Harriers Banbury Academy
an Aspirations Academy

Long Term Scheme of Work for Science

Curriculum Intent:

At Harriers, Science enables pupils to be curious and ask questions allowing authenticity and improving their science capital. It engages pupils and meets exciting challenges allowing them to investigate. Pupils will be able to explore, think, talk and be scientists.

Whole School thread:

1. Children using different enquiry types to answer scientific questions about the world around them.

2. Children develop independence in: asking scientific questions, planning how to investigate them, carrying out and evaluating investigations.

3. Children having the opportunity to understand the implications of science today and in the future.

Working Scientifically (All terms)
Need to Knows

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• Show curiosity about objects, events and people Playing & Exploring • Questions why things happen • Explore the world around them and raise their own simple questions • Engage in open-ended activity Playing & Exploring Experience different types of science enquiries, including practical activities • Take a risk, engage in new experiences and learn by trial and error Playing & Exploring Begin to recognise different ways in which they might answer scientific questions • Find ways to solve problems / find new ways to do things / test their ideas • Creating & Thinking critically • Carry out simple tests • Develop ideas of grouping, sequences, cause and effect. • Know about similarities and differences in relation to places,	• Ask simple questions and recognise that they can be answered in different ways. • Use simple equipment to observe closely • Perform simple tests • Identify and classify • Use his/her observations and ideas to suggest answers to questions • Gather and record data to help in answering questions	• Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum • Use simple equipment to observe closely including changes over time • Perform simple comparative tests • Identify, group and classify • Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns • Gather and record data to help in answering questions including from secondary sources of information.	• Ask relevant questions and use different types of scientific enquiries to answer them • Set up simple practical enquiries, comparative and fair tests • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	• Ask relevant questions and use different types of scientific enquiries to answer them • Set up simple practical enquiries, comparative and fair tests • Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gather, record, classify and present data in a variety of ways to help in answering questions • Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	• Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and	• Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary • Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Use test results to make predictions to set up further comparative and fair tests • 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

objects, materials and living things • ELG: The World • Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying) • Comments and asks questions about aspects of their familiar world such as the place where • they live or the natural world • Ask people questions and use simple secondary sources to find answers • Closely observes what animals, people and vehicles do • Use senses to explore the world around them Playing & Exploring • Observe closely using simple equipment • With help, observe changes over time • Make links and notice patterns in their experience • With guidance, they should begin to notice patterns and relationships • Choose the resources they need for their chosen activities • Handle equipment and tools effectively			• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support his/her findings.	• Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identify differences, similarities or changes related to simple scientific ideas and processes. • Use straightforward scientific evidence to answer questions or to support his/her findings.	written forms such as displays and other presentations • Identify scientific evidence that has been used to support or refute ideas or arguments.	displays and other presentations • 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 • Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources • Group and classify things and recognise patterns.

• Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data • Create simple representations of events, people and objects • Answer how and why questions about their experiences • Make observations of animals and plants and explain why some things occur, and talk about • change • Use their observations and ideas to suggest answers to questions • Talk about what they have found out and how they found it out • Develop their own narratives and explanations by connecting ideas or events • Builds up vocabulary that reflects the breadth of their experience • With help, they should record and communicate their findings in a range of ways and begin to • use simple scientific language.						

