Nebula
where stars are born

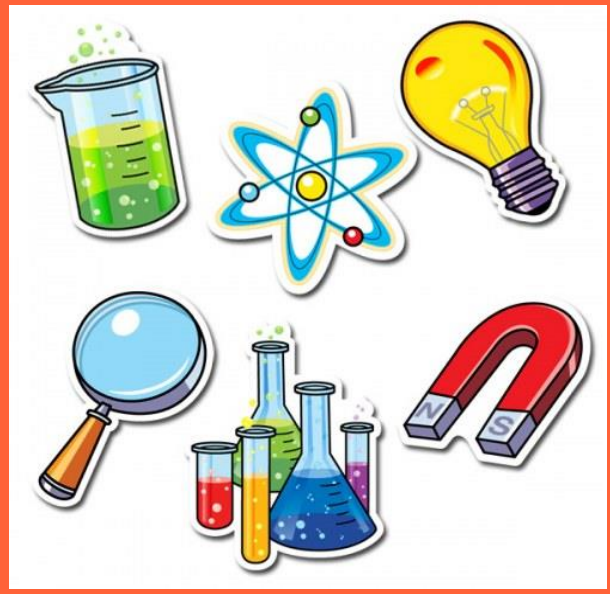
2022-2023

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 we 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 describe what animals need to survive and link this to their habitats?	• 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 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?

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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.

<table>
<tr><th colspan="2">Skills Map - Science</th></tr>
<tr><th colspan="2">Year 3 – Plants and Animals, including Humans</th></tr>
<tr><th>Animals, including Humans</th><th>Plants</th></tr>
<tr><th>Year 1, Autumn 1 – Health and Movement</th><th>Year 1, Summer 2 – How Plants Grow</th></tr>
<tr><td><u>National Curriculum Statutory Objectives:</u>
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.
<u>Unit Learning Objectives:</u>
To sort foods into food groups and find out about the nutrients that different foods provide.
To explore the nutritional values of different foods by gathering information from food labels.
To sort animal skeletons into groups, discussing patterns and similarities and differences.
To investigate an idea about how the human skeleton supports movement.
To explain how bones and muscles work together to create movement.
To design and carry out my own investigation.</td><td><u>National Curriculum Statutory Objectives:</u>
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.
<u>Unit Learning Objectives:</u>
To identify and describe the functions of the roots of flowering plants.
To investigate the way in which water is transported within plants.
To identify and describe the functions of leaves in flowering plants.
To explore the part that flowers play in the life cycle of flowering plants.
To explore some of the ways in which flowering plants disperse their seeds.
To understand the structure of seeds and their importance as a food source.</td></tr>
<tr><th colspan="2">Year 3 Greater Depth</th></tr>
</table>

• 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 we didn't have a skeleton? What would happen if you only ate junk food for: a day, a week, a month, a year?	• Describe one of the ways in which flowering plants reproduce. • Identify how seeds are dispersed based on their appearance. Higher Order Questions Design a seed to disperse in the desert. Explain your reasoning. What is the most important thing a plant needs in order to survive? Why? What is the most important part of a plant? Why?

Skills Map - Science		
Year 3 – Rocks, Forces and Magnets, Light		
Rocks	**Forces and Magnets**	**Light**
Year 1, Summer 1 – Rocks, Fossils and Soils	**Year 1, Autumn 2 – Forces and Magnets**	**Year 1, Spring 1 – Light and Shadow**
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.* Unit Learning Objectives: • To be able to identify naturally occurring rocks and explore their uses. • To be able to group rocks according to their characteristics. • To be able to plan, carry out and evaluate experiments to compare rocks. • To be able to identify rocks that are used for a particular purpose. • To explore soil and how it is formed. • To explore what fossils are and how they are formed. • To be able to identify fossilised remains.	*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.* • *Describe magnets as having two poles.* • *Predict whether two magnets will attract or repel each other, depending on which poles are facing.* Unit Learning Objectives: • To explore what forces are and notice that some forces need contact between two objects. • To compare how things move on different surfaces. • To explore how magnetic forces work. • To be able to identify magnetic materials. • To investigate uses for magnets.	*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.* Unit Learning Objectives: • To recognise that we need light in order to see. • To explore the sun as a light source and identify the difference between night and day. • To investigate what shadows are and why they are formed. • To investigate how shadows behave. • To investigate how the size of shadows change during the day. • To explore how light is reflected from surfaces.

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 Questions You need to make an arrowhead for an upcoming battle. Which of these will you choose to use? Chalk, Marble or Flint. An animal dies near a volcano, what happens next?	• 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 football 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 Questions Mary says, "the sun moves across the sky during the day." Her friend Raj disagrees. Who is correct? Why? An example of a transparent item is glass. How are we able to see it?

Skills Map - Science			
Year 3 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
3P1: Use different ideas and suggest how to find something out. 3P2: Make and record a prediction before testing. 3P3: Plan a fair test and explain why it was fair. 3P4: Set up a simple fair test to make comparisons. 3P5: Explain why they need to collect information to answer a question.	3O1: Take accurate measurements using different equipment and units of measure. 3O2: Record their observations in different ways - labelled diagrams, charts etc. 3O3: Describe what they have found using scientific language.	3E1: Explain what they have found out and use their measurements to say whether it helps to answer their question.	3I1: Children should have the opportunity to investigate. 3I2: Observing changes over different periods of time. 3I3: Noticing patterns. 3I4: Grouping and classifying. 3I5: Carrying out comparative and fair tests. 3I6: Finding things out using secondary resources.
Year 3 Greater Depth			
GD3P1: Record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables.	GD3O1: Explain their findings in different ways (display, presentation, and writing). GD3O2: Use their findings to draw a simple conclusion. GD3O3: Suggest improvements and predictions for further tests.	GD3E1: Suggest how to improve their work if they did it again.	

Skills Map - Science		
Year 4 – Living Things and their Habitats, Animals including Humans and States of Matter		
Animals including Humans	**Living Things and their Habitats**	**States of Matter**
Year 2, Summer 1 – Eating and Digestion	**Year 2, Summer 2 – Living in Environments**	**Year 2, Autumn 1 – States of Matter**
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.* Unit Learning Objectives: • To be able to identify and classify carnivores, herbivores and omnivores. • To be able to construct and interpret a variety of food chains. • To identify the different types of teeth in humans and identify their functions. • To explore different ways of keeping teeth healthy. • To investigate how the digestive system works. • To be able to describe the functions of the basic parts of the digestive system.	*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.* Unit Learning Objectives: • To be able to identify a variety of habitats and explore why organisms live in different habitats. • To be able to group organisms according to their characteristics. • To be able to classify animals into specific groups according to their characteristics. • To be able to use a classification key to identify animals. • To be able to identify and classify a variety of British plants. • To explore the human impact on habitats and environments.	*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: • To compare and group materials together according to whether they are solids or liquids. • To identify and explore the properties of gases. • To observe that materials change state when they are heated or cooled. • To research the temperature in degrees Celsius at which materials change state. • To understand the process of evaporation. • To understand the process of condensation.

