Nebula
where stars are born

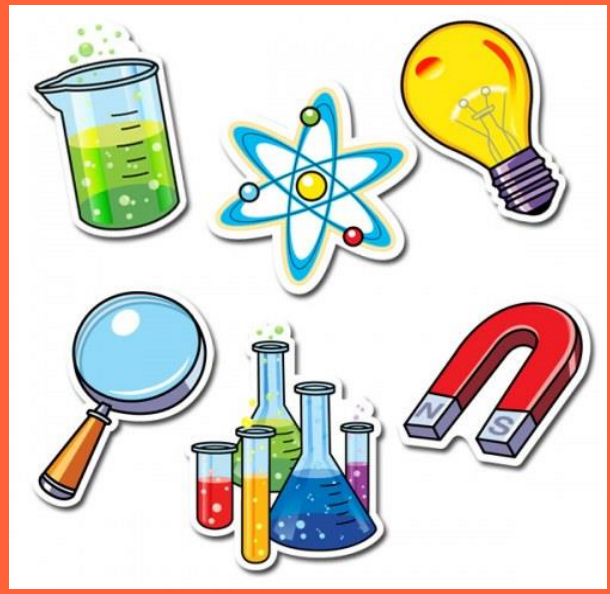
2024-2025

Curriculum Skills and Progression Map Science

Old Catton C of E Junior School's Distinctiveness Statement

At Old Catton C of E Junior School, we instil in our pupils our Christian Distinctiveness, the importance of religious literacy and our school's Key Values: Love, Hope and Joy. Our rich and varied Science curriculum encourages pupils to explore, challenge and wonder at the world around them. Our Science curriculum teaches children to love the natural world for all of its diversity and ask questions about how and why. We teach children to have hope that the advances of science improves the world around us and have joy for all that this world has to offer. Through gaining an understanding of the science behind our natural world, pupils gain a deepening appreciation of differences, in both animals and humans which further instils the message behind our School's Bible story of The Lost Sheep, that no one person or animal be left behind.

'Spirituality is the bitter-sweet yearning for beauty, truth, love and wonder beyond ourselves. It is a longing to pursue together and a treasure we glimpse in ourselves and one another and seek beyond us into eternity. It is life in all its fullness'
Nebula Spirituality Statement



The Nebula Federation

Old Catton Junior School

SCIENCE - WORKING SCIENTIFICALLY: STATUTORY REQUIREMENTS			
	KEY STAGE ONE	LOWER KEY STAGE TWO	UPPER KEY STAGE TWO
QUESTIONING	Asking simple questions, recognising they can be answered in different ways	Asking relevant questions, using range of scientific enquiries to answer them. Using straightforward scientific evidence to answer questions or support findings.	Planning range of scientific enquiries to answer questions, recognising and controlling variables where necessary.
OBSERVING	Observing closely using simple equipment	Making systematic, careful observations, taking accurate measurements. Using a range of equipment, including thermometers and data loggers	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
EXPERIMENTING	Performing simple tests	Setting up simple practical enquiries, comparative and fair tests	Using test results to make predictions to set up further comparative and fair tests.
CLASSIFYING	Identifying and classifying	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
APPLYING	Using observations and ideas to suggest answers to questions	Using results to draw simple conclusions, make prediction, suggest improvements raise further questions. Identifying differences, similarities or changes related to scientific ideas processes	Identifying scientific evidence that has been used to support or refute ideas or arguments.
RECORDING	Gathering and recording data to help in answering questions	Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, oral and written explanations, displays or presentations of results and conclusions	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

The following tables outline the knowledge, skills and understanding expected in Year 2, KS1. These tables have been included as reference in order to clearly show the progression from Key Stage 1 to Key Stage 2 and the baseline of knowledge and skills prior to Year 3.

Skills Map - Science		
Year 2 – Living things and their Habitats, Animals including Humans and Plants (*for reference*)		
Living things and their Habitats	**Animals, including Humans**	**Plants**
• Can they match certain living things to the habitats they are found in? • Can they explain the differences between living and non-living things? • Can they describe some of the life processes common to plants and animals, including humans? • Can they describe how a habitat provides for the basic needs of things living there? • Can they describe how some animals get their food using basic food chains? • Can they describe how plants and animals are suited to their habitat? • Finding things out using secondary sources of information. • Can they use - see, touch, smell, hear or taste - to help them answer questions? • Can they organise things into groups?	• Can they describe what animals need to survive? Can they explain that animals grow and reproduce? • Can they explain why animals have offspring which grow into adults? • Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) • Can they explain the basic needs of animals, including humans for survival? (water, food, air) • Can they describe why exercise, balanced diet and hygiene are important for humans? Can they suggest how to find things out? • Can they use prompts to find things out? • Finding things out using secondary sources of information	• Can they describe what plants need to survive? • Can they observe and describe how seeds and bulbs grow into mature plants? • Can they investigate and describe the impact of removing light, soil or water from a growing or germinating plant. • Observing changes over time. • Can they suggest how to find things out? • Can they use prompts to find things out?
Year 2 Greater Depth		
• Can they name some characteristics of an animal that help it to live in a particular habitat?	• Can they explain that animals reproduce in different ways?	• Can they describe what plants need to survive and link it to where they are found?

• Can they describe what animals need to survive and link this to their habitats?		• Can they explain that plants grow and reproduce in different ways?

Skills Map - Science	
Year 2 – Materials (*for reference*)	
Classifying and grouping materials	**Changing materials**
• Can they describe the simple physical properties of a variety of everyday materials? • Can they compare and group together a variety of materials based on their simple physical properties? • Can they use - see, touch, smell, hear or taste - to help them answer questions? • Can they use some scientific words to describe what they have seen and measured?	• Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching) • Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam) • Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses? • Can they organise things into groups? • Can they find simple patterns (or associations)? • Can they say whether things happened as they expected?
Year 2 Greater Depth	
• Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.? • Can they sort materials into groups and say why they have sorted them in that way? • Can they say which materials are natural and which are man-made?	• Can they explain how materials are changed by heating and cooling? • Can they explain how materials are changed by bending, twisting and stretching? • Can they tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted?

Skills Map - Science Year 2 – Working Scientifically (*for reference*)				
Observing closely	**Performing Tests**	**Identifying and Classifying**	**Recording findings**	**Types of investigations**
• Can they use - see, touch, smell, hear or taste to help them answer questions? • Can they use some scientific words to describe what they have seen and measured? • Can they compare several things?	• Can they carry out a simple fair test? • Can they explain why it might not be fair to compare two things? • Can they say whether things happened as they expected? • Can they suggest how to find things out? • Can they use prompts to find things out?	• Can they organise things into groups? • Can they find simple patterns (or associations)? • Can they identify animals and plants by a specific criteria, e.g. lay eggs or not; have feathers or not?	• Can they use text, diagrams, pictures, charts, tables to record their observations? • Can they measure using simple equipment?	• Children should have the opportunity to investigate: • Observing changes over time • Noticing similarities, differences and patterns. • Grouping and classifying. • Carrying our comparative tests. • Finding things out using secondary sources of information.
Year 2 Greater Depth				
• Can they suggest ways of finding out through listening, hearing, smelling, touching and tasting?	• Can they say whether things happened as they expected and if not why not?	• Can they suggest more than one way of grouping animals and plants and explain their reasons?	• Can they use information from books and online information to find things out?	• Can they begin to independently consider controlling variables to create a fair test?

At Old Catton Junior School, we have previously been working using a two-year rolling programme. However, we are working towards each pupil completing the elements of the curriculum that follow their current year group. For this academic year, Year 3 and 4 will be completing the same topics, but from September 2025, they will be focusing on different topics. Year 5 and 6 will mostly be completing separate topics, but there is one topic which overlaps due to the unrolling of the topics.

To ensure that there is clear progression of skills from Year 3 to Year 6, the Science work completed in each year group will reflect the skills required for each year as found in 'Working Scientifically', however there are many opportunities within Lower School and Upper School to revisit skills to ensure fluency, confidence and clarity before moving on to new skills.

For each unit of work completed, the Science book of each child clearly outlines the knowledge taught in the unit, alongside the skills taught. While a child in Year 4 may be accessing knowledge from a Year 3 unit, the skills taught during the unit will reflect the Year 4 'Working Scientifically' skills. Children are assessed each half term against the skills and knowledge for each unit. This is recorded clearly in the Science book of each child and on the Foundation Subject excel.

Skills Map - Science				
Year 3 – Working Scientifically				
Asking Questions and Carrying Out Fair and Comparative Tests	**Observing and Measuring Changes**	**Identifying, Classifying, Recording and Presenting Data**	**Drawing Conclusions, Noticing Patterns and Presenting Findings**	**Using Scientific Evidence and Secondary Sources of Information**
Pupils will be expected to ask relevant questions and use different types of scientific enquiries to answer them. They will also need to set up simple practical enquiries, comparative and fair tests. A. Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. B. Start to make their own decisions about the most appropriate type	Pupils will be expected to make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. A. Make systematic and careful observations. B. Observe changes over time. C. Use a range of equipment, including thermometers and data loggers. D. Ask their own questions about	Pupils will be expected to Gather, record, classify and present data in a variety of ways to help in answering questions. They will also need to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. A. Talk about criteria for grouping, sorting and classifying. B. Group and classify things. C. Collect data from their own observations and measurements. D. Present data in a variety of ways to	Pupils will be using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. They will also be reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. A. Draw simple conclusions from their results. B. Make predictions. C. Suggest improvements to investigations; D. Raise further questions which could be investigated; E. First talk about, and then go on to	Pupils will be identifying differences, similarities or changes related to simple scientific ideas and processes. They will also be sing straightforward scientific evidence to answer questions or to support their findings. A. Make links between their own science results and other scientific evidence. B. Use straightforward scientific evidence to answer questions or support their findings. C. Identify similarities, differences, patterns and changes

of scientific enquiry they might use to answer questions; C. Recognise when a fair test is necessary. D. Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. E. Set up and carry out simple comparative and fair tests.	what they observe. E. Where appropriate, take accurate measurements using standard units using a range of equipment.	help in answering questions. E. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. F. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	write about, what they have found out. F. Report and present their results and conclusions to others in written and oral forms with increasing confidence.	relating to simple scientific ideas and processes. D. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Year 3 Greater Depth

Record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables.
Explain their findings in different ways (display, presentation, and writing).
Use their findings to draw a simple conclusion.
Suggest improvements and predictions for further tests.
Suggest how to improve their work if they did it again.

Skills Map - Science

Year 3 – Plants and Animals, including Humans	
Animals, including Humans: Health and Movement	**Plants**
Autumn 1	**Summer 1**
National Curriculum Statutory Objectives: • *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.* Unit Learning Objectives: • 1: To sort foods into food groups and find out about the nutrients that different foods provide. • 2: To explore the nutritional values of different foods by gathering information from food labels. • 3: To sort animal skeletons into groups, discussing patterns and similarities and differences. • 4: To investigate an idea about how the human skeleton supports movement. • 5: To explain how bones and muscles work together to create movement. Scientific Skills: • Recognise when a fair test is necessary. • Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.	*National Curriculum Statutory Objectives:* • *Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers* • *Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.* • *Investigate the way in which water is transported within plants.* • *Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.* Unit Learning Objectives: • 1: To name the different parts of flowering plants and explain • their jobs. • 2: To set up an investigation to find out what plants need to grow well. • 3: To record my observations and present the results of my investigation using scientific language. • 4: To investigate how water is transported in plants. • 5: To name the different parts of a flower and explain their role in pollination and fertilisation. • 6: To understand and order the stages of the life cycle of a • flowering plant. Scientific Skills: • Recognise when a fair test is necessary.

• Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers. • Where appropriate, take accurate measurements using standard units using a range of equipment. • Talk about criteria for grouping, sorting and classifying. • Group and classify things. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • Make predictions. • Suggest improvements to investigations; • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	• Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. • Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Observe changes over time. • Use a range of equipment, including thermometers and data loggers. • Ask their own questions about what they observe. • Where appropriate, take accurate measurements using standard units using a range of equipment. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • Make predictions. • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Make links between their own science results and other scientific evidence. • Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Year 3 Greater Depth	

• Explain how the muscular and skeletal systems work together to create movement. • Classify things by a number of characteristics that they have thought of. • Explain how certain living things depend on one another to survive. Higher Order Questions What would happen if you only ate junk food for: a day, a week, a month, a year? What would happen if we didn't have a skeleton?	• Describe one of the ways in which flowering plants reproduce. • Identify how seeds are dispersed based on their appearance. Higher Order Questions What would happen to a plant if its roots were damaged? What do you think the most effective method of seed dispersal is?

Skills Map - Science		
Year 3 – Rocks, Forces and Magnets, Light		
Rocks	**Forces and Magnets**	**Light**
Summer 2	**Autumn 2**	**Spring**
National Curriculum Statutory Objectives: • *Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.* • *Describe in simple terms how fossils are formed when things that have lived are trapped within rock.* • *Recognise that soils are made from rocks and organic matter.*	*National Curriculum Statutory Objectives:* • *Compare how things move on different surfaces.* • *Notice that some forces need contact between two 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.*	*National Curriculum Statutory Objectives:* • *Recognise that they need light in order to see things and that dark is the absence of light.* • *Notice that light is reflected from surfaces.* • *Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.* • *Recognise that shadows are formed when the light from a light source is blocked by an opaque object.* • *Find patterns in the way that the size of shadows change.*

<u>Unit Learning Objectives:</u> • 1: To compare different types of rocks. • 2: To group rocks based on their properties and make systematic and careful observations. • 3: To explain how fossils are formed. • 4: To explain Mary Anning's contribution to palaeontology. • 5: To explain how soil is formed. • 6: To observe carefully and systematically and present my findings using scientific vocabulary. <u>Scientific Skills:</u> • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers.	• *Describe magnets as having two poles.* • *Predict whether two magnets will attract or repel each other, depending on which poles are facing.* <u>Unit Learning Objectives:</u> • 1: To identify the forces acting on objects. • 2: To investigate the effects of friction on different surfaces. • 3: To sort magnetic and non-magnetic materials. • 4: To investigate the strength of magnets. • 5: To explore magnetic poles. • 6: To observe how magnets attract some materials. <u>Scientific Skills:</u> • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. • Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers.	<u>Unit Learning Objectives:</u> • 1: To understand the difference between light and dark. • 2: To investigate which surfaces reflect light • 3: To use a mirror to reflect light and explain how mirrors work. • 4: To understand why light from the sun can be dangerous and how to protect our eyes. • 5: To investigate which materials block light to form shadows. • 6: To find patterns when investigating how shadows change size. <u>Scientific Skills:</u> • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. • Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers.

• Talk about criteria for grouping, sorting and classifying. • Group and classify things. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Make links between their own science results and other scientific evidence. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	• Ask their own questions about what they observe. • Group and classify things. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • Make predictions. • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Make links between their own science results and other scientific evidence. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	• Ask their own questions about what they observe. • Where appropriate, take accurate measurements using standard units using a range of equipment. • Group and classify things. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. Make predictions. First talk about, and then go on to write about, what they have found out. Report and present their results and conclusions to others in written and oral forms with increasing confidence. Make links between their own science results and other scientific evidence. Use straightforward scientific evidence to answer questions or support their findings. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.

Year 3 Greater Depth		
• Begin to relate the properties of rocks with their uses. • Understand, and explain, that there are different layers of soil. Higher Order Question You need to make an arrowhead for an upcoming battle. Which of these will you choose to use? Chalk, Marble or Flint.	• Understand that some metals are not magnetic. Higher Order Questions If you could choose any surface in the world, which would you choose to make a ball roll the furthest and why? Coke cans are made from aluminium, this is not magnetic. Is it important that some materials are not magnetic? Why?	• Explain why lights need to be bright or dimmer according to need. • Begin to understand **how** light helps us to see. • Explain why their shadow changes when the light source is moved closer or further from the object. Higher Order Question Mary says, "the sun moves across the sky during the day." Her friend Raj disagrees. Who is correct? Why?

