. ✓ 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	➢ 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	Tier action discover discovery fit for purpose invent inventor pull push suitable use	Tier 3 previously taught elastic elasticity squashy squash stiff stretchy stretch twist test bend flexible material property rigid

Summer 2	**Growing Healthy Plants** (5 lessons)	2	1) How can we care for our plants? 2) Do mature plants need light? 3) Does temperature affect the growth of mature plants? 4) Do mature plants need water? 5) What have we learnt about what mature plants need to grow healthy?	To know:- ✓ Seeds germinate into seedlings and then grow into mature plants. ✓ Mature plants need light and water to grow healthily. ✓ Different mature plants require different temperatures to grow healthily depending on the type of plant	➢ Performing simple tests ➢ Using their observations and ideas to suggest answers to questions ➢ Gathering and recording data to help in answering questions	Tier compare describe record	Tier 3 previously taught comparative test enquiry explain explanation measure measurement pattern seeking predict prediction results temperature thermometer bulb conditions germinate germination healthy light mature seedling soil leaf roots seed stem

National Curricuum Objectives Year 3

Plants	Animals, inc humans	Rocks	Light	Forces and Magnets
1) identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 2) 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 3) investigate the way in which water is transported within plants 4) explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	5) 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 6) identify that humans and some other animals have skeletons and muscles for support, protection and movement.	7) compare and group together different kinds of rocks on the basis of their appearance and simple physical 8) properties describe in simple terms how fossils are formed when things that have lived are trapped within rock 9) recognise that soils are made from rocks and organic matter.	10) recognise that they need light in order to see things and that dark is the absence of light 11) notice that light is reflected from surfaces 12) recognise that light from the sun can be dangerous and that there are ways to protect their eyes 13) recognise that shadows are formed when the light from a light source is blocked by an opaque object 14) find patterns in the way that the size of shadows change.	15) compare how things move on different surfaces 16) notice that some forces need contact between two objects, but magnetic forces can act at a distance 17) observe how magnets attract or repel each other and attract some materials and not others 18) 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 19) describe magnets as having two poles 20) predict whether two magnets will attract or repel each other, depending on which poles are facing.

National Curricuum Objectives Year 4

Living Things and their Habitats	Animals, inc humans	States of Matter	Sound	Electricity
1) recognise that living things can be grouped in a variety of ways explore and use	3) describe the simple functions of the basic parts of the digestive system in humans	6) compare and group materials together, according to whether	8) identify how sounds are made, associating some of them with something vibrating	12) identify common appliances that run on electricity

classification keys to help group, identify and name a variety of living things in their local and wider environment 2) recognise that environments can change and that this can sometimes pose dangers to living things.	4) identify the different types of teeth in humans and their simple functions 5) construct and interpret a variety of food chains, identifying producers, predators and prey.	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) 7) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	9) recognise that vibrations from sounds travel through a medium to the ear 10) find patterns between the pitch of a sound and features of the object that produced it 11) 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.	13) construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers 14) 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 15) recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit 16) recognise some common conductors and insulators, and associate metals with being good conductors.

Year 3							
Term	Module	NC obj	Lesson Sequence	Substantive Knowledge	Working Scientifically (Disciplinary Knowledge)		
Autumn 1	Rocks, soils and fossils (6 lessons)	7 8 9	1) How are rocks different and what rock is this? 2) What are rocks used for? 3) How are soils different? 4) Which soils hold water? 5) What is this fossil? 6) Who was Mary Anning and how did she become a palaeontologist?	✓ Rocks can be compared according to their appearance and properties ✓ Properties of rocks make them useful for different purposes ✓ Some rocks contain fossils ✓ Fossils are formed when living things are trapped within a rock ✓ Mary Anning is a fossil Scientist	➢ 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 ➢ identifying differences, similarities [or changes] related to simple scientific ideas and processes ➢ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	Tier 2 appearance compare drain flood layer similar structure texture	Tier 3 previously taught evidence identifying and classifying microscope crystal crystalline erosion fossil hardness organic Palaeontologist remains rock sediment weathering comparative test enquiry identify observe observation test absorb absorbent durable material property