		• To identify the part played by evaporation and condensation in the water cycle.
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 Questions Why is it important that we have diverse and varied food chains? Why is it important that food travels through your digestive system in the order it does?	• 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 would happen if all the glaciers melted? What would happen if the deserts of the world start to spread further? Scientists have discovered a new creature called an Umbongodrongo. Design an ideal habitat for it to live. It is a meat eater and dislikes the cold. Explain your choices.	• 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 Yesterday there was a huge storm which left massive puddles on the playground! You venture outside today and discover they have disappeared. Why has this happened? Is most of the water in the world liquid? Explain your reasoning. Is water always liquid? Explain. 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?

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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.

<table>
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<tr><th colspan="2">Year 4 – Sound and Electricity</th></tr>
<tr><th>Sound</th><th>Electricity</th></tr>
<tr><th>Year 2, Autumn 2 – Changing Sound</th><th>Year 2, Spring 1 – Circuits and Conductors</th></tr>
<tr><td><u>National Curriculum Statutory Objectives:</u>
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.
<u>Unit Learning Objectives:</u>
To find out that sounds are made when objects and materials vibrate.
To investigate whether sounds can travel through different materials.
To explore the relationship between distance and volume.
To find out that some materials are effective in preventing vibrations from sound sources reaching the ear.
To investigate how sounds can be different pitches and volumes.</td><td><u>National Curriculum Statutory Objectives:</u>
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.
<u>Unit Learning Objectives:</u>
To identify common appliances that run on electricity.
To understand how to keep safe around electrical appliances.
To construct simple circuits.
To recognise common conductors and insulators.
To make a simple device which includes a circuit.</td></tr>
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• To find out how the length, thickness and tightness of a string affects its pitch. • To find out how sounds can be made by air vibrating and how to change the pitch of notes produced by vibrating air.	
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 If a tree falls in the woods does it make a sound? Explain. 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?	• 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 4 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
4P1: Plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated. 4P2: Suggest improvements and predictions. 4P3: Ask their own questions. 4P4: Decide which information needs to be collected and decide what the best way to collect it is. 4P5: Use their findings to draw a simple conclusion.	4O1: Take measurements using different equipment and units of measure and record what they have found in a range of ways. 4O2: Use a range scientific equipment to take accurate measurements or readings. 4O3: Explain their findings in different ways (display, presentation, writing). 4O4: Record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs.	4E1: Find any patterns in their evidence or measurements. 4E2: Evaluate and communicate their methods and findings. 4E3: Make a prediction based on something they have found out. 4E4: Ask further questions based on their data and observations. 4E5: Evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables. 4E6: Identify differences, similarities or changes related to simple scientific ideas or processes.	4I1: Observing changes over different periods of time. 4I2: Noticing patterns. 4I3: Grouping and classifying. 4I4: Carrying out comparative and fair tests. 4I5: Finding things out using secondary resources.
Year 4 Greater Depth			
GD4P1: Plan and carry out an investigation by controlling variables fairly and accurately. GD4P2: Use test results to make further predictions and set up further comparative tests.	GD4O1: Record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models.	GD4E1: Report findings from investigations through written explanations and conclusions. GD4E2: Use a graph or diagram to answer scientific questions.	GD4I1: Use a range of variables to investigate.

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While a child in Year 6 may be accessing knowledge from a Year 5 unit, the skills taught during the unit will reflect the Year 6 'Working Scientifically' skills.

Skills Map - Science		
Year 5 – Living Things and their Habitats, Properties and changes to materials		
Animals including Humans	**Living Things and their Habitats**	**Properties and changes to materials**
Year 2, Summer 2 – Changes and Reproduction	**Year 1, Autumn 1 – Life Cycles**	**Year 2, Spring 1 – Properties and Changes of Materials**
National Curriculum Statutory Objectives: • *Describe the changes as humans develop to old age.* Unit Learning Objectives: • To recognise the stages of growth and development in humans. • To know the stages in the gestation period of humans and compare them to other animals. • To recognise the stages of development during childhood and understand the needs of children at those stages. • To understand the initial changes inside and outside of the body during puberty.	*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 flowering plants. • To describe the process of asexual reproduction in plants. • To describe the process of sexual reproduction in animals.	*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.*

• To know the changes that occur during puberty and how they differ for boys and girls. • To understand how the body changes during adulthood and old age.	• To observe and compare the life cycles of animals in our local environment with other animals around the world. • To compare how different animals reproduce and grow. • To find out about the work of naturalists.	Unit Learning Objectives: • To know that some materials will dissolve in liquid to form a solution and to describe how to recover a substance from a solution. • To know that some changes of state and dissolving and mixing processes can be reversed through filtering, sieving and evaporating. • To explain that some changes form new materials, and that these changes are not usually reversible. • To explain that some changes, caused by heating or cooling form new materials and that these changes are often not reversible. • To explain that changes caused by burning form new materials and that these changes are not reversible. • To compare and group together everyday materials on the basis of their properties. • To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials.
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 Why do the needs of humans change at different points in their life cycle? 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.	• 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.

	What would happen if living things did not die?	

Skills Map - Science	
Year 5 – Earth, Space and Forces	
Earth and Space	**Forces**
Year 2, Autumn 2 – Earth and Space	**Year 2, Summer 1 – Forces in Action**
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 describe the movements of the Sun, Earth and Moon. • To explore how the rotation of Earth creates day and night. • To learn about how the Earth's tilt creates seasons. • To learn about the phases of the Moon. • To discover how theories about our solar system have changed. • To investigate the planets in the solar system.	*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 explain that unsupported objects fall towards the • Earth because of the force of gravity acting between the Earth and the falling object. • To identify the effects of friction acting between moving surfaces. • To identify and explain the effects of air resistance. • To identify and explain the effects of water resistance. • To recognise that levers and pulleys allow a smaller force to have a greater effect. • To recognise that gears allow a smaller force to have a greater effect.
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 Some countries, at some points in the year, have close to 24 hours of sunlight or 24 hours of darkness. Why is this?	• 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?

Are there any negatives to exploring Space? If so, why? If not, why not?	

Skills Map - Science			
Year 5 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
5P1: Plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary. 5P2: Make a prediction with reasons. 5P3: Use test results to make predictions to set up comparative and fair tests.	5O1: Take measurements using a range of scientific equipment with increasing accuracy and precision. 5O2: Take repeat readings when appropriate. 5O3: Record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs.	5E1: Use a graph to answer scientific questions. 5E2: Present a report of their findings through writing, display and presentation.	5I1: Children should have the opportunity to investigate through: 5I2: Recognising and controlling variables accurately and fairly, including changes over different periods of time. 5I3: Noticing patterns, groupings and classifying. 5I4: Carrying out comparative and fair tests. 5I5: Finding things out using a wide range of secondary sources.
Year 5 Greater Depth			
GD5P1: Explore different ways to test an idea, choose the best way and give reasons. GD5P2: Vary one factor whilst keeping the others the same in an experiment. GD5P3: Use information to help make a prediction. GD5P4: Explain in simple terms, a scientific idea and what evidence supports it.	GD5O1: Decide which units of measurement they need to use. GD5O2: Explain why a measurement needs to be repeated.	GD5E1: Find a pattern from their data and explain what it shows. GD5E2: Link what they have found out to other science. GD5E3: Suggest how to improve their work and say why they think this.	