Skills Map - Science
Year 4 – Working Scientifically

Asking Questions and Carrying Out Fair and Comparative Tests	Observing and Measuring Changes	Identifying, Classifying, Recording and Presenting Data	Drawing Conclusions, Noticing Patterns and Presenting Findings	Using Scientific Evidence and Secondary Sources of Information
Pupils will be expected to ask relevant questions and use different types of scientific enquiries to answer them. They will also need to set up simple practical enquiries, comparative and fair tests. A. Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. B. Start to make their own decisions about the most appropriate type of scientific enquiry they	Pupils will be expected to make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. A. Make systematic and careful observations. B. Observe changes over time. C. Use a range of equipment, including thermometers and data loggers. D. Ask their own questions about what they observe.	Pupils will be expected to Gather, record, classify and present data in a variety of ways to help in answering questions. They will also need to record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. A. Talk about criteria for grouping, sorting and classifying. B. Group and classify things. C. Collect data from their own observations and measurements. D. Present data in a variety of ways to help in answering questions.	Pupils will be using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. They will also be reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. A. Draw simple conclusions from their results. B. Make predictions. C. Suggest improvements to investigations; D. Raise further questions which could be investigated; E. First talk about, and then go on to write about, what	Pupils will be identifying differences, similarities or changes related to simple scientific ideas and processes. They will also be sing straightforward scientific evidence to answer questions or to support their findings. A. Make links between their own science results and other scientific evidence. B. Use straightforward scientific evidence to answer questions or support their findings. C. Identify similarities, differences, patterns and changes relating to simple

might use to answer questions; C. Recognise when a fair test is necessary. D. Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. E. Set up and carry out simple comparative and fair tests.	E. Where appropriate, take accurate measurements using standard units using a range of equipment.	E. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. F. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	they have found out. F. Report and present their results and conclusions to others in written and oral forms with increasing confidence.	scientific ideas and processes. D. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Year 4 Greater Depth

Plan and carry out an investigation by controlling variables fairly and accurately.
Use test results to make further predictions and set up further comparative tests.
Record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models.
Report findings from investigations through written explanations and conclusions.
Use a graph or diagram to answer scientific questions.
Use a range of variables to investigate.

Skills Map - Science

Year 4 – Living Things and their Habitats, Animals including Humans and States of Matter

Animals including Humans: Eating and Digestion	Living Things in their Habitats	States of Matter
Summer 1	**Summer 2**	**Autumn 1**
National Curriculum Statutory Objectives: • *Describe the simple functions of the basic parts of the digestive system in human.* • *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.*	*National Curriculum Statutory Objectives:* • *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.*	*National Curriculum Statutory Objectives:* • *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.*
Unit Learning Objectives: • 1: To discuss how to keep teeth healthy and to carry out an investigation into tooth decay. • 2: To identify and examine different types of teeth. • 3: To identify the parts of the digestive system and their function. • 4: To demonstrate and explain the process of digestion. • 5: To construct food chains for different habitats and explain findings using the correct scientific language.	Unit Learning Objectives: • 1: To group living things in a range of ways. • 2: To generate questions to use in a classification key. • 3: To use a key to identify invertebrates. • 4: To show the characteristics of living things in a classification key. • 5: To recognise positive and negative changes to the local environment and record my observations in different ways. • 6: To describe environmental dangers to endangered species.	Unit Learning Objectives: • 1: To sort and describe materials. • 2: To investigate gases and explain their properties. • 3: To investigate materials as they change state. • 4: To explore how water changes state. • 5: To investigate how water evaporates. • 6: To identify and describe the different stages of the water cycle.

• 6: To compare the teeth of different animals and link this with their role in a food chain. <u>Scientific Skills:</u> • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers. • Ask their own questions about what they observe. • Talk about criteria for grouping, sorting and classifying. • Group and classify things. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • First talk about, and then go on to write about, what they have found out. • Make links between their own science results and other scientific evidence.	<u>Scientific Skills:</u> • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; • Recognise when a fair test is necessary. • Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. • Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Observe changes over time. • Use a range of equipment, including thermometers and data loggers. • Ask their own questions about what they observe. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions.	<u>Scientific Skills:</u> • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; • Recognise when a fair test is necessary. • Help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. • Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Observe changes over time. • Use a range of equipment, including thermometers and data loggers. • Ask their own questions about what they observe. • Where appropriate, take accurate measurements using standard units using a range of equipment. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions.

• Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	• Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • Make predictions. • Suggest improvements to investigations; • Raise further questions which could be investigated; • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	• Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • Make predictions. • Suggest improvements to investigations; • Raise further questions which could be investigated; • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Make links between their own science results and other scientific evidence. • Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Year 4 Greater Depth		

• Suggest reasons why different animals have different types of teeth. • Explain how certain living things depend on one another to survive. Higher Order Question Which part of the digestive system is the most important and why? Give at least 2 reasons.	• Give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment. • Name and group a variety of living things based on feeding patterns (producer, consumer, predator, prey, herbivore, carnivore, omnivore). Higher Order Questions What are the draw backs of using classification keys? What would happen to local habitats if there were no humans around?	• Group and classify a variety of materials according to the impact of temperature on them. • Explain what happens over time to materials such as puddles on the playground or washing hanging on a line. Higher Order Questions If it was hotter outside, what would happen to the rate of evaporation? If the temperature was colder outside, what would happen to the rate of evaporation?

Year 4 – Sound and Electricity	
Sound	**Electricity**
Autumn 2	**Spring**
National Curriculum Statutory Objectives: • *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.*	*National Curriculum Statutory Objectives:* • *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.*
Unit Learning Objectives: • 1: To describe and explain sound sources • 2: To explain how different sounds travel. • 3: To explore ways to change the pitch of a sound. • 4: To investigate ways to absorb sound. • 5: To investigate ways to absorb sound. • 6: To explore how instruments make different sounds.	Unit Learning Objectives: • 1: To classify and present data, identifying common appliances that run on electricity. • 2: To identify circuit components and build working circuits. • 3: To investigate whether circuits are complete or incomplete. • 4: To investigate which materials are electrical conductors or insulators. • 5: To explain how a switch works in a circuit, build switches and report findings. • 6: To discuss and solve problems about electricity using reasoning skills.
Scientific Skills: • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences.	Scientific Skills: • Start to raise their own relevant questions about the world around them in response to a range of scientific experiences.

• Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers. • Where appropriate, take accurate measurements using standard units using a range of equipment. • Collect data from their own observations and measurements. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Make links between their own science results and other scientific evidence. • Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	• Set up and carry out simple comparative and fair tests. • Make systematic and careful observations. • Use a range of equipment, including thermometers and data loggers. • Ask their own questions about what they observe. • Collect data from their own observations and measurements. • Present data in a variety of ways to help in answering questions. • Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. • Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. • Draw simple conclusions from their results. • Make predictions. • First talk about, and then go on to write about, what they have found out. • Report and present their results and conclusions to others in written and oral forms with increasing confidence. • Make links between their own science results and other scientific evidence. • Use straightforward scientific evidence to answer questions or support their findings. • Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.
Year 4 Greater Depth	

• Explain why sound gets fainter or louder according to the distance. • Explain how pitch and volume can be changed in a variety of ways. • Work out which materials give the best insulation for sound. Higher Order Questions Your brother's taste in music is awful, his favourite song is Baby Shark! You hate it. What materials can you use to drown out this racket? Think about alternatives to what you used in the experiment.	• Explain how a bulb might get lighter. • Recognise if all metals are conductors of electricity. • Work out which metals can be used to connect across a gap in a circuit. • Explain why cautions are necessary for working safely with electricity. Higher Order Questions Is it possible to use too many batteries in a circuit? Explain. Is it possible to use too many bulbs in a circuit? Explain. Rupert is creating a circuit. He is using a pencil to complete it. Will his bulb light up? Why?

Skills Map - Science				
Year 5 – Working Scientifically				
Asking Questions and Carrying Out Fair and Comparative Tests	**Observing and Measuring Changes**	**Identifying, Classifying, Recording and Presenting Data**	**Drawing Conclusions, Noticing Patterns and Presenting Findings**	**Using Scientific Evidence and Secondary Sources of Information**
Pupils will be planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. They will also be using test results to make predictions to set up further comparative and fair tests. A. With growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; B. With increasing independence, make their own decisions about	Pupils will be taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. A. Choose the most appropriate equipment to make measurements and explain how to use it accurately; B. Take measurements using a range of scientific equipment with	Pupils will record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. A. Independently group, classify and describe living things and materials; B. Use and develop keys and other information records to identify, classify and describe living things and materials;	Pupils will be 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. A. Notice patterns; B. Draw conclusions based in their data and observations; C. Use their scientific knowledge and understanding to explain their findings; D. Read, spell and pronounce scientific vocabulary correctly;	Pupils will be identifying scientific evidence that has been used to support or refute ideas or arguments. A. Use primary and secondary sources evidence to justify ideas; B. Identify evidence that refutes or supports their ideas; C. Recognise where secondary sources will be most useful to research ideas

the most appropriate type of scientific enquiry they might use to answer questions; C. Explore and talk about their ideas, raising different kinds of scientific questions; D. Ask their own questions about scientific phenomena; E. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; F. Make their own decisions about what observations to make, what measurements to use and how long to make them for,	increasing accuracy and precision; C. Make careful and focused observations; D. Know the importance of taking repeat readings and take repeat readings where appropriate.	C. Decide how to record data from a choice of familiar approaches; D. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.	E. Identify patterns that might be found in the natural environment; F. Look for different causal relationships in their data; G. Discuss the degree of trust they can have in a set of results; H. Independently report and present their conclusions to others in oral and written forms.	and begin to separate opinion from fact; D. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; E. Talk about how scientific ideas have developed over time.

and whether to repeat them; G. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; H. Use their test results to identify when further tests and observations may be needed; I. Use test results to make predictions for further tests.				

Year 5 Greater Depth

Explore different ways to test an idea, choose the best way and give reasons.
Vary one factor whilst keeping the others the same in an experiment.
Use information to help make a prediction.
Explain in simple terms, a scientific idea and what evidence supports it.
Decide which units of measurement they need to use.
Explain why a measurement needs to be repeated.
Find a pattern from their data and explain what it shows.
Link what they have found out to other science.
Suggest how to improve their work and say why they think this.

Skills Map - Science

Year 5 – Living Things and their Habitats, Properties and changes to materials		
Animals including Humans: Changes and Reproduction	**Living Things and their Habitats: Life Cycles**	**Properties and changes to materials**
Summer 2	**Autumn 1**	**Spring**
National Curriculum Statutory Objectives: • *Describe the changes as humans develop to old age.* Unit Learning Objectives: • To explain what gestation periods are for different animals, including humans. • To describe the changes as humans develop from fertilisation to birth. • To explain how babies grow and develop during early childhood. • To describe and explain the main changes that occur during puberty. • To identify the changes that take place in late adulthood. • To describe the stages of human development	*National Curriculum Statutory Objectives:* • *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 animal.* Unit Learning Objectives: • To describe the process of sexual reproduction in plants. • To describe the process of asexual reproduction in plants. • To describe the life cycle of a mammal in different habitats. • To describe the process of reproduction and the life cycle of a mammal. • To describe the differences in the life cycles of an amphibian and an insect. • To compare the life cycles of plants, mammals,	*National Curriculum Statutory Objectives:* • *Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.* • *Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.* • *Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.* • *Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.* • *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.* Unit Learning Objectives: • To compare materials according to their properties • To investigate thermal conductors and insulators • To investigate which electrical conductors make a bulb shine brightest • To investigate materials which will dissolve.

<u>Scientific Skills:</u> • Raise relevant questions about the world around them in response to a range of scientific experiences. • Explore and talk about ideas, raising different kinds of scientific questions. • Ask own questions about scientific phenomena. • Independently group, classify and describe living things and materials. • Use and develop keys and other information records to identify, classify and describe living things and materials. • Decide how to record data from a choice of familiar approaches. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Notice patterns.	amphibians, insects and birds. <u>Scientific Skills:</u> • Explore and talk about ideas, raising different kinds of scientific questions. • Independently group, classify and describe living things and materials. • Make careful and focused observations. • Read, spell and pronounce scientific vocabulary correctly. • Identify patterns that might be found in the natural environment. • Independently report and present conclusions in oral and written forms. • Use evidence from primary and secondary sources to justify ideas. • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations	• To use different processes to separate mixtures of materials. • To identify and explain irreversible chemical changes <u>Scientific Skills:</u> • Raise relevant questions about the world in response to a range of scientific experiences. • Make decisions about the most appropriate type of scientific enquiry they might use to answer questions. • Explore and talk about ideas, raising different kinds of scientific questions. • Ask questions about scientific phenomena. • Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. • Make decisions about what observations to make, what measurements to use and how long to make them fore, and whether to repeat them. • Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. • Choose the most appropriate equipment to make measurements and explain how to use it accurately. • Take measurements using a range of scientific equipment with increasing accuracy and precision. • Make careful and focused observations. • Know the importance of taking repeat readings and take repeat readings where appropriate. • Independently group, classify and describe living things and materials.

• Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly. • Identify patterns that might be found in the natural environment. • Look for different causal relationships in their data. • Independently report and present conclusions to others in oral and written forms. • Use evidence from primary and secondary sources to justify ideas. • Identify evidence that refutes or supports ideas. • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	to discuss, communicate and justify their scientific ideas.	• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Look for different causal relationships in data. • Read, spell and pronouns scientific vocabulary correctly. • Independently report and present their conclusions to others in oral and written forms. • Use evidence from primary and secondary sources to justify ideas. • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.
Year 5 Greater Depth		

• Describe the changes experienced in puberty. • Describe how the needs of humans change at different points in their life cycle. • Draw a timeline to indicate stages in the growth and development of humans. Higher Order Questions At what stage in life do the most changes take place? What is puberty's purpose?	• Observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border. • Give reasons why secondary sources of scientific evidence cannot always be trusted. Higher Order Questions What would be affected if plants didn't reproduce? Think about the effect it would have on animals and us, as humans. What would happen if living things did not die?	• Describe methods for separating mixtures (filtration, distillation). • Use their knowledge of materials to suggest ways to classify (solids, liquids, gases). • Explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda. Higher Order Questions What would the world be like if we couldn't heat or cool materials? What would everyday life be like? Scientists keep discovering new elements and materials all the time. Would it be possible/easy to group new ones with other materials? Explain your reasoning.

Year 5 – Earth, Space and Forces	
Earth and Space	**Forces**
Autumn 2	**Summer 1**
National Curriculum Statutory Objectives: • *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.* Unit Learning Objectives: • To explain why we know the Sun, Earth and Moon are spherical • To name, order and describe the planets in our solar system • To explain how planets move in our solar system • To explain day and night and the apparent movement of the sun across the sky • To investigate night and day in different parts of the Earth • To explain the movement of the moon Scientific Skills: • Raise relevant questions about the world in response to a range of scientific experiences. • Make decisions about the most appropriate type of scientific enquiry to answer questions. • Explore and talk about ideas, raising different kinds of scientific questions. • Ask own questions about scientific phenomena.	*National Curriculum Statutory Objectives:* • *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.* Unit Learning Objectives: • To identify forces acting on objects • To explore the effect that gravity has on objects. • To investigate the effects of air resistance • To explore the effects of water resistance • To investigate the effects of friction • To explore and design mechanisms Scientific Skills: • Explore and talk about ideas, raising different kinds of scientific questions. • Make independent decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. • Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary.

• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Notice patterns. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly. • Identify patterns that might be found in the natural environment. • Look for different casual relationships in data. • Independently report and present conclusions to others in oral and written forms. • Identify evidence that refutes or supports their ideas. • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. • Talk about how scientific ideas have developed over time.	• Use test results to identify when further tests and observations may be needed. • Use test results to make predictions for further tests. • Choose the most appropriate equipment to make measurements and explain how to use it accurately. • Take measurements using a range of scientific equipment with increasing accuracy and precision. • Know the importance of taking repeat readings and take repeat readings where appropriate. • Decide how to record data from a choice of familiar approaches. • Notice patterns. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly. • Look for different causal relationships in data. • Independently report and present conclusions to others in oral and written forms. • Identify patterns that might be found in the natural environment. • Look for different causal relationships in their data. • Use evidence from primary and secondary sources to justify ideas. • Identify evidence that refutes or supports ideas. • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. • Talk about how scientific ideas have developed over time.

Year 5 Greater Depth	
• Compare the time of day at different places on the earth. • Use multiplication to work out ages if living on a different planet. • Explain why the moon appears to change shape during the lunar cycle. Higher Order Questions How would the Solar System be affected if the Sun, Earth and Moon were not spherical? Using what you know so far, would it be possible for there to be life on other planets?	• Describe and explain how motion is affected by forces (including gravitational attractions, magnetic attraction and friction). • Design very effective parachutes. Higher Order Questions What would the world be like without air resistance? How have levers and pulleys had an effect on our lives?

Skills Map - Science				
Year 6 – Working Scientifically				
Asking Questions and Carrying Out Fair and Comparative Tests	**Observing and Measuring Changes**	**Identifying, Classifying, Recording and Presenting Data**	**Drawing Conclusions, Noticing Patterns and Presenting Findings**	**Using Scientific Evidence and Secondary Sources of Information**
Pupils will be planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. They will also be using test results to make predictions to set up further comparative and fair tests.	Pupils will be taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	Pupils will record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	Pupils will be 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.	Pupils will be identifying scientific evidence that has been used to support or refute ideas or arguments.
J. With growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; K. With increasing independence,	E. Choose the most appropriate equipment to make measurements and explain how to use it accurately; F. Take measurements using a range of	E. Independently group, classify and describe living things and materials; F. Use and develop keys and other information records to identify, classify and describe living	I. Notice patterns; J. Draw conclusions based in their data and observations; K. Use their scientific knowledge and understanding to explain their findings; L. Read, spell and pronounce scientific	F. Use primary and secondary sources evidence to justify ideas; G. Identify evidence that refutes or supports their ideas; H. Recognise where secondary sources

make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; L. Explore and talk about their ideas, raising different kinds of scientific questions; M. Ask their own questions about scientific phenomena; N. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; O. Make their own decisions about what observations to make, what measurements to use and how long	scientific equipment with increasing accuracy and precision; G. Make careful and focused observations; H. Know the importance of taking repeat readings and take repeat readings where appropriate.	things and materials; G. Decide how to record data from a choice of familiar approaches; H. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.	vocabulary correctly; M. Identify patterns that might be found in the natural environment; N. Look for different causal relationships in their data; O. Discuss the degree of trust they can have in a set of results; P. Independently report and present their conclusions to others in oral and written forms.	will be most useful to research ideas and begin to separate opinion from fact; I. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; J. Talk about how scientific ideas have developed over time.

to make them for, and whether to repeat them; P. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; Q. Use their test results to identify when further tests and observations may be needed; R. Use test results to make predictions for further tests.				

Year 6 Greater Depth

Choose the best way to answer a question and use information from different sources to plan an investigation.
Make a prediction which links with other scientific knowledge.
Plan which equipment they will need and use it effectively.
Explain qualitative and quantitative data.
Identify scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it.
Explain how they could improve their way of working.
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.

Skills Map - Science		
Year 6 – Living Things		
Evolution and Inheritance	**Living things and their Habitats: Classifying Organisms**	**Animals, including Humans: Healthy Bodies**
Spring	**Summer 1**	**Autumn 1**
National Curriculum Statutory Objectives: • *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.*	*National Curriculum Statutory Objectives:* • *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.*	*National Curriculum Statutory Objectives:* • *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.*
Unit Learning Objectives: • To explain the scientific concept of inheritance. • To demonstrate my understanding of the scientific meaning of adaptation. • To identify the key ideas of the theory of evolution. • To examine the evidence demonstrating how plants have evolved. • To understand how human beings have evolved.	Unit Learning Objectives: • To classify animals based on similarities and differences. • To describe how living things are classified into groups. • To identify characteristics of different creatures and use these to classify them. • To describe and investigate helpful and harmful microorganisms.	Unit Learning Objectives: • To know the main parts of the circulatory system and describe the job of the heart. • To describe the important jobs of the blood vessels and blood. • To describe the importance of exercise and how it affects the heart.

• To explain how human intervention affects evolution	• To identify the characteristics of different types of microorganisms. • To classify organisms found in my local habitat.	• To understand that regular exercise is important for a healthy body. • To explain how diet and exercise affect the body. • To recognise the impact of drugs and alcohol in the way bodies function.
<u>Scientific Skills:</u> • With growing independence, raise own relevant questions about the world around you in response to a range of scientific experiences. • Explore and talk about ideas, raising different kinds of scientific questions. • Ask own questions about scientific phenomena. • Independently group, classify and describe living things and materials. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Use and develop keys and other information records to identify, classify and describe living things and materials. • Notice patterns. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific knowledge and understanding to explain findings.	<u>Scientific Skills:</u> • Explore and talk about ideas, raising different kinds of scientific questions. • Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. • Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. • Make careful and focussed observations. • Independently group, classify and describe living things and materials. • Use and develop keys and other information records to identify,	<u>Scientific Skills:</u> • With growing independence, raise own relevant questions about the world around them in response to a range of scientific experiences. • Explore and talk about ideas, raising different kinds of scientific questions. • Ask own questions about scientific phenomena. • Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. • Decide how to record data from a choice of familiar approaches.

• Identify patterns that might be found in the natural environment. • Independently report and present own conclusions to others in oral and written forms. • Use evidence from primary and secondary sources to justify ideas. • Identify evidence that refutes or supports ideas. • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. • Talk about how scientific ideas have developed over time.	classify and describe living things and materials. • Decide how to record data from a choice of familiar approaches. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly. • Identify patterns that might be found in the natural environment. • Independently report and present conclusions to others in oral and written forms. • Recognise where secondary sources will be most useful t research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations to discuss,	• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Notice patterns. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly. • Identify patterns that might be found in the natural environment. • Look for different causal relationships in data. • Independently report and present conclusions to others in oral and written forms. • Use evidence from primary and secondary sources to justify ideas. • Identify evidence that refutes or supports their ideas. • Recognise where secondary sources will be most useful to research ideas and being

	communicate and justify scientific ideas.	to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.
Year 6 Greater Depth		
• Research and discuss the work of famous scientists, such as Charles Darwin, Mary Anning and Alfred Wallace. • Explain how some living things adapt to survive in extreme conditions. • Analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet. Higher Order Questions If Darwin and Linnaeus hadn't developed our understanding of evolution, what do you think we would understand about evolution today? Do you think that science should interfere with evolution? Is your opinion different for animals or plants?	• Explain why classification is important. • Readily group animals into reptiles, fish, amphibians, birds and mammals. • Sub divide their original groupings and explain their divisions, such as vertebrates and invertebrates. • Find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. Higher Order Questions If you discovered a new species, how would you begin to classify it? How do you think human interference in nature has an effect on how organisms cope in their natural habitats?	• Accurately record their own resting heart rate. • Make a diagram of the human body and explain how the circulatory system works. • Explain why their pulse rate increases when they exercise. Higher Order Questions Do you think that people had healthier diets in the pasts, or do we have healthier diets today? Explain your reasoning. If we know the harmful effects of tobacco and alcohol, why do some people choose to take them?

Skills Map - Science	
Year 6 – Electricity and Light	
Electricity	**Light**
Autumn	**Summer 2**
National Curriculum Statutory Objectives: • *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.* Unit Learning Objectives: • To explain the importance of the major discoveries in electricity. • To use recognised symbols when representing a simple circuit in a diagram. • To observe and explain the effects of differing volts in a circuit. • To understand variations in how components function. • To conduct an investigation, record data and report findings. • To use test results to compare variations and to make predictions to set up further tests. Scientific Skills:	*National Curriculum Statutory Objectives:* • *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.* Unit Learning Objectives: • To explain how light travels. • To understand how mirrors reflect light, and how they can help us see objects. • To investigate how refraction changes the direction in which light travels. • To investigate how a prism changes a ray of light to show the spectrum. • To investigate how light enables us to see colours. • To explain why shadows have the same shape as the object that casts them. Scientific Skills: • Explore and talk about ideas raising different scientific questions. • Ask own questions about scientific phenomena.

• Raise relevant questions about the world around them in response to a range of scientific experiences (with growing independence). • Make own decisions about the most appropriate type of scientific enquiry that might be used to answer questions (with increasing independence). • Explore and talk about ideas, raising different kinds of scientific questions. • Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. • Make own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. • Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. • Use test results to identify when further tests and observations may be needed. • Use test results to make predictions for further tests. • Make careful and focussed observations. • Independently group, classify and describe living things and materials. • Decide how to record data from a choice of familiar approaches. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Notice patterns. • Draw conclusions based in data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly.	• Chose the most appropriate equipment to make measurements and explain how to use it accurately. • Take measurements using a range of scientific equipment with increasing accuracy and precision. • Make careful and focussed observations. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. • Notice patterns. • Draw conclusions based on data and observations. • Use scientific knowledge and understanding to explain findings. • Read, spell and pronounce scientific vocabulary correctly. • Discuss the degree of trust you can have in a set of results. • Independently report and present conclusions to others in oral and written forms. • Recognise where secondary sources will be most useful to research ideas and being to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify scientific views. • Talk about how scientific ideas have developed over time. • Identify evidence that refutes or supports their ideas.

• Look for different causal relationships in data. • Discuss the degree of trust they can have in a set of results. • Independently report and present conclusions to others in oral and written forms. • Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas. • Talk about how scientific ideas have developed over time.	
Year 6 Greater Depth	
• Make their own traffic light system or something similar. • Explain the danger of short circuits. • Explain how to make changes in a circuit. • Explain the impact of changes in a circuit. • Explain the effect of changing the voltage of a battery. Higher Order Questions Do you think that an increase in energy will always make a bulb brighter or a motor faster? Explain your answer and include evidence.	• Explain how different colours of light can be created. • Use and explain how simple optical instruments work (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope). Higher Order Questions How would the world be different if there was no natural light? What are shadows? How are they made? What factors affect their size and shape?

Reasonable Adjustments and Adaptive Teaching

At Old Catton Junior School, we ensure that every child has access to the curriculum, and are able to reach their potential, regardless of the challenges they may face or the limitations they may have. We ensure that we make reasonable adjustments to our teaching, and to our curriculum, to facilitate all of the types of leaners that we teach in our school. Below is a list of some of the many ways in which we make reasonable adjustments to our school as a whole and more specifically, our PSHE Curriculum and teaching:

- *Word Banks for pre-learning and to support during topics and themes*
- *Cutting and Sticking Key Words on to work as prompts*
- *Coloured Paper or recycled paper to minimise visual stress*
- *Breaking down lessons into short, manageable chunks*
- *Mixed ability groups – using peers as support and role models*
- *Adult assistance nearby*
- *Using another student as a reader/support*
- *Knowledge map/Mind Maps*
- *Recording ideas on whiteboards as an aide memoire*
- *Printing work larger and in smaller chunks*
- *Draw answers or explanations*
- *Songs and rhymes/mnemonics – Horrible Histories*
- *Actions – telling the story of a lesson*
- *My Turn/Your Turn*
- *Breaks*
- *Targets made clear for lessons and learning – linked to IEP*
- *Now/Next*
- *Weighted lap/shoulder blanket*
- *Visual Timetables – class and individual*
- *Fidget toys available*
- *Cushions for seats – wobble and wedge cushions*
- *Coloured Overlays*
- *Headphones/ear defenders*
- *Remembering/'to do' lists*
- *iPad as a translator*
- *iPad to record ideas*
- *Equipment adapted for needs (books, scissors, pencils, whiteboard, pencil grippers)*

- *Changing font size*
- *Writing frames and scaffolding*
- *Word lists of key vocabulary for pre-learning and as prompts*
- *Checking seating position – sight problems – near the back for sensory needs*
- *A safe/quiet space in or near the classroom*
- *Special interest projects linked to and alongside class learning*
- *Sensory time/circuits/sensory room*
- *Reduced timetable*
- *Proud/success book*
- *Extra break time-or break at a different time*
- *Behaviour plans*
- *One Page Pupil Profiles*
- *Resistance bands*
- *Social stories*
- *Extra time for the trickier tasks*
- *Visual and Picture aids*
- *Emotion fans/PATHS cards*
- *Allow talk time for those who find recording difficult*
- *Use of a scribe*
- *Worry monsters and boxes*
- *Time-outs*
- *Simplified work*
- *Keeping instructions short and one at a time*
- *Adjust attainment expectations – P levels, AET targets*
- *Personal calendar/ knowledge planner*
- *Checklists (e.g., going home)*
- *Learning some basics of a language for an EAL pupil*

Addressing Gaps (Interventions):
Science is an essential part of the curriculum, aiming to develop children's curiosity through enquiry, analysis and wonder. It helps to promote an understanding of how the nautral world works, interacting with the pupils every day lives. Science develops questioning, reasoning and predicting skills which interlink with other core subjects. In an ever changing world, it is essential that our pupils foster an understanding and appreciation of the world around them and the consequences of their actions. As a result, it is paramount that any gaps in Scientific knowledge and skills are recognised and addressed. Due to the closure of schools in 2020 and 2021, there are children in our school who have significant gaps in the Science education. We need to ensure that all pupils are allowed to develop the foundations of their previous year groups expectations before progressing onto their current year groups learning. Teachers of Science will be using this document in order to identify the necessary skills needed to fill any gaps before moving them on. Ensuring and continuing to adopt a culture of scientific thinking throughout the school, including in classrooms, with displays and opportunities to experiment, question and talk about Science will be the strongest asset in building good progress and encouraging a love of our natural world.
Opportunities to Revisit:
Pupils will revisit key topics such as Animals including Humans, Light and Electricity throughout their time at OCJS, allowing them opportunity to consolidate their understanding. Our skills also are focused on a lower school programme and an upper school programme, it helps to ensure that all pupils are able to revisit the skills necessary to become fluent and confident with the required skills before moving on.
Assessment:
For each unit of work completed, the Science book of each child clearly outlines the knowledge taught in the unit, alongside the skills taught. Both teachers and pupils assess the understanding gained during each lesson and subject specific vocabulary is corrected. Children are assessed each half term against the skills and knowledge for each unit. This is recorded clearly in the Science book of each child and on the Foundation Subject Excel where it is monitored regularly by the subject lead.

Appendix I

Science Overview – Long Term Plan

Year 3 and 4 (September 2024-July 2025); Year 3 (September 2025 onwards):

	Topics
Autumn 1	Animals including Humans: Health and Movement
Autumn 2	Forces and Magnets
Spring	Light
Summer 1	Plants
Summer 2	Rocks

Year 4 (September 2025 onwards)

	Topics
Autumn 1	States of Matter
Autumn 2	Changing Sound
Spring	Electricity
Summer 1	Animals including Humans: Eating and Digestion
Summer 2	Living Things in their Habitats

Year 5 (September 2024-onwards)

	Topics
Autumn 1	Living Things and Their Habitats: Life Cycles
Autumn 2	Earth and Space
Spring	Properties and Changes of Materials
Summer 1	Forces
Summer 2	Animals including Humans: Changes and Reproduction

Year 6 (September 2024-July 2025)

	Topics

Autumn 1	Living Things and Their Habitats: Life Cycles
Autumn 2	Electricity
Spring	Evolution and Inheritance
Summer 1	Living Things and Their Habitats: Classifying Organisms
Summer 2	Light

Year 6 (September 2025-onwards)

	Topics
Autumn 1	Animals including Humans: Healthy Bodies
Autumn 2	Electricity
Spring	Evolution and Inheritance
Summer 1	Living Things and Their Habitats: Classifying Organisms
Summer 2	Light

Appendix II

Writing Opportunities

Year 3 and 4 (September 2024-July 2025); Year 3 (September 2025 onwards):

	Writing Opportunities	Scientific Skills
Autumn 1	Health and Movement To explain how bones and muscles work together to create movement. **Explanation text about how muscles and bones work together.**	Make systematic and careful observations. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Autumn 2	Forces To observe how magnets attract some materials. **Non-fiction information book.**	Use a range of equipment, including thermometers and data loggers. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.
Spring	Light To use a mirror to reflect light and explain how mirrors work. **Explanation text about how mirrors work**	Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. Make systematic and careful observations. Use a range of equipment, including thermometers and data loggers. Ask their own questions about what they observe. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. First talk about, and then go on to write about, what they have found out. Make links between their own science results and other scientific evidence. Use straightforward scientific evidence to answer questions or support their findings. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Summer 1	Plants	Make systematic and careful observations. Observe changes over time.

