Year Group	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Nursery 2s **Seasonal Changes throughout**	All about me using a mirror/ photograph. Make connections of themselves and others. Notice differences between people All about Autumn. Exploring Autumn objects treasure basket	Animals All about Winter. Exploring Winter objects	Exploring natural materials linked to the story Make Gingerbread men/porridge.	Dinosaurs textured dinosaurs/ natural treasure basket (differentiated)	Growing baby-adult Make connections and noticing differences. Exploring natural foods and materials, planting cress Exploring flowers using senses Farm animals	Vehicles (differentiated) Under the sea (differentiated) Exploring toys
Nursery 3s **Seasonal Changes throughout**	All about me Myself / family and friends / environment Explore natural materials Autumn materials / textures – what is similar and different	Dinosaurs (differentiated) Winter	Transport (differentiated)	Explore spring natural materials/environment – respect and care for the environment Shadows – link to materials Explore forces of different materials – why can we not use paper for windows – link to story Spring new life - Lifecycle of a chick	Growth – animals, people and plants	Under the Sea (differentiated)
Reception **Seasonal Changes throughout**	Nocturnal animals Light and Dark Shadows Day and night		Space Snow and Ice	Spring/New Life (chicks)	Animals and environments	Keeping healthy Plants/mini beasts

Year 1	Animals Including Humans (humans) Blackpool Zoo	Animals Including Humans	Materials	Materials	Plants	Seasonal Changes
Year 2	Plants	Everyday Materials	Living Things and Their Habitats	Living Things and Their Habitats	Animals Including Humans	Animals Including Humans
Year 3	Plants	Forces and Magnets	Rocks and Fossils	Rocks and Fossils	Light	Animals Including Humans
Year 4	Animals Including Humans	States of matter	Electricity	Sound	Living Things and their Habitats Heathfield Primary School	Living Things and their Habitats
Year 5	Forces	Earth and Space	Properties and Changes to Materials	Living Things and Their Habitats Blackpool Zoo	Properties and Changes to Materials	Animals Including Humans
Year 6	Electricity	Light	Animals Including Humans	Evolution and Inheritance	Living Things and Their Habitats	Scientific enquiry project

EYFS
EYFS Statutory Educational Programme **Understanding the World** Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.
End Points **Understanding the World** ELG: Past and Present Children at the expected level of development will: - Talk about the lives of the people around them and their roles in society; - Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class; - Understand the past through settings, characters and events encountered in books read in class and storytelling. ELG: People, Culture and Communities Children at the expected level of development will: - Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps; - Know some similarities and differences between different religious and cultural communities in this country, drawing on their experiences and what has been read in class; - Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and – when appropriate – maps.

ELG: The Natural World Children at the expected level of development will: - Explore the natural world around them, making observations and drawing pictures of animals and plants; 15 - 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.

	KS1			
	Year 1			
	Materials	**Plants**	**Animals including humans**	**Seasonal changes**
Knowledge	• **K1a** - Distinguish between an object and the material from which it is made • **K1b** - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • **K1c -** Describe the simple physical properties of a variety of everyday materials • **K1d -** Compare and group together a variety of everyday materials on the basis of their simple physical properties.	• **K1e -** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • **K1f -** Identify and describe the basic structure of a variety of common flowering plants, including trees.	• **K1g -** Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals **(pets too)** • **K1h -** Identify and name a variety of common animals that are carnivores, herbivores and omnivores • **K1i -** Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • **K1j -** Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• **K1k -** observe changes across the four seasons • **K1l -** observe and describe weather associated with the seasons and how day length varies.
Scientific Enquiry	comparative testing	comparative testing	comparative testing	comparative testing
	research	research	research	research
	observation over time	observation over time	observation over time	observation over time
	pattern seeking	pattern seeking	pattern seeking	pattern seeking
	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying.	identifying, grouping, classifying
Skills	**Asking simple questions and recognising that they can be answered in different ways** • **S1a** – While exploring, develop their ability to naturally ask questions e.g. what something is, how it works, why it is used. • **S1b** – Ask yes/no questions to help sort objects. (identifying and classifying) • **S1c** – Answer questions developed with the teacher through a scenario. • **S1d** – Ask one or two simple questions linked to a topic (research) • **S1e** - Identify a question to investigate from a range of questions provided by the teacher. (Comparative/Fair Test)			

