Manland Primary School - Science Curriculum Intent

Purpose of Study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Aims

The national curriculum for science aims to ensure that all pupils:

develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

Reception

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. Children in Reception will develop the prerequisite skills they need to access the Key Stage 1 Science Curriculum through a range of activities. These include both taught sessions and access to continuous provision.

Early learning goals that link to Science:

ELG The natural world

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter

Children will:

- Explore their own bodies and their senses
- Learn to name the parts of the body and what we use them for.
- Learn about animals and their homes, including pets, farm animals and wild animals.
- Discuss the weather each day and how it differs from the previous day.
- Observe changes in animals and nature.
- Learn about being healthy, including eating a range of foods and taking part in exercise.
- Develop a sense of curiosity and exploration through a range of resources.

Children will know:

- They have a body with many parts.
- They have senses that they interpret the world through.
- We have 4 seasons: summer, autumn, winter and spring
- Weather changes daily and fits into patterns in each season.
- The names of some animals.
- Animals, including humans, change as they grow
- Plants change over time as they grow.
- Plants grow from seeds.

Key Vocab:
Spring, summer, autumn and winter
Seeds, plants, growing, change

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

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Year 1	**National Curriculum Content Area: Animals, including Humans** •Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **Pupils will know:** That we have 5 senses through which we gather information about our environment. The names of some parts of the human body Which body part is associated with which sense **Pupils will learn to:** •Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. •Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense **Working scientifically** •Use observations and ideas to suggest answers to simple questions •Observe closely, using simple equipment •Perform simple tests •Gather and record data to help in answering questions •Identify and classify **Key Vocabulary:**	**National Curriculum Content Area: Everyday Materials** *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 **Pupils will know::** *There are naturally occurring materials, such as wood, rock and water. *There are man-made materials, such as glass, metal and plastic. *Sometimes objects can be made from different materials, e.g., a spoon – plastic, wood, metal. *Materials have properties (see through, waterproof, absorbant) **Pupils will learn to:** -Distinguish between an object and the material from which it is made. -Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. -Describe the simple physical properties of a variety of everyday materials.	**National Curriculum Content Area: Animals, including Humans** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals. (fish, amphibians, reptiles, birds and mammals, including pets) **Pupils will know::** That animals can be grouped into categories, including fish amphibians, reptiles, birds, and mammals. Animals can be carnivores, herbivores or omnivores, depending on what they eat. Animals eat different types of food. **Working Scientifically** Observe closely, using simple equipment. Use their observations and ideas to suggest answers to questions. Gather and record data to help in answering questions. **Pupils will learn to:** •identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals •Identify and name a variety of common animals that are carnivores, herbivores and omnivores •Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) **Working scientifically** •Use observations and ideas to suggest answers to simple questions •Observe closely, using simple equipment •Perform simple tests •Gather and record data to help in answering questions •Identify and classify **Key Vocabulary:** fish, amphibians, reptiles, birds, mammals herbivore, omnivore, carnivore paw, hoof, tail, fin, shell, skin, wings, beak, fir, scales, feathers, Fish: goldfish, tuna, salmon Birds: blackbird, magpie, robin, sparrow, crow, swan Reptiles: snake, lizard, tortoise Mammals: mouse, horse, cow, sheep, hamster, rabbit Amphibians: frog, toad, newt,	**National Curriculum Content Area: Plants** •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. **Pupils will know::** *Plants produce seeds *There are differences between plants *Some plants live in the garden *Some plants live in the wild *Deciduous trees change throughout the year **Pupils will learn to:** •Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. •Identify and describe the basic structure of a variety of common flowering plants, including trees. **Working Scientifically** •Observe closely, using simple equipment. Perform simple tests. •Identify and classify. •Use observations and ideas to suggest answers to questions **Key Vocabulary:** flowers, deciduous and evergreen trees, plant, leaves, flowers, blossom, petals, fruit, roots, bulb, seed, trunk, branches, stem tall, teller, tallest, wild, trunk, similar, different, within, under, next to, soil, shrub, alive, vegetable, grass, garden, habitat, earth, compost, non-living, living, not alive, dead, artificial, Names, e.g. daffodil, daisy, sunflower, rose, lavender, tulip, snowdrop, holly, dandelion, oak, beech, chestnut, pine

	head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, Sense: feel, hear, smell, see, taste, touch	-Compare and group together a variety of everyday materials on the basis of their simple physical properties. **Working Scientifically** -Decide on foci. -Observe closely, using simple equipment. -Gather and record data to help in answering questions. -Identify and classify. -Use their observations and ideas to suggest answers to questions. **Key Vocabulary:** wood, plastic, glass, metal, water, rock hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent fabric, magnetic		

National Curriculum Content Area:
Seasonal Changes – start and continue in Summer 2
*observe changes across the 4 seasons
*observe and describe weather associated with the seasons and how day length varies

Pupils will know::
*There are 4 seasons.
*There are changes across the 4 seasons.