	To record my observations and present the results of my investigation using scientific language. **Television 'script' for Good Plant Growing show.**	Use a range of equipment, including thermometers and data loggers. Where appropriate, take accurate measurements using standard units using a range of equipment. Collect data from their own observations and measurements. Present data in a variety of ways to help in answering questions. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. Draw simple conclusions from their results. First talk about, and then go on to write about, what they have found out. Report and present their results and conclusions to others in written and oral forms with increasing confidence. Make links between their own science results and other scientific evidence. Use straightforward scientific evidence to answer questions or support their findings. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Summer 2	Rocks To explain how fossils are formed. **Explanation Text (How Fossils are Formed)**	Start to raise their own relevant questions about the world around them in response to a range of scientific experiences. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Make links between their own science results and other scientific evidence. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Year 4 (September 2025 onwards)

	Writing Opportunities	Scientific Skills
Autumn 1	States of Matter To identify and describe the different stages of the water cycle. **Story of a rain drop (Water Cycle)**	Make systematic and careful observations. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

		Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. First talk about, and then go on to write about, what they have found out. Make links between their own science results and other scientific evidence. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Autumn 2	Changing Sound To explain how different sounds travel. **Script for an educational programme to explain how different sounds travel to our ears.**	Make systematic and careful observations. Ask their own questions about what they observe. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. First talk about, and then go on to write about, what they have found out. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Spring	Electricity To explain how a switch works in a circuit, build switches and report findings. **Create a sales pitch to convince others to buy your switch.**	Make systematic and careful observations. Use a range of equipment, including thermometers and data loggers. Ask their own questions about what they observe. Collect data from their own observations and measurements. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. First talk about, and then go on to write about, what they have found out. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Summer 1	Eating and Digestion To demonstrate and explain the process of digestion. **Story about a piece of food travelling through the Digestive System**	Talk about criteria for grouping, sorting and classifying. Group and classify things. Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.

		Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
Summer 2	Living Things in their Habitats To describe environmental dangers to endangered species. **Presentation about endangered animals.**	Use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. Identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.

Year 5 (September 2024 onwards):

	Writing Opportunities	Scientific Skills
Autumn 1	Living Things and Their Habitats: Life Cycles To describe the process of reproduction and the life cycle of a mammal. **Create a profile about Jane Goodall (or another naturalist if preferred)**	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.
Autumn 2	Earth and Space To explain day and night and the apparent movement of the sun across the sky. **Explanation text about night and day.**	Raise relevant questions about the world in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Identify evidence that refutes or supports ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.
Spring	Properties and Changes of Materials To investigate materials which will dissolve. **Experiment Write Up**	Raise relevant questions about the world in response to a range of scientific experiences. Make decisions about the most appropriate type of scientific enquiry they might use to answer questions. Explore and talk about ideas, raising different kinds of scientific questions.

		Ask questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make decisions about what observations to make, what measurements to use and how long to make them fore, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Choose the most appropriate equipment to make measurements and explain how to use it accurately. Take measurements using a range of scientific equipment with increasing accuracy and precision. Make careful and focused observations. Know the importance of taking repeat readings and take repeat readings where appropriate. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Look for different causal relationships in data. Independently report and present their conclusions to others in oral and written forms. Use evidence from primary and secondary sources to justify ideas. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.
Summer 1	Forces To investigate the effects of friction. **Experiment Write Up**	Explore and talk about ideas, raising different kinds of scientific questions. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Use test results to identify when further tests and observations may be needed. Take measurements using a range of scientific equipment with increasing accuracy and precision. Know the importance of taking repeat readings and take repeat readings where appropriate.

		Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Independently report and present conclusions to others in oral and written forms. Use relevant scientific and illustrations to discuss, communicate and justify scientific ideas.
Summer 2	Animals including Humans: Changes and Reproduction To describe the stages of human development. **Fact file about the stages of the human life cycle.**	Make own decisions about the most appropriate type of scientific enquiry that could be used to answer questions. Explore and talk about ideas, raising different kinds of scientific questions. Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Look for different causal relationships in their data. Independently report and present conclusions to others in oral and written forms.

Year 6 (September 2024-July 2025)

	Writing Opportunities	Scientific Skills
Autumn 1	Living Things and Their Habitats: Life Cycles To describe the process of reproduction and the life cycle of a mammal. **Create a profile about Jane Goodall (or another naturalist if preferred)**	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.
Autumn 2	Electricity To understand variations in how components function.	Raise relevant questions about the world around them in response to a range of scientific experiences (with growing independence).

	Experiment Write Up	Make own decisions about the most appropriate type of scientific enquiry that might be used to answer questions (with increasing independence). Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Read, spell and pronounce scientific vocabulary correctly.
Spring	Evolution and Inheritance To explain how human intervention affects evolution. **Persuasive Argument**	With growing independence, raise own relevant questions about the world around you in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific knowledge and understanding to explain findings. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.
Summer 1	Living Things and Their Habitats: Classifying Organisms To describe and investigate helpful and harmful microorganisms. **Experiment Write Up**	Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Make careful and focussed observations. Decide how to record data from a choice of familiar approaches. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.

Summer 2	Light To explain how light travels. **Explanation Text about how light enters our eyes**	Explore and talk about ideas raising different scientific questions. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views.

Year 6 (September 2025-onwards)

	Writing Opportunities	Scientific Skills
Autumn 1	Animals including Humans: Healthy Bodies To explain how human intervention affects evolution **Persuasive Letter to the Head of School**	With growing independence, raise own relevant questions about the world around them in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Use evidence from primary and secondary sources to justify ideas. Identify evidence that refutes or supports their ideas. Recognise where secondary sources will be most useful to research ideas and being to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.
Autumn 2	Electricity To understand variations in how components function. **Experiment Write Up**	Raise relevant questions about the world around them in response to a range of scientific experiences (with growing independence). Make own decisions about the most appropriate type of scientific enquiry that might be used to answer questions (with increasing independence). Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Read, spell and pronounce scientific vocabulary correctly.

Spring	Evolution and Inheritance To explain how human intervention affects evolution. **Persuasive Argument**	With growing independence, raise own relevant questions about the world around you in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific knowledge and understanding to explain findings. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.
Summer 1	Living Things and Their Habitats: Classifying Organisms To describe and investigate helpful and harmful microorganisms. **Experiment Write Up**	Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Make careful and focussed observations. Decide how to record data from a choice of familiar approaches. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.
Summer 2	Light To explain how light travels. **Explanation Text about how light enters our eyes**	Explore and talk about ideas raising different scientific questions. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views.

Appendix III	
Key Vocabulary	
Year 3	
Animals, including Humans: Health and Movement	Plants
Autumn 1	Summer 1
Carbohydrates Conclusion Contract Endoskeleton Energy Exoskeleton Fats Fibre Healthy Hydroskeleton Invertebrate Investigation Joints Measure Minerals Muscles Nutrients Observe Prediction Protein Relax Results Tendons Vertebrate Vitamins Water	Anchor Anther Carbon Dioxide Compare Conclusion Dispersal Evaporate Explore Fertilisation Filament Flowers Germination Investigate Leaves Life Cycle Light Nutrients Observe Ovary Ovule Petals Pollen Pollen Tube Pollination Prediction Roots Seeds

	Sepal Soil Stages Stamen Stem Stigma Style Sunlight Temperature Transport Trunk Water

Rocks	Forces and Magnets	Light
Summer 2	**Autumn 2**	**Spring**
Animals Beach Bedrock Bones Change Compare Dinosaurs Durable Footprints Form Fossil Group Hard Human-Made Igneous Impermeable Jurassic Layers Matter	Attract Compass Direction Force Friction Magnet Magnetic Magnetic Field Non-Magnetic North Pole Predict Pull Push Repel South Surface	Beam Block Bright Change Damage Danger Dark Distance Energy Glare Light Mirror Observe Opaque Pattern Protect Pupil Ray Reflect

Metamorphic Natural Organic Permeable Pressure Properties Rock Sea Sedimentary Semi-Permeable Soft Soil Transformations Types Volcano		Reverse Rough Scatter Shadow Shiny Smooth Source Spectrum Straight Sun Translucent Transparent UV Visible

Year 4		
Animals including Humans: Eating and Digestion	**Living Things in their Habitats**	**States of Matter**
Summer 1	**Summer 2**	**Autumn**
Adult Teeth	Abdomen	Carbon Dioxide
Anus	Antenna	Clouds
Baby (Milk) Teeth	Carroll diagram	Collection
Bile	Change	Condense
Canine	Characteristic	Dry
Carnivore	Classification	Energy
Conclusion	Conservation	Evaporate
Consumer	Criteria	Freeze
Decomposer	Danger	Gas
Dental Plaque	Endangered	Gas
Diet	Environment	Hail
Digestion	Extinct	Heat
Digestive System	Group	Ice
Enamel	Habitat	Liquid
Energy	Invertebrate	Mass
Enzymes	Key	Material
Evaluation, Observation	Organism	Matter
Faeces (Poo)	Segmented	Melt
Food Chain	Sort	Particles
Food Groups	Specimen	Precipitation
Food Web	Variation Classification	Process
Gall Bladder	Venn diagram	Properties
Habitat	Vertebrates	Rain
Herbivore	Wildlife	Sleet
Incisor		Snow
Large Intestine		Solid
Liver		State
Method		State
Molar		Temperature

Mouth Nutrients Oesophagus Omnivore Organ Pancreas Predator Prediction Premolar Prey Producer Rectum Results Saliva Small Intestine Stomach Teeth Tongue Tooth Decay Decay Function Wisdom Teeth		Thermometer Water Water Vapour Weight

Sound	Electricity
Autumn 2	Spring
Sound Vibrations Sound Waves Air Particles Materials Soundproofing Orchestra Pitch Volume Length Tightness Thickness	Electricity Circuits Conductors Components Static Electricity Current Electricity Universe Atoms Protons Electrons Power source Battery Wire Bulb Complete Circuit Mains Electricity Appliances Plug Socket Pylon Power Station Caution Portable Replaced Recharged Conductor Insulator Voltage

Year 5		
Animals including Humans: Changes and Reproduction	Living Things and their Habitats: Life Cycles	Properties and changes to materials
Summer 2	Autumn 1	Spring
adolescence amphibians	albumen	chemical
breasts	amphibian	conductor
crustaceans	asexual	dissolve
egg	cell	evaporate
embryo	cuttings	filter
fertilisation	embryo	flexible
foetus	endangered	insoluble
genitals	extinct	insulator
gestation	fertilisation	irreversible
growth rate	fusion	magnetic
infancy	gamete	material
invertebrates	gestation	mixture
life cycle	insect	particles
life expectancy	larvae	permeable
menstruation	metamorphosis	product
offspring	nymph	property
prenatal	ovule	reaction
puberty	ovum	reactant
sperm	penis	resistance
vertebrates	pollen	reversible
Sanitary Pads	pollination	separate
Tampons	pregnancy	sieve
Wet Dream	pupa	solution
Sweat	reproduction	soluble
Deodorant	roots	suspension
Antiperspirant	sexual	thermal
Genitals	sperm	transparent
Balanced Diet	transform	
Hygiene	vagina	

Adolescence Mature Elasticity Smoking Alcohol	yolk young Incubate Metamorphosis Pupa Breeding Naturalists Oceanographer Laboratories Pollution Conservation Pesticides	

Earth and Space	Forces
Autumn 2	**Summer 1**
axis circle Earth flat geocentric heliocentric Moon orbit planet rotate round shadow sphere star Sun	air resistance apply attract average buoyancy compress extend exert force meter friction gravity mass mean median newton (N) parachute repel resistance streamline

	unit variables (independent, dependent and control) water resistance weight

Year 6		
Evolution and Inheritance	Living things and their Habitats: Classifying Organisms	Animals, including Humans: Healthy Bodies
Spring	Summer 1	Autumn 1
adaptation ancestor accidental biological parent characteristics common ancestor DNA environment evolution family fossil genes genus habitat homo sapiens inheritance intervention modification mutation offspring replication selective breeding species taxonomy traits variation	amphibians annelids arachnids bacteria birds cell class classification crustaceans DNA domain eukaryote family fish fungus genus insects invertebrates kingdom Linnaean mammal microorganism microscopic molluscs mould nucleus order organism phylum	alcohol arteries blood vessels calories capillaries chambers circulatory system deoxygenated diet drugs energy input energy output exercise heart muscle nutrients oxygen oxygenated plasma plaque platelets pump red blood cells smoking veins waste products white blood cells

	reptiles species standard vertebrates virus	

Electricity	Light
Autumn 2	Summer 2
alternating battery brightness bulb buzzer cell circuit comparative test current decrease direct current electricity fair test increase loudness motor switch voltage wires	albumen amphibian asexual cell cuttings embryo endangered extinct fertilisation fusion gamete gestation insect larvae metamorphosis nymph ovule ovum penis pollen pollination pregnancy pupa reproduction roots

	sexual sperm transform vagina yolk young

Appendix IV		
Cross Curricular Links		
Year 3		
Animals, including Humans: Health and Movement		**Plants**
Autumn 1		**Summer 1**
ICT – Internet Research Maths – Data English – Writing Opportunities		Maths – Data, Units of Measure English – Writing Opportunities, Sequencing
Rocks	**Forces**	**Light**
Summer 2	**Autumn 2**	**Spring**
Geography – Local Environment History – Pre-history English – Writing Opportunities Maths – Data	ICT – Internet Research Maths – Units of Measure English – Writing Opportunities	Art – Drawing Results Maths – Data, Units of Measure English – Writing Opportunities
Year 4		
Animals including Humans: Eating and Digestion	**Living Things and their Habitats**	**States of Matter**
Summer 1	**Summer 2**	**Autumn 1**
Maths – Data English – Writing Opportunities	Geography – Local Area Maths – Data English – Writing Opportunities	Art – Drawing Results Maths – Data, Units of Measure English – Writing Opportunities
Sound		**Electricity**
Autumn 2		**Spring**
Music – Pitch, Tone DT - Design English – Writing Opportunities		English – Writing Opportunities PSHE – Electrical Safety

Year 5		
Animals including Humans: Changes and Reproduction	**Living Things and their Habitats: Life Cycles**	**Properties and changes to materials**
Summer 2	**Autumn 1**	**Spring**
RSE/PSHE – Puberty, Drug Maths – Data English – Writing Opportunities	Maths – Data ICT – Internet Research English – Writing Opportunities	Maths – Data English – Writing Opportunities
Earth and Space		**Forces**
Autumn 2		**Summer 1**
Maths – Shape, Units of Measure History – Scientific Misconceptions, Explorers, Measuring Spheres, Addition, Subtraction, Multiplication, Line Graph English – Writing Opportunities Art – Drawing Results		Maths – Units of Measure, data DT – Making a Parachute, Making Gears Art – Drawing Results English – Writing Opportunities

Year 6		
Evolution and Inheritance	**Living things and their Habitats: Classifying Organisms**	**Animals, including Humans: Healthy Bodies**
Spring	**Summer 1 –**	**Autumn 1**
PSHE – Family, Discussion Art – Drawing Organisms Geography – Countries of the World, Climates ICT – Internet research History – Prehistory English – Writing Opportunities	Maths – Data, Patterns ICT – Internet Research Geography – Local Environment English – Writing Opportunities	Maths – Data PE – The Effects of Exercise PSHE – Drug and Alcohol Abuse English – Writing Opportunities
Electricity		**Light**
Autumn 2		**Summer 2**
Maths - Data English – Writing Opportunities		DT – Shadow Puppets Maths – Data English – Writing Opportunities

Appendix V
Mad Science
In addition to the Science Curriculum, pupils also have the opportunity to 'work scientifically' in an extra-curricular after-school club called Mad Science. The children take part in an interactive after-school programme, led by instructors, that fosters creative thinking and problem solving. It covers a wide range of science topics and provides children with the opportunity to experience Science in a hands on way.