At Old Catton Junior School, we currently work on a two-year rolling programme. This means that pupils will at times be accessing elements of the curriculum outside of their current year group (for example: a pupil in Year 3 may be completing a Year 4 unit in Science). 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'.
While a child in Year 6 may be accessing knowledge from a Year 5 unit, the skills taught during the unit will reflect the Year 6 'Working Scientifically' skills.

Skills Map - Science		
Year 6 – Living Things		
Evolution and Inheritance	**Living things and their Habitats**	**Animals, including Humans**
Year 1, Spring 1 – Evolution and Inheritance	**Year 1, Summer 1 – Classifying Organisms**	**Year 2, Autumn 1 – Healthy Bodies**
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.* Unit Learning Objectives: • To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • To identify how animals and plants are adapted to suit their environment in different ways. • To understand that adaptation of plants and animals to suit their environment may lead to evolution. • To find out about how the work of scientists helped develop our understanding of the process of 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.* Unit Learning Objectives: • To recap ways of grouping organisms according to their characteristics. • To explore ways of distinguishing between organisms that have similar characteristics. To be able to classify plants according to their characteristics. • To find out about Carl Linnaeus and his classification system. To explore	*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 find out how scientific ideas about food and diet were tested in the past and how this has contributed to our knowledge of a balanced diet.

• To recognise that living things have changed over time and that a number of factors can affect a species' evolution. • To understand how humans have evolved over time, and how human behaviour can affect change in species over time.	what micro-organisms are and how they can be grouped. • To be able to identify and classify organisms in the local area.	• To investigate some different food groups and find out why a variety of food is important for a healthy diet. • To find out how nutrients and water are transported in the body. • To investigate what happens to the heart when we exercise and explain why. • To investigate how muscles move the skeleton and how muscle activity requires increased blood flow. • To investigate the effects of tobacco, alcohol and other drugs.
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?	• 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.

	How do you think human interference in nature has an effect on how organisms cope in their natural habitats?	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**
Year 1, Autumn 2 – Changing Circuits	**Year 1, Summer 2 – Seeing Light**
<u>*National Curriculum Statutory Objectives:*</u> • *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.* <u>Unit Learning Objectives:</u> • To recap knowledge of electricity and circuits. • To investigate ways in which the brightness of a bulb or the speed of a motor is changed. • To be able to recognise and use conventional symbols for circuits. • To be able to plan, carry out, and evaluate an experiment to see how changing the wire in a circuit affects the brightness of the bulb. • To be able to review and assess understanding of circuits. *In addition to the learning objectives mentioned above, there is an additional unit of work that looks at the life and inventions of Nikola Tesla which can be used in this unit of work.*	<u>*National Curriculum Statutory Objectives:*</u> • *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.* <u>Unit Learning Objectives:</u> • To review understanding of light and shadow and to explore how light travels. • To investigate how we see things through light entering the eyes. • To explore how light can be reflected and change direction. • To investigate reflections from a variety of surfaces. • To be able to plan and carry out an experiment to investigate how shadows behave. • To explore the differences between shadows and • reflections and consolidate knowledge of how we see things.

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. Do you think that electricity has a negative impact on the world? Why?	• 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? How has artificial light had a positive or negative effect on technology? Explain your answer.

Skills Map - Science			
Year 6 – Working Scientifically			
Planning	**Obtaining and presenting evidence**	**Considering evidence and evaluating**	**Types of investigations**
6P1: Explore different ways to test an idea, choose the best way, and give reasons. 6P2: Identify the key factors when planning a fair test. 6P3: Vary one factor whilst keeping the others the same in an experiment. Explain why they do this. 6P4: Use information to make a prediction and give reasons for it. 6P5: Use test results to make further predictions and set up further comparative tests. 6P6: Explain, in simple terms, a scientific idea and what evidence supports it.	6O1: Explain why they have chosen specific equipment (including ICT based equipment). 6O2: Decide which units of measurement they need to use. 6O3: Make precise measurements. 6O4: Explain why a measurement needs to be repeated. 6O5: Record their measurements in different ways (including bar charts, tables and line graphs). 6O6: Read and record measurements systematically using a range of scientific equipment with increasing accuracy and precision. 6O7: Present a report of their findings through writing, display and presentation.	6E1: Find a pattern from their data and explain what it shows. 6E2: Use a graph to answer scientific questions. 6E3: Link what they have found out to other science. 6E4: Suggest how to improve their work and say why they think this. 6E5: Record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models. 6E6: Draw conclusions from their work. 6E7: Report findings from investigations through written explanations and conclusions using appropriate scientific language.	6I1: Children should have the opportunity to investigate through: 6I2: Recognising and controlling variables accurately and fairly, including changes over different periods of time. 6I3: Noticing patterns, groupings and classifying. 6I4: Carrying out comparative and fair tests. 6I5: Finding things out using a wide range of secondary sources.
Year 6 Greater Depth			
GD6P1: Choose the best way to answer a question and use information from different sources to plan an investigation. GD6P2: Make a prediction which links with other scientific knowledge.	GD6O1: Plan which equipment they will need and use it effectively. GD6O2: Explain qualitative and quantitative data.	GD6E1: Identify scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it. GD6E2: Explain how they could improve their way of working. GD6E3: 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.	

Appendix I

Science Overview – Long Term Plan

Year 1

	Year 3 and 4	Year 5 and 6
Autumn 1	Health and Movement	Life Cycles
Autumn 2	Forces and Magnets	Changing Circuits
Spring 1	Light and Shadows	Evolution and Inheritance
Spring 2	**SCIENCE FAIR**	**SCIENCE FAIR**
Summer 1	Rocks, Fossils and Soils	Classifying Organisms
Summer 2	How Plants Grow	Seeing Light

Year 2

	Year 3 and 4	Year 5 and 6
Autumn 1	States of Matter	Healthy Bodies
Autumn 2	Changing Sound	Earth and Space
Spring 1	Circuits and Conductors	Properties and Changes of Materials
Spring 2	**SCIENCE FAIR**	**SCIENCE FAIR**
Summer 1	Eating and Digestion	Forces in Actions
Summer 2	Living in Environments	Changes and Reproduction

Appendix II

Writing Opportunities

Year 1: Year 3 and 4

	Writing Opportunities	Year 3 Scientific Skills	Year 4 Scientific Skills
Autumn 1	Health and Movement To identify that a balanced diet is needed in order to stay healthy. **Letter to Head of School about the Importance of Healthy Food**	Explaining why they need to collect information to answer a question. Describing what they have found out using scientific language. Using their findings to draw simple conclusions.	Explaining their findings in different ways. Making a prediction based on something they have found out. Evaluating what they have found out using scientific language. Reporting findings from investigations through written explanations and conclusions.
Autumn 2	Forces and Magnets To compare how things move on different surfaces. **Experiment Write Up**	Planning and setting up a fair test. Making a prediction. Using findings to draw a conclusion. Recording observations using tables and bar graphs. Describing what they have found using scientific language. Using their findings to draw simple conclusions.	Planning and setting up a fair test. Making a prediction. Using findings to draw a conclusion. Recording data using tables and bar graphs. Evaluating their findings using scientific language. Planning and carrying out an investigation by controlling variables fairly and accurately. Using test results to make further predictions. Reporting findings from investigations through written explanations and conclusions.
Spring 1	Light and Shadow To recognise that we need light in order to see. **Argument (For or Against Artificial Lights)**	Describing what they have found out using scientific language. Using their findings to draw simple conclusions.	Explaining their findings in different ways e.g. explanation text or story. Using their findings to draw a simple conclusion.

