Subject Leader Planning Grid Subject: Science Leader – Dan Cohen

Year A

Year	Statutory Requirements	Knowledge	Guidance	Key Vocabulary
R Autumn All About Me	Early learning goal for understanding the world; The world (development matters): ▪ Children know about similarities and differences in relation to places, objects, materials and living things. ▪ They talk about the features of their own immediate environment and how environments might vary from one another. ▪ They make observations of animals and plants and explain why some things occur, and talk about changes.	▪ To know the change from baby, toddler, child to adult. ▪ To know what they do at each age e.g. when they were a baby they had to be fed but now they can feed themselves. ▪ To know features of school, home and classroom in relation to their life. ▪ To know the difference between what animals, plants and humans need to sustain life.	▪ Encourage children to explore the outdoor area or the school field. What objects can they collect? Can they describe the texture of the objects? ▪ Invite children to take photos of each other using an iPad. Print the photos and cut them into four or six pieces. Encourage children to build the picture puzzles up. ▪ Ask children to bring in baby pictures from home. Compare pictures of the children as babies to now. How have they changed? What can they do now that they could not do as babies?	Rough Smooth Bumpy Shiny Stretchy Stiff Baby Child Adult
Autumn			▪ Take the children out on an autumn walk. Ask them to look around at all the different things they can see. Encourage them to talk about what	Seasons Autumn Leaves Trees Plants

			they notice and how their surroundings have changed from the summer. ▪ Take iPads on the autumn walk. Encourage the children to take pictures of anything that interests them so they can talk about them later on. ▪ Enable the children to explore autumn using their senses. Provide a range of autumn objects and ask them to look, feel, smell and touch the items. Ask the children to describe their findings. ▪ Use iPads to create autumn pictures.	Dark Light
R Spring Spring Easter	As above	As above	▪ Stick a photograph of each child's face on to a small pot. With the children, fill the pots with soil and sprinkle with cress seeds. Encourage children to observe what happens to the seeds. When the cress grows, it will resemble the children's hair. ▪ Add the changing seasons to the floor book. Children can capture spring changes on camera or through artwork and writing. ▪ Make a rain gauge and collect and measure the spring rain showers. Explore the vocabulary of capacity through rain. ▪ Discuss new life and baby birds hatching. Observe birds in the environment and encourage children to make their own birds' nests from grass and twigs	Soil Plants Water Sunlight Cress Growing Seasons Spring Rain Rain shower Rain gauge Eggs Birds Chicks Nest New life Life cycle Egg Caterpillar Butterfly

			▪ Explore new life with the children and the life cycles of different species. Children could explore the life cycle of a butterfly and create a life cycle picture using pastas (rice to represent an egg, fusilli for a caterpillar, shell pasta for the chrysalis and farfalle pasta for the butterfly). ▪ Turn a 'Bee-Bot' into an Easter Bunny and programme it to reach different locations or Easter eggs. ▪ Search for signs of new life in nature and ask the children to record these on an iPad. The photos could be added to the floor book, alongside children's drawings, observations and writing.	Chrysalis Easter Bee-bot Easter eggs Nature
R Summer Summer	As above	As above	▪ Learn all about how important bees are. Discuss with the children how to make your outside area more bee friendly and what to do if you are afraid of bees. ▪ Enjoy some planting and growing with the children. Plant some lettuce seeds and mark each one with the children's names. Encourage the children to take care of their lettuce and allow them to take it home at the end of term. ▪ Using fresh fruits, make some ice lollies for the children to enjoy and observe the process of freezing and melting. ▪ Provide children with iPads and allow them to take summer-themed photos	Bees Hive Nectar Pollen Plants Seeds Water Sunlight Growing Planting Freezing Melting Sun Shadow Flowers Insects Wildlife

Minibeasts			of the outside world, for example bees in flowers, shadows and sunshine. Use these to create a class book or display. ▪ Using a large activity tray, line the tray with soil or sawdust and add plastic minibeasts. Provide the children with magnifying glasses. ▪ In a water tray or large activity tray, create a pond dipping activity by adding gravel and small pebbles to the base, add real or artificial plants, plastic pond-dwelling minibeasts and nets. ▪ Build a Minibeast Hotel and allow the children to make observations, explore with magnifying glasses and investigate the different types of minibeasts that visit. ▪ Build an ant farm or a wormery and explore the habitat and how the minibeasts move, feed and work together.	Minibeasts Spider Ant Butterfly Wasp Fly Woodlice Beetle Soil Habitat

Year 1 / 2 – Working Scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- 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.