	Observing closely, using simple equipment • **S1f** – Make simple observations linked to answering a question the children have chosen to investigate (comparative/fair test) • **S1g** – Compare objects based on obvious observable features using some of their senses e.g. size, shape, colour.(identifying and classifying) • **S1h** – To identify a magnifying glass and use to make simple observations. **Performing simple tests** • **S1i** - Choose equipment to use from a range given by the teacher when planning a comparative test. (comparative/fair test) • **S1j** - Decide what to do and what to observe or measure with guidance from the teacher to answer the question being investigated. (comparative/fair test) • **S1k** - Use practical resources provided to carry out simple tests, enquiries and observations to answer the question. **Identifying and classifying** • **S1l** – To sort and group objects, materials and animals correctly using simple tables.(identifying and classifying) • **S1m** – To use identification sheets to name plants, materials and animals.(identifying and classifying) • **S1n** – To identify headings for the two groups (It is.. It is not…) (identifying and classifying) **Using their observations and ideas to suggest answers to questions** • **S1o** - Present what they have learnt verbally or using pictures (research) • **S1p** - Recognise 'biggest and smallest' 'best and worst' from their investigations (comparative/fair testing) • **S1q** - Suggest appropriate answers to questions relating to their evidence with support from the teacher. (pattern seeking) • **S1r** – Talk about the number of objects/names in each group e.g. which has more/less (identifying and classifying) **Gathering and recording data to help in answering questions.** • **S1s** - Record their observations by using photographs, drawings and labelled diagrams. • **S1t** – Record simple measurements using prepared tables and pictograms. (pattern seeking) • **S1u** – Using their data, classify into simple prepared tables and sorting rings. (identifying and classifying) • **S1v** – Talk about and explain what I have done using scientific language.
Vocabulary	**Animal including humans** - Chris Packham, Reptiles, Amphibians, Fish, Mammals, Birds, Carnivores, Herbivores, Omnivores, Senses, Touch, Taste, Sight, Hear, Smell. **Materials** – Charles Mackintosh, Wood, Glass, Metal, Plastic, Transparent, Opaque, Absorbent, Waterproof. **Plants** – Beatrix Potter, Deciduous, Evergreen, Stem, Trunk, Leaf, Wild flowers, Garden plants. **Seasonal Changes** – Dr Steve Lyons, Autumn, Winter, Spring, Summer, Weather, Daylight.

End Points	**By the end of Year 1 through the coverage of the 4 Science units, children will be able to:** • Name the material or materials that an object is made from.***** • Identify and name a variety of everyday materials.***** • Describe the simple physical properties of some everyday materials and use this knowledge to group materials.***** • Identify and name a variety of common wild and garden plants and talk confidently about the differences between an evergreen tree and a deciduous tree. • Identify the 4 main parts of a plant including parts of a tree. • Identify and name a range of animals. • Recall the 5 main types of animal (fish, amphibians, reptiles, birds and mammals) • Talk about what the words herbivore, carnivore and omnivore mean and be able to group animals according to what they eat.***** • Describe and compare the observable features of animals from a range of groups using pictures to support.***** • Name and locate parts of the human body, including those related to the senses • Describe seasonal changes***** **By the end of Year 1 through the coverage of the working scientifically objectives, children will be able to:** • Develop their ability to naturally ask questions linked to a topic while they are exploring. • Recognise that Scientists find ways to answer the questions they have. • Identify, name and use a magnifying glass to support making comparisons between objects based on obvious observable features. • Use practical resources provided to carry out simple tests, enquiries and observations to answer the question. • To begin to spot patterns in observations and data provided by the teacher. • To sort and group objects, materials and animals correctly using simple tables. • Begin to research with support using pictures, photographs, books or the internet. ***linked to the teacher assessment framework for the end of key stage one.**

	KS1			
	Year 2			
	Materials	**Plants**	**Animals including humans**	**Living things and their habitats**
Knowledge	• **K2a -** Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • **K2b -** Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• **K2c -** Observe and describe how seeds and bulbs grow into mature plants • **K2d -** Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	• **K2e -** Notice that animals, including humans, have offspring which grow into adults. • **K2f -** Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) • **K2g -** Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• **K2h -** Explore and compare the differences between things that are living, dead, and things that have never been alive. • **K2i -** 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 • **K2j -** Identify and name a variety of plants and animals in their habitats, including microhabitats. • **K2k -** 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.
Scientific Enquiry	comparative testing	comparative testing	comparative testing	comparative testing
	Research	research	Research	research
	observation over time	observation over time	observation over time	observation over time
	pattern seeking	pattern seeking	pattern seeking	pattern seeking
	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying
Skills	**Asking simple questions and recognising that they can be answered in different ways** • **S2a** – While exploring, use their previous knowledge to ask more specific questions e.g. what something is, how it works, why it is used. • **S2b** – Ask a question about what might happen in the future based on a simple observation. (Observation over time) • **S2c** – Ask a question that is looking for a pattern based on observations (pattern seeking) • **S2d** – Choose an appropriate method to answer a question from a list given e.g. book, internet, practical test, ask an adult. Helping them to recognise that questions can be answered in different ways. • **S2e** – Identify a question to investigate from a scenario. (Comparative/Fair Test) **Observing closely, using simple equipment**			