Autumn 2	**Light and Shadows** (5 lessons)	10, 11, 12, 13, 14	1) What do we need to see? 2) Which object is the most reflective? 3) How are shadows made? 4) Is my shadow like me? 5) How can we change the size of a shadow?	✓ Light comes from light sources ✓ Dark is the absence of light ✓ Shiny objects have surfaces that are good at reflecting light ✓ When there is less light, more reflective materials are easier to see than less reflective ones. ✓ Shadows form when light is blocked. ✓ Opaque materials block all light ✓ To know how shadows can be changed	➢ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers ➢ using results to draw simple conclusions, making 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 support their findings	Tier 2 absence absent artificial block similar surface	Tier 3 previously taught Conclude Conclusion Comparative test data data logger explain explanation identifying and classifying measure measurement pattern predict prediction bright dark darkness data logger dim light light source lux opaque reflect reflection sensor shadow sun sunlight translucent transparent ultraviolet enquiry measure measurement observe observation pattern predict prediction

Spring 1	**Forces, friction and magnets** (6 lessons)	15 16 17 18 19 20	1) What makes it move? 2) How long does a top spin on different surfaces? 3) How well can an object slide on different surfaces? 4) How do magnets affect each other? 5) Which materials are magnetic? 6) How strong are the magnets?	✓ A force is a push or pull that can make something move. ✓ The surface a spinning top is moving on affects how long it spins for. ✓ 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 materials 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.	➢ 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 ➢ using results to draw simple conclusions, making 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 support their findings	Tier 2 contact pendulum pull pulling push pushing rough slide smooth surface texture	Tier 3 **previously taught** stopwatch value attract contact force force like poles magnet magnetic non-contact force north/south pole repel enquiry classify classification comparative test data diagram evidence measure measurement pattern predict prediction test material

Spring 2	**Movement and nutrition for the human body** (6 lessons)	5 6	1) What nutrition do we get from our food? 2) Which nutrients are in school dinners? 3) What is in a human skeleton? 4) How do muscles help humans to move? 5) How are vertebrate and invertebrate bodies supported? 6) Are all vertebrate skeletons the same?	✓ The different types of food we eat contain different nutrients. ✓ A healthy diet contains a balance of different nutrients. ✓ Some of the bones in our skeleton protect our vital organs. ✓ Other bones provide support so that our body can remain upright. ✓ Our joints allow us to move our bones so that our bodies can move. ✓ Muscles work in pairs to move the bones in our skeleton. ✓ Vertebrate bodies are supported by an internal bony skeleton including a spine (made of many vertebrae). ✓ Invertebrates have no bony skeleton. ✓ Vertebrate skeletons all have a spine. The bones vary in size and shape.	➢ 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, keys, bar charts and tables ➢ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ➢ setting up simple practical enquiries, comparative [and fair] tests	Tier 2 balanced contract diagram internal key protect support system	Tier 3 previously taught data evidence investigate sequence calcium carbohydrate cartilage energy exoskeleton fat fibre roughage fluid heart invertebrate joint mineral nutrient organ protein ribs skull spinal cord spine sugar tendon vitamin x-ray enquiry classify conclude conclusion identify measure observe brain amphibian bird diet fish invertebrate mammal reptile vertebrate

Summer 1	**Flowering pants and plant growth** (5 lessons)	1 2 3	1) What do leaves do? 2) What do roots and stems do? 3) What are the functions of the parts of a flowering plant? 4) What happens if plants do not have enough space? 5) How are plants different?	✓ Leaves capture sunlight. ✓ The energy from the sunlight is used to produce the plant's food. ✓ 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 within the stem. ✓ The stem also provides support for the plant and holds the leaves and flowers up. ✓ Leaves have tiny 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. ✓ Plants are adapted to the habitat that they live in.	➢ 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, making predictions for new values, suggest improvements [and raise further questions] ➢ identifying differences, similarities [or changes] related to simple scientific ideas and processes	Tier 2 compare compete feature function space transport	Tier 3 **previously taught** investigate research adaptation adapted anchor capture nutrient comparative test explain explanation enquiry stem sunlight identify measure observe observing over time predict prediction consumer flower food chain habitat producer roots seed