Pupils will learn to:
Observe changes across the four seasons.
Observe and describe weather associated with the seasons and how day length varies.

Working Scientifically
Decide on foci.
Observe closely, using simple equipment.
Gather and record data to help in answering question. (for that season)

Key Vocabulary:

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	Seasons: Autumn, Spring, Summer, Winter, deciduous, evergreen, shoot, fruit, earth, seeds, leaves, flowers Weather types: rain, hail, snow, ice, frost, sun, showers, wind Reproduce, babies/adults, life cycles, birds, insects, cold, warm, hot, sunrise, sunset					
Year 2	**National Curriculum Content Area:** **Use of everyday materials** *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 **Pupils will know::** *Common materials have uses. *Materials are suitable for their jobs. *Some materials will have more than one property which increases its suitability for its purpose (e.g., glass is transparent, rigid and weatherproof) *Materials may not be suitable for a particular purpose. *Some materials can be easily changed with force. *Changes in shape can result of the action of pushes, pulls and twists **Pupils will learn to:** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock,	**National Curriculum Content Area:** **Animals, including Humans – started and continued into Spring term 1** *Notice that animals, including humans, have offspring which grow into adults *Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) *Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene **Pupils will know::** *Animals produce young *Changes take place as animals get older *Adult animals no longer grow *Pets need looking after in order to survive *Exercise is important *There are different types of food that make up their diet **Pupils will learn to:** Notice that animals, including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).	**National Curriculum Content Area:** **Animals, including Humans – continued from Autumn term 2** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Working Scientifically** Gather and record simple data to help in answering questions. Use their ideas and observations to suggest answers to questions. Identify and classify	**National Curriculum Content Area:** **Plants - started and continued into summer term 1.** *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 **Pupils will know::** *Flowering plants produce seeds which grow into new plants *Some plants have bulbs from which they grow *Plants grow from seeds and bulbs Plants are living and need water, light and warmth to grow **Pupils will learn 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 **Key Vocabulary:** Seedling, bulb, buds, shoot, water, sun, light, seeds, nuts, fruit stones, warm, grow, temperature	**National Curriculum Content Area:** **Plants – continued from Spring term 2** *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 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. **Working Scientifically** Ask simple questions and recognise that they can be answered in different ways. Perform simple tests. Observe closely, using simple equipment. Use their observations and ideas to suggest answers to questions. Identify and classify. Gather and record data to help in answering questions. **Key vocabulary** Seeds, bulbs, water, light, temperature	**National Curriculum Content Area:** **Living things and their habitats** *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 microhabitats *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 **Pupils will know::** *Different plants live in the local environment. *Habitats have different features. *A microhabitat is a small habitat. *There are similarities between plants and animals. *There are differences between living and non-living things in terms of characteristics, such as movement and growth. *Plants provide food for humans and other animals within an environment