			Evaluating and communicating their findings. Identifying differences, similarities or changes related to simple scientific ideas or processes. Reporting findings from investigations through written explanations and conclusions.
Spring 2	**SCIENCE FAIR**		
Summer 1	Rocks, Fossils and Soils To explore what fossils are and how they are formed. **Explanation Text (How Fossils are Formed)**	Describing what they have found using scientific language. Explaining their findings in different ways e.g. explanation text or story. Using their findings to draw a simple conclusion.	Explaining their findings in different ways e.g. explanation text or story. Identifying differences, similarities or changes related to simple scientific ideas or processes. Reporting findings from investigations through written explanations and conclusions.
Summer 2	How Plants Grow To explore some of the ways in which flowering plants disperse their seeds. **Information Text (Seed Dispersal)**	Describing what they have found using scientific language. Explaining their findings in different ways e.g. labelled diagram or writing.	Explaining their findings in different ways e.g. explanation text or story. Identifying differences, similarities or changes related to simple scientific ideas or processes. Reporting findings from investigations through written explanations and conclusions.

Year 1: Year 5 and 6

	Writing Opportunities	Year 5 Scientific Skills	Year 6 Scientific Skills
Autumn 1	Life Cycles To find out about the work of naturalists. **Biography (Chosen Naturalist)**	Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and the evidence that supports it.	Explaining, in simple terms, a scientific idea and what evidence supports it. Presenting a report of their findings through writing.

			Linking what they have found out to other science. Finding things out using a wide range of secondary sources. Reporting and presenting findings from enquiries in written forms.
Autumn 2	Changing Circuits To investigate ways in which the brightness of a bulb or the speed of a motor is changed. **Experiment Write Up**	Planning and carrying out a scientific enquiry to answer questions. Making a prediction with reasons. Recording more complex data and results in a range of ways. Presenting a report of their findings through writing. Varying one factor whilst keeping the others the same in an experiment. Explaining, in simple terms, a scientific idea and the evidence that supports it. Finding a pattern from their data and explaining what it shows.	Exploring different ways to test an idea, choose the best way, and give reasons. Identifying the key factors when planning a fair test. Varying one factor whilst keeping the others the same in an experiment. Using information to make a prediction and give reasons for it. Explaining, in simple terms, a scientific idea and what evidence supports it. Recording measurements in different ways. Presenting a report of their findings through writing. Drawing conclusions from their work. Making a prediction which links with other scientific knowledge. Identifying scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it. Reporting and presenting findings from enquiries in written forms.
Spring 1	Evolution and Inheritance	Presenting a report of their findings through writing.	Explaining, in simple terms, a scientific idea and what evidence supports it.

	To understand how humans have evolved over time and how human behaviour can affect change in species over time. **Discussion Text**	Explaining, in simple terms, a scientific idea and the evidence that supports it.	Presenting a report of their findings through writing. Reporting and presenting findings from enquiries in written forms.
Spring 2	**SCIENCE FAIR**		
Summer 1	Classifying Organisms To be able to identify and classify organisms in the local area. **Information Text About the Local Environment**	Taking repeated readings when appropriate. Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and what evidence supports it. Finding a pattern from their data and explaining what it shows.	Recording their measurements in different ways. Presenting a report of their findings through writing. Finding a pattern from their data and explaining what it shows. Linking what they have found out to other science. Drawing conclusions from their work. Reporting findings from investigations through written explanations and conclusions using appropriate scientific language. Noticing patterns, groupings and classifying. Reporting and presenting findings from enquiries in written forms.
Summer 2	Seeing Light To investigate how we see things through light entering our eyes. **Explanation Text**	Recording more complex data and results using scientific diagrams and writing. Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and what evidence supports it.	Explaining, in simple terms, a scientific idea and what evidence supports it. Presenting a report of their findings through writing. Reporting and presenting findings from enquiries in written forms.

Year 2: Year 3 and 4

	Writing Opportunities	Year 3 Scientific Skills	Year 4 Scientific Skills
Autumn 1	States of Matter	Describing what they have found using scientific language.	Explaining their findings in different ways e.g. explanation text or story.

	To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Explanation Text (Water Cycle)**	Explaining their findings in different ways e.g. explanation text or story.	Reporting findings from investigations through written explanations and conclusions.
Autumn 2	Changing Sound To find out that some materials are effective in preventing vibrations from sound sources reaching the ear. **Experiment Write Up (Fancy Something Different – Soundproofing Experiment)**	Planning and setting up a fair test. Making a prediction. Using findings to draw a conclusion. Recording observations using tables and bar graphs. Describing what they have found using scientific language. Using their findings to draw a conclusion.	Planning and setting up a fair test. Making a prediction. Using findings to draw a conclusion. Recording data using tables and bar graphs. Evaluating their findings using scientific language. Planning and carrying out an investigation by controlling variables fairly and accurately. Using test results to make further predictions. Reporting findings from investigations through written explanations and conclusions.
Spring 1	Circuits and Conductors To investigate the differences between mains and battery-powered circuits. **Information Text (Mains and Battery Circuits)**	Describing what they have found using scientific language. Recording their observations in different ways, such as labelled diagrams. Explaining their findings in different ways.	Explaining their findings in different ways e.g. explanation text or story. Identifying differences, similarities or changes related to simple scientific ideas or processes. Reporting findings from investigations through written explanations and conclusions.
Spring 2	**SCIENCE FAIR**		
Summer 1	Eating and Digestion To investigate how the digestive system works. **Poem About the Digestive System**	Describing what they have found using scientific language. Explaining their findings in different ways.	Explaining their findings in different ways e.g. explanation text or story. Reporting findings through different text types.

Summer 2	Living in Environments To explore the human impact on habitats and environments. **Persuasive Argument**	Describing what they have found using scientific language. Explaining why they need to collect information to answer a question. Observing changes over different periods of time. Explaining their findings in different ways e.g. explanation text or story.	Explaining their findings in different ways e.g. explanation text or story. Using their findings to draw a simple conclusion. Evaluating and communicating their findings. Identifying differences, similarities or changes related to simple scientific ideas or processes. Observing changes over different periods of time. Reporting findings from investigations through written explanations and conclusions.