Appendix VI
Trips and Visits
Amazona Zoo: July 2021 Planetarium: June 2022 London Science Museum: May 2022 Colchester Zoo: July 2024

Nebula
where stars are born

Appendix VII
Medium Term Plans
Year 3

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Health and Movement	1: To sort foods into food groups and find out about the nutrients that different foods provide.	I can explain the things that animals and humans need to survive and stay healthy. I can sort foods into their relevant food groups. I can describe the nutrients provided by a range of foods.	group and classify things. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	Year 3: Complete the Eatwell Plate. Year 4: Complete the food group table
Vocabulary Carbohydrates Conclusion Contract Endoskeleton Energy Exoskeleton Fats Fibre Healthy Hydroskeleton Invertebrate Investigation Joints Measure Minerals Muscles Nutrients Observe Prediction Protein Relax Results Tendons	2: To explore the nutritional values of different foods by gathering information from food labels.	I can explain how different animals require a different balance of nutrients. I can make predictions about which foods will be high in certain nutrients. I can find evidence from food labels to prove or disprove statements.	present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	Year 3: Order and compare food labels. Year 4: Investigation Statements **Deeper Learning Question:** What would happen if you only ate junk food for: a day, a week, a month, a year?
	3: To sort animal skeletons into groups, discussing patterns and similarities and differences.	I can explain what vertebrates and invertebrates are and give some examples of each. I can sort animals according to their skeleton type. I can discuss the advantages and disadvantages of different skeleton types. I can begin to explore how animals with different skeletons move.	make systematic and careful observations. use a range of equipment, including thermometers and data loggers. talk about criteria for grouping, sorting and classifying. group and classify things. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	Year 3: Sort the types of skeletons. Year 4: Sort the types of skeletons and share the advantages and disadvantages.

Vertebrate Vitamins Water			record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	
	4: To investigate an idea about how the human skeleton supports movement.	I can label some parts of a human skeleton on a diagram. I can explain how to make a test fair. I can take careful measurements and record these on a table. I can draw conclusions from the results of the investigation.	recognise when a fair test is necessary. help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. set up and carry out simple comparative and fair tests. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. suggest improvements to investigations. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence.	Year 3 and 4: Experiment + write up. **Deeper Learning Question:** What would happen if we didn't have a skeleton?
	5: To explain how bones and muscles work together to create movement.	I can use some scientific words in my discussions about bones and muscles. I can observe and describe how muscles work in pairs. I can make a scientific model of the upper arm muscles at work and explain how it works.	make systematic and careful observations. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	Year 3 and 4: Longer Write **Longer Writing Opportunity:** Explanation text

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Forces and Magnets	1: To identify the forces acting on objects.	I can name different types of force. I can say when there is a push or a pull acting on an object.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	Year 3: Forces sheet Year 4: Forces cards
Vocabulary Attract Compass Direction Force Friction Magnet Magnetic Magnetic Field Non-Magnetic North Pole Predict Pull Push Repel South Surface	2: To investigate the effects of friction on different surfaces.	I can explain the force of friction. I can make a prediction about which surface creates the most friction for a toy car. I can take measurements and record my results in a table. I can explain my results.	set up and carry out simple comparative and fair tests. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. ask their own questions about what they observe. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. make links between their own science results and other scientific evidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	Year 3 and 4: Experiment write up. Resources: Car, Ramp, tape measure **Deeper Learning Question:** If you could choose any surface in the world, which would you choose to make a ball roll the furthest and why?
	3: To sort magnetic and non-magnetic materials.	I can explain that magnets produce a force that attracts some materials. I can use a magnet to separate items that are magnetic and non-magnetic. I can name some magnetic materials and some non-magnetic materials.	use a range of equipment, including thermometers and data loggers. group and classify things. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	Year 3 and 4: sorting magnetic materials. Resources: You will need a range of "scrapyard" objects for pupils to sort, magnets **Deeper Learning Question:** Coke cans are made from aluminium, this is not magnetic. Is it important that some materials are not magnetic? Why?
	4: To investigate the strength of magnets.	I can identify different types of magnet. I can predict which magnet will be the strongest. I can test my prediction by adding paperclips to different magnets. I can record my results in a table and present them in a bar chart.	set up and carry out simple comparative and fair tests. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	Year 3 and 4: Experiment Resources: magnets of different strengths, paperclips

		I can explain my results.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	
	5: To explore magnetic poles.	I can identify the poles of a magnet. I can look at poles to say whether two magnets will attract or repel each other. I can explain that a compass always points north-south.	make systematic and careful observations. use a range of equipment, including thermometers and data loggers. collect data from their own observations and measurements. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	Year 3 and 3: Make a compass Resources: a bar magnet, flat plastic lid, plastic bowl, water and compass template
	6: To observe how magnets attract some materials.	I can identify materials that are attracted to magnets. I can use the force of magnetic attraction to make a magnetic game. I can explain how a magnetic game works by attracting materials.	use a range of equipment, including thermometers and data loggers. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	**Year 3 and 4 Longer Writing Opportunity:** Make a book about magnets. Include information about magnetic materials, types of magnets and magnetic poles. You could even include pop ups!

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Light	1: To understand the difference between light and dark.	I can identify a range of light sources. I can explain that dark is caused by the absence of light. I can explain that I need light to see things.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. group and classify things.	**Optional resource:** 5 'feely bags' (drawstring bags for children to feel inside without looking) 5 objects to place inside them- for example, an orange, a shell, a pine cone, bubble wrap, pumice stone, a dice, an avocado or cotton wool. **Activity:** Year 3: Complete sheet and light/dark illustration Year 4: Complete sheet and 'True or False' Quiz
Vocabulary Beam Beneficial Dangerous Block Bright Change Damage Dark Distance Energy Glare Light Mirror Observe Opaque Pattern Protect Pupil Ray Reflect Retina Reverse Rough Scatter Shadow Shiny Smooth Source	2: To investigate which surfaces reflect light	I can explain reflection. I can identify reflective materials. I can select the most reflective material for a purpose.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. set up and carry out simple comparative and fair tests. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. ask their own questions about what they observe. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence.	**Resources:** Torch per pair A5 piece of white card per pair 6 materials to test such as CDs, tin foil, paper, different fabrics, bubble wrap, cardboard. **Activity:** Year 3 and 4: Experiment (and write up) to test reflective materials
	3: To use a mirror to reflect light and explain how mirrors work.	I can explain why mirrors are good reflectors. I can use mirrors to reflect light onto different objects. I can explain how mirrors work when carrying out different tasks.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. ask their own questions about what they observe. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Mirrors **Longer Writing Opportunity:** Explanation Text about how mirrors work.
	4: To understand why light from the sun can be dangerous	I can explain the benefits and dangers of the sun. I can explain about UV light and its dangers.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. make systematic and careful observations. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. use straightforward scientific evidence to answer questions or support their findings.	**Resources:** Hero and Villain signs **Activity:** Design and advertise a pair of UV sunglasses/sunhat.

Spectrum Straight Sun Translucent Transparent UV UV Visible	and how to protect our eyes.	I can describe ways to protect our eyes from the sun.		
	5: To investigate which materials block light to form shadows.	I can explain how light travels. I can sort different materials according to whether they are opaque, transparent or translucent. I can use these materials in an investigation into different shadows.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. set up and carry out simple comparative and fair tests. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. group and classify things. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Torch Range of materials (opaque, translucent and transparent **Activity:** Experiment to find opaque materials
	6: To find patterns when investigating how shadows change size.	I can explain how a shadow is formed. I can plan and set up an investigation into the way shadows change size. I can observe patterns in the way shadows change size. I can explain the patterns I find.	help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. set up and carry out simple comparative and fair tests. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. make links between their own science results and other scientific evidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** torch, a ruler or metre stick, and an object. **Activity:** Shadow size investigation **Deeper Learning Question:** Mary says, "the sun moves across the sky during the day." Her friend Raj disagrees. Who is correct? Why?

Curriculum Skills and Progression Map

Nebula
where stars are born

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Plants	1: To name the different parts of flowering plants and explain their jobs.	I can name the different parts of a plant. I can explain the jobs that the different parts of a plant do.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.	**Activity:** Year 3: Parts of the flower leaflet Year 4: Parts of the flower matching **Deeper Learning Questions:** What would happen to a plant if its roots were damaged?
Vocabulary: Absorb Air Anchor Anther Carbon Dioxide Compare Conclusion Dispersal Evaporate Explore Fertilisation Filament Flowers Germination Investigate Leaves Life Cycle Light Nutrients Observe Ovary Ovule Petals Pollen Pollen Tube Pollination Prediction Roots Seeds Sepal Soil Stages Stamen Stem Stigma Style Sunlight Temperature	2: To set up an investigation to find out what plants need to grow well.	I can think about what plants need to grow well. I can think of a question to investigate. I can predict what will happen in my investigation. I can plan what I will do to set up my investigation. I can set up my investigation carefully.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. use a range of equipment, including thermometers and data loggers. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. make predictions.	**Activity:** Plant investigation
	3: To record my observations and present the results of my investigation using scientific language.	I can describe what I have observed. I can record what I observe. I can answer my original question using my observations. I can think about whether my prediction was accurate. I can explain my results using scientific language.	make systematic and careful observations. observe changes over time. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Extra Notes:** This relies on the experiment in the previous lesson being completed. **Activity:** Finish experiment write up, writing opportunity. **Longer Writing Opportunity:** Television 'script' for Good Plant Growing Guided show.
	4: To investigate how water is transported in plants.	I can explain the function of the stem. I can explain how water is transported in a plant. I can set up a comparative investigation. I can suggest ways to find answers. I can make a prediction. I can make a conclusion.	recognise when a fair test is necessary. help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. set up and carry out simple comparative and fair tests. make systematic and careful observations. observe changes over time. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. present data in a variety of ways to help in answering questions.	**Resources:** Bright white flowers (carnations, chrysanthemums or gerberas) with stems, ends cut at an angle of equal length. Food colouring (darker colours work well) Tablespoons Beakers of the same size filled with 100ml

Transport Trunk Water			use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	water Access to a places with different temperatures (e.g. over a heater, normal classroom temperature, a fridge) Thermometers **Activity:** Investigation into how temperatures will cause different speeds of water transportation.
	5: To name the different parts of a flower and explain their role in pollination and fertilisation.	I can identify the different parts of a flower. I can explain what each part of a flower does. I can explain the process of pollination. I can explain how pollination leads to fertilisation.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. make systematic and careful observations. ask their own questions about what they observe. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Flowers with visible stamens, stigma and style - tulips and lilies are good examples. **Activity:** To dissect and label a plant, to explain the pollination process.
	6: To understand and order the stages of the life cycle of a flowering plant.	I can understand the process of seed dispersal. I can understand the processes of pollination, fertilisation and germination. I can order the different stages of the life cycle of a flowering plant.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Create a life cycle of a flowering plant. **Deeper Learning Question:** What do you think the most effective method of seed dispersal is?

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Rocks	1: To compare different types of rocks.	I can name the three different types of rocks. I can explain the difference between natural and human-made rocks. I can use the appearance of rocks to group and compare them.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. make systematic and careful observations. group and classify things. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Sorting rocks into man-made/natural
Vocabulary Additions Animals Anthropic Beach Bedrock Body Fossils Bones Buoyancy Change Chemical Fossils Compare Coprolite Dinosaurs Durable Footprints Form Fossil Group Hard Human-Made Ichthyosaur Igneous Impermeable Jurassic Layers	2: To group rocks based on their properties and make systematic and careful observations.	I can name the three different types of rocks. I can explain the difference between natural and human-made rocks. I can use the appearance of rocks to group and compare them.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. make systematic and careful observations. talk about criteria for grouping, sorting and classifying. group and classify things. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	**Resources:** A selection of igneous, sedimentary and metamorphic rocks A selection of books on rocks Computers/Laptops/Tablets Sandpaper Pipette A large container or plastic box **Activity:** Investigation into different properties of rocks **Deeper Learning Question:** You need to make an arrowhead for an upcoming battle. Which of these will you choose to use? Chalk, Marble or Flint.
	3: To explain how fossils are formed.	I can explain the difference between a bone and a fossil. I can order the steps of how a fossil is formed.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. make links between their own science results and other scientific evidence. recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	**Longer Writing Opportunity:** Explanation Text – how are fossils formed?

<table>
<tr>
<td rowspan="3">Matter
Metamorphic
Natural
Organic
Permeable
Poverty
Pressure
Properties
Rock
Sea
Sedimentary
Semi-Permeable
Soft
Soil
Split
Strata
Transformations
Translocations
Types
Volcano</td>
<td>4: To explain Mary Anning's contribution to palaeontology.</td>
<td>I can explain what a palaeontologist does.
I can understand why Mary Anning's fossil findings were important.
I can describe how palaeontology has changed our understanding of prehistoric animals.</td>
<td colspan="2">use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.
identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.
recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</td>
<td><u>Activity:</u>
Year 3: Quiz about Mary Anning, comprehension questions
Year 4: Comprehension and then diary entry</td>
</tr>
<tr>
<td>5: To explain how soil is formed.</td>
<td>I can state that soil is composed of different things.
I can describe the 4 processes of soil formation.</td>
<td>start to raise their own relevant questions about the world around them in response to a range of scientific experiences.
use a range of equipment, including thermometers and data loggers.
present data in a variety of ways to help in answering questions.
use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</td>
<td colspan="2"><u>Optional Resources:</u>
Clear plastic bottles (Round bottomed two litre bottles are best.)
Thin pieces of fabric
Cardboard pieces
Shredded paper
Fruit and vegetable scraps (cut into small pieces)
Compost
Small stones
5 to 6 tiger worms per group
Scissors
Plastic gloves
Plant saucers
Elastic bands</td>
</tr>
<tr>
<td>6: To observe carefully and systematically and present my findings using scientific vocabulary.</td>
<td>I can identify how to make careful observations.
I can observe how much water has filtered through different types of soil.
I can use the same equipment and length of time for each observation.
I can record my observations accurately in a table.
I can contribute to creating a group presentation.
I can use simple scientific language accurately in my presentation.</td>
<td colspan="2">set up and carry out simple comparative and fair tests.
make systematic and careful observations.
observe changes over time.
use a range of equipment, including thermometers and data loggers.
ask their own questions about what they observe.
where appropriate, take accurate measurements using standard units using a range of equipment.
collect data from their own observations and measurements.
use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.
record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.
draw simple conclusions from their results.
make predictions.
first talk about, and then go on to write about, what they have found out.
report and present their results and conclusions to others in written and oral forms with increasing confidence.
identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.</td>
<td><u>Resources:</u>
Samples of the different types of soil (premeasured to ensure the children use the same amount of soil)
Beakers
Funnels
Coffee filter paper
Measuring cylinders
Water
Visualiser equipment or a webcam (if available)