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	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. **Working Scientifically** Perform simple tests. Observe closely, using simple equipment. Using their observations and ideas to suggest answers to questions. Gather and record simple data to help in answering questions. Identify and classify. **Key vocabulary** wood, metal, plastic, glass, brick, rock, paper, cardboard transparent, waterproof, insulate, keep warm, hard, rigid, strong, flexible, squash, stretch, twist, bend	**Working Scientifically** Observe closely, using simple equipment. Ask simple questions and recognise that they can be answered in different ways. **Key vocabulary** survival, exercise, nutrition, humans, reproduction, growth, animals, egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep, baby, toddler, child, teenager, adult. Fruit, vegetables, water, fibre, meat, fish, cheese, fish, beans, Washing, diet, offspring				**Pupils will learn to:** Identify and name a variety of plants and animals in their habitats, including micro-habitats. Explore and compare the differences between things that are living, dead, and things that have never been alive. 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. 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. **Working Scientifically** Gather and record simple data to help in answering questions. Identifying and classifying. Use their observations and ideas to suggest answers to questions. **Key vocabulary** Habitat, microhabitat, Dead, alive, living, non-living, keys, breathe, grow, eat, have babies, move, sense, go to the toilet, food chain
Year 3	**National Curriculum Content Area: Light** *Recognise that they need light in order to see things and that dark is the absence of light	**National Curriculum Content Area: Forces and Magnets** *Compare how things move on different surfaces *Notice that some forces need contact between 2	**National Curriculum Content Area: Animals, including Humans – start and continue in Spring term 2** *Identify that animals, including humans, need the	**National Curriculum Content Area: Animals, including Humans continued from Spring term 1** **Working Scientifically**	**National Curriculum Content Area: Rocks** *Compare and group together different kinds of rocks on the basis of their appearance and	**National Curriculum Content Area: Plants** *Identify and describe the functions of different parts of flowering plants: roots,

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	*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 **Pupils will know::** *There are a number of light sources, including the sun. *Light sources are seen when light from them enters the eyes. *They cannot see in the dark. *Light travels from a source. *Places are dark because they have no light and a light source is needed to help us see in such places. *Reflections can be seen in shiny surfaces. *When light is blocked a shadow is formed. *Shadows are a similar shape to the object forming them. **Pupils will learn to:** Gather and record data to help in answering questions. 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	objects, but magnetic forces can act at a distance *Observe how magnets attract or repel each other and attract some materials and not others *Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and *identify some magnetic materials *Describe magnets as having 2 poles *Predict whether 2 magnets will attract or repel each other, depending on which poles are facing **Pupils will know::** *Pushes and pulls are forces. *A force acts in a particular direction. *Friction is a force. *Magnets have a north and south pole. **Pupils will learn to:** Compare how things move on different surfaces. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing **Working Scientifically** Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests.	right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat *Identify that humans and some other animals have skeletons and muscles for support, protection and movement **Pupils will know::** *There are certain foods needed for a healthy and varied diet. *There are different food groups. *They have muscles and bones in their body. *Humans and other animals have skeletons. *Invertebrates do not have an internal skeleton. *Their skeleton has a function. *Movement depends on both skeleton and muscles. *Their skeleton grows as they grow. **Pupils will learn to:** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Key vocabulary** Nutrition, skeleton, muscles Balanced diet, carbohydrates, protein, fats, fibre, fruit and vegetables, bones, muscles, femur, ribs, spine, tibia, shoulder blade, hollow, relax	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.	simple physical properties *Describe in simple terms how fossils are formed when things that have lived are trapped within rock *Recognise that soils are made from rocks and organic matter **Pupils will know::** *Rocks have characteristics *Rocks have fossils in them. Rocks are used for different purposes dependent on their physical properties Different types of rock react differently to physical forces (e.g., water, rubbing) *There are rocks under the Earth's surface *Soil is a mixture of different materials and living things **Pupils will learn to:** Compare and group together different kinds of rocks on the basis of their appearance and simple properties. Describe in simple terms how fossils are formed when things that have lived are trapped in rocks. **Working Scientifically** Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Making systematic and careful observations and,	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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal **Pupils will know::** *Healthy roots and a healthy stem are needed for plants to grow *Leaves of a plant are associated with healthy growth and nutrition *Know: plants need water, light and warmth and healthy leaves, roots and stems in order to grow well *Water travels from the roots up the stem *Plants make their own food *Fertilisers contain minerals *Plants absorb minerals from the soil *Pollen and seeds are dispersed **Pupils will learn to:** Identify and describe the functions of different parts of flowing plants. 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.