1/2 Autumn Seasonal Changes (Y1)	Pupils should be taught to: ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies.	▪ To know that hedgehogs, dormice and bats hibernate in UK. ▪ To know the four seasons and weather associated with these. ▪ To understand how the length of the day varies at different times of the year. ▪ To know the sun is a star. ▪ To know the Earth moves around the sun. ▪ To know that looking directly at the sun can damage your eyes.	Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Spring Summer Autumn Winter Season Weather Rainy Cloudy Sunny Windy Morning Afternoon Evening Noon

Everyday materials (Y1)	Pupils should be taught 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 ▪ 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.	• To know that an object is a thing and a material is what the thing is made from. • To know that translucent means that it lets light and shape through but is unclear. • To know that opaque does not let any light through. • To know that transparent means that all light is visible through and objects can be seen. • To know why certain materials are better for some purposes than others e.g. leather shoes. • To know that absorbent means the material soaks the liquid in.	Pupils should explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent. Pupils should explore and experiment with a wide variety of materials, not only those listed in the programme of study, but including for example: brick, paper, fabrics, elastic, foil. Pupils might work scientifically by: performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'	Properties Materials suitable hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent.
Animals including humans (Y1)	Pupils should be taught to: ▪ identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	▪ To know and use key vocabulary. ▪ To know amphibians are frogs, toads and newts.	Pupils should use the local environment throughout the year to explore and answer questions about animals in their habitat. They should understand how to take care of animals taken from their local environment and the need to return them	fish, amphibians, reptiles, birds and mammals

	▪ identify and name a variety of common animals that are carnivores, herbivores and omnivores ▪ describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ▪ identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	▪ To know reptiles are turtles, lizard and grass snakes. ▪ To know that birds are magpies, pigeons, pheasants and crows. ▪ To know that mammals are foxes, squirrels, badgers, rabbits and deer. ▪ To know that a carnivore is an animal that feeds of other animals. ▪ To know that a herbivore eats only plants. ▪ To know that an omnivore eats both plants and animals. ▪ To know the main body parts. ▪ To know that an environment is the surroundings or conditions in which a person/animal/plant lives or operates.	safely after study. Pupils should become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. Pupils should have plenty of opportunities to learn the names of the main body parts (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) through games, actions, songs and rhymes. Pupils might work scientifically by: using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; grouping animals according to what they eat; and using their senses to compare different textures, sounds and smells.	head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth environment senses textures sounds smells compare similar different
1/2 Spring Seasonal Changes (Y1)	Pupils should be taught to: ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies.	▪ To know the four seasons and weather associated with these. ▪ To understand how the length of the day varies at different times of the year. ▪ To know the Earth moves around the sun.	Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the	Spring Summer Autumn Winter Season Weather Rainy Cloudy Sunny Windy

		▪ To know that looking directly at the sun can damage your eyes.	world around them, including day length, as the seasons change.	Morning Afternoon Evening Noon
Living things and their habitats (Y2)	Pupils should be taught 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.	• To know that to stay alive living things need food and shelter. • To know that living refers to something which is alive and relies on other things to survive. • To know that dead thing used to be a living thing. • To know that some things have never been a living thing and never will be. • To know that a habitat is a natural environment or home to a variety of plants and animals. • To know that a micro-habitat is a smaller habitat e.g. in a woodland habitat there are trees, rocks, burrows.	Pupils should be introduced to the idea that all living things have certain characteristics that are essential for keeping them alive and healthy. They should raise and answer questions that help them to become familiar with the life processes that are common to all living things. Pupils should be introduced to the terms 'habitat' (a natural environment or home of a variety of plants and animals) and 'micro-habitat' (a very small habitat, for example for woodlice under stones, logs or leaf litter). They should raise and answer questions about the local environment that help them to identify and study a variety of plants and animals within their habitat and observe how living things depend on each other, for example, plants serving as a source of food and shelter for animals. Pupils should compare animals in familiar habitats with animals found in less familiar habitats, for example, on the seashore, in woodland, in the ocean, in the rainforest. Pupils might work scientifically by: sorting and classifying things according to whether they are living, dead or were never alive, and recording their findings using charts.	Living Dead Never alive Habitats Characteristics Micro-habitat seashore, woodland, ocean, rainforest sorting classifying food chain depend conditions