<u>Activity:</u>
Investigate soil permeability</td>
</tr>
</table>

Year 4

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
States of Matter	1: To sort and describe materials.	I can sort materials into solids, liquids or gases. I can describe the properties of solids, liquids and gases. I can show the difference between the particles in solids, liquids and gases.	ask their own questions about what they observe. group and classify things. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. first talk about, and then go on to write about, what they have found out. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Draw a diagram and describe the different states.
Vocabulary Solid Liquid Gas Particles State Material Properties Gas Carbon Dioxide Matter Weight Mass Melt Freeze Thermometer Temperature Condense Evaporate Process State Water Ice Water Vapour Dry Energy Heat Precipitation Collection Clouds Rain	2: To investigate gases and explain their properties.	I can identify solids, liquids and gases. I can explain some uses of gases. I can investigate the weight of a gas.	start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a fair test is necessary. help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. set up and carry out simple comparative and fair tests. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. suggest improvements to investigations; raise further questions which could be investigated; first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Plastic bottle of lemonade per group 3-5 different fizzy drinks Digital weighing scales Beakers or plastic cups **Activity:** Investigation and experiment write up
	3: To investigate materials as they change state.	I can understand how heat can cause solids to change to liquids and vice versa. I can identify materials that melt at different temperatures. I can investigate the melting and freezing temperature of a material.	recognise when a fair test is necessary. help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. set up and carry out simple comparative and fair tests. make systematic and careful observations.	**Optional Experiment Resources:** Thermometers Foil pie tins Chocolate

Sleet Hail Snow			observe changes over time. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	Three trays per group, each filled with a different temperature of water (approx. 5, 30 and 40 degrees. Stopwatches **Activity: Both classes need to choose the same.** Melting chocolate experiment or researching materials
	4: To explore how water changes state.	I can identify the different states water can be in. I can identify the temperatures at which water changes state. I can identify and observe the processes that cause water to change state.	make systematic and careful observations. observe changes over time. use a range of equipment, including thermometers and data loggers. ask their own questions about what they observe. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Container of warm water with cling film stretched over Ice cubes Kettle Plate Beakers Teaspoon Salt **Activity:** Series of investigations to be recorded in books
	5: To investigate how water evaporates.	I can explain the effect of temperature on the process of evaporation. I can plan and carry out a comparative test using equipment accurately and display my results.	start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a fair test is necessary. help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. set up and carry out simple comparative and fair tests. make systematic and careful observations. observe changes over time.	**Resources:** Tea towels - 3 per group Water and measuring jugs - 1 per group Weighing scales - 1 per group Three washing lines and pegs Thermometers - 1 per group Clock Access to places in different temperatures, where the washing lines can be set up.

			use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. suggest improvements to investigations; raise further questions which could be investigated; first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Carry out evaporation experiment **Deeper Learning Questions:** If it was hotter outside, what would happen to the rate of evaporation? If the temperature was colder outside, what would happen to the rate of evaporation?
	6: To identify and describe the different stages of the water cycle.	I can describe the different stages of the water cycle. I can explain the role of evaporation and condensation in the water cycle.	make systematic and careful observations. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Longer Writing Opportunity:** Story of a water droplet **Extension:** Water cycle wheel

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Changing Sound	**1:** To describe and explain sound sources	I can identify and describe sound sources around school. I can explain how sources of sound vibrate, creating sound.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Rice Drum - per group Tuning fork - per group Bowl of water - per group Data logger with sound sensor per group - if required School map - per group Access to locations around school **Activity:** Explore vibrations; Sound walk
Vocabulary Absorb Amplitude Distance Ear High Loud Low Particles Pitch Quiet Sound Soundproof Telephone Transmit Travel Vibrate Vibration Volume	**2:** To explain how different sounds travel.	I can describe how vibrations make sounds. I can explain how vibrations change when a sound gets louder. I can explain how loud and quiet sounds travel to our ears.	make systematic and careful observations. ask their own questions about what they observe. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Rice Drum per pair A camera to film performances - if required **Longer Writing Opportunity:** Write a script for an educational programme to explain how different sounds travel to our ears.
	3: To explore ways to change the pitch of a sound.	I can identify and describe high and low sounds. I can observe and describe patterns between the pitch of a sound and features of the object that made the sound. I can create a musical instrument and explain how it makes high and low sounds.	make systematic and careful observations. ask their own questions about what they observe. collect data from their own observations and measurements. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** String instruments Pitched percussion instruments Wind instruments Straws (approximately 5 per child) Sticky tape String **Activity:** Explore pitch on a range of instruments/watching videos; Create panpipes to then label and explain how the pitch varies.

Wave	4: To investigate ways to absorb sound.	I can identify how sounds change over distance. I can identify sounds at a distance. I can create a string telephone and explain how sound travels through it.	make systematic and careful observations. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Alarm clock/music Measuring stick Paper cup per child Compasses or sewing needles String - kite string works well (Approximately 20m per pair) Access to the hall, or playground if possible **Activity:** Travelling sound sheet; String telephone experiment
	5: To investigate ways to absorb sound.	I can explain that sound needs something to travel through. I can investigate the best material for absorbing sound. I can explain why some materials absorb sounds.	set up and carry out simple comparative and fair tests. make systematic and careful observations. use a range of equipment, including thermometers and data loggers. where appropriate, take accurate measurements using standard units using a range of equipment. collect data from their own observations and measurements. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. make links between their own science results and other scientific evidence. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Small music player - per group Box per group, large enough to put the music players in Different materials to wrap around the boxes (ideas include: tin foil, bubble wrap, tea towels, sheets of cotton wool, newspapers etc.) Data logger with sound sensor – per group **Activity:** Soundproofing experiment **Deeper Learning Question:** Your brother's taste in music is awful, his favourite song is Baby Shark! You hate it. What materials can you use to drown out this racket? Think about alternatives to what you used in the experiment.
	6: To explore how instruments make different sounds.	I can use my knowledge of sound to answer questions. I can create a musical instrument that will play sounds of different pitch and loudness. I can explain how my musical instrument makes different sounds.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Junk modelling materials **Activity:** Design and make a musical instrument or look at the Lesson Plan to complete a Taskit activity

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Electricity	**1:** To classify and present data, identifying common appliances that run on electricity.	I can identify electrical and non-electrical appliances. I can group appliances based on whether they are mains- or battery-powered. I can use a Venn diagram to present my findings.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	**Activity:** Sort appliances into mains/battery/both on Venn diagram
Vocabulary Appliance Battery Bulb buzzer Cell Circuit Classify closed Complete component Conclusion Conductor Device Electric Electricity Equipment Incomplete Insulator Mains Material	**2:** To identify circuit components and build working circuits.	I can identify the different components (parts) in a circuit. I can explain how to work safely with electrical components. I can build a working series circuit. I can draw labelled diagrams of my circuits.	group and classify things. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Bulbs Wires Buzzers Motors Cells (batteries) Switches Bulb/battery holders **Activity:** Create and draw circuits
	3: To investigate whether circuits are complete or incomplete.	I can explain how an energy ball works. I can make a prediction (what do you think will happen?) about whether a circuit will work. I can identify circuits as incomplete or complete circuits. I can explain what makes a complete circuit and why a circuit may be incomplete.	make systematic and careful observations. use a range of equipment, including thermometers and data loggers. ask their own questions about what they observe. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. make predictions. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Circuit equipment Energy Ball video **Activity:** Complete or incomplete circuit investigation **Deeper Learning Questions** Is it possible to use too many batteries in a circuit? Explain. Is it possible to use too many bulbs in a circuit? Explain.

Object Powered Prediction Results Series circuit Switch Wire	**4:** To investigate which materials are electrical conductors or insulators.	I can say what electrical conductors and insulators are. I can carry out an investigation where I only change one thing and keep everything else the same. I can test materials to identify if they are electrical conductors or insulators.	make systematic and careful observations. use a range of equipment, including thermometers and data loggers. group and classify things. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Circuit equipment Energy Ball video **Activity:** Conductor or insulator investigation **Deeper Learning Question:** Rupert is creating a circuit. He is using a pencil to complete it. Will his bulb light up? Why?
	5: To explain how a switch works in a circuit, build switches and report findings.	I can explain what a switch is and the job it does in a circuit. I can name some different types of switches. I can build a switch and use it in a series circuit. I can report my findings through giving a presentation.	make systematic and careful observations. use a range of equipment, including thermometers and data loggers. ask their own questions about what they observe. collect data from their own observations and measurements. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Resources:** Circuit equipment Split pins Binder clips Cardboard Paperclips Modelling clay/BluTac **Activity:** Design a switch **Longer Writing Opportunity:** Create a sales pitch to convince others to buy your switch.
	6: To discuss and solve problems about electricity using reasoning skills.	I can apply my knowledge of electricity to new situations. I can use my reasoning skills to answer questions and justify my answers. I can discuss my answers with others.	set up and carry out simple comparative and fair tests. a make systematic and careful observations. use a range of equipment, including thermometers and data loggers. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Discussion Card Reasoning Task

Nebula
where stars are born

<table>
<tr><th>Topic:</th><th>Lesson Objective:</th><th>Lesson Assessment Outcomes:</th><th colspan="2">Scientific Skills:</th><th>Additional Notes:</th></tr>
<tr><td rowspan="2">Animals including Humans: Eating and Digestion</td><td>1: To discuss how to keep teeth healthy and to carry out an investigation into tooth decay.</td><td>I can explain what tooth decay is.
I can explain how to look after my teeth.
I can decide what to change, what to keep the same and what to observe in an investigation.
I can plan and set up an investigation.</td><td colspan="2">talk about criteria for grouping, sorting and classifying.
group and classify things.
use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.
record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.
identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.</td><td><u>Experiment Equipment:</u>
Transparent beakers/jars of equal size and shape
Measuring jugs
Spoons
Eggs (to be hard-boiled) or marble chips, if using eggs is not appropriate
A selection of drinks (cola, orange juice, milk, water, etc.)

<u>Activity:</u>
Tooth decay investigation</td></tr>
<tr><td>2: To identify and examine different types of teeth.</td><td>I can draw conclusions from a set of results and evaluate an investigation.
I can name the different types of teeth found in humans.
I can explain the function (job) of the different teeth types.
I can make observations and recordings of teeth.</td><td colspan="2">start to raise their own relevant questions about the world around them in response to a range of scientific experiences.
talk about criteria for grouping, sorting and classifying.
group and classify things.
use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.
record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.
identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.</td><td><u>Resources:</u>
Mirrors

<u>Activity:</u>
Observing teeth sheet</td></tr>
<tr><td rowspan="2">Vocabulary

Adult Teeth
Anus
Baby (Milk) Teeth
Bile
Canine
Canines
Carnivore
Conclusion
Consumer
Decomposer
Dental Plaque
Diet
Digestion
Digestive System
Enamel
Energy
Enzymes
Evaluation,
Observation
Faeces (Poo)
Food Chain
Food Groups
Food Web
Gall Bladder
Habitat
Herbivore
Incisor
Large Intestine</td><td>3: To identify the parts of the digestive system and their function.</td><td>I can name the main parts of the digestive system.
I can say where the digestive system organs are located in the body.
I can explain the function (job) of each part of the digestive system.</td><td colspan="2">make systematic and careful observations.
use a range of equipment, including thermometers and data loggers.
ask their own questions about what they observe.
talk about criteria for grouping, sorting and classifying.
group and classify things.
use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.
record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables.
use straightforward scientific evidence to answer questions or support their findings.
identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.</td><td><u>Activity:</u>
Create model of the digestive system</td></tr>
<tr><td>4: To demonstrate and explain the process of digestion.</td><td>I can order the steps in the digestion process using my knowledge of the parts and their function.
I can use a scientific model and secondary source to verbally explain the process of digestion.</td><td>talk about criteria for grouping, sorting and classifying.
group and classify things.
use, read and spell scientific vocabulary correctly and with confidence, using their growing</td><td colspan="2"><u>Optional Resources:</u>
Sticky notes
Measuring jugs
Large plastic trays
Bowls
Spoons
Green and yellow food colouring (other colours would work, if not available)</td></tr>
</table>

Liver Method Molar Mouth Nutrients Oesophagus Omnivore Organ Pancreas Predator Prediction Premolar Prey Producer Rectum Results Saliva Scavenger Small Intestine Stomach Teeth Tongue Tooth Decay Decay Function Wisdom Teeth		I can summarise the key stages of digestion using the correct scientific vocabulary.	word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	Loaf of sliced bread Cartons of orange juice Sealable plastic bags Kitchen roll Pairs of tights/stockings (one leg needed per group) Potato mashers **Activities:** Recreate Digestive System activity **Longer Writing Opportunity:** Story of a piece of food on their journey through the digestive system **Deeper Learning Question:** Which part of the digestive system is the most important and why? Give at least 2 reasons.
	5: To construct food chains for different habitats and explain findings using the correct scientific language.	I can construct a food chain for a given habitat. I can identify the producer, predator and prey in a food chain. I can interpret what a food chain is telling me.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. Make systematic and careful observations. ask their own questions about what they observe. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. make links between their own science results and other scientific evidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Food chain creation
	6: To compare the teeth of different animals and link this with their role in a food chain.	I can identify omnivores, carnivores and herbivores by their teeth. I can compare similarities and differences between the teeth of different animals. I can link what I observe about an animal's teeth with where they are in the food chain.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes. recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	**Activity:** Teeth Detectives Activity Sheet

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Skills:	Additional Notes:
Animals including Humans: Eating and Digestion	1: To group living things in a range of ways.	I can sort living things into groups. I can generate criteria to sort living things. I can sort living things into a Venn diagram. I can sort living things into a Carroll diagram.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out.	**Activity:** Sort animals on Venn and Carrol diagrams
Vocabulary Abdomen Antenna Carroll diagram Change Characteristic Classification Conservation Criteria Danger Endangered Environment Extinct Group Habitat Invertebrate Key Organism Segmented Sort Specimen Variation Classification	2: To generate questions to use in a classification key.	I can generate questions about animals. I can use questions to sort animals in a key. I can see similarities and differences between vertebrates. I can use these to identify vertebrate groups.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. use straightforward scientific evidence to answer questions or support their findings. recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	**Activity:** Create classification keys **Deeper Learning Question:** What are the draw backs of using classification keys?
	3: To use a key to identify invertebrates.	I can answer the questions in a key by looking closely at invertebrates. I can use a key to name the invertebrates I have found. I can identify invertebrates by looking at their characteristics. I can explain how I have used evidence to do this.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. first talk about, and then go on to write about, what they have found out. use straightforward scientific evidence to answer questions or support their findings. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Invertebrate hunt and classification
	4: To show the characteristics of living things in a	I can identify the characteristics of living things. I can use the characteristics of living things to sort them using a classification key. I can show the characteristics of living things in a table.	start to raise their own relevant questions about the world around them in response to a range of scientific experiences. start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a fair test is necessary.	**Activity:** Organism classification

Venn diagram Vertebrates Wildlife	classification key.	I can create a classification key.	help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. make predictions. suggest improvements to investigations	
	5: To recognise positive and negative changes to the local environment and record my observations in different ways.	To recognise positive and negative changes to the local environment and record my observations in different ways.	set up and carry out simple comparative and fair tests. make systematic and careful observations. observe changes over time. use a range of equipment, including thermometers and data loggers. collect data from their own observations and measurements. present data in a variety of ways to help in answering questions. use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. draw simple conclusions from their results. make predictions. suggest improvements to investigations; raise further questions which could be investigated; first talk about, and then go on to write about, what they have found out. report and present their results and conclusions to others in written and oral forms with increasing confidence. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Activity:** Identify local habitats which have dangers and suggest improvements. **Deeper Learning Question:** What would happen to local habitats if there were no humans around?
	6: To describe environmental dangers to endangered species.	I can name some endangered species. I can say how changes to the environment have affected endangered species. I can write a report about information I have gathered through research. I can present my findings to the class.	use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge. identify similarities, differences, patterns and changes relating to simple scientific ideas and processes.	**Longer Writing Opportunity:** Create a presentation sharing information about endangered animals.