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	and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object. To group and compare light sources. To observe over time. **Working Scientifically** Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 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 straightforward scientific evidence to answer questions or to support their findings. **Key vocabulary** Light, reflected, Shadow, opaque, pattern, distance Flames, block, direction, travels, shortest, longest, highest, torch, shape, similar, transparent, translucent, light source, sun, object, daytime, night-time, shine, shiny, absorb, reflective, surface, mirror, sundial, block, lamp	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. Use results to draw simple conclusions. **Key vocabulary** Surfaces, forces, magnetic, distance, attract, repel, materials, magnets, poles Push, pull, speed up, slow down, change shape, change direction, movement, direction, friction, magnets, magnetism, north pole, south pole	and contract, protect, support, internal skeleton, exoskeleton		where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Recording findings using simple scientific language. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. **Key Vocabulary** Properties, fossils, Soils, rocks, organic matter, grains, crystals, sedimentary rock Marble, granite, sand, stone, slate, chalk, clay, texture, absorbed, permeable, pebble, characteristic, surface, organic, impermeable, crumbly, igneous, metamorphic	Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Working Scientifically** Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations 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. Using results to draw simple conclusions, and raise further questions. **Key vocabulary** roots, stem/trunk, leaves, flowers, plants, life, growth, air, light, water, nutrients, soil, water, pollination, seed formation, seed dispersal, ground, transport, attract, bees, catch, sunshine, green, pollen, carpel, stamen, anther, style, nutrition, support, anchor, reproduction

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Year 4	**National Curriculum Content Area: States of matter** *Compare and group materials together, according to whether they are solids, liquids or gases observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) *Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature **Pupils will know::** *Air is a gas *There are differences between solids, liquids and gases *Gases can be easily compressed *When ice melts it turns to liquid and when water freezes it becomes ice. *Some processes can be reversed. *Liquids evaporate to form gases and gases condense to form liquids *There is a sequence of changes in the water cycle *There are processes in the water cycle *There is a relationship between liquids and solids in terms of melting and freezing. *There is a relationship between liquids and gases in terms of evaporation and condensation.	**National Curriculum Content Area: Animals, including Humans** *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 **Pupils will know::** *There are organs in the digestive system. *The organs in the digestive system have a role. *Food needs to be broken down. *They need to take care of their teeth. *There are different types of teeth *The different types of teeth have different functions. *Animals have different diets and different types of teeth. **Pupils will learn 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. **Working Scientifically** Set up simple practical enquiries, comparative and fair tests.	**National Curriculum Content Area: Living things and their habitats – start and continue into Spring term 2** *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 **Pupils will know::** *There are ways of grouping living things including animals and plants (flowering and non-flowering) *Animals can be grouped into vertebrates and invertebrates *Some of the characteristics of the vertebrate (fish, mammals, amphibians, reptiles, and birds) groups (e.g., warm-blooded, have fur, lay eggs) *Animal groups of vertebrates are fish, mammals, amphibians, reptiles, and birds *Animal invertebrate groups are snails, slugs, spiders, worms and insects. *Some animals are hard to classify. *Some animals feed on other animals and some on plants. *A food chain must always start with a green plant which 'produces' food for the other organisms. *Some of the more complex features aid survival in specific	**National Curriculum Content Area: Living things and their habitats – continued from Spring term 1** 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. Recognise that living things can be grouped in a variety of ways. **Working Scientifically** Gather, record , classify and present data in a variety of ways to help in answering questions. Use straightforward scientific evidence to answer questions or to support their findings.	**National Curriculum Content Area: Electricity** *Identify common appliances that run on electricity *Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers *Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery *Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit *Recognise some common conductors and insulators, and associate metals with being good conductors **Pupils will know::** *Some common appliances run on electricity. *There are mains operated and battery-operated devices. *Some of the dangers associated with mains electricity. *There are some components of a simple electrical circuit. *Batteries are sources of energy. *A circuit must be complete for it to work. *Materials can be conductors or insulators.	**National Curriculum Content Area: Sound** *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 **Pupils will know::** *They hear sounds through their ears. *When sounds are generated by objects, something moves or vibrates. *The difference between pitch and volume. *Altering vibrations alters the pitch or volume. **Pupils will learn to:** Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and then strength of the vibrations that produced it.