		• To know a variety of plants, animals and habitats that are found locally and further afield (e.g. Ocean or Rainforest). • To know that different living things have different habitats based on what they need to survive. • To know how temperature and weather effect habitats and the needs of the plants and animals living there. • To know that a food chain is how animals obtain their food.	They should describe how they decided where to place things, exploring questions for example: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions. They could construct a simple food chain that includes humans (e.g. grass, cow, human). They could describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions affect the number and type(s) of plants and animals that live there.	
1/2 Summer Seasonal Changes (Y1)	Pupils should be taught to: ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies.	▪ To know the four seasons and weather associated with these. ▪ To understand how the length of the day varies at different times of the year. ▪ To know the sun is a star. ▪ To know the Earth moves around the sun. ▪ To know that looking directly at the sun can damage your eyes.	Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Spring, Summer, Autumn, Winter Season Weather Rainy, Cloudy, Sunny Windy Morning Afternoon Evening Noon germination, growth reproduction survival environment

Plants (Y2)	Pupils should be taught to: ▪ observe and describe how seeds and bulbs grow into mature plants ▪ find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	▪ To know that plants are a living thing ▪ To know and name the different parts of a plant ▪ To know that most plants need sunlight, proper temperature, water, air and nutrients to stay alive ▪ To know that seeds and bulbs do not need sunlight to grow ▪ To know and observe the process of germination	Pupils should use the local environment throughout the year to observe how different plants grow. Pupils should be introduced to the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. **Note:** Seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them. Pupils might work scientifically by: observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth; setting up a comparative test to show that plants need light and water to stay healthy.	seeds bulbs observe record comparative test healthy light water

Year 3/4 Working Scientifically During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ▪ 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 ▪ 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, 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.				
3/4 Autumn Forces and magnets (Y3)	Pupils should be taught to: ▪ compare how things move on different surfaces ▪ notice that some forces need contact between two objects, but magnetic forces can act at a distance	• To know that different surfaces allow things to travel at different speeds due to friction and resistance. • To know why magnetic forces, act from a distance and that they do not need to touch for this force to act. • To know that magnets can attract and repel each other.	Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button and horseshoe). Pupils might work scientifically by: comparing how different things move and grouping them; raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions; exploring the strengths of different magnets and finding a fair way to compare them; sorting materials	Magnetic Force Push Pull Attract Repel bar, ring, button and horseshoe magnets compare group sort

	▪ 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.	• To know what is magnetic and what is not. • To know the names of a variety of magnetic and non-magnetic materials. • To know that magnets have two poles called north and south. • To know that opposites attract with magnetic forces. • To know and name some everyday items which use magnets and their uses.	into those that are magnetic and those that are not; looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another; identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.	patterns
Electricity (Y4)	Pupils should be taught to: ▪ identify common appliances that run on electricity ▪ construct a simple series electrical circuit, identifying and naming its	• To know what everyday appliances use electricity. • To know that electricity can be carried by conductors. • To know that electricity can be insulated/isolated. • To know that electricity can travel through a circuit.	Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. **Note:** Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be	Circuit Simple Series Component Bulb Buzzer Motor Switch Device Precaution

	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.	• To recognise and name the basic parts of a circuit including cells, wires, bulbs, switches and buzzers. • To know what makes a circuit complete. • To know what material is a conductor and what is not a conductor. • To know the importance of a switch and how it can open and close a circuit. • To know what materials can be good conductors and good insulators.	taught about precautions for working safely with electricity. Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.	Observe Patterns Conductor Insulator
3/4 Spring Animals including humans (Y3)	Pupils should be taught to: ▪ identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get		Pupils should continue to learn about the importance of nutrition and should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Pupils might work scientifically by: identifying and grouping animals with and without skeletons and observing and comparing their movement; exploring ideas about what would happen if humans did not have skeletons. They might compare and contrast	Nutrition Skeleton Muscles Function Identify Group Observe Compare Contrast Food group