	• **S2f** - Make accurate observations linked to answering a question the children have chosen to investigate (comparative/fair test) • **S2g** - Compare objects based on observable features using more of their senses e.g. size, shape, colour, texture. (identifying and classifying) • **S2h** - Make observations, comparisons and simple measurements in non-standard units to notice change. • **S2i** - To identify and use microscopes and to make simple observations. **Performing simple tests** • **S2j** - Choose equipment to use when planning a comparative test. (comparative/fair test) • **S2k** - Decide what to do and what to observe or measure with support from their group to answer the question being investigated. (comparative/fair test) • **S2l** - Use practical resources provided to carry out simple tests, enquiries and observations to answer their choice of question. **Identifying and classifying** • **S2m** – To sort and group objects, materials and living things correctly using simple tables and venn diagrams. (identifying and classifying) • **S2n** – To use identification sheets to identify plants, materials and living things and describe their characteristics. (identifying and classifying) • **S2o** – To sort and group objects based on their own criteria. (identifying and classifying) **Using their observations and ideas to suggest answers to questions** • **S2p** - Present what they have learnt verbally, using pictures (research) or block diagrams (comparative/fair testing) • **S2q** - Suggest and then write appropriate answers to questions relating to their evidence with support from the teacher. (pattern seeking) • **S2r** – Talk about the number of objects/names in each group e.g. which has more/less and suggest reasons why (identifying and classifying) **Gathering and recording data to help in answering questions** • **S2s** - Record their observations by using videos, labelled diagrams or in writing. • **S2t** – Record simple measurements using tally charts and block graphs (pattern seeking) • **S2u** – Using their data, classify into their own tables and sorting rings. (identifying and classifying) • **S2v** – Begin to use simple scientific language to talk about things that are similar and different.
Vocabulary	**Animals including Humans** – Steve Irwin, Offspring, Hygiene, Reproduction, Survive, Exercise. **Materials** – John MacAdam, Suitable, Bending, Stretching, Squashing, John McAdam Twisting. **Living things and their habitats** – Rachel Carson, Habitat, Microhabitat, Food chain, Living, Dead, Never alive. **Plants** - Jane Colden, Germinate, Seed, Bulb, Wilting, Seedling, Mature plant.
End Points	**By the end of Year 2 through the coverage of the 4 Science units, children will be able to:** • Name an object, say what material it is made from, identify its properties and explain why the properties makes its suitable for this particular use.***** • Describe the action they are using to change the shape of an object (squashing, bending, twisting and stretching) • Describe how plants are grown from seeds or bulbs and recall the different stages in the life cycle of a plant.*****

	• Describe how plants need water, light and a suitable temperature to grow and stay healthy and talk about the impact of changing these.***** • Name different pairs of adults and their young, describe the different stages of the life cycle of a butterfly and the life cycle of a human.***** • Describe the basic needs of animals, including humans, for survival (water, food and air)***** • Describe what it is important for human to do (in relation to exercise and hygiene) and eat in order to have a healthy lifestyle**.*** • Identify from a range of images or objects which are living or dead and which have never been alive.***** • Give examples of different habitats and microhabitats, including what animals or plants might live there and why.***** • Construct a simple food chain that starts with a plant and has the arrows pointing in the correct direction, and be able to talk about what this shows.***** **By the end of Year 2 through the coverage of the working scientifically objectives, children will be able to:** • Ask questions about what they notice that are informed by previous learning.***** • Give examples of different ways to find an answer to a scientific question. • Identify and use a microscope to make simple observations. • Make observations, comparisons and simple measurements in non-standard units to notice change. • Make decisions over which equipment to use or not use to perform a simple test. • Use simple tables and Venn diagrams to sort and group objects or information. • Present what they have learned verbally and verbalise an answer to the scientific question they are investigating. • Record simple measurements using tally charts and block graphs. • Use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions.***** • Use appropriate scientific language to communicate their ideas, what they do and what they find out in a variety of ways.***** ***linked to the teacher assessment framework for the end of key stage one.**

	KS2				
	Year 3				
	Animals Including Humans	**Plants**	**Rocks and Fossils**	**Light**	**Forces and Magnets**
Knowledge	• **K3a -** 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 • **K3b -** Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	• **K3c -** identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • **K3d -** 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 • **K3e -** Investigate the way in which water is transported within plants • **K3f -** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	• **K3g-** compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • **K3h -** describe in simple terms how fossils are formed when things that have lived are trapped within rock • **K3i -** Recognise that soils are made from rocks and organic matter.	• **K3j -** recognise that they need light in order to see things and that dark is the absence of light • **K3k -** notice that light is reflected from surfaces • **K3l -** recognise that light from the sun can be dangerous and that there are ways to protect their eyes • **K3m -** recognise that shadows are formed when the light from a light source is blocked by an opaque object • **K3n -** find patterns in the way that the size of shadows change.	• **K3o -** compare how things move on different surfaces • **K3p -** notice that some forces need contact between two objects, but magnetic forces can act at a distance • **K3q -**observe how magnets attract or repel each other and attract some materials and not others • **K3r -** 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
Scientific Enquiry	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing
	research	research	research	research	research
	observation over time	observation over time	observation over time	observation over time	observation over time
	pattern seeking	pattern seeking	pattern seeking	pattern seeking	pattern seeking
	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying
Skills	**Asking relevant questions and using different types of scientific enquiries to answer them (covered during all types of Scientific enquiry and in all units)** • **S3a** - The children consider their prior knowledge when asking questions linked to a topic. They use a range of question stems with support. Where appropriate, they answer their own questions appropriately with guidance from the teacher or a group. • **S3b** - The children answer questions posed by the teacher appropriately. • **S3c** - From a range of resources provided by the teacher, children with support from their group, can decide for themselves what to use and/or do to answer the question.				