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	*The temperature can affect the rate of evaporation or condensation **Pupils will learn to:** Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Working Scientifically** Ask relevant questions and use different types of scientific enquiries to answer them. Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gather and record data in a variety of ways to help in answering questions. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identify differences, similarities or changes related to simple scientific ideas and processes.	Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Record and present findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Report on findings from enquires in simple scientific language, using both oral and written explanations, displays or presentations or results and conclusions. Identify similarities, differences or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. With support, make predictions for new values, within or beyond the data collected. With support, raise further questions. **Key vocabulary** digestive system, mouth, tongue, teeth, oesophagus, stomach, small and large intestine, carnivores, herbivores	habitats (e.g., gills, blubber, camouflage) *Different organisms are found in different habitats because of the differences in environmental factors **Pupils will learn to:** Construct and interpret a variety of food chains, identifying producers, predators and prey. **Working Scientifically** Ask relevant questions and using different types of scientific enquiries to answer them. Make systematic and careful observations. Gather, record and present data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. **Key vocabulary** Habitat, living things, animals, flowering plants, non-flowering plants, vertebrate, fish, amphibians, reptiles, birds, mammals; invertebrates, snails, slugs, worms, spiders, insects, ferns, mosses, environments Predator, prey, producer, river, ocean, desert, artic, rainforest, mountain, farmland, wood, dry, wet, vegetation, shelter Classify, characteristic		*Metal is a good conductor. **Pupils will learn to:** Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. Working Scientifically Set up simple practical enquiries, comparative and fair tests. Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Report on findings from enquiries, including oral and written explanations, displays or presentations	Recognise that sounds get fainter as the distance from the sound sources increases. **Working Scientifically** Ask relevant questions and using different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests. Make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. **Key vocabulary** sounds, vibrations, ear, patterns, pitch, volume medium, insulation, travel, instrument

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	Use straightforward scientific evidence to answer questions or to support their findings. **Key vocabulary** solids, liquids, gases, heated, cooled, temperature, evaporation, condensation, water cycle water, air, ice, milk, lemonade, juice, metal, pour, flow, change shape, squash, grain/granular, thermometer, freeze, melt, boil, steam, smoke, sea water, properties, melting point, degrees Celsius	Teeth and eating: incisor, molar, canine, diet, decay, healthy, acids, sugars, rip, tear, chew, grind Digestive system: saliva, tongue, toilet waste, nutrients, energy, brain, lungs, movement, urine, faeces,			of results and conclusions. Use results to draw simple conclusions. Make predictions for new values and suggest improvements. With support, raise further questions. **Key vocabulary** Appliances, electricity, simple series electrical circuit, cells, wires, bulbs, switches, buzzers, lamp, conductors, insulators Battery, crocodile clips, symbols, plastic, metal, component	
Year 5	**National Curriculum Content Area: Properties and changes of Materials - start and continue into Autumn 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 *Know: 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	**National Curriculum Content Area: Properties and Changing of Material continued from Autumn term 1.** *To compare and group everyday materials on the basis of their properties including their solubility, transparency and responses to magnets. *To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, woods and plastics. *To know: some materials will dissolve in liquid to from a solution, and describe how to recover a substance from a solution. *To use knowledge of solids, liquids and gases to decide how mixtures might be separated,	**National Curriculum Content Area: Forces** *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 **Pupils will know::** *A force is measured in Newtons. *There are simple forces: gravity, friction and air resistance. *More than one force can act on an object. *Air resistance slows things down.	**National Curriculum Content Area: Earth and Space** *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 *Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky **Pupils will know::** *The components of the solar system are the Sun, Moon, Earth and the other planets. *The earth and the other planets orbit the Sun. *It takes the Earth one year to orbit the Sun. *The Earth rotates on its axis, and this takes one day.	**National Curriculum Content Area: Animals, including Humans** *Describe the changes as humans develop to old age **Pupils will know::** *Humans change and develop to old age. *The appearance of humans changes as they get older. *Some characteristics do not change. *There are stages of growth and development in humans, including puberty. **Pupils will learn to:** To describe the changes as humans develop to old age. **Working Scientifically**	**National Curriculum Content Area: Living things and their habitats/ Life Cycles** *Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird *Describe the life process of reproduction in some plants and animals **Pupils will know::** *There are similarities in the life cycles of plants, animals and humans. *Parts of a flower have names and functions. *Reproduction can be asexual, sexual and/or both. *Most animals reproduce by sexual reproduction. **Pupils will learn to:** To describe the differences in life cycles of a mammal, amphibian, insect and a bird.