Animals including humans (Y4)	nutrition from what they eat ▪ identify that humans and some other animals have skeletons and muscles for support, protection and movement. Pupils should be taught to: ▪ describe the simple functions of the basic parts of the digestive system in humans ▪ identify the different types of teeth in humans and their simple functions ▪ construct and interpret a variety of food chains, identifying producers, predators and prey.		the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. They might research different food groups and how they keep us healthy and design meals based on what they find out. Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them. They might draw and discuss their ideas about the digestive system and compare them with models or images.	Diet mouth, tongue, teeth, oesophagus, stomach and small and large intestine digestive system function compare contrast carnivore herbivore omnivore producer predator prey teeth decay canine molar premolar incisor wisdom food chain
3/4 Summer Rocks (Y3)	Pupils should be taught to: ▪ compare and group together different kinds of rocks on the basis of their appearance and simple physical properties		Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment. Pupils might work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether	Rock Soil Metamorphic Igneous Sedimentary Lava Magma Fossil Compare

	▪ 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.		they have fossils in them. Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They can raise and answer questions about the way soils are formed.	Contrast Observe Classify Identify investigate
Year 5/6 Working Scientifically				

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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.

5/6 Autumn Living things and their habitats (Y6)	Pupils should be taught 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.	▪ To know that living things are classified using the Linnaeus system. ▪ To know why we classify living things. ▪ To know what subdivision is ▪ To know that we use similarities and difference to classify living things based on specific characteristics. ▪ To know that micro-organisms grow in different conditions ▪ To know that environments are constantly changing which creates difficulties for some species.	Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). They should discuss reasons why living things are placed in one group and not another. Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.	Living things Classify Observable characteristics Compare Contrast Micro-organisms Plants Animals invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals classification system key habitat

Forces (Y5)	Pupils should be taught 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.	▪ To know that some animals do not fit the Linnaeus system of classification (e.g. platypus). ▪ To know that gravity is the main force that keeps us on planet Earth. ▪ To know how the theory of gravitation came to be from the scientists Galileo and Isaac Newton. ▪ To know that resistance affects forces by creating drag which slows down moving objects. ▪ To know how to minimise the effects of resistance. ▪ To know that gears, levers and pulleys can create and affect forces.	Pupils should explore falling objects and raise questions about the effects of air resistance. They should explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. They should experience forces that make things begin to move, get faster or slow down. Pupils should explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. Pupils should explore the effects of levers, pulleys and simple machines on movement. Pupils might find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. Pupils might work scientifically by: exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. They might explore resistance in water by making and testing boats of different shapes. They might design and make products that use levers, pulleys, gears and/or springs and explore their effects.	gravity air resistance water resistance friction mechanism lever pulley gear spring push pull movement
5/6 Spring	Pupils should be taught to:	▪ To know and define the different types of	Pupils should build a more systematic understanding of materials by exploring and	Properties hardness,

Properties and changes of materials (Y5)	▪ 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 ▪ know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution ▪ use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating ▪ give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	vocabulary used to describe materials e.g. porous, hardness, transparency, magnetic, solubility, conductivity, electrical and thermal. ▪ To know how materials dissolve under temperature change and chemical reaction. ▪ To know that separation can be reversed through filtering, sieving and evaporating. ▪ To know what a particle is and how they behaves in different states of matter. ▪ To know and explain reversible and irreversible change e.g. sugar cube is irreversible but water is. ▪ To know and explain why different materials are better used for different purposes e.g. metal for	comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. They should explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. They should find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. Pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials. Pupils might work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' They might compare materials in order to make a switch in a circuit. They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes	solubility, transparency, conductivity dissolve solution substance mixture separate filtering sieving evaporating melting freezing reversible change irreversible change

	▪ demonstrate that dissolving, mixing and changes of state are reversible changes ▪ 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.	conducting heat in saucepan.	have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.	
Earth and Space (Y5)	Pupils should be taught 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 approximately spherical bodies	▪ To know how the Earth moves in relation to the sun in the solar system. ▪ To know how the moon moves in relation to the Earth and use appropriate vocabulary (waxing, waning, full, eclipse, crescent). ▪ To know that planets are spherical. ▪ To know that night due to the Earth's rotation away from the sun.	Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by	Sun Earth Moon Planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune Solar system Rotation Axis Orbit Sphere Day Night Year