	• **S3d** - Children recognise which questions can be answered by research (using secondary sources) and which questions can be answered by practical work. (Needs to be dripped in whenever a Scientific question is posed) **Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, Including thermometers and data loggers** • **S3e** - The children use a range of equipment to measure length and time. They use standard units for their measurements where not all the numbers are marked on the scale. **(fair test or observation over time)** • **S3f** - To use data loggers to make careful observations. **(observation over time)** • **S3g** - Children can compare objects such as rocks on more sophisticated observable features and present their observations in labelled diagrams **(identifying and classifying)** **Setting up simple practical enquiries, comparative and fair tests** • **S3h** - Follow a plan to carry out a specific type of enquiry **(observation over time, pattern seeking, comparative and fair testing)** • **S3i** - When researching, be able to choose the best source from a range provided (could be different books and/or different websites) **(research)** • **S3j** - Decide as a group what to change and what to measure or observe. **(Comparative and Fair testing, observation over time, pattern seeking)** **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** • **S3k** - The children are sometimes given a choice by the teacher of which way they would like to present their evidence. • **S3l** - Sort objects and living things into groups using intersecting Venn diagrams and Carroll diagrams. **(identifying and classifying)** • **S3m** - The children record their observations in a variety of ways drawing on their previous knowledge of photographs, videos, picture, labelled diagrams and writing from KS1. • **S3n** - The children prepare their own tables to record their own measurements. • **S3o** - The children present data in tally charts and bar charts (may need a template to which they can add headings) • **S3p** - Children are supported to present the same data in different ways in order to help answer the question (e.g. purplemash 2graph) **Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.** • **S3q** - The children communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary by: • **S3r** - identifying similarities and differences (identifying and classifying) - explaining simple causal relationships (comparative and fair testing). - talk about what research they found out using their source (Research). - talk about patterns they have spotted (pattern seeking). - talk about the changes they have observed (observation over time). **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.** • **S3s** - The children draw conclusions based on their evidence and current subject knowledge. • **S3t** - They identify ways in which they adapt their method as they progressed or how they would do it differently if they repeated the enquiry with support. • **S3u** - The children use their evidence to make predictions for new values of different items e.g. the distance travelled by a car on an additional surface. • **S3v** - Following a scientific experience, the children ask further questions. **Identifying differences, similarities or changes related to simple scientific ideas and processes** • **S3w** - Children interpret their data to generate simple comparative statements based on their evidence. (e.g. the older the child, the taller they are) • **S3x** -They begin to identify naturally occurring patterns and causal relationships (rocks).

	Using straightforward scientific evidence to answer questions or to support their findings. • **S3y -** Children answer the teacher's questions based on: - observations they have made - measurements they have taken - information they have gained from secondary sources. The answers are consistent with the evidence.
Vocabulary	**Animals including humans** - Wilhelm Rontgen, Vertebrate, Invertebrate, Nutrition, Skeleton. **Plants Function** - Ahmed Mumin Warfa, Seed dispersal, Requirements, Pollination, Germination. **Forces** – Andre Marie Ampere, Push, Pull, Twist, Friction, Magnetic. **Rocks, fossils and soils** – Mary Anning, Fossils, Palaeontologist, Sedimentary, Igneous, Metamorphic. **Light** – James Clerk Maxwell, Shadow, Light source, Reflect, Emit.
End Points	**By the end of Year 3 through the coverage of the 5 Science units, children will be able to:** • Identify and describe the functions of different parts of flowering plants and trees.* • Describe how plants also need air, nutrients and room to grow in addition to water, light and a suitable temperature. • Describe how water is transported through a celery plant and apply this knowledge to other plants.* • Describe the life cycle of a flowering plant including pollination, seed formation and seed dispersal. • Explain where humans get their nutrients and why, and identify that animals, including humans, need the right types and amount of nutrition. • Identify animals that have a skeleton and muscles and describe how these are used for support, protection and movement. • Recognise that they need light in order to see things, that dark is the absence of light and that light is reflected from surfaces.* • Explain how light from the sun can be dangerous and give ways to protect their skin and eyes. • Explain how shadows are formed and describe patterns in the way that shadows change size.* • Name 3 different types of rocks and explain how and why they are grouped together based on their appearance and simple physical properties. • Describe in simple terms how fossils are formed and identify that soils are made from rocks and organic matter.* • Explain who Mary Anning is and why she is a famous scientist. • Explain that magnets have two poles that can attract or repel other magnets and can also attract some (magnetic) materials and not others. Be able to give examples. • Explain what a contact and non-contact force is and give examples.* • Talk about friction as a force with prompts and examples to support. **By the end of Year 3 through the coverage of the working scientifically objectives, children will be able to:** • Ask scientific questions using question stems where appropriate and work with a group to give answers. • Identify whether the answer to a question will need to be researched or tested out practically. • Use equipment to measure length and time in standard units. • Use data loggers to make careful observations.