Year 5

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Living Things and Their Habitats – Life Cycles	To describe the process of sexual reproduction in plants.	To explain the difference between sexual and asexual reproduction. To identify the function of the parts of a flower. To describe ways that plants are pollinated in order to reproduce. **Activity:** Label the parts of a flower. Sorting activity – Are plants pollinated by insects or the wind. Table can be drawn in books.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
Vocabulary albumen amphibian asexual cell cuttings embryo endangered extinct fertilisation fusion gamete gestation insect larvae metamorphosis nymph ovule ovum penis pollen pollination pregnancy pupa	To describe the process of asexual reproduction in plants.	To describe asexual reproduction in plants. To identify advantages and disadvantages to sexual and asexual reproduction in plants. To explain different ways to make new plants. **Activity:** Advantages and disadvantages of sexual and asexual reproduction. Cuttings activity. Write up for cuttings activity can be done in books **without** the worksheet.	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focused observations. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Resources: Geranium plants Jars **Deeper Learning Question:** What would be affected if plants didn't reproduce? Think about the effect it would have on animals and us, as humans.
	To describe the life cycle of a mammal in different habitats.	To describe the process of reproduction in mammals. To describe different types of mammals. To describe and compare the life cycles of different mammals **Activity:** Describing reproduction Research the lifecycle of a mammal.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	

reproduction roots sexual sperm transform vagina yolk young	To describe the process of reproduction and the life cycle of a mammal.	To describe Jane Goodall's work with chimpanzees. To explain why chimpanzees are endangered. **Activity:** Biography about Jane Goodall.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	**Longer Writing Opportunity:** Create a profile about Jane Goodall (or another naturalist if preferred)
	To describe the differences in the life cycles of an amphibian and an insect.	To explain metamorphosis and give examples. To describe the life cycles of amphibians and insects. To describe the similarities and differences between the life cycles of amphibians and insects. **Activity:** Life cycles of insects and amphibians Comparing the life cycles of amphibians and insects.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	
	To compare the life cycles of plants, mammals, amphibians, insects and birds.	To identify the stages of a bird's life cycle. To describe the similarities and differences between different plants' and animals' life cycles. **Activity:** Crack an egg and identify the parts. Draw and label in books. Life cycle of a bird.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Independently report and present conclusions in oral and written forms. Use primary and secondary sources evidence to justify ideas. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Resources: Eggs Bowls **Deeper Learning Question:** What would happen if living things did not die?

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Earth and Space	To explain why we know the Sun, Earth and Moon are spherical	To describe a sphere and the Sun, Earth and Moon as spherical. To name at least different shapes the Earth was thought to be. To identify scientific evidence that has been used to support or refute ideas. **Activity:** Write a short explanation text, including evidence, about the Flat Earth theory and the Spherical Earth Theory.	Explore and talk about ideas, raising different kinds of scientific questions Read, spell and pronounce scientific vocabulary correctly. Identify evidence that refutes or supports their ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. Talk about how scientific ideas have developed over time.	**Use sheets to support the activity but complete the text in books.** **Deeper Learning Question:** How would the Solar System be affected if the Sun, Earth and Moon were not spherical?
Vocabulary axis circle Earth flat geocentric heliocentric Moon orbit planet rotate round shadow sphere star Sun	To name, order and describe the planets in our solar system	To name the planets in the solar system To describe the features of the planets To place the planets in the solar system in the correct order **Activity:** Create a planetary poster, containing interesting facts about the planets.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Planet templates for poster are available in the resources. **Deeper Learning Question:** Using what you know so far, would it be possible for there to be life on other planets?
	To explain how planets move in our solar system	To explain how the planets orbit the Sun. To distinguish between heliocentric and geocentric ideas of planetary movement. To explain theories of planetary movement in the solar system using evidence. **Activity:** Create a biography about one of the astronomers including the different theories of planetary movement and how these differ to what we know today.	Explore and talk about their ideas, raising different kinds of scientific questions. Ask questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Identify evidence that refutes or supports their ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas. Talk about how scientific ideas have developed over time.	Laptops may be required for research.
	To explain day and night and the apparent movement of the sun across the sky	To explain that day and night is due to rotation of the Earth. To explain how night and day occur using evidence. **Activity:** Explanation text about night and day – planning sheet available in the folder.	Raise relevant questions about the world in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Identify evidence that refutes or supports ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	**Longer Writing Opportunity:** Write an explanation text about night and day.

	To investigate night and day in different parts of the Earth	To make predictions about night and day in different places on Earth. To explain why night and day occur at different times in different places on Earth (using evidence to justify ideas) To report and present findings from enquires and write a conclusion which explains these findings. **Activity:** Time zones activity – Using time zones maps to calculate times in other countries.	Make decisions about the most appropriate type of scientific enquiry to answer questions. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Use scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Look for different casual relationships in data. Use evidence from primary and secondary sources to justify ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific and illustrations to discuss, communicate and justify scientific ideas	
	LO: To explain the movement of the moon	To explain that the Moon orbits the Earth not the sun. To explain how the Moon moves relative to the Earth. To explain how the Earth and the Moon move relative to the Sun. **Activity:** Creating moon models. Write a short explanation to describe the movement of the moon.	Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Properties and Changes of Materials	To compare materials according to their properties	To describe a material's properties. To explain the uses of different materials based on their properties. To sort and compare materials according to their properties. **Activity:** Matching properties with definitions. Testing a range of materials – results can be recorded in books.	Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make careful and focused observations. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronouns scientific vocabulary correctly. Independently report and present their conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Resources: Feely bags with different materials inside. Materials to test Magnets Small metal nails Goggles (safety) Empty trays Elastic bands Water **Deeper Learning Question:** Scientists are regularly discovering new elements and materials. Would it be possible/easy to group new ones with other materials? Explain your reasoning.
Vocabulary chemical conductor dissolve evaporate filter flexible insoluble insulator irreversible magnetic material mixture particles permeable product property reaction reactant resistance reversible separate sieve solution	To investigate thermal conductors and insulators	To identify materials that are thermal conductors and insulators. To explain what thermal conductors and insulators are. To plan and carry out an investigation into thermal conductors and insulators. To give reasons for the uses of thermal conductors and insulators. **Activity:** Testing thermal insulation of different materials – keeping an ice cube from melting.	Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Take measurements using a range of scientific equipment with increasing accuracy and precision. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronouns scientific vocabulary correctly. Independently report and present their conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Resources: Ice cubes Syringes to measure water Small bowls Range of materials – woollen fabric, cotton fabric, tin foil, plastic sandwich bag, bubble wrap, cardboard **Deeper Learning Question:** What would the world be like if we couldn't heat or cool materials? What would everyday life be like?
	To investigate which electrical conductors make a bulb shine brightest	To identify electrical conductors and insulators. To explain that some materials are better conductors than others. To plan and carry out an investigation to find the best electrical conductor. **Activity:** Testing electrical conductors	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focused observations. Independently group, classify and describe living things and materials. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronouns scientific vocabulary correctly. Independently report and present their conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Resources: Batteries, bulbs, wires, crocodile clips Metals to test – copper coin, iron nail, steel spoon, paperclip, silver jewellery, gold

soluble suspension thermal transparent				jewellery.
	To investigate materials which will dissolve.	To describe dissolving. To explain the difference between melting and dissolving. To identify materials which will dissolve in water. To investigate factors which affect the speed of dissolving. **Activity:** Investigating Dissolving – choosing own experiment. Alternatively, complete the temperature dissolving investigation.	Raise relevant questions about the world in response to a range of scientific experiences. Make decisions about the most appropriate type of scientific enquiry they might use to answer questions. Explore and talk about ideas, raising different kinds of scientific questions. Ask questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Choose the most appropriate equipment to make measurements and explain how to use it accurately. Take measurements using a range of scientific equipment with increasing accuracy and precision. Make careful and focused observations. Know the importance of taking repeat readings and take repeat readings where appropriate. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Look for different causal relationships in data. Independently report and present their conclusions to others in oral and written forms. Use evidence from primary and secondary sources to justify ideas. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	**Longer Writing Opportunity:** Experiment write up. Resources: Materials to dissolve Beakers Different water (temperature or types) Teaspoons Stopwatches Weighing Scales Thermometers
	To use different processes to separate mixtures of materials.	To identify different ways materials can be mixed together. To use sieving, filtering, evaporating and other processes to separate mixtures of materials. To know when to use which processes to separate mixtures. **Activity:** Using different processes to separate mixtures of materials.	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focused observations. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronouns scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Resources: Sand Water Raisins Flour Rice Salt Paper clips Containers and bowls Magnets Funnels Filter paper Sieve
	To identify and explain irreversible chemical changes	To identify irreversible chemical changes. To explain irreversible chemical changes. To describe the new materials created in irreversible chemical changes. **Activity:** Identifying changes as reversible or irreversible. Irreversible changes tests.	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focused observations. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Use scientific knowledge and understanding to explain findings. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	Resources: Milk (warmed, approximately 40°) White vinegar Mixing bowls or beakers Tablespoons Bicarbonate of soda Cardboard Balloons Plastic bottles

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Forces	To identify forces acting on objects	To identify forces as pushes and pulls. To identify and explain the different forces acting on objects. **Activity:** Class discussion "Talk Forces" Forces in Action activity – identifying forces acting on objects.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	
Vocabulary air resistance apply attract average buoyancy compress extend exert force meter friction gravity mass mean median newton (N) parachute repel resistance streamline unit variables (independent, dependent and control) water resistance weight	To explore the effect that gravity has on objects.	To explain the effect of gravity on unsupported objects. To explain Isaac Newton's role in developing a theory of gravity. To accurately measure the force of gravity pulling on objects. **Activity:** Measuring gravity – measuring the mass and weight of objects. Identifying any links between mass and weight.	Explore and talk about ideas, raising different kinds of scientific questions. Take measurements using a range of scientific equipment with increasing accuracy and precision. Decide how to record data from a choice of familiar approaches. Notice patterns. Draw conclusions based on data and observations Read, spell and pronounce scientific vocabulary correctly. Look for different causal relationships in data. Independently report and present conclusions to others in oral and written forms. Use evidence from primary and secondary sources to justify ideas. Identify evidence that refutes or supports ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. Talk about how scientific ideas have developed over time.	Resources: Newton meters Weighing scales Objects to be measured Clear bags with handles (sandwich bags)
	To investigate the effects of air resistance	To explain how air resistance affects moving objects. To plan and conduct an investigation into the effects of air resistance. **Activity:** Creating the perfect parachute.	Explore and talk about ideas, raising different kinds of scientific questions. Make independent decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Use test results to identify when further tests and observations may be needed. Use test results to make predictions for further tests. Choose the most appropriate equipment to make measurements and explain how to use it accurately. Take measurements using a range of scientific equipment with increasing accuracy and precision. Know the importance of taking repeat readings and take repeat readings where appropriate. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Independently report and present conclusions to others in oral and written forms.	Resources: Plastic bags e.g. bin bags or shopping bags Paper Card String Sticky tape Objects to attach to the parachutes (e.g. paperclips, toy figures) Metre sticks Stopwatch **Deeper Learning Question:** What would the world be like without air resistance?

			Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To explore the effects of water resistance	To explain the effects of water resistance. To identify streamlined shapes. To minimise the effects of water resistance on an object. **Activity:** Testing streamlined shapes – could do more with this instead of boat building. E.g. testing other shapes, flatter objects. Optional activity - Making a boat using knowledge of streamlined shapes. If possible, complete the activity sheet in books (rather than on the sheet) using the sheet as a template.	Explore and talk about ideas, raising different kinds of scientific questions. Choose the most appropriate equipment to make measurements and explain how to use it accurately. Take measurements using a range of scientific equipment with increasing accuracy and precision. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Independently report and present conclusions to others in oral and written forms. Identify patterns that might be found in the natural environment. Look for different causal relationships in their data. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Resources: Plasticine or modelling clay Measuring cylinders / vases Water If boat making: Junk modelling materials or card / paper to build a boat. Large water tray. Battery powered handheld fan / small plug in fan. Stopwatch.
	To investigate the effects of friction	To explain the effects of friction on a moving vehicle. To investigate the effects of friction created by different materials. To recognise and control variables in an investigation. **Activity:** Friction experiment. Use a force meter to pull an object across a range of surfaces to test which one creates the most friction.	Explore and talk about ideas, raising different kinds of scientific questions. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Use test results to identify when further tests and observations may be needed. Take measurements using a range of scientific equipment with increasing accuracy and precision. Know the importance of taking repeat readings and take repeat readings where appropriate. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Independently report and present conclusions to others in oral and written forms. Use relevant scientific and illustrations to discuss, communicate and justify scientific ideas.	Resources: Flat surfaces to test e.g. table, carpet, playground, sandpaper Something to pull e.g. baskets or old food tubs. Weight to put in the tubs. Newton meters String attached to tubs. **Longer Writing Opportunity:** Experiment write up.
	To explore and design mechanisms	To explain how different mechanisms work. To investigate a simple mechanisms. To design own mechanism for a given purpose. **Activity:** Jigsaw activity to learn about mechanisms (pulleys, levers and gears) Design a machine for a specified purpose.	Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. Talk about how scientific ideas have developed over time.	Jigsaw pieces will need to be printed and cut out in advance of the lesson. **Deeper Learning Question:** How have levers and pulleys had an effect on our lives?

Topic:	Lesson Objectives:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Living Things and Their Habitats – Changes and Reproduction	To explain what gestation periods are for different animals, including humans.	To state how long the gestation period for a human is. To compare the gestation periods of different animals. To report findings in oral form. **Activity:** Researching gestation periods of different animals.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	
Vocabulary adolescence amphibians breasts crustaceans egg embryo fertilisation foetus genitals gestation growth rate infancy invertebrates life cycle life expectancy menstruation offspring prenatal puberty sperm vertebrates	To describe the changes as humans develop from fertilisation to birth.	To describe how an embryo and foetus grow and develop. To visualise the size of the developing baby at each stage of prenatal development. To order the stages of development on a timeline. **Activity:** Prenatal development timeline	Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based in their data and observations. Use their scientific knowledge and understanding to explain their findings. Read, spell and pronounce scientific vocabulary correctly.	
	To explain how babies grow and develop during early childhood.	To demonstrate understanding of how babies grow in height and weight. To describe the different developmental stages in early childhood. To compare graph types and select which is most appropriate for my data. **Activity:** Creating graphs and analysing data.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To describe and explain the main changes that occur during puberty.	To describe the main changes that occur during puberty. To give reasons why changes occur during puberty. To analyse the similarities and differences between how boys and girls experience puberty throughout their adolescence. **Activity:** Changes during puberty Puberty in Other Animals	Raise relevant questions about the world around them in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Use evidence from primary and secondary sources to justify ideas. Identify evidence that refutes or supports ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	**Deeper Learning Question:** What is the purpose of puberty?

	To identify the changes that take place in late adulthood.	To describe the main changes that take place in late adulthood. To distinguish between facts and myths about late adulthood. To identify some of the achievements that people have had in late adulthood. **Activity:** Comprehension and poster about late adulthood.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be fund in the natural environment. Independently report and present their conclusions to others in oral and written forms. Use evidence from primary and secondary resources to justify ideas. Recognise where secondary sources will be most useful to research ideas and being to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To describe the stages of human development	To order the stages of human development. To name the eight distinct stages of the human life cycle. To explain the changes that occur during the stages of human development. **Activity:** Fact file about the stages of the human life cycle.	Make own decisions about the most appropriate type of scientific enquiry that could be used to answer questions. Explore and talk about ideas, raising different kinds of scientific questions. Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Look for different causal relationships in their data. Independently report and present conclusions to others in oral and written forms.	**Longer Writing Opportunity:** Create a fact file about the stages of the human life cycle. **Deeper Learning Question:** At what stage in life do the most changes take place?