Summer 2	<u>Flowering plants life cycle</u> (5 lessons)	4	1) What is inside a flower? 2) What is animal pollination? 3) What is wind pollination? 4) What are fruits? 5) 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 stamen) 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. ✓ 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 by wind, water, animals	➢ 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 language, drawings, labelled diagrams, keys, bar charts and tables ➢ identifying differences, similarities [or changes] related to simple scientific ideas and processes	Tier 2 compete formation invent savoury scar similar structure	Tier 3 previously taught burr carpel dispersal nectar nutrient ovary ovule pollen pollination pollinator ripe scent sepal stamen explain explanation observe observation flower fruit insect petal seed

Year 4							
Term	Module	NC obj	Lesson Sequence	Substantive Knowledge	Working Scientifically (Disciplinary Knowledge)		
Autumn 1	**Changes of State** (8 lessons)	6 7	1) Is this material a liquid or a solid? 2) How is temperature measured? 3) What difference does temperature make to how quickly the ice block melts? 4) What are melting and freezing? 5) Are spaces really empty? 6) What is evaporation and how does it help get things dry? 7) Where did the water come from? 8) Where does the rain come from?	✓ To know a solid holds its shape ✓ To know liquids can be poured and will spread out ✓ To know water freezes at 0 degrees C ✓ To know melting is changing from solid to liquid ✓ To know freezing/solidifying is changing from liquid to solid ✓ To know air is a gas ✓ To know gases, have a weight and take up space ✓ To know evaporation is water changing from a liquid to a gas ✓ To know condensation is when water vapour changes from a gas to a liquid ✓ To have some understanding of the water cycle	➢ 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 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, making 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 support their findings	**Tier 2** Cool Empty Flow Heat Horizontal Space vertical	**Tier 3 previously taught** Control variable Degree Celsius Fair test Interval Model Scale Variable Volume Air Boil Boiling point Bubble Carbon dioxide change of state cloud compress condense condensation snow solid solidify steam viscous water vapour evaporate evaporation expand freeze freezing point gas grabule granular heat-sensitive helium ice liquid melt melting point oxygen powder rain bar chart classify data logger enquiry evidence explain explanation identifying and classifying measure measurement observe observation observing over time pattern sensor temperature thermometer weight flexible material opaque property transparent

Autumn 2	**Electricity: circuits** (5 lessons)	12 13 14 15 16	1) What makes an appliance work? 2) How can you light the bulb? 3) What does a switch do? 4) Why doesn't the circuit work? 5) 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 the component on and off. ✓ If there is a break in a circuit, a loose connection or a short circuit, the component will not work. ✓ Metals are good electrical conductors. ✓ Non-metals are generally electrical insulators except for graphite (pencil lead), human tissue and water	➢ 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, 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.	Tier 2 absence absent artificial block similar surface	Tier 3 previously taught Conclude Conclusion Comparative test data data logger explain explanation identifying and classifying measure measurement pattern predict prediction bright dark darkness data logger dim light light source lux opaque reflect reflection sensor shadow sun sunlight translucent transparent ultraviolet enquiry measure measurement observe observation pattern predict prediction

Spring 1	**Human impact on the environment** (5 lessons)	1 2	1) What is the impact of litter in our school? 2) How do materials change over time? 3) How do micro-plants get into our food chains? 4) How can we prevent micro-plastics from getting into our seas ad oceans? 5) 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. ✓ 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 organic materials to decompose. ✓ Some materials including plastics and glass cannot decompose. They are not biodegradable. ✓ Pollution is the introduction of non-biodegradable materials into the environment. Pollution can result in habitat destruction and cause harm to animals.	➢ 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.	Tier 2 compare litter	Tier 3 previously taught evaluate variable biodegradable compost decompose environment filter fungi micro-organism organism pollution classify enquiry measure investigate Comparative test Measurement Observe Observation Observing over time Rank Decay Decomposer] Food chain Habitat Organic recycle soil