	• Follow a plan to carry out a specific type of enquiry and decide as a group what to change and what to measure or observe. • When researching, be able to choose the best source from a range provided. • Sort objects and living things into groups using intersecting Venn diagrams and Carroll diagrams. • The children prepare their own tables to record their own measurements and present data in tally charts and bar charts. • Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary. • Draw simple conclusions based on their evidence and current subject knowledge to answer the question. • Interpret their data to give a simple comparative statement and identify causal relationships within the rocks topic. • Use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions. • Give examples of lessons where they have used research, fair testing, identifying and classifying, pattern seeking and observation over time (using their class book to support them) ***linked to the teacher assessment framework for the end of key stage two.**

	KS2				
	Year 4				
	Animals including Humans	**Living Things and their habitats**	**States of matter**	**Sound**	**Electricity**
Knowledge	• **K4a -** describe the simple functions of the basic parts of the digestive system in humans. • **K4b -** identify the different types of teeth in humans and their simple functions • **K4c -** construct and interpret a variety of food chains, identifying producers, predators and prey (taught in year 2).	• **K4d -** recognise that living things can be grouped in a variety of ways • **K4e -** explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • **K4f** - recognise that environments can change and that this can sometimes pose dangers to living things. **(See Year 2 for previous learning in this topic)**	• **K4g -** compare and group materials together, according to whether they are solids, liquids or gases • **K4h - O**bserve 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) • **K4i -** identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• **K4j -** identify how sounds are made, associating some of them with something vibrating • **K4k -** recognise that vibrations from sounds travel through a medium to the ear • **K4l -** find patterns between the pitch of a sound and features of the object that produced it • **K4m -** find patterns between the volume of a sound and the strength of the vibrations that produced it • **K4n -** recognise that sounds get fainter as the distance from the sound source increases.	• **K4o -** identify common appliances that run on electricity • **K4p -** construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • **K4q -** 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 • **K4r -** recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • **K4s -** recognise some common conductors and insulators, and associate metals with being good conductors.
Scientific Enquiry	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing
	research	research	research	research	research
	observation over time	observation over time	observation over time	observation over time	observation over time
	pattern seeking	pattern seeking	pattern seeking	pattern seeking	pattern seeking
	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying
Skills	**Asking relevant questions and using different types of scientific enquiries to answer them** • **S4a -** The children consider their prior knowledge when asking a range of questions linked to a topic. They independently use a range of question stems and independently answer their own questions appropriately some of the time.				

	• **S4b -** The children give suitable answers to questions posed by the teacher using the correct vocabulary. • **S4c -** From a range of resources provided by the teacher, children can decide for themselves what to use to answer the question. • **S4d -** Children identify the type of enquiry they are using to answer a question (enabling children to learn the names of the 5 types of enquiry across the year). **Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, Including thermometers and data loggers** • **S4e -** The children use a range of equipment to measure temperature and capacity. They use standard units for their measurements. • **S4f -** To use data loggers and thermometers to make systematic observations. • **S4g -** Children can compare living things on more sophisticated observable features and present their observations in labelled diagrams **(identifying and classifying).** **Setting up simple practical enquiries, comparative and fair tests** • **S4h -** Follow their own/group plan to carry out a specific type of enquiry **(observation over time, pattern seeking, comparative and fair testing).** • **S4i -** When researching, be able to identify the appropriate and inappropriate sources from a range provided (could be different books and/or different websites) **(research).** • **S4j -** Decide what to change and what to measure or observe and decide how often to take a measurement **(Comparative and Fair testing, observation over time, pattern seeking).** **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** • **S4k** - The children are sometimes given a choice of which way they would like to present their evidence. • **S4l -** The children continue to record their observations in a variety of ways drawing on their previous knowledge of photographs, videos, picture, labelled diagrams and writing from KS1 and LKS2. • **S4m** - The children present data in tables, tally charts and bar charts (without templates where possible) **(Comparative and Fair testing, observation over time, pattern seeking).** • **S4n -** Children present the same data in different ways in order to help answer the question (e.g. purplemash 2graph or Microsoft Word) • **S4o** – Create simple branching databases to enable others to be able to name living things. **Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** • **S4p** - The children communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary by: - identifying and showing labelled diagrams to talk about similarities and differences (**identifying and classifying).** - explaining causal relationships **(comparative and fair testing).** - talk about what research they found out using their sources and why the source was chosen. **(Research).** - talk about patterns they have spotted and conclusions they have made **(pattern seeking).** - talk about the changes they have observed and make simple conclusions **(observation over time).** **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** • **S**4q - The children draw conclusions based on their evidence and current subject knowledge, including any limitations on the investigations (e.g. I only had one book to research from). • **S4r -** They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. • **S4s** - The children use their results to make predictions about any further results. • **S4t** - Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. **Identifying differences, similarities or changes related to simple scientific ideas and processes**