Year 2: Year 5 and 6

	Writing Opportunities	Year 5 Scientific Skills	Year 6 Scientific Skills
Autumn 1	Healthy Bodies To investigate how muscles move the skeleton and how muscle activity requires increased blood flow. **Information Text**	Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and the evidence that supports it.	Explaining, in simple terms, a scientific idea and what evidence supports it. Presenting a report of their findings through writing. Reporting and presenting findings from enquiries in written forms.
Autumn 2	Earth and Space To describe the Sun, Earth and Moon as approximately spherical bodies. **Diary Entry (First Person Recount – Finding Out the Earth is Round)**	Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and the evidence that supports it.	Explaining, in simple terms, a scientific idea and what evidence supports it. Presenting a report of their findings through writing. Reporting and presenting findings from enquiries in written forms.
Spring 1	Properties and Changes of Materials To explain that some changes from new materials and that these changes are not usually reversible.	Planning and carrying out a scientific enquiry to answer questions. Making a prediction with reasons.	Exploring different ways to test an idea, choose the best way, and give reasons.

	Experiment Write Up	Recording more complex data and results in a range of ways. Presenting a report of their findings through writing. Varying one factor whilst keeping the others the same in an experiment. Explaining, in simple terms, a scientific idea and the evidence that supports it. Finding a pattern from their data and explaining what it shows.	Identifying the key factors when planning a fair test. Varying one factor whilst keeping the others the same in an experiment. Using information to make a prediction and give reasons for it. Explaining, in simple terms, a scientific idea and what evidence supports it. Recording measurements in different ways. Presenting a report of their findings through writing. Drawing conclusions from their work. Making a prediction which links with other scientific knowledge. Identifying scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it.
Spring 2	**SCIENCE FAIR**		
Summer 1	Forces in Actions To identify and explain the effects of air resistance. **Explanation Text**	Making a prediction with reasons. Taking measurements using a range of scientific equipment with increasing accuracy and precision. Recording more complex data and results using scientific diagrams etc. Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and the evidence that supports it. Varying one factor whilst keeping the others the same in an experiment.	Exploring different ways to test an idea, choose the best way, and give reasons. Identifying the key factors when planning a fair test. Varying one factor whilst keeping the others the same in an experiment. Using information to make a prediction and give reasons for it. Explaining, in simple terms, a scientific idea and what evidence supports it. Recording measurements in different ways.

		Finding a pattern from their data and explaining what it shows.	Presenting a report of their findings through writing. Drawing conclusions from their work. Making a prediction which links with other scientific knowledge. Identifying scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it.
Summer 2	Changes and Reproduction To recognise the stages of development during childhood and understand the needs of children at those stages. **Chronological Report (How Children Grow)**	Presenting a report of their findings through writing. Explaining, in simple terms, a scientific idea and the evidence that supports it.	Explaining, in simple terms, a scientific idea and what evidence supports it. Presenting a report of their findings through writing. Reporting and presenting findings from enquiries in written forms.

Appendix III	
Key Resources	
Year 3 and 4	
Unit	Equipment Needed
Health and Movement	*No Additional Equipment Needed*
Forces and Magnets	• Variety of magnets including bar magnets • Variety of magnetic and non-magnetic materials to check if they are magnetic • Forcemeters • Variety of surfaces (carpet etc to check how much friction there is) • Ramps and toy cars • Tape measurers
Light and Shadow	• Variety of transparent, translucent and opaque objects • Torches • Variety of small objects to create shadows with • Chalk • Shadow Stick • Mirrors
Rocks, Fossils and Soils	• Soil samples in bags (3 different types of soil) • Graded sieves • Rock samples • Stopwatches • Pipettes
How Plants Grow	• Dried bean seeds • Cotton wool • Clear pots • Food dye • Variety of edible seeds and beans
State of Matter	*No Additional Equipment Needed*
Changing Sound	• Dried rice • Prepared string telephones • Tape measures • Buzzers

	• Materials such as: foam sheets, fabric, newspaper, bubble wrap, tin foil, kitchen roll, cling film, paper towels, cotton wool, etc • Small glass bottles
Circuits and Conductors	• Balloons • Variety of materials to test e.g. a rubber, paperclips, pencil, teaspoon, coin, paper, teabags, pen, etc • Batteries, bulbs, wires, crocodile clips • Buzzers • Variety of materials to construct switches e.g. pins, paper clips, butterfly clips, card, sticky tape, etc
Eating and Digestion	*No Additional Equipment Needed*
Living in Environments	*No Additional Equipment Needed*
Year 5 and 6	
Unit	Equipment Needed
Changing Circuits	• Batteries and bulbs • Different thicknesses of fuse wire • Wires and crocodile clips, buzzers and motors
Life Cycles	*No Additional Equipment Needed*
Classifying Organisms	*No Additional Equipment Needed*
Evolution and Inheritance	*No Additional Equipment Needed*
Seeing Light	• Torches • Variety of opaque, transparent and translucent • Objects • Mirrors
Earth and Space	*No Additional Equipment Needed*
Changes and Reproduction	*No Additional Equipment Needed*
Forces in Action	• Marbles, ball bearings, golf balls • Forcemeters • Variety of surfaces to test • Plastic bags, string/wool, paper clips, rubber bands • Plasticine • Stopwatches • Lollipop sticks, rubber bands • Milk/water bottles with handles

	• String, cord or thin rope
Properties and Changes of Materials	• Water, salt, sugar, poster paint, sand, plaster of Paris, baking powder • Sand, marbles, paperclips, rice, gravel, ground coffee, sugar, water, filter paper, different sizes of sieves Vinegar, bicarbonate of soda, lemon juice, plaster of Paris, effervescent tablets • Batteries, bulbs and wires; magnets; torches; weights • sand, candles, tweezers • A variety of different materials e.g. polystyrene, different woods, plastics, metals etc
Healthy Bodies	*No Additional Equipment Needed*

Appendix IV	
Key Vocabulary	
Year 3 – Plants and Animals, including Humans	
Animals, including Humans	**Plants**
Year 1, Autumn 1 – Health and Movement	**Year 1, Summer 2 – How Plants Grow**
Nutrients	Roots
Starches	Stem
Protein	Flower
Balanced Diet	Leaf
Carbohydrates	Flowering Plants
Fibre	Seed
Digestive System	Moisture
Antioxidants	Absorb
Minerals	Minerals
Carnivores	Soil
Predators	Photosynthesis
Herbivores	Chlorophyll
Prey	Evaporates
Omnivores	Pollen
Organs	Reproduction
Collar Bone	Egg Cell
Ribs	Pollination
Femur	Sepal
Fibula	Petal
Tibia	Stamen
Pelvis	Carpel
Vertebrae	Anther
Shoulder Blade	Filament
Skull	Aquatic Plants
Vertebrates	Nectar
Invertebrates	Style
Muscle	Stigma
Contract	Ovary

Relax Skeletal System Muscular System	Fertilization Germination Seed Dispersal Petals