Spring 2	**Digestion and Food Chains** (6 lessons)	3 4 5	1) Where does all the food we eat go? 2) What teeth do humans have? 3) What do teeth do in the digestive system? 4) What happens to food after we put it in our mouths? 5) What do animals eat? 6) What do animals teeth tell us?	To know:- ✓ The digestive system breaks down food into smaller pieces that our body can use for energy and growth and gets 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, the large intestine absorbs 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 animal (a carnivore) that eats the consumer. ✓ Animals have teeth appropriate to the food they eat. ✓ Carnivores have sharp slicing teeth for eating meat.	➢ 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]. ➢ 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.	Tier 2 contract flow function grind key(legend)	Tier 3 previously taught model anus canine chemicals constipation decompose diarrhoea digestion extinct food web incisor jaw large intestine mechanical milk teeth molar oesophagus predator prey rectum saliva small intestine stomach vomit classify diagram enquiry evaluate evidence explain explanation identity identifying and classifying investigate observe observation research sequence carnivore consumer depend diet energy food chain fossil habitat herbivore nutrient omnivore palaeontologist producer

				✓ Herbivores have flat topped teeth for crushing plant matter.			
Summer 1	**Sound** (6 lessons)	8 9 10 11	1) How are sounds made? 2) How do sounds reach our ears? 3) How can we change the volume of a sound? 4) How does the volume of a sound change as we move away from the source? 5) How can we change the pitch of a sound? 6) 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 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 size of the object vibrating. ✓ The pitch of a note played on a stringed instrument depends on the length, thickness and tautness of the vibrating string	➢ 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, make predictions for new values, [suggest improvements and raise further questions.] ➢ Identifying differences, similarities or changes related to simple scientific ideas and processes.	Tier 2 communicate compare pluck taut travel	Tier 3 previously taught evaluate fair test refute support variable air decibel gas liquid pitch solid sound sound source vibrate vibration volume prediction material accurate comparative test conclude/conclusion data data logger diagram enquiry evidence explain explanation fair measure measurement observe observation pattern predict sensor

Summer 2	**Classification of plants and animals** (5 lessons)	1	1) How are living things classified? 2) How are vertebrates classified? 3) How are invertebrates classified? 4) Can you use a branching key? (branching databases are taught in computing in year 3) 5) What is this living thing?	✓ Living things are classified into five groups. These include animals and plants. ✓ Classification is the process of grouping living things together based on how they look and how they're related to each other. ✓ Vertebrates are classified into five main groups: mammals, fish, amphibians, reptiles and birds. ✓ Vertebrates have an internal backbone for support. ✓ Invertebrates are classified into three main groups: arthropods, molluscs and annelids. ✓ Using branching keys helps us to identify and name familiar and unfamiliar living things	➢ 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.	Tier 2 characteristics feature internal observable segment	Tier 3 **previously taught** branching key annelid arachnid cold-blooded crustacean flowering plant mollusc myriapod non-flowering plant organism warm-blooded classify identity research amphibian bird deciduous evergreen exoskeleton fish flower insect invertebrate mammal reptile skeleton vertebrate

National Curricuum Objectives Year 5				
Living things and their habitats	Animals, inc humans	Properties and Changes of Materials	Earth and Space	Forces
1) describe the changes as humans develop to old age.	2) 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 3) know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution 4) use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 5) give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic 6) demonstrate that dissolving, mixing and changes of state are reversible changes 7) 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.	8) 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 9) know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution 10) use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 11) give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic 12) demonstrate that dissolving, mixing and changes of state are reversible changes 13) 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.	14) describe the movement of the Earth, and other planets, relative to the Sun in the solar system 15) describe the movement of the Moon relative to the Earth 16) describe the Sun, Earth and Moon as approximately spherical bodies 17) use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	18) explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object 19) identify the effects of air resistance, water resistance and friction, that act between moving surfaces 20) recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
National Curricuum Objectives Year 6				
Living Things and their Habitats	Light	Evolution and Inheritance	Animals, inc humans	Electricity
17) describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals	19) recognise that light appears to travel in straight lines 20) 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 21) 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	23) recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago 24) recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	26) .identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 27) recognise the impact of diet, exercise, drugs	29) associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit 30) compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers

18) give reasons for classifying plants and animals based on specific characteristics.	22) use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	25) identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	and lifestyle on the way their bodies function 28) describe the ways in which nutrients and water are transported within animals, including humans.	and the on/off position of switches 31) use recognised symbols when representing a simple circuit in a diagram.