	• **S4u -** Children interpret their data to generate comparative statements based on their evidence (e.g. the bigger the vibration, the louder the sound). • **S4v -** The children spot patterns in the data particularly two criteria with no examples e.g. there are no living things with wings and no legs **(identifying and classifying).** • **S4w -** They begin to identify naturally occurring patterns and causal relationships (animals). • **S4x -** Interpreting time graphs with support if needed **(observation over time).** **Using straightforward scientific evidence to answer questions or to support their findings.** • **S4y -** Children answer their own and others questions based on: - observations they have made - measurements they have taken - information they have gained from secondary sources. The answers are consistent with the evidence.
Vocabulary	**Animal Including humans** – Ivan Pavlov, Organism, Food Chain, Producer, consumers, predators, Digestive System, Incisors, Canine, Molar, Pre molar, Wisdom. **States of Matter** - Anders Celsius, Solid, Liquid, Gas, Particles, Condensation, Evaporation, Melting, freezing, Water cycle, **Electricity** - Thomas Edison, Insulator, Conductor, Circuit, Switch, Bulb, Appliances. **Sound** - Aristotle, Vibration, Pitch, Frequency, Muffle, Conductor, Insulator, Sound waves. **Living Things** - Cindy Looy, Environmental Change, Extinction, Habitat, Vertebrate, Invertebrate, Classification.
End Points	**By the end of Year 4 through the coverage of the 5 Science units, children will be able to:** • Compare and group materials together, according to whether they are solids, liquids or gases.* • Describe what happens when a material changes state after it is heated or cooled, including the temperature at which these things happen.* • Describe the stages of the water cycle, including the parts played by evaporation and condensation, using diagrams to support.* • 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 label a variety of food chains, identifying producers, predators and prey.* • Recognise a classification key and use to help group, identify and name living things. • Give at least one example of what might happen to an animal if their habitat/environment changed.* • Explain how sounds are made and heard, linked to vibrations.* • Describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source.* • Identify common appliances that run on electricity and recognise some common conductors and insulators. • Construct a simple series circuit and name its basic parts. • Recognise that a switch opens and closes a circuit and explain why a bulb will/will not light in a simple series circuit. **By the end of Year 4 through the coverage of the working scientifically objectives, children will be able to:** • Ask and answer their own questions independently some of the time using appropriate resources and applying their knowledge of the 5 types of scientific enquiry. The answers are consistent with the evidence. • Use equipment to measure temperature and capacity in standard units.

	• Use data loggers and thermometers to make systematic observations. • Create and follow a plan with their group to carry out a specific type of enquiry including making some decisions on what to change, what to measure or observe and how often to take a measurement. • When researching, be able to explain which sources are appropriate and which are inappropriate and why. • Make a choice on how they would like to present their evidence/data (graphs, tables, charts, Venn diagram, Carroll diagrams, labelled diagram, writing) • Create simple branching databases to enable others to be able to name living things. • Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary for each type of enquiry. • Draw conclusions based on their evidence and current subject knowledge to answer the question including identifying ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. • Use their results to make simple predictions about any further results. • Interpret data to give a comparative statement based on the evidence and spot patterns within the data. • Interpret time graphs with support. • Identify the names of the 5 types of Scientific enquiry and describe each one using examples from their lessons. ***linked to the teacher assessment framework for the end of key stage two.**

	KS2				
	Year 5				
	Living Things and their habitats	**Animals including Humans**	**Properties and changes of materials**	**Earth and Space**	**Forces**
Knowledge	• **K5a -** describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • **K5b -** describe the life process of reproduction in some plants and animals. **See Year 4 and Year 2 for previous learning**	• **K5c -** describe the changes as humans develop to old age. **See Year 2 for previous learning.**	• **K5d -** 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. • **K5e -** know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • **K5f -** use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • **K5g -** give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • **K5h -** demonstrate that dissolving, mixing and changes of state are reversible changes. • **K5i -** 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. **See Year 2 for previous learning in this topic (same name) and Y4 look at states of matter.**	• **K5j -** describe the movement of the Earth, and other planets, relative to the Sun in the solar system • **K5k -** describe the movement of the Moon relative to the Earth • **K5l -** describe the Sun, Earth and Moon as approximately spherical bodies • **K5m -** use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	• **K5n -** explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • **K5o -** identify the effects of air resistance, water resistance and friction, that act between moving surfaces • **K5p -** recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. **Y3 look at forces and magnets for previous learning.**
Scientific Enquiry	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing
	research	research	research	research	research
	observation over time	observation over time	observation over time	observation over time	observation over time
	pattern seeking	pattern seeking	pattern seeking	pattern seeking	pattern seeking
	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying

Skills	**<u>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</u>** • **S5a** – Children can ask scientific questions from a whole class scientific demonstration. • **S5b** – Ask a range of questions recognising that some can be answered through research and others may not. • **S5c** – When given a range of questions children can identify the type of enquiry that will help to answer them, with support from their group. • **S5d** – Recognise the independent variable as being the variable the child can change and control (e.g. a light source being moved closer to an object in increments). • **S5e** – Recognise the dependent variable as the variable the child can observe or measure (e.g. the size of the shadow formed). **<u>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</u>** • **S5f** – The children select measuring equipment to give the most precise results e.g. ruler, tape measure, trundle wheel, force meter with a suitable scale. • **S5g** – Measure using standard units using equipment that has scales involving decimals. • **S5h** – During an enquiry, they make decisions on some of the following: - Whether they need to take repeat readings during a fair test. - Whether they need to increase the sample size during pattern seeking. - Whether they need to adjust the observation period and/or frequency during an observation over time. - Whether they need to check further secondary sources when researching. In order to get the most accurate data/information. **<u>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</u>** • **S5i** – To record measurements using line graphs as well tables and charts taught previously. • **S5j** – To record classifications using classification keys as well as tables and diagrams taught previously (Venn and Carroll). • **S5k** - Create branching databases **and keys** to enable others to be able to name living things and / or objects. **<u>Using test results to make predictions to set up further comparative and fair tests</u>** • **S5l** – Using a set of incomplete results, with support children can make predictions on what further results would be and then be able to carry this out as a comparative / fair test. • **<u>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</u>** • **S5m** – In their conclusions, children identify causal relationships and patterns in the natural world. • **S5n -** In their conclusions, children identify results that do not fit the overall pattern. • **S5o** – Children evaluate with their group by explaining their degree of trust in their results e.g. precision in taking measurements, identifying variables that might not have been controlled, credibility of secondary sources used and accuracy of results. • **S5p** – They communicate their findings to an audience using relative scientific language and illustrations. **<u>Identifying scientific evidence that has been used to support or refute ideas or arguments</u>** • **S5q** – Children can discuss whether other evidence e.g. from other groups or secondary sources support or refutes their answer.

	• **S5r** – They talk about how their scientific understanding can change due to new evidence that they have gathered.
Vocabulary	**Animals including humans** - Alexander Fleming, Gestation, Foetus, Puberty, Offspring, Milestones. **Earth and Space** – Neil Armstrong, Spherical bodies, Orbit, Rotation, Axis, Satellite. **Properties and changes to materials** – Spence Silver, Arthur Fry, Alan Amron, Absorbent, Hypothesis, Solute, Soluble, Solvent. **Living things and their habitats** – Sir David Attenborough, Species, Reproduction, Pollination, Fertilisation, Metamorphosis. **Properties and changes to materials**- Reversible, Irreversible, Filtering, Sieving, Magnetism. **Forces** – Isaac Newton, Newtons, Gravity, Water resistance, air resistance, mechanisms
End Points	**By the end of Year 5 through the coverage of the 5 Science units, children will be able to:** • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.* • Give scientific reasons why a particular material is used for a particular use. • Describe how a solution is made and how a substance can be recovered from a solution.* • Separate mixtures by filtering, sieving and evaporating.* • Explain what reversible and irreversible changes are and give examples.* • Describe the changes as humans develop to old age. • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.* • Name the parts of a plant involved in reproduction and explain their role.* • Describe the life process of reproduction in some animals.* • Talk about their understanding of the force of gravity with examples. • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces (contact forces)* • Identify simple mechanisms, including levers, gears and pulleys, which increase the effect of a force.* • Identify the Earth, its shape and its moon and describe the movement of the Moon relative to the Earth.* • Identify the sun as a star and name all 8 planets in our solar system, describing how they move relative to the sun.* • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.* **By the end of Year 5 through the coverage of the working scientifically objectives, children will be able to:** • Ask a range of scientific questions from a whole class scientific demonstration. • When given a range of questions children can identify the type of enquiry that will best help to answer them, with support from their group. • Create and follow a plan with a partner to carry out a specific type of enquiry including making decisions on what to resources to use, what the variables are and how often to take a measurement. • Recognise the independent variable as being the variable the child can change and control and recognise the dependent variable as the variable the child can observe or measure. • Select measuring equipment to give the most precise results, using standard units and scales involving decimals. • During an enquiry, they make some decisions and adjustments in order to get the most accurate data/information.