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	particular uses of everyday materials, including metals, wood and plastic *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 **Pupils will know::** *The properties of materials can be hardness, transparency, magnetism, electrical and thermal conductivity *Some materials are good thermal insulators *Some metals are both good thermal and electrical conductors. *Salt and sugar dissolves in water but sand won't. *An undissolved solid can be separated from a liquid by filtering. *A solid can be recovered from a solution by evaporation. *When solids dissolve they break up so small they can pass through the holes in filter paper. *Dissolving is a reversible change. *Some changes can be reversed and some cannot. *There are hazards when burning materials.	including filtering, sieving and evaporating. *To demonstrate that dissolving, mixing and changes of state are reversible changes. *To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Working Scientifically** To plan different types of scientific enquiries to answer questions, recognising and controlling variables where necessary. To record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. To report and present findings from enquiries, including conclusions, causal relationships and explanations of and the degree of trust in results in oral and written explanations such as displays and other presentations. To use test results to make predictions to set up further comparative fair tests.	*Friction can be both useful and non-useful. *Balanced forces on an object cause it to remain stationary or travel at the same speed. *Unbalanced forces on an object cause it to speed up, change shape or slow down. *Air resistance is the frictional force of air on objects moving through it. *Some factors increase friction between solid surfaces and increase air and water resistance. *The effects of levers, pulleys and gears. *Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Pupils will learn to:** To identify the effects of air resistance, water resistance, and friction that act between moving surfaces. To explain that unsupported objects fall towards the Earth because of the forces of gravity acting between the Earth and the falling object. To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Working Scientifically** To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. To take measurements using scientific equipment, with increasing accuracy and precision. To take repeat reading when appropriate.	*The Moon orbits the Earth. The Earth, Sun and Moon are spherical. *It is daylight in the part of the Earth facing the Sun. *A shadow from the Sun changes over the course of a day. *It is night-time in Australia when it is daytime in England. **Pupils will learn to:** To describe the movement of the Earth and other planets, relative to the Sun in the Solar. To describe the movement of Moon relative to the Earth. To describe the Sun, and Moon as approximately spherical bodies. To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Working Scientifically To identify scientific evidence that has been used to support or refute ideas or arguments. **Key vocabulary** Sun, Earth, day, night, solar system, planets, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, moon, orbit, geocentric model, heliocentric model Spherical, day and night, celestial body, rotation, hemisphere, gravity, shadow, daylight ,	To record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. To report on findings from enquire in oral and written explanations **Key vocabulary** Growth, development, humans, puberty, gestation, animals New-born, infant, child, teenager, adult, wrinkles, grey hair, height, weight	To describe the life process of reproduction in plants and animals. **Working Scientifically** To record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. To report on findings from enquire in oral and written explanations. **Key vocabulary** life cycle, mammal, amphibian, insect, bird, life process, reproduction, plants, animals Live young, hatch, tadpole, caterpillar, butterfly, ladybird, pupae, larvae, chrysalis, asexual, sexual, pollination, seed dispersal, pollen, stamen, stigma

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	Pupils will learn to: To compare and group together everyday materials on the basis of their properties, including hardness, transparency and conductivity electrical and thermal) . Working Scientifically To plan different types of scientific enquiries to answer questions, recognising and controlling variables where necessary. To record data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter graphs, bar chart line graphs. To report and present findings from enquiries, including conclusions, causal relationships and explanations of and the degree of trust in results in oral and written forms such as displays and other presentations. To use test results to make predictions to set up further comparative fair tests. **Key vocabulary** evaporating, filtering, sieving, melting, dissolving, materials, properties, hardness, solubility, transparency, conductivity (electrical and thermal), solids, liquids, gases, separated, metals, wood, plastic, reversible insulation, solution, polymers, reversible, irreversible, burning, rusting, vinegar, bicarbonate of soda,		To record data and results of increasing complexity. To record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. To report and present 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 To identify scientific evidence that has been used to support or refute ideas of arguments. **Key vocabulary** Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, levers, pulleys. Gears Magnetic attraction, gravitational attraction, direction, motion, weight, upthrust, Newton, forcemeter, stationary, surface area,			