Working Scientifically
Skills

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• I can ask simple scientific questions. • I can use simple equipment to make observations. • I can identify the similarities and differences in relation to objects, materials and living things. • I can talk about the features of my own environment and how environments may differ from one another. • I can make observations of animals and plants and explain why some things occur. • I can talk about changes.	• I can ask simple scientific questions. • I can use simple equipment to make observations. • I can carry out simple tests. • I can identify and classify things. • I can suggest what I have found out. • I can use simple data to answer questions	• I can ask simple scientific questions. • I can use simple equipment to make observations. • I can carry out simple tests. • I can identify and classify things. • I can suggest what I have found out. • I can use simple data to answer questions.	• I can ask relevant scientific questions. • I can use observations and knowledge to answer scientific questions. • I can set up a simple enquiry to explore a scientific question. • I can set up a test to compare two things. • I can set up a fair test and explain why it is fair. • I can make careful and accurate observations, including the use of standard units. • I can use equipment, including thermometers and data loggers to make measurements. • I can gather, record, classify and present data in different ways to answer scientific questions. • I can use diagrams, keys, bar charts and tables; using scientific language. • I can use findings to report in different ways, including oral and written explanations, presentation.	• I can ask relevant scientific questions. • I can use observations and knowledge to answer scientific questions. • I can set up a simple enquiry to explore a scientific question. • I can set up a test to compare two things. • I can set up a fair test and explain why it is fair. • I can make careful and accurate observations, including the use of standard units. • I can use equipment, including thermometers and data loggers to make measurements. • I can gather, record, classify and present data in different ways to answer scientific questions. • I can use diagrams, keys, bar charts and tables; using scientific language. • I can use findings to report in different ways, including oral and written explanations, presentation.	• I can plan different types of scientific enquiry. • I can control variables in an enquiry. • I can measure accurate and precisely using a range of equipment. • I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • I can use the outcome of test results to make predictions and set up a further comparative fair test. • I can report findings from enquiries in a range of ways. • I can explain a conclusion from an enquiry. • I can explain causal relationships in an enquiry. • I can relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory.	• I can plan different types of scientific enquiry. • I can control variables in an enquiry. • I can measure accurate and precisely using a range of equipment. • I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. • I can use the outcome of test results to make predictions and set up a further comparative fair test. • I can report findings from enquiries in a range of ways. • I can explain a conclusion from an enquiry. • I can explain causal relationships in an enquiry. • I can relate the outcome from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory. • Read, spell and pronounce scientific vocabulary accurately.

			• I can draw conclusions and suggest improvements. • I can make a prediction with a reason. • I can identify differences, similarities and changes related to an enquiry.	• I can draw conclusions and suggest improvements. • I can make a prediction with a reason. • I can identify differences, similarities and changes related to an enquiry	• I can read, spell and pronounce scientific vocabulary accurately.	

Working Scientifically Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• 'How' and 'Why' questions	• question • answer • observe • observing • equipment • identify • sort • diagram • chart • compare • contrast • describe • group • record	• question • answer • observe • observing • equipment • identify • classify • sort • diagram • chart • map • data • compare • contrast • describe • biology • chemistry • physics • group • record	• experiment • fair test • prediction • observation • thermometer • temperature • microscope • accuracy • results • diagram • conclusion	• experiment • fair test • variables • prediction • observation • thermometer • temperature • microscope • accuracy • results • diagram • conclusion • enquiry	• fair test • dependent variable • independent variable • control variables • prediction • observation • accurate • average • reliable • pattern • relationship • rogue • conclusion • improvement • comparative test	• fair test • dependent variable • independent variable • control variables • prediction • observation • accurate • average • reliable • trend • pattern • causal • relationship • rogue • conclusion • improvement • precision

Animals Including Humans
Need to Knows

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• Children know about similarities and differences in relation to places, objects, materials and living things. Talk about the features of their own immediate environment and how environments might vary from one another. • They make observations of animals and plants and explain why some things occur and talk about changes.	• Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (TERM 5) • Identify and name a variety of common animals that are carnivores, herbivores and omnivores (TERM 5) • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) (TERM 5) SCIENTIST: ALFRED RUSSEL WALLACE • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (TERM 1) SCIENTIST: EDWARD JENNER	• Understand that animals, including humans, have offspring which grow into adults (TERM 3) • Describe the basic needs of animals, including humans, for survival (water, food and air) (TERM 4) • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene (TERM 4) SCIENTIST: FLORENCE NIGHTINGALE	• 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 (TERM 6) • Identify that humans and some other animals have skeletons and muscles for support, protection and movement (TERM 6) SCIENTIST: JANE GOODALL	• Describe the simple functions of the basic parts of the digestive system in humans (TERM 1) • Identify the different types of teeth in humans and their simple functions (TERM 1) SCIENTIST: PIERRE FAUCHARD • Construct and interpret a variety of food chains, identifying producers, predators and prey (TERM 3) SCIENTIST: LOUIS PASTEUR	• Describe the changes as humans develop to old age (TERM 5) SCIENTIST:ANDREUS VASELIUS	• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood (TERM 5) • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function (TERM 5) • Describe the ways in which nutrients and water are transported within animals, including humans (TERM 5) SCIENTIST: WILLIAM HARVEY