Year 5							
Term	Module	NC obj	Lesson Sequence	Substantive Knowledge	Working Scientifically (Disciplinary Knowledge)		
Autumn 1	**Forces and Mechanisms (7 Lessons)**	18 19 20	1) What is the friction between different surfaces? 2) Why do objects fall at different speeds? 3) How does the size of the canopy affect the time it takes a parachute to fall? 4) Does the shape of an object affect its movement in liquid? 5) How can we lift a heavy load? 6) How does the length of the lever affect the force needed to lift a load? 7) How do gears work?	✓ Friction is a force that makes it harder to move an object across a surface or slows down an object moving over a surface. ✓ The unit of measurement of a force is Newtons (abbreviated to N). ✓ Gravity is a force that pulls all objects to 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. ✓ 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. ✓ 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. ✓ A gear is a mechanism which consists of wheels with teeth that slot together. Gears change the direction of movement and the force required to make something move.	➢ 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. ➢ 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.	Tier 2 anticlockwise clockwise system	Tier 3 previously taught accuracy dependent variable independent variable line graph air resistance force meter fiction fulcrum gears gravity impact level load magnetism Newton Oppose Pivot Pulley Water resistance accurate comparative test conclude conclusion control variable enquiry evaluate fair test precise predict prediction refute support variable contact force force non-contact force

Autumn 2	Properties and uses of materials (6 Lessons)	8 9 10 11 12 13	1) How can we compare and group materials? 2) Which materials did the builders use when constructing our school and why? 3) Which liquid is the thickest? 4) Who invents things? 5) Can the same container keep cold things cold and hot things hot? 6) Which materials are absorbent, permeable or waterproof?	✓ To know some properties of everyday materials such as hardness, solubility, transparency, conductivity, electrical and thermal and response to magnets ✓ To know why metals, wood and plastics have particular uses ✓ Weathering, wear and tear can occur over time and this will have an impact upon a material's fitness for purpose. ✓ The properties of liquids include having a fixed weight, a fixed volume, an ability to flow, a level of viscosity; and they take on the shape of a container. ✓ The viscosity of a liquid describes how thick or thin it is and how fast or slowly it will flow. ✓ A thermal insulator is a material that does not transmit heat through it well. ✓ A thermal conductor is a material that transmits heat through it very well. ✓ A thermal insulator keeps hot things hot and cold things cold. ✓ Materials can be absorbent and can soak 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.	➢ 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 arguments.	Tier 2 construction design disassemble dispose flow invent invention leak pour structure	Tier 3 previously taught criterion dependent variable independent variable survey brittle ductile fragile impermeable malleable malleability permeable thermal conductor thermal insulator viscosity viscous wear and tear comparative test control variable data evaluate observe observation predict predicting scale variable absorb absorbent compost decompose durable elastic elasticity electrical conductor Iinsulator flexible flexibility hard hardness

Spring 1	Earth and Space (6 Lessons)	14 15 16 17	1) What's in space? 2) How do the planets move? 3) How does the position of the Sun in the sky change? 4) What causes day and night? 5) How does the Moon move? 6) What patterns can we find I data about the planets?	✓ The main bodies that are found in space are the Sun, Moon, Earth and planets. ✓ They are all spherical. ✓ The Earth and the other planets all orbit 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 distances and taking 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 changes in shadows. ✓ The Moon orbits the Earth every 28 days and rotates on its axis.	➢ 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.	Tier 2 dawn diameter dusk horizon midday spherical sunrise sunset	Tier 3 previously taught Axis Moon Orbit Planet Rotate Solar system Star Year data diagram enquiry evidence explain explanation model pattern predict prediction support dark darkness light light source opaque shadow sun