Year 6

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Animals including Humans – Healthy Bodies **Vocabulary** alcohol arteries blood vessels calories capillaries chambers circulatory system deoxygenated diet drugs energy input energy output exercise heart muscle nutrients oxygen oxygenated plasma plaque platelets pump red blood cells smoking veins	To know the main parts of the circulatory system and describe the job of the heart.	To identify the three main parts of the human circulatory system. To explain what the heart does. To work with others to create a living model of the circulatory system. **Activity:** Blood flow ordering activity. Labelling heart. Optional – living model Alternative – heart dissection	Explore and talk about ideas, raising different kinds of scientific questions. Use and develop keys and other information records to identify, classify and describe living things and materials. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To describe the important jobs of the blood vessels and blood.	To describe the differences between arteries, capillaries and veins. To discuss the four parts that blood is made up from. To explain why blood is oxygenated and deoxygenated. **Activity:** Blood vessels diagram and label.	Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly.	
	To describe the importance of exercise and how it affects the heart.	To plan a scientific enquiry. To make a prediction about the effect of exercise on heart rate. To carry out an investigation to look at how exercise affects heart rate. To record, report and present results appropriately. To draw a conclusion from my results. **Activity:** Heart rate investigation – can complete in books using sheet as a guide.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To understand that regular exercise is important for a healthy body.	To state the benefits of exercise. To conduct a survey to find the favourite forms of exercise in my class. To explain the importance of exercise and its impact on the body. **Activity:** Favourite class exercise survey.	With growing independence, raise own relevant questions about the world around them in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Read, spell and pronounce scientific vocabulary correctly. Use evidence from primary and secondary sources to justify ideas. Identify evidence that refutes or supports their ideas. Recognise where secondary sources will be most useful to research ideas and being	**Longer Writing Opportunity:** Persuasive letter to headteacher. (Optional)

waste products white blood cells		Persuasive letter.	to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	
	To explain how diet and exercise affect the body.	To discuss what might make a lifestyle more healthy or less healthy. To interpret information about the diet and activities of different people. To explain why different people have different calorie requirements. **Activity:** Healthy and Unhealthy Lifestyle Choices. Diet and Exercise Activity Sheet.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Independently report and present conclusions to others in oral and written forms, Use evidence from primary and secondary sources to justify ideas. Recognise where secondary sources will be most useful to research ideas and being to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	**Deeper Learning Question:** Do you think that people had healthier diets in the pasts, or do we have healthier diets today? Explain your reasoning.
	To recognise the impact of drugs and alcohol in the way bodies function.	To explain how drugs and alcohol can affect the body. To describe the impact of drugs and alcohol on the circulatory system. To give my opinion about whether or not the government guidance on drugs and alcohol is suitable. **Activity:** Impact of Smoking and Alcohol on the Body. Alternatively, could make a poster about the harmful effects of smoking and alcohol on the body.	With increasing independence, make own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Explore and talk about ideas, raising different kinds of scientific questions. Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Look for different causal relationships in data. Independently report and present conclusions to others in oral and written forms.	**Deeper Learning Question:** If we know the harmful effects of tobacco and alcohol, why do some people choose to take them?

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Electricity – Changing Circuits	To explain the importance of the major discoveries in electricity.	To identify how our understanding of electricity has changed over time. To explain how major discoveries affected our understanding and use of electricity. **Activity:** Scientist comprehension Alternatively, research a scientist (e.g. Tesla, Edison, Volta or Franklin) and their discoveries for electricity.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas. Talk about how scientific ideas have developed over time.	Laptops required for alternative activity.
Vocabulary alternating battery brightness bulb buzzer cell circuit comparative test current decrease direct current electricity fair test increase loudness motor switch voltage wires	To use recognised symbols when representing a simple circuit in a diagram.	To know the scientific symbols for the main parts of a circuit. To create circuit diagrams using scientific symbols. **Activity:** Interpreting and drawing Circuit diagrams	Explore and talk about ideas, raising different kinds of scientific questions. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	
	To observe and explain the effects of differing volts in a circuit.	To draw circuit diagrams indicating the voltage. To explain the effect of increasing or decreasing the voltage on different parts of a circuit. **Activity:** Using an online circuit simulator, investigate different volts within a circuit https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html Alternatively, worksheet about different circuits with varying volts.	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focussed observations. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based in data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Look for different causal relationships in data. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.	**Deeper Learning Question:** Do you think that an increase in voltage will always make a bulb brighter or a motor faster? Explain your answer and include evidence.
	To understand variations in how components function.	To select an appropriate scientific enquiry. To plan an investigation in detail. To decide which variables to control. To explain variations in functions. **Activity:** Planning a scientific experiment – can be completed in books using sheet as a guide	Raise relevant questions about the world around them in response to a range of scientific experiences (with growing independence). Make own decisions about the most appropriate type of scientific enquiry that might be used to answer questions (with increasing independence). Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including	**Longer Writing Opportunity:** Science experiment write up (complete in lessons 4, 5 or 6).

			recognising and controlling variables where necessary. Read, spell and pronounce scientific vocabulary correctly.	
	To conduct an investigation, record data and report findings.	To use a plan to conduct an investigation. To adjust the plan if necessary. To decide how to record findings as data. To decide how to report findings appropriately. **Activity:** Conducting experiment Write conclusion - can be completed in books using sheet as a guide	Make own decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Use test results to identify when further tests and observations may be needed. Make careful and focused observations. Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Look for different causal relationships in their data. Discuss the degree of trust they can have in a set of results. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	**Longer Writing Opportunity:** Science experiment write up (complete in lessons 4, 5 or 6).
	To use test results to compare variations and to make predictions to set up further tests.	To use results to make new predictions. To plan and conduct a further investigation. **Activity:** Experiment write up, making new predictions, plan and conduct further experiments.	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Make own decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat them. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Use test results to identify when further tests and observations may be needed. Use test results to make predictions for further tests. Make careful and focused observations. Decide how to record data from a choice of familiar approaches. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Look for different causal relationships in their data. Discuss the degree of trust they can have in a set of results. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	**Longer Writing Opportunity:** Science experiment write up (complete in lessons 4, 5 or 6).

Curriculum Skills and Progression Map

Topic:	Lesson Objectives:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Living Things and Their Habitats – Evolution and Inheritance	To explain the scientific concept of inheritance.	To identify inherited characteristics that are passed from parent to offspring. To explain how inherited characteristics can lead to variation. **Activity:** Mr Men and Little Miss inherited characteristics.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Read, spell and pronounce scientific knowledge and understanding to explain findings. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Keep key vocabulary sheet as it is revisited in lesson 3.
Vocabulary adaptation ancestor accidental biological parent characteristics common ancestor DNA environment evolution family fossil genes genus habitat homo sapiens inheritance intervention modification mutation offspring replication selective breeding species taxonomy traits variation	To demonstrate my understanding of the scientific meaning of adaptation.	To understand that adaptations are mutations. To identify adaptive traits. **Activity:** Adaptive traits activity (see additional notes). Alternatively, pupils can choose and environment and research the plants and animals that live there. Identify adaptive traits for each living thing.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Notice patterns. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific knowledge and understanding to explain findings. Identify patterns that might be found in the natural environment. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Draw tables rather than use the ones on the sheet. Pre-cut information so children can sort this for themselves. Can draw animals, habitats and write information independently – adapt based on individual pupils.
	To identify the key ideas of the theory of evolution.	To demonstrate understanding of how ideas about evolutions developed over time, To explain the terms adaptation, evolution and natural selection. **Activity:** Research one of the scientists discussed in the lesson. Present information as a fact file. Include what their theory was and analyse accuracy of their ideas. Example in the resources folder. Alternatively, write a diary entry from the point of view of either Darwin or Wallace, reflecting on their investigations that led them to the idea of evolution.	Explore and talk about ideas, raising different kinds of scientific questions. Read, spell and pronounce scientific knowledge and understanding to explain findings. Use evidence from primary and secondary sources to justify ideas. Identify evidence that refutes or supports ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. Talk about how scientific ideas have developed over time.	Laptops needed for research. **Deeper Learning Question:** If Darwin hadn't developed our understanding of evolution, what do you think we would understand about evolution today?
	To examine the evidence demonstrating how plants have evolved.	To examine fossil evidence. To explain how a living thing has evolved over time. **Activity:** Fossil evidence of evolution activity. Pictures can be stuck in, writing to be completed in books, ideally. Alternative – Fossil record research.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific knowledge and understanding to explain findings. Identify patterns that might be found in the natural environment.	

			Independently report and present own conclusions to others in oral and written forms. Identify evidence that refutes or supports ideas. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To understand how human beings have evolved.	To identify adaptive traits in humans as a species. To describe the known stages of human evolution. To compare modern humans with members of the same genus and family. **Activity:** Similarities and differences between a modern human and an Australopithecus Afarensis.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific knowledge and understanding to explain findings. Identify patterns that might be found in the natural environment. Use evidence from primary and secondary sources to justify ideas. Identify evidence that refutes or supports own ideas. Recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas. Talk about how scientific ideas have developed over time.	
	To explain how human intervention affects evolution	To understand that some living things have acquired more adaptive traits than others. To explain how adaptations can result in both advantages and disadvantages. To identify advantages and disadvantages of specific interventions. To explain how humans have created new varieties of living things through selective breeding. To demonstrate understanding of the issues raised by human intervention in the evolutionary process. **Activity:** "Humans should deliberately breed plants and animals to produce particular characteristics." Persuasive argument for or against this statement.	With growing independence, raise own relevant questions about the world around you in response to a range of scientific experiences. Explore and talk about ideas, raising different kinds of scientific questions. Ask own questions about scientific phenomena. Independently group, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific knowledge and understanding to explain findings. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	**Longer Writing Opportunity:** Persuasive argument. **Deeper Learning Question:** Do you think that science should interfere with evolution? Is your opinion different for animals or plants?

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Living Things and Their Habitats – Classifying Organisms	To classify animals based on similarities and differences.	To sort and group animals based on their features. To give reasons for the way animals have been classified. **Activity:** Classifying zoo animals. Use the activity sheets as an idea.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
Vocabulary amphibians annelids arachnids bacteria birds cell class classification crustaceans DNA domain eukaryote family fish fungus genus insects invertebrates kingdom Linnaean mammal microorganism microscopic molluscs mould nuclues order organism phylum reptiles species standard vertebrates	To describe how living things are classified into groups.	To describe who Carl Linnaeus was. To explain how living things are classified using the Linnaean system. To classify living things using the Linnaean system. **Activity:** Classifying Species	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Laptops needed for research. **Deeper Learning Question:** If you discovered a new species, how would you begin to classify it?
	To identify characteristics of different creatures and use these to classify them.	To identify different types of animals. To match the types of animals to their characteristics. To design a creature that has a set of characteristics of one type of animal. To classify creatures based on their characteristics. **Activity:** Identifying animal characteristics. Creating a curious creature and fact file.	Explore and talk about ideas, raising different kinds of scientific questions. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and material. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To describe and investigate helpful and harmful microorganisms.	To identify types of microorganism. To describe helpful and harmful microorganisms. To investigate harmful microorganisms. **Activity:** Growing mould on bread (could complete as a class to test bread in a range of locations).	Explore and talk about ideas, raising different kinds of scientific questions. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. Plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary. Make careful and focussed observations. Decide how to record data from a choice of familiar approaches.	Resources: Bread Clear plastic bags. **Longer Writing Opportunity: (Alternative opportunity in lesson 6)** Science experiment write up

virus		Work could be completed in books using the sheet as a guide.	Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
	To identify the characteristics of different types of microorganisms.	To draw conclusions from my results. To describe and compare the structure of different cells. To describe the characteristics of different microorganisms. To design a microorganism using these characteristics. **Activity:** Conclusion of mould experiment – use sheet as a guide. Make a microorganism – can draw this is no modelling clay available.	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focussed observations. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Independently report and present conclusions to others in oral and written forms. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	Resources: Modelling clay
	To classify organisms found in my local habitat.	To group living things according to whether they are plants or animals. To classify living things according to their characteristics. To give reasons for the classification of different organisms. To identify the characteristics of different groups of organisms **Activity:** Create a field guide about organisms living in the school habitat.	Explore and talk about ideas, raising different kinds of scientific questions. Make careful and focussed observations. Independently group, classify and describe living things and materials. Use and develop keys and other information records to identify, classify and describe living things and materials. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Identify patterns that might be found in the natural environment. Independently report and present conclusions to others in oral and written forms. Recognise where secondary sources will be most useful t research ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	**Alternative Longer Writing Opportunity** **Deeper Learning Question:** How do you think human interference in nature influences how organisms cope in their natural habitats?

Curriculum Skills and Progression Map

Topic:	Lesson Objective:	Lesson Assessment Outcomes:	Scientific Enquiry Skills covered:	Additional Notes:
Seeing Light	To explain how light travels.	To demonstrate that light travels in a straight line. To create a model to show how light travels from a light source to our eyes, or to an object and then our eyes. To explain how we see things. **Activity:** Light experiments	Explore and talk about ideas raising different scientific questions. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views.	Torches Card all the same size A hole punch Blu tac Small objects Mirrors **Deeper Learning Question:** How would the world be different if there was no natural light? **Longer Writing Opportunity** Explanation text about how light enters our eyes – how we see.
Vocabulary absorb bend electromagnetic filter focal point lens opaque photons prism reflection refraction shadow source spectrum tilt transparent vacuum wavelength	To understand how mirrors reflect light, and how they can help us see objects.	To explain how light is reflected. To measure the angles of incidence and reflection. To use my understanding of reflection to create a working periscope. To explain how the periscope allows me to see objects I would not usually be able to see. **Activity:** Testing angles of incidence and reflection Making a periscope	Explore and talk about ideas raising different scientific questions. Chose the most appropriate equipment to make measurements and explain how to use it accurately. Take measurements using a range of scientific equipment with increasing accuracy and precision. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views.	Resources: Torches Card Cereal boxes Scissors Mirrors Sticky tape
	To investigate how refraction changes the direction in which light travels.	To understand how light is refracted. To investigate the effects of refraction. To understand the way refraction alters the direction of light **Activity:** Observing an arrow through a glass of water.	Explore and talk about ideas raising different scientific questions. Ask own questions about scientific phenomena. Make careful and focussed observations. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Notice patterns. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly.	Resources: Transparent cups Water Arrows

			Use relevant scientific language and illustrations to discuss, communicate and justify scientific views.	
	To investigate how a prism changes a ray of light to show the spectrum.	To understand how a prism affects a ray of light. To explain what this tells us about the visible spectrum. To describe what Isaac Newton discovered about light. To make a colour wheel and explain what it shows about light. **Activity:** Colour wheel	Explore and talk about ideas raising different scientific questions. Ask own questions about scientific phenomena. Make careful and focussed observations. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views. Talk about how scientific ideas have developed over time.	Resources: Coloured card
	To investigate how light enables us to see colours.	To explain what Isaac Newton discovered about colour. To investigate and understand how light enables us to see colours. **Activity:** Isaac Newton comprehension – could be completed as a quiz or just read. Filters experiment.	Explore and talk about ideas raising different scientific questions. Ask own questions about scientific phenomena. Make careful and focussed observations. Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs. Draw conclusions based on data and observations. Use scientific knowledge and understanding to explain findings. Read, spell and pronounce scientific vocabulary correctly. Discuss the degree of trust you can have in a set of results. Independently report and present conclusions to others in oral and written forms. Recognise where secondary sources will be most useful to research ideas and being to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views. Talk about how scientific ideas have developed over time.	Resources: Coloured filters Coloured objects.
	To explain why shadows have the same shape as the object that casts them.	To explain how a shadow is formed. To explain why shadows are the same shape as the object that casts them. To use knowledge of Isaac Newton's ideas about light to create a shadow puppet play. **Activity:** Shadow puppets – script optional	Explore and talk about ideas raising different scientific questions. Read, spell and pronounce scientific vocabulary correctly. Identify evidence that refutes or supports their ideas. Use relevant scientific language and illustrations to discuss, communicate and justify scientific views. Talk about how scientific ideas have developed over time.	Resources: Card Straws **Deeper Learning Question:** What are shadows? How are they made? What factors affect their size and shape?