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	magnetism, insulators, conductors, soluble, insoluble					
Year 6	**National Curriculum Content Area: Light** *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 *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 **Pupils will know::** *Reflections are light 'bouncing off' objects. *In order to be seen, all luminous objects must reflect light. *We see things because light travels from light sources to our eyes or from light objects to objects and then to our eyes. *There are a variety of ways of changing the size of the shadow produced by an object. *There is a relationship between the size of a shadow and the distance between the light source and an object. **Pupils will learn to:**	**National Curriculum Content Area: Electricity** *Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit *Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches *Use recognised symbols when representing a simple circuit in a diagram **Pupils will know::** *The 'amount' of electricity (voltage) depends on the number of batteries. *There are conventional circuit symbols. *The brightness of the bulbs and the volume of the buzzer can change. *There are ways of changing the brightness of the bulbs and the volume of the buzzer. *The amount of electricity is measured in voltage. **Pupils will learn to:** Use recognised symbols when representing a simple circuit in a diagram. Associate the brightness of a lamp or the volume of a buzzer with the number	**National Curriculum Content Area: Living things and their habitats** *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 **Pupils will know::** *There is a wide variety of living things. *Classification is important. *There are five vertebrate groups. *There are living things that are too small to be seen and these can affect our lives. **Pupils will learn to:** Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. **Working Scientifically** Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	**National Curriculum Content Area: Animals including Humans** *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 animals, including humans **Pupils will know::** *The heart is made of muscle *They can measure their pulse rate. *The blood transports and protects. *The blood comes from the heart in arteries and returns to the heart in veins. *The blood carries oxygen and other essential materials around the body. *There are harmful effects of smoking. *Sometimes there are reasons why it is necessary to take medicines. *There are harmful effects of drugs. *Food is a fuel for the body. **Pupils will learn to:** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, vessels and blood.	**National Curriculum Content Area: Evolution and inheritance** *Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago *Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents *Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution **Pupils will know::** *There are useful micro-organisms that can be used in food production *Micro-organisms feed, grow and reproduce like other organisms. *Yeast is living. *Micro-organisms can move from one food source to another or from one animal to another. *Offspring have some features from their parents. *Animals have to compete for food. *Animals avoid predators. *Animals and plants are adapted to their environments. *Being well adapted to your environment means an organism is more likely to survive. **Pupils will learn to:** Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. 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. **Working Scientifically** Identify scientific evidence that has been used to support or refute ideas or arguments. Use test results to make predictions and to set up further comparative fair tests. **Key vocabulary**	

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	Recognise that light appears to travel in straight lines. Explain that we see things because light travels from the light source 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 object that cast them. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. **Working Scientifically** Plan different types of scientific enquiries to answer questions, recognising and controlling variables where necessary. Take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Report and present findings from enquires including conclusions, causal relationships and explanations, of and a degree of trust in results, in oral and written explanations such as displays and other presentation.	and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. **Working Scientifically** Plan different types of scientific enquiries to answer questions recognising and controlling vairables where necessary. Take measurements, in standard units, using a range of scientific quiepment, with increasing accuracy and precision, taking repeat readings when appropriate. Record and present findings using scientific diagram and labels, classification keys, tables, scatter grpahs, bar and line graphs. Identify causal relationships and expalnations of results. Draw conlsuions conclusions, explain and interpet results (incuding the degree of trust). Use test result to make predictions and to set up further tcomparative and fair tests. **Key vocabulary** Brightness, lamp, volume, buzzer, voltage, cells, circuit, variations, components, bulbs, loudness, symbols	**Key vocabulary** living things, classification, micro-organisms, plants, animals microbe, fungus, bacteria, virus, classified, classification key, yeast, characteristics, microscope	Recognise the impact of diet, exercise, drugs, and lifestyle on the way their bodies function. Describe the way in which nutrients and water are transported within animals, including humans. **Working Scientifically** To plan different types of scientific enquires to answer questions, recognising and controlling variables where necessary. Take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Report and present 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. **Key vocabulary** human circulatory system, heart, blood vessels, blood, diet, exercise, drugs, lifestyle, nutrients, water, transported, animals, humans veins, arteries, capillaries, pulse, beats, oxygen, carbon dioxide, organs, medicines, minerals, vitamins, lungs, caffeine, medical, legal, illegal	living things, fossils, inhabited, offspring, animals, plants, adapted, environment variety, variation, species, competition, adapt, adaptation, reproduce, survive, evolve, record, gills, blubbers, moulting, long neck, hooves, eyelashes, tails, generation

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	Use test results to make predictions and to set up further comparative and fair tests. **<u>Key vocabulary</u>** Light, travel, straight lines, reflect, eye, shadows Transparent, translucent, opaque, periscope, luminous, non-luminous, absorb, direction	Current, series, conductor, positive, negative, terminal, complete circuit, battery			