	▪ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	▪ To know that the seasons influence the length of day and night due to the Earth orbiting the sun on its axis. ▪ To know that different countries have different lengths of day and night at different times to us. ▪ To know scientific thinking has changed away from a geocentric model to a heliocentric model over time.	considering the work of scientists such as Ptolemy, Alhazen and Copernicus. Pupils might work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.	
5/6 Summer Animals including humans (Y6)	Pupils should be taught to: ▪ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood ▪ recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function ▪ describe the ways in which nutrients and water are transported within	▪ To know that the circulatory system allows blood to travel through the body using red and white blood cells. ▪ To know that the heart is the organ which pumps the circulatory system. ▪ To know that blood vessels are tubular structures (e.g. vein, artery and capillary) which carry blood through the tissues and organs. ▪ To know that having a healthy lifestyle helps to	Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.	Circulation Circulatory system Heart Blood vessel Blood Diet Exercise Drugs Lifestyle Function Nutrients Transportation Harmful substances Relationships

	animals, including humans.	maintain positive functions of the body. ▪ To know that drugs, alcohol, tobacco and certain medications can be harmful to the function of human organs as they can cause damage. ▪ To know the ways which nutrients and water are transported around the body after the digestive process.		

Year B

Year	Statutory Requirements		Guidance	Key Vocabulary
		EYFS is on a one year rolling programme – please see the provision for Year A.		
		Year 1 / 2 – Working Scientifically During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ▪ asking simple questions and recognising that they can be answered in different ways ▪ observing closely, using simple equipment ▪ 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.		
1/2 Autumn Seasonal Changes (Y1)	Pupils should be taught to: ▪ observe changes across the four seasons	▪ To know that hedgehogs, dormice and bats hibernate in UK. ▪ To know the four seasons and weather associated with these.	Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.	Spring, Summer, Autumn, Winter Season Weather Rainy, Cloudy, Sunny Windy

	▪ observe and describe weather associated with the seasons and how day length varies.	▪ To understand how the length of the day varies at different times of the year. ▪ To know the sun is a star. ▪ To know the Earth moves around the sun. ▪ To know that looking directly at the sun can damage your eyes.	Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Morning, Afternoon Evening, Noon
Uses of everyday materials (Y2)	Pupils should be taught 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 ▪ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• To know and name a range of different materials including; glass, plastic, wood, metal, brick, rock, paper and cardboard. • To know why different materials are used for different things and why some are more suitable than others. • To know that playdough, rubber, sponges, paper all change when a force (squashing, bending, twisting and stretching) is used.	Pupils should identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors, and telegraph poles) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). They should think about the properties of materials that make them suitable or unsuitable for particular purposes and they should be encouraged to think about unusual and creative uses for everyday materials. Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs); observing closely,	Metal Wood Plastic Glass Suitable Unsuitable Purpose Useful Compare Observe Identify Classify Record Everyday materials Force

			identifying and classifying the uses of different materials, and recording their observations.	
1/2 Spring Seasonal Changes (Y1)	Pupils should be taught to: ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies.	▪ To know that hedgehogs, dormice and bats hibernate in UK. ▪ To know the four seasons and weather associated with these. ▪ To understand how the length of the day varies at different times of the year. ▪ To know the sun is a star. ▪ To know the Earth moves around the sun. ▪ To know that looking directly at the sun can damage your eyes.	Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Spring Summer Autumn Winter Season Weather Rainy Cloudy Sunny Windy Morning Afternoon Evening Noon
Animals including humans (Y2)	Pupils should be taught 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)	• To know that mammals have live babies and other species lay eggs (e.g. reptiles). • To know that offspring have different names. • To know that the appearance of animals changes over their lifetime. • To know that animals need water, food, air and shelter for survival.	Pupils should be introduced to the basic needs of animals for survival, as well as the importance of exercise and nutrition for humans. They should also be introduced to the processes of reproduction and growth in animals. The focus at this stage should be on questions that help pupils to recognise growth; they should not be expected to understand how reproduction occurs.	Basic needs Survival Exercise Nutrition Reproduction Growth Observing Measurement Healthy