Spring 2	Plant and animal life cycles (7 Lessons)	2 3 4 5 6 7	1) How do flowering plants produce seeds? 2) Do all plants have the same number of stamen? 3) How can we grow more plants without using seeds? 4) How do chickens change over their lifetime? 5) Do all mammals have the same gestation period? 6) How do amphibians change throughout their life cycle? 7) Do all insects go through the same life cycle?	✓ All living things have a life cycle which includes growth and reproduction, eventually ending in death and decay. ✓ 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. ✓ Female mammals give birth to live young and produce milk to feed their young. ✓ Amphibians reproduce by sexual reproduction. ✓ Amphibian females' eggs are fertilised outside her body. Some amphibians go through a process of metamorphosis. ✓ The majority of insects go through a process of complete metamorphosis. ✓ Some insects go through a process of incomplete metamorphosis. ✓ Flowers contain male sex organs called stamens and female sex organs called carpel. ✓ 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. The plant that grow from them are not identical to the parent plants. ✓ Asexual reproduction creates new plants that are identical to the parent.	➢ 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.	Tier 2 dissect	Tier 3 previously taught anther asexual breeding embryo filament female fertilisation gestation larva male mate metamorphosis ovary ovule propagation pupa reproduction seed dispersal stamen style thorax pattern amphibian bird carpel exoskeleton flower insect life cycle mammal organism pollen pollination pollinator vertebrate

Summer 1	**Separating mixtures and changing materials** (6 Lessons)	8 9 10 11 12 13	1) How can we separate mixtures? 2) What happens when we mix liquids and solids? 3) What makes a difference to how fast sugar or salt dissolves? 4) How can we clean up contaminated water? 5) What makes a change non-reversible? 6) 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. ✓ Solids that do not dissolve can be separated from a liquid by filtering. ✓ Solids which dissolve can be retrieved from a solution if the liquid is evaporated. ✓ Some changes of state are reversible, and others are non-reversible. ✓ Non-reversible changes result in the formation of new materials	➢ 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. ➢ Learn to use apparatus and techniques, such as filtering, sieving and evaporating, to separate materials. ➢ 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.	**Tier 2** combine flow chart grade inflate particle proportion puncture recommendation room temperature sieve (noun)	**Tier 3 previously taught** contamination dissolve filter insoluble non-reversible react reaction reversible saturated separate sieve (verb) soluble solution accurate comparative test control variable conclude conclusion data evidence explain explanation evaluate fair test observe pattern predict prediction secondary source variable condense carbon dioxide crystal crystallin evaporat evaporat on gas liquid solid

Summer 2	**Human Growth (4 Lessons)**	1	1) How do newborn babies turn into teenagers? 2) How do girls become women? 3) How do boys become men? 4) What is the human life cycle?	✓ From before they are born to puberty, humans go through distinct periods of development: gestation, infancy and childhood. ✓ The female body changes as it goes through puberty, from about age 12. ✓ There is a fast period of growth and the changes occur that prepare women to have babies. ✓ The male body changes as it goes through puberty, from about age 12. ✓ There is a fast period of growth and sexual organs develop. ✓ The human body changes as it gets older. ✓ The human life cycle has different stages: gestation, infancy, childhood, puberty, adulthood, ageing and death.	➢ 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	Tier 2 ageing milestone stage system	Tier 3 previously taught abdomen Adam's apple breast childhood genitals gestation infancy menstruation newborn pregnancy puberty pubic hair reproduction sweat teenage umbilical cord uterus vagina diagram evidence hygiene large intestine life cycle mammal muscle organ oesophagus small intestine stomach

Year 6						
Term	Module	NC obj	Lesson Sequence	Substantive Knowledge	Working Scientifically (Disciplinary Knowledge)	

Autumn 1	Classification of Living Things (7 Lessons)	17 18	1) How can we sort the mess? 2) What plants are there other than flowering plants? 3) How can we classify animals? 4) What else is living besides plants and animals? 5) How can we identify living things? 6) What lives here? 7) Where do these organisms fit in my key?	✓ To know that living things can be grouped, classified and identified ✓ To know ferns, mosses and conifers are plants that do not have flowers ✓ To know animals are split into vertebrates and invertebrates ✓ To know vertebrates are mammals, birds, reptiles, amphibians, fish ✓ To know there are five kingdoms of living things – plants and animals are two of them ✓ To know what a branching key is	➢ 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.] ➢ 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	Tier 2 Characteristic Common observable	Tier 3 previously taught arthropod cone conifer echnodermata fern flatworm monera moss mould needle protista spore taxonomy crustacean fish Branching key classify enquiry identify identifying and classifying observing overtime amphibian annelid arachnid bird carpel cold-blooded flowering plant fungi insect invertebrate mammal mollusc myriapod organism reproduction reptile species stamen vertebrate warm blooded