Year 3 – Rocks, Forces and Magnets, Light		
Rocks	**Forces and Magnets**	**Light**
Year 1, Summer 1 – Rocks, Fossils and Soils	**Year 1, Autumn 2 – Forces and Magnets**	**Year 1, Spring 1 – Light and Shadow**
Rock	Force	Light
Fossil	Magnet	Shadow
Soil	Push	Dark
Mineral	Pull	Emit
Crystal	Forcemeter	Light Sources
Marble	Spring	Reflection
Hard-wearing	Stretch	Day
Slate	Newton Meters	Night
Chalk	Gravity	Axis
Limestone	Weightless	Dawn
Natural	Magnetism	Dusk
Man-made	Magnetic Field	Artificial Light
Criterion	Iron Filings	UV
Characteristics	Magnetic Poles	Opaque
Venn Diagram	Compass	Transparent
Carroll Diagram	Attract	Translucent
Erosion	Repel	
Permeable	Magnetic	
Microorganisms	Non-Magnetic	
Pedologists	Predict	
Fragment	Iron	
Contract	Steel	
Weathering	Copper	
Decaying	Brass	
Organic Layer	Aluminium	

Topsoil Subsoil Regolith Bedrock Sand Silt Compressed Inner Core Outer Core Crust Mantle Iron Igneous Rock Sedimentary Rock Metamorphic Rock Petrified Dissolves Palaeontologist Organisms Prehistoric Erosion Ammonite Trilobite Camarasaurus	Alloys Nickel Cobalt	
Year 4 – Living Things and their Habitats, Animals including Humans and States of Matter		
Animals including Humans	**Living Things and their Habitats**	**States of Matter**
Year 2, Summer 1 – Eating and Digestion	**Year 2, Summer 2 – Living in Environments**	**Year 2, Autumn 1 – States of Matter**
Energy Nutrients Healthy Herbivore Omnivore Carnivore	Habitat Environment Organism Internal Skeleton Outer Skeleton Conditions	Solid Liquid Gas Evaporate Freeze Compare

Food chain	Characteristics	Group
Diet	Classification System	Similarities
Producers	Vertebrate	Differences
Consumer	Invertebrate	Particles
Photosynthesis	Mammal	Properties
Organism	Bird	Air Resistance
Ecosystem	Insect	Compress
Teeth	Reptile	Changing State
Tongue	Fish	Solidify
Liver	Amphibian	Temperature
Gallbladder	Exoskeleton	Thermometer
Large Intestine	Mollusc	Mercury
Small Intestine	Annelids	Molten rock
Oesophagus	Arachnids	Lava
Stomach	Crustaceans	Degrees Celsius
Pancreas	Warm Blooded	Fahrenheit
Anus	Cold Blooded	Gallium
Digestion	Oxygen	Condensation
Digestive System	Deforestation	Water Cycle
Incisors	Eco Friendly	Water Vapour
Canines	Endangered Species	Condensation
Molars	Criterion	Precipitation
Premolars		
Milk Teeth		
Saliva		
Enzymes		
Bloodstream		
Bile		
Fat		
Hydrates		
Absorbs		
Toxins		
Bacteria		

Yeast Faeces		

Year 4 – Sound and Electricity	
Sound	**Electricity**
Year 2, Autumn 2 – Changing Sound	**Year 2, Spring 1 – Circuits and Conductors**
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 – Living Things and their Habitats, Properties and changes to materials		
Animals including Humans	**Living Things and their Habitats**	**Properties and changes to materials**
Year 2, Summer 2 – Changes and Reproduction	**Year 1, Autumn 1 – Life Cycles**	**Year 2, Spring 1 – Properties and Changes of Materials**
Growth	Life Cycles	Properties
Development	Flower	Materials
Exercise	Petal	Dissolve
Factors	Filament	Solid
Life Cycle	Anther	Liquid
Gestation	Stigma	Gas
Infancy	Style	Solution
Childhood	Ovary	Particles
Adolescence	Carpel	Transparent
Adulthood	Stamen	React
Old Age	Sepals	Float
Fertilised Female Egg Cell	Egg cells	Sink
Womb	Pollen	Soluble
Microscopic	Nectar	Evaporation
Embryo	Fertilised	Reversible
Foetus	Sexually	Filtering
Ultrasound Scan	Reproduce	Filtration
Babies	Pollination	Sieving
Infant	Genetic Information	Insoluble
Puberty	Pollen Tubes	Water Cycle
Sperm Cell	Asexual Reproduction	Effervescent
Reproduce	Sexual Reproduction	Substance
Nutrients	Bulb	Heating
Twins	Tubers	Cooling
Sexual Intercourse	Runner	Temperate
Bladder	Plantlets	Condensation
Penis	Clone	Freezing
Testes	Genetically Identical	Melting
Reproductive Organs	Cuttings	Vapour

Urine	Parent Plant	Ignite
Uterus	Organism	Flammable
Ovary/ies	Internal Fertilisation	Transparent
Bladder	External Fertilisation	Malleable
Vagina	Mating	Brittle
Vulva	Womb	Comparative
Embryo	Nutrients	Translucent
Breastfeed	Offspring	Soluble
Breasts	Sperm	Conductive
Hormones	Embryo	Flexible
Glands	Female Sex Cell	Compressed
Pituitary Gland	Pregnant	Waterproof
Sex Hormones	Hermaphrodites	
Pubic Hair	Colonies	
Armpit	Environment	
Ejaculate	Gestation Periods	
Periods	Mammal	
Hips	Life Expectancy	
Menstruation	Reptile	
Sanitary Pads	Incubate	
Tampons	Metamorphosis	
Wet Dream	Pupa	
Sweat	Breeding	
Deodorant	Naturalists	
Antiperspirant	Oceanographer	
Genitals	Laboratories	
Balanced Diet	Pollution	
Hygiene	Conservation	
Adolescence	Pesticides	
Mature		
Elasticity		
Smoking		
Alcohol		

Year 5 – Earth, Space and Forces	
Earth and Space	**Forces**
Year 2, Autumn 2 – Earth and Space	**Year 2, Summer 1 – Forces in Action**
Sun	Force
Earth	Gravity
Moon	Earth
Spherical	Weight
Space	Gravitational Force
Sphere	Centre of the Earth
Astronauts	Meteorite
Horizon	Crater
Diameter	Diameter
Rotation	Atmosphere
Shadow	Eroded
Axis	Friction
Rotate	Resistance
Time Zones	Forcemeter
Sunrise	Newtons
Sunset	Grams
Orbits	Isaac Newton
Satellite	Water Resistance
Craters	Streamlined
Meteors	Levers
Emits	Pulleys
Reflects	Hinge
Waning Crescent	Fulcrum
Waning Gibbous	Air Resistance
Waxing Crescent	Gears
Waxing Gibbous	Cog Wheels
Half Moon	Transmission
New Moon	Axle
Full Moon	Driver Gear
Calendar	Anticlockwise

Lunar Cycle Solar System Leap Year Planets Asteroid Belt Mercury Venus Mars Jupiter Saturn Uranus Neptune	Torque

Year 6 – Living Things		
Evolution and Inheritance	**Living things and their Habitats**	**Animals, including Humans**
Year 1, Spring 1 – Evolution and Inheritance	**Year 1, Summer 1 – Classifying Organisms**	**Year 2, Autumn 1 – Healthy Bodies**
Evolution	Plant	Balanced Diet
Inheritance	Mammal	Energy
Inherited	Amphibian	Muscle
Offspring	Bird	Exercise
Characteristics	Fish	Heart Rate
Traits	Reptile	Vitamins
Distinctive	Insect	Minerals
Variation	Crustacean	Protein
Resistance	Arachnid	Carbohydrate
Disease	Mollusc	Minerals
Pigment	Organism	Fibre
Crossbreed	Features	Fat
Adapted	Plants	Sugars
Advantageous	Animals	Starches
Invertebrates	Invertebrates	Organs
Disadvantageous	Vertebrates	Immune System
Scarcer	Exoskeleton	Digestive System
Environments	Warm Blooded	Source of Energy