	▪ describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• To know that humans need to exercise to stay healthy. • To know that the heart pumps blood around the body when you exercise. • To know and name the five different food groups; fats, dairy, carbohydrates, protein and fruit and veg. • To know that humans need to maintain a good level of personal hygiene and self-care to avoid getting poorly.	The following examples might be used: egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. Growing into adults can include reference to baby, toddler, child, teenager, adult. Pupils might work scientifically by: observing, through video or first-hand observation and measurement, how different animals, including humans, grow; asking questions about what things animals need for survival and what humans need to stay healthy; and suggesting ways to find answers to their questions.	
1/2 Summer Seasonal Changes (Y1)	Pupils should be taught to: ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies.	▪ To know that hedgehogs, dormice and bats hibernate in UK. ▪ To know the four seasons and weather associated with these. ▪ To understand how the length of the day varies at different times of the year. ▪ To know the sun is a star. ▪ To know the Earth moves around the sun. ▪ To know that looking directly at the sun can damage your eyes.	Pupils should observe and talk about changes in the weather and the seasons. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: making tables and charts about the weather; and making displays of what happens in the world around them, including day length, as the seasons change.	Spring, Summer, Autumn, Winter Season Weather Rainy, Cloudy, Sunny Windy Morning, Afternoon Evening, Noon
Plants (Y1)	Pupils should be taught to:	• To know and recognise the names of common wild plants	Pupils should use the local environment throughout the year to explore and answer questions about plants growing in their habitat. If	Environment Flowers Vegetables deciduous and evergreen trees,

	▪ 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.	found in the UK (e.g. Daisies, Hawthorne, Foxglove, bluebells) • To know what garden plants survive in the UK. • To know that deciduous means that trees lose their leaves throughout the year. • To know and name some deciduous trees (e.g apple tree, oak trees). • To know that evergreen trees do not lose their leaves. • To know and name some evergreen trees (e.g. conifer, spruce). • To know that a flowering plant has a stem, a leaf and a bud which produces a flower.	possible, they should observe the growth of flowers and vegetables they plant. They should become familiar with common names of flowers, examples of deciduous and evergreen trees, and plant structures (including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem). Pupils might work scientifically by: observing closely, perhaps using magnifying glasses, and comparing and contrasting familiar plants; describing how they were able to identify and group them, and drawing diagrams showing the parts of different plants including trees. Pupils might keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about different plants.	plant structures leaves, blossom, petals, fruit, roots, bulbs, seed, trunk, branches, stem

Year 3/4 Working Scientifically

In years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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
- 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, 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.				
3/4 Autumn Light (Y3)	Pupils should be taught 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 when the light from a light source is blocked by an opaque object ▪ find patterns in the way that the size of shadows change.	▪ To know that we see what light reflects. ▪ To know that the dark is the absence of light. ▪ To know different light sources (natural and artificial). ▪ To know that opaque means not visible through and that transparent means to see through. ▪ To know that an opaque object will create a shadow. ▪ To know that a shadow is the light source being blocked. ▪ To know that light travels in straight lines. ▪ To know that the pattern determines the size of a shadow and that shadows change according to the position of the light source.	Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them to answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change. **Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. Pupils might work scientifically by: looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.	Reflect Mirror Reflective surface Protect Measure Shadow Patterns Light source Sun Opaque

Sound (Y4)	Pupils should be taught 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.	▪ To know that sound is a vibration which travels through air particles. ▪ To know that sound travels differently through different objects. ▪ To know that sound travels quicker through solids than liquids and gases. ▪ To know how sound travels. ▪ To understand how different sounds make different volumes and pitches. ▪ To know what loud and quiet is. ▪ To know that thunder is the sound of lightening (thunder is lightening – not thunder and lightning). ▪ To know that sound can be insulated to prevent travel.	Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways. Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.	Vibration Pitch Volume Patterns Musical instruments Materials Investigate Ear Insulate
3/4 Spring Plants (Y3)	Pupils should be taught to: ▪ identify and describe the functions of different parts of flowering plants: roots,	▪ To know the different parts of a plant e.g. stem, leaf, root. ▪ To know how a plant stays alive and what it needs to grow.	Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and	Relationship Structure Function Root, Stem Leaves, Flowers Nutrition Support