Autumn 2	**Evolution and Inheritance** (6 lessons)	23 24 25	1) How are living things different? 2) How is an organism adapted to live in its habitat? 3) How do an animal's adaptations help it to survive? 4) What can fossils tell us? 5) How does evolution happen? 6) 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. ✓ To know that living things have changed over time ✓ To know that fossils provide information about living things that previously inhabited the earth ✓ To recognise that living things produce offspring of the same kind but normally offspring vary and are not identical to their parents - variation ✓ To know some ways that animals and plants are adapted to suit their environment ✓ To know that adaptation may lead to evolution – the process where one species develops into another. ✓ If all the animals of the same species die out then they have become extinct.	➢ 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.	Tier 2	Tier 3 previously taught anomaly camouflage evolution extinction inherited migrate natural selection offspring variation classify evidence explain explanation model adaptation adapted fossil habitat organism predator reproduction species

Spring 1	**What light does** (6 lessons)	19 20 21 22	1) How does light travel? 2) What can we change about a shadow? 3) What micht affect the size of a shadow? 4) What affects the size of a shadow? 5) How is light reflected? 6) 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. ✓ 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 falls onto them into our eyes	➢ 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.] ➢ 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.	Tier 2 **block** **travel**	Tier 3 previously taught light ray reflection conclude conclusion control variable data dependent variable diagram enquiry evidence explain explanation fair test independent variable measure measurement model observe observation pattern predict prediction support variable dark darkness light light source opaque reflect reflective shadow transparent translucent

Spring 2	**Human Circulation** (5 lessons)	26 27 28	1) What is blood made of? 2) What is the circulatory system and what does it do? 3) What is the heart and what does it do? 4) What are blood vessels and what do they do? 5) What did William Harvey find out about the circulatory system?	✓ Blood carries water and the nutrients from food that are used for energy, health and growth around the body. ✓ Blood is made up of plasma, red blood cells, white blood cells and platelets. ✓ The 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. One side pumps blood full of oxygen from the lungs, the other side pumps blood with the oxygen used up, from the body. ✓ Arteries are blood vessels that carry blood away from the heart. ✓ Veins carry the blood from the rest of the body back to the heart. ✓ Veins have valves to stop the blood flowing backwards.	➢ 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.	Tier 2 circulate contract flow pump system transport	Tier 3 previously taught aorta arteries atrium blood blood vessels capillaries cell deoxygenated blood hormone oxygenated blood plasm platelets pulmonary artery pulse red blood cells valve veins ventricle white blood cells evaluate model secondary source

Summer 1	**Electricity: changing circuits (5 Lessons)**	29 30 31	1) How do we light the lamp? 2) How can we change a circuit? 3) How can we change the brightness of a lamp? 4) How can we change how other components work? 5) How can we predict which circuit will have the brighter lamp?	✓ Circuits diagrams using standard symbols are used to record circuits. ✓ Adding cells to a circuit makes a lamp brighter. ✓ A lamp gets brighter if the voltage in the circuit is increased. ✓ A 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.	➢ 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.] ➢ 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.	Tier 2 Fan Flow propellor	Tier 3 previously taught standard symbol voltage volts comparative test dependent variable diagram evidence independent variable predict prediction refute support battery cell circuit connection points electrical component electrical conductor electrical insulator electricity lux switch

Summer 2	**Body Health** **(4 lessons)**	**26** **27** **28**	1) How can we make healthy food choices? 2) What can happen if you don't east a balanced diet? 3) How does physical activity affect heart rate? 4) How do smoking or vaping affect your lung capacity?	✓ A healthy diet helps maintain or improve general health in humans and other animals. ✓ 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 exercise to meet the increased need for oxygen in our muscles. ✓ Regular physical activity 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 the body works.	➢ 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.	Tier 2 balanced deficiency recovery	Tier 3 previously taught arteries heart rate malnutrition pulse salt veins data line graph secondary source carbohydrate chemicals fats fibre lungs mineral nutrients oxygen protein vitamin