Organism	Offspring	Insulation
Generation	Cold Blooded	Nerve Fibres
Predators	Unsegmented	Iron
Reproduce	Segmented	Calcium
Survival	Echinoderm	Magnesium
Descended	Annelid	Zinc
Classifying	Myriapod	Potassium
Natural Selection	Classification	Circulatory System
Species	Aquatic	Small Intestine
Primates	Carnivore	Absorbs
Prehensile	Herbivore	Blood Stream
Carl Linnaeus	Omnivore	Heart
Charles Darwin	Botanist	Lungs
Haplorhini	Vascular	Oxygen (o2)
Mutations	Non Vascular	Carbon Dioxide (co2)
External Factors	Nutrients	Bronchioles
Fossils	Roots	Arteries
Palaeontologists	Stem	Scurvy
Extinct	Rhizoids	Vitamin C
Mammals	Spores	Mortality Rate
Deforestation	Non Flowering	Clinical Trial
Cross Pollination	Flowering	Vitamin Deficiencies
Selective Breeding	Carl Linnaeus	Rickets
	Classification System	Blood Vessels
	Taxonomy	Veins
	Kingdom	Pulse Rate
	Order	Smooth Muscles
	Genesis	Cardiac Muscles
	Species	Skeletal Muscles
	Binomial Nomenclature	Extensor
	Phylum	Flexor
	Class	Contract
	Microbes	Relax

	Bacteria Fungi Viruses Oxygen Diseases Protists Joseph Lister Sterilise Habitat	Beneficial Harmful Illegal Legal Medicines Prescription Tobacco Cigarettes Nicotine Addictive Drugs Cardiovascular Disease Emphysema Blood Pressure Asthma Alcohol Alcoholism Depression Paracetamol Liver Cocaine Cannabis Ecstasy Pharmacy Superior Vena Cava Pulmonary Veins Right Atrium Right Ventricle Inferior Vena Cava Aorta Left Ventricle Left Atrium Pulmonary Veins

		Pulmonary Artery Pectorals Biceps Rectus Abdominus Quadriceps Obliques Deltoids Trapezius Triceps Gastrocnemius Biceps Femoris Gluteals Latissimus Dorsi

Year 6 – Electricity and Light	
Electricity	**Light**
Year 1, Autumn 2 – Changing Circuits	**Year 1, Summer 2 – Seeing Light**
Electricity Circuits Volt Current Conductor Component Battery Motor Insulator Amperes Wires Bulbs Buzzer Switch Open Switch Closed Switch	Light Shadows Source Reflects Cornea Lens Sclera Optic Nerves Retina Pupil Iris Transparent Opaque Translucent

Series Circuit Parallel Circuit Voltage Dimmer Conventional Symbols	

Appendix V		
Cross Curricular Links		
Year 3 – Plants and Animals, including Humans		
Animals, including Humans	**Plants**	
Year 1, Autumn 1 – Health and Movement	**Year 1, Summer 2 – How Plants Grow**	
ICT – Internet Research Maths – Creating Tally Charts, Pictograms and Bar Graphs English – Writing Opportunities	Maths – Creating Tally Charts, Measuring Height English – Writing Opportunities, Sequencing Art – Drawing Results	
Year 3 – Rocks, Forces and Magnets, Light		
Rocks	**Forces and Magnets**	**Light**
Year 1, Summer 1 – Rocks, Fossils and Soils	**Year 1, Autumn 2 – Forces and Magnets**	**Year 1, Spring 1 – Light and Shadow**
Geography – Local Environment Art – Drawing Results History – Pre-history English – Writing Opportunities Maths – Venn and Carroll Diagrams	ICT – Internet Research Art – Drawing Results Maths – Units of Measure English – Writing Opportunities	Art – Drawing Results Maths – Bar Graphs, Units of Measure English – Writing Opportunities
Year 4 – Living Things and their Habitats, Animals including Humans and States of Matter		
Animals including Humans	**Living Things and their Habitats**	**States of Matter**
Year 2, Summer 1 – Eating and Digestion	**Year 2, Summer 2 – Living in Environments**	**Year 2, Autumn 1 – States of Matter**
Maths – Venn Diagram English – Writing Opportunities	Geography – Local Area Maths – Carroll Diagram English – Writing Opportunities	Art – Drawing Results Maths – Bar Graphs, Units of Measure English – Writing Opportunities
Year 4 – Sound and Electricity		
Sound	**Electricity**	
Year 2, Autumn 2 – Changing Sound	**Year 2, Spring 1 – Circuits and Conductors**	

Music – Pitch, Tone Art – Drawing Results DT - Design English – Writing Opportunities		Art – Drawing Results English – Writing Opportunities
Year 5 – Living Things and their Habitats, Properties and changes to materials		
Animals including Humans	**Living Things and their Habitats**	**Properties and changes to materials**
Year 2, Summer 2 – Changes and Reproduction	**Year 1, Autumn 1 – Life Cycles**	**Year 2, Spring 1 – Properties and Changes of Materials**
RSE/PSHE – Puberty, Drug Maths – Bar Graphs English – Writing Opportunities	Maths – Carroll Diagram ICT – Internet Research English – Writing Opportunities	Maths – Carroll Diagram Art – Drawing Results English – Writing Opportunities
Year 5 – Earth, Space and Forces		
Earth and Space		**Forces**
Year 2, Autumn 2 – Earth and Space		**Year 2, Summer 1 – Forces in Action**
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, Using a Protractor DT – Making a Parachute, Making Gears Art – Drawing Results History – Ancient Greek Technology English – Writing Opportunities
Year 6 – Living Things		
Evolution and Inheritance	**Living things and their Habitats**	**Animals, including Humans**
Year 1, Spring 1 – Evolution and Inheritance	**Year 1, Summer 1 – Classifying Organisms**	**Year 2, Autumn 1 – Healthy Bodies**

PSHE – Family, Discussion Art – Drawing Organisms Geography – Countries of the World, Climates ICT – Internet research History – Prehistory English – Writing Opportunities	ICT – Internet Research Geography – Local Environment English – Writing Opportunities	History – 18th Century Sailors PE – The Effects of Exercise PSHE – Drug and Alcohol Abuse English – Writing Opportunities
Year 6 – Electricity and Light		
Electricity	**Light**	
Year 1, Autumn 2 – Changing Circuits	**Year 1, Summer 2 – Seeing Light**	
History – Nikola Tesla PSHE – Mental Health, Bullying English – Writing Opportunities	Art – Shading Maths – Bar Graphs English – Writing Opportunities	

Appendix VI
Science Fair
As part of the Key Stage 2 curriculum, all year groups have the statutory requirement to 'work scientifically' within the Science curriculum as well as in other subjects. This statutory requirement gives children the opportunity to plan, carry out and evaluate a range of scientific experiments and while pupils have many chances to do this throughout each academic year, we wanted to trial addressing this part of the curriculum in a creative and interactive way in the form of a 'Science Fair'. Each class decides on their chosen area of Science to explore and also their chosen research topic. Once these have been decided, the class work together to plan and carry out an experiment to answer their chosen research question. During the Science Fair, each class presents their findings from their 6 weeks' worth of research, experiments and evaluations in the form of a Science Fair. We invite families into the school hall to peruse the presentations of every class and to marvel at all of their hard work and scientific enquiries. There is an opportunity during the Science Fair to chat to both staff and pupils from each class about their findings as well as watching some of the practical experiments in action!