	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 ▪ explore the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	▪ To know that plants make their own food. ▪ To understand how water is transported within plants using the roots. ▪ To know the lifecycle of flowering plants. ▪ To know that pollination is the reproduction of plants through insects. ▪ To know that seed formation and dispersal is the reproduction of plants through the plants own making.	support, leaves for nutrition and flowers for reproduction. **Note:** Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens. Pupils might work scientifically by: comparing the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser; discovering how seeds are formed by observing the different stages of plant life cycles over a period of time; looking for patterns in the structure of fruits that relate to how the seeds are dispersed. They might observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers.	Reproduction Pollination Seed formation Seed dispersal Life cycle Air Light Water Nutrients Soil Identify
States of matter (Y4)	Pupils should be taught 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	▪ To know the properties of solids, liquids and gasses and explain the particle movements. ▪ To know that materials can change states of matter e.g melting, evaporating, freezing.	Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. **Note:** Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning.	States of matter Solid Liquid Gas Evaporation Condensation Water cycle Temperature Degrees Celsius Heated Cooled Observe Group classify Substance Investigate

	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.	▪ To know that this is all caused by a change in temperature. ▪ To know the water cycle (to be revised if not already covered through Geography) and understand the role played by evaporation and condensation.	Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.	Record
3/4 Summer Living things and their habitats (Y4)	Pupils should be taught 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 ▪ recognise that environments can change and that this can sometimes pose dangers to living things.	▪ To know that animals and living things can be grouped in a variety of ways (i.e. classify). ▪ To know what animals live in the local and national/wider environment. ▪ To identify things which are living (humans), dead (dinosaurs) and never lived (rocks). ▪ To know the threats posed to environments e.g. deforestation, population growth, development.	Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. **Note:** Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically	Local environment Identify Explore Vertebrate animals fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Flowering plants Non-flowering plants Human impact Classification keys Group Population development, litter deforestation.

		▪ To name simple foods and food chains in the local environment.	planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation. Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.	
Year 5/6 Working Scientifically In years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: ▪ 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.				
5/6 Autumn All living things and their habitats (Y5)	Pupils should be taught to: ▪ describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	▪ To know the different life cycles of a mammal, amphibian, insect and a bird and how these are different. ▪ To know and name the stages and describe the changes.	Pupils should study and raise questions about their local environment throughout the year. They should observe life-cycle changes in a variety of living things, for example, plants in the vegetable garden or flower border, and animals in the local environment. They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall.	Life cycle Mammal Amphibian Insect Bird Reproduction Life processes Naturalist Animal behaviourist Sexual and asexual

	▪ describe the life process of reproduction in some plants and animals.	▪ To know how plants reproduce sexually and asexually. ▪ To know that animals reproduce sexually. ▪ To know who Jane Goodall was and how her work with chimpanzees was influential. ▪ To know that David Attenborough is an important natural historian.	Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow.	Observe Compare Contrast
Light (Y6)	Pupils should be taught to: ▪ recognise that light appears to travel in straight lines ▪ use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye	▪ To know that light travels in straight lines. ▪ To know that objects are seen because they reflect light into the eye. ▪ To know and describe the process of light making its way to the eye.	Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in	Light source Reflection Refraction Shadow Straight line Periscope

	▪ 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.	▪ To know that darkness is the absence of light. ▪ To know that reflections are a continuation of how light travels. ▪ To explain that shadows block light and that this is why shadows are the same shape as the object that the light hits. ▪ To know that light can be refracted to show the different colours. ▪ To know that colour is in light and comes from the way light is refracted from objects.	water and coloured filters (they do not need to explain why these phenomena occur).	
5/6 Spring Evolution and inheritance (Y6)	Pupils should be taught 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		Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the	Characteristics Offspring Adaption survive Evolution Variation Palaeontologist Inheritance Analyse Advantages Disadvantages

Electricity (Y6)	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. Pupils should be taught 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		development of insulating fur on the arctic fox. Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. **Note:** At this stage, pupils are not expected to understand how genes and chromosomes work. Pupils might work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins or camels. They might analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers. Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols. **Note:** Pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity. Pupils might work scientifically by: systematically identifying the effect of changing one	Series circuit Component Lamp Buzzer Cell Switch Motor Symbols Circuit diagram Systematically identify Function Variation Voltage Current Amp

	buzzers and the on/off position of switches ▪ use recognised symbols when representing a simple circuit in a diagram.		component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.	
5/6 Summer Animals including humans (Y5)	Pupils should be taught to: ▪ describe the changes as humans develop to old age.		Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.	Time-line Growth Development Puberty Gestation Periods Ovaries, Vagina, Womb Fallopian tube Breasts Penis, Testicles Infant, Childhood Adolescence Adulthood, Old age