	• Record measurements using line graphs. • Use classification keys and create a branching database with a key. • Using a set of incomplete results, make predictions on what further results would be and begin to explain how they would carry this out. • Identify results that do not fit the overall pattern. • Evaluate with their group by explaining their degree of trust in their results. • Identify causal relationships and patterns in the natural world. • Discuss whether other evidence e.g. from other groups or secondary sources, support or refutes their answer and talk about how their scientific understanding can change due to new evidence being gathered. ***linked to the teacher assessment framework for the end of key stage two.**

	KS2				
	Year 6				
	Living things and their Habitats	**Animals including Humans**	**Evolution and Inheritance**	**Light**	**Electricity**
Knowledge	• **K6a -** 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 • **K6b –** give reasons for classifying plants and animals based on specific characteristics.	• **K6c** – identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • **K6d –** recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • **K6e –** describe the ways in which nutrients and water are transported within animals, including humans.	• **K6f –** recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • **K6g –** recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • **K6h –** identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Previous learning fossils in year 3** **Possible link to adaptations in living things and their habitats (Y4, Y2)**	• **K6i –** recognise that light appears to travel in straight lines. • **K6j –** 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 • **K6k –** 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 • **K6l –** use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Previous learning light in year 3**	• **K6m –** associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • **K6n –**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 • **K6o –** use recognised symbols when representing a simple circuit in a diagram. **Previous learning in year 4**
Scientific Enquiry	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing	comparative / fair testing
	research	research	research	research	research
	observation over time	observation over time	observation over time	observation over time	observation over time
	pattern seeking	pattern seeking	pattern seeking	pattern seeking	pattern seeking
	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying	identifying, grouping, classifying
Skills	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** • **S6a** – Children can independently ask scientific questions stimulated from a scientific experience (trip or visitor). • **S6b** – When given a range of questions children can identify the type of enquiry that will help to answer them • **S6c** – Children are able to choose a type of enquiry to carry out and justify their choice. **(Summer project)**				

	• **S6d** – Recognise an apply their knowledge that the independent variable as being the variable the child can change and control (e.g. a light source being moved closer to an object in increments). • **S6e** – Recognise and apply their knowledge that the dependent variable as the variable the child can observe or measure (e.g. the size of the shadow formed). **Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** • **S6f** - During an enquiry, they make decisions on some of the following: - Whether they need to take repeat readings during a fair test. - Whether they need to increase the sample size during pattern seeking. - Whether they need to adjust the observation period and/or frequency during an observation over time. - Whether they need to check further secondary sources when researching. In order to get the most accurate data/information. **Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** • **S6g** - To record measurements using line graphs and scatter graphs as well tables and charts taught previously. • **S6h** – Children present the same data if different ways in order to help answer the question (not using I.C.T). **Using test results to make predictions to set up further comparative and fair tests** • **S6i** - Using a set of incomplete results, children can make predictions on what further results would be and then be able to carry this out as a comparative / fair test. **Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations** • **S5m** – In their conclusions, children identify causal relationships and patterns in the natural world as well as results that do not fit the overall pattern, and explain their finding using their subject knowledge (oral or written). • **S6n** – Children evaluate by explaining their degree of trust in their results e.g. precision in taking measurements, identifying variables that might not have been controlled, credibility of secondary sources used and accuracy of results. • **S6o** - They communicate their findings to an audience using relative scientific language and illustrations, recognising that some scientific questions may not have been answered definitively. **Identifying scientific evidence that has been used to support or refute ideas or arguments** • **S6p** - Children can discuss whether other evidence e.g. from other groups or secondary sources and their scientific understanding support or refutes their answer. • **S6q** - They can talk about how new discoveries can change scientific understanding.

Vocabulary	**Animals including Humans** - Dr Katherine Dibb, Circulatory system, Blood vessels, Pulse, Nutrients, Function. **Electricity** – Nikola Tesla, Electrical component, Circuit symbols/ diagram, Voltage, Electrons, Cell. **Living things and their habitats** – Carl Linneus, Vertebrate/ Invertebrate, Microorganisms, Observable characteristics, Flowering/ non-flowering plants. **Evolution and inheritance** – Charles Darwin, Offspring, Evolution, Inherited, Fossils, Variation. **Light** – Thomas Edison, Opaque, Periscope, Ray, Beam, Light source, Reflection **Working Scientifically**
End Points	**By the end of Year 6 through the coverage of the 5 Science units, children will be able to:** • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.* • Recognise and give examples detailing the way diet, exercise, drugs and lifestyle can impact the human body.* • Describe the ways in which nutrients and water are transported within animals, including humans. • Use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods.* • Explain who Carl Linnaeus is and why he is a famous scientist. • Give reasons for classifying plants and animals based on specific characteristics. • Use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved and describe how fossils are formed which provide evidence for evolution.* • Use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects, and the formation, shape, and size of shadows.* • Use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams.* • Compare and give reasons for variations in how components function (e.g. brightness, volume, and position of switches) and associate the brightness or the volume with the number and voltage of cells used in the circuit. **By the end of Year 6 through the coverage of the working scientifically objectives throughout their school journey, children will be able to:** • Describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.* • Ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources)* • Use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate.* • Record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graph.* • Draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways.* • Raise further questions that could be investigated, based on their data and observations.* • Use a wide range of scientific vocabulary to communicate their understanding.* ***linked to the teacher assessment framework for the end of key stage two.**