Appendix VII
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 VIII
Trips and Visits
Amazona Zoo: July 2022 Planetarium: June 2022 London Science Museum: Planned for Spring/Summer 2023

Appendix IX

Progression of Scientific Skills Overview

	Planning
Y3	3P1: Use different ideas and suggest how to find something out. 3P2: Make and record a prediction before testing. 3P3: Plan a fair test and explain why it was fair. 3P4: Set up a simple fair test to make comparisons. 3P5: Explain why they need to collect information to answer a question. GD3P1: Record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables.
Y4	4P1: Plan and set up a fair test and isolate variables, explaining why it was fair and which variables have been isolated. 4P2: Suggest improvements and predictions. 4P3: Ask their own questions. 4P4: Decide which information needs to be collected and decide what the best way to collect it is. 4P5: Use their findings to draw a simple conclusion. GD4P1: Plan and carry out an investigation by controlling variables fairly and accurately. GD4P2: Use test results to make further predictions and set up further comparative tests.
Y5	5P1: Plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary. 5P2: Make a prediction with reasons. 5P3: Use test results to make predictions to set up comparative and fair tests. GD5P1: Explore different ways to test an idea, choose the best way and give reasons. GD5P2: Vary one factor whilst keeping the others the same in an experiment. GD5P3: Use information to help make a prediction. GD5P4: Explain in simple terms, a scientific idea and what evidence supports it.
Y6	6P1: Explore different ways to test an idea, choose the best way, and give reasons. 6P2: Identify the key factors when planning a fair test. 6P3: Vary one factor whilst keeping the others the same in an experiment. Explain why they do this. 6P4: Use information to make a prediction and give reasons for it.

	6P5: Use test results to make further predictions and set up further comparative tests. 6P6: Explain, in simple terms, a scientific idea and what evidence supports it. GD6P1: Choose the best way to answer a question and use information from different sources to plan an investigation. GD6P2: Make a prediction which links with other scientific knowledge.

	Obtaining and Presenting Evidence
Y3	3O1: Take accurate measurements using different equipment and units of measure. 3O2: Record their observations in different ways - labelled diagrams, charts etc. 3O3: Describe what they have found using scientific language. GD3O1: Explain their findings in different ways (display, presentation, and writing). GD3O2: Use their findings to draw a simple conclusion. GD3O3: Suggest improvements and predictions for further tests.
Y4	4O1: Take measurements using different equipment and units of measure and record what they have found in a range of ways. 4O2: Use a range scientific equipment to take accurate measurements or readings. 4O3: Explain their findings in different ways (display, presentation, writing). 4O4: Record data using diagrams, labels, classification keys, tables, scatter graphs, bar graphs and line graphs. GD4O1: Record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models.
Y5	5O1: Take measurements using a range of scientific equipment with increasing accuracy and precision. 5O2: Take repeat readings when appropriate. 5O3: Record more complex data and results using scientific diagrams, labels, classification keys, table, scatter graphs, bar and line graphs. GD5O1: Decide which units of measurement they need to use. GD5O2: Explain why a measurement needs to be repeated.
Y6	6O1: Explain why they have chosen specific equipment (including ICT based equipment). 6O2: Decide which units of measurement they need to use. 6O3: Make precise measurements. 6O4: Explain why a measurement needs to be repeated.

	6O5: Record their measurements in different ways (including bar charts, tables and line graphs). 6O6: Read and record measurements systematically using a range of scientific equipment with increasing accuracy and precision. 6O7: Present a report of their findings through writing, display and presentation. GD6O1: Plan which equipment they will need and use it effectively. GD6O2: Explain qualitative and quantitative data.

	Considering Evidence and Evaluating
Y3	3E1: Explain what they have found out and use their measurements to say whether it helps to answer their question. GD3E1: Suggest how to improve their work if they did it again.
Y4	4E1: Find any patterns in their evidence or measurements. 4E2: Evaluate and communicate their methods and findings. 4E3: Make a prediction based on something they have found out. 4E4: Ask further questions based on their data and observations. 4E5: Evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables. 4E6: Identify differences, similarities or changes related to simple scientific ideas or processes. GD4E1: Report findings from investigations through written explanations and conclusions. GD4E2: Use a graph or diagram to answer scientific questions.
Y5	5E1: Use a graph to answer scientific questions. 5E2: Present a report of their findings through writing, display and presentation. GD5E1: Find a pattern from their data and explain what it shows. GD5E2: Link what they have found out to other science. GD5E3: Suggest how to improve their work and say why they think this.
Y6	6E1: Find a pattern from their data and explain what it shows. 6E2: Use a graph to answer scientific questions. 6E3: Link what they have found out to other science. 6E4: Suggest how to improve their work and say why they think this. 6E5: Record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models.

	6E6: Draw conclusions from their work. 6E7: Report findings from investigations through written explanations and conclusions using appropriate scientific language. GD6E1: Identify scientific evidence that has been used to support or to refute ideas or arguments and link their conclusions to it. GD6E2: Explain how they could improve their way of working. GD6E3: 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.

	Types of Investigations
Y3	3I1: Children should have the opportunity to investigate. 3I2: Observing changes over different periods of time. 3I3: Noticing patterns. 3I4: Grouping and classifying. 3I5: Carrying out comparative and fair tests. 3I6: Finding things out using secondary resources.
Y4	4I1: Observing changes over different periods of time. 4I2: Noticing patterns. 4I3: Grouping and classifying. 4I4: Carrying out comparative and fair tests. 4I5: Finding things out using secondary resources. GD4I1: Use a range of variables to investigate.
Y5	5I1: Children should have the opportunity to investigate through: 5I2: Recognising and controlling variables accurately and fairly, including changes over different periods of time. 5I3: Noticing patterns, groupings and classifying. 5I4: Carrying out comparative and fair tests. 5I5: Finding things out using a wide range of secondary sources.
Y6	6I1: Children should have the opportunity to investigate through: 6I2: Recognising and controlling variables accurately and fairly, including changes over different periods of time. 6I3: Noticing patterns, groupings and classifying.

		6I4: Carrying out comparative and fair tests. 6I5: Finding things out using a wide range of secondary sources.

Appendix X

Reasonable Adjustments

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 Science 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*
- *Print out portions of work and learning objectives to minimise writing*
- *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)*
- *Coloured exercise books*
- *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*