Animals including Humans
Skills

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• I can name a variety of animals including fish, amphibians, reptiles, birds and mammals. • I can classify and name animals by what they eat (carnivore, herbivore and omnivore). • I can sort animals into categories (including fish, amphibians, reptiles, birds and mammals). • ·I can sort living and non-living things. • ·I can name the parts of the human body that I can see. • ·I can link the correct part of the human body to each sense.	• I can explain the basic stages in a life cycle for animals, including humans. • I can describe what animals and humans need to survive. • I can describe why exercise, a balanced diet and good hygiene are important for humans.	• I can explain the importance of a nutritious, balanced diet. • I can explain how nutrients, water and oxygen are transported within animals and humans. • I can describe and explain the skeletal system of a human. • I can describe and explain the muscular system of a human. • I can describe the purpose of the skeleton in humans and animals.	• I can identify and name the parts of the human digestive system. • I can describe the functions of the organs in the human digestive system. • I can identify and describe the different types of teeth in humans. • I can describe the functions of different human teeth. • I can use food chains to identify producers, predators and prey. • I can construct food chains to identify producers, predators and prey.	• I can create a timeline to indicate stages of growth in humans.	• I can identify and name the main parts of the human circulatory system. • I can describe the function of the heart, blood vessels and blood. • I can discuss the impact of diet, exercise, drugs and lifestyle on health. • I can describe the ways in which nutrients and water are transported in animals, including humans.

Animals including Humans
Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• ommon animals • fish • amphibians • reptiles • birds • mammals • pets • senses • tongue - taste • nose - smell • eyes - vision	• basic need • offspring • water • food • air • exercise • hygiene • adult • amount	• nutrition • energy • healthy • grow • nutrition • omnivores • carnivores • herbivores • vitamins • minerals • fat	• Mouth • Tongue • Teeth • Oesophagus • Stomach • Small • Intestine • Large Intestine • Herbivore • Carnivore • Canine	• Foetus • Embryo • Womb • Gestation • Baby • Toddler • Teenager • Elderly • Growth, • Development • Puberty	• Circulatory • Heart • Blood • Vessels • Veins, • Arteries • Oxygenated • Deoxygenated • Valve • Exercise • Respiration

	• skin - touch • ears - hearing • head • neck • arms • elbows • legs • knees • face • ears • eyes • hair • mouth • teeth • omnivores • meat and plants • badger • human • bear • chickens • carnivores • meat • cat • dog • lion • tiger • fox • shark • killer • whale • eagle • hawk • snake • Tyrannosaurus rex		• carbohydrate • protein • organ • balanced • diet • dairy • sugary • fatty • fruit • vegetables • calories • saturated • non-saturated • skeleton • bone • nutrition • nutrients • carbohydrates • protein • fats • fibre • water • vitamins • minerals • skeleton • bones • joints • endoskeleton • exoskeleton • hydrostatic • skeleton • vertebrate • invertebrate • contract • relax • muscles • ball joint • socket joint • hinge joint • gliding joint	• Incisor • Molar		

Living Things and their Habitats
Need to Knows

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• Explore and compare the differences between things that are living, dead, and things that have never been alive (TERM 2) SCIENTIST: ROBERT HOOKE • Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other (TERM 3) • Identify and name a variety of plants and animals in their habitats, including micro-habitats (TERM 3) • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name		• Recognise that living things can be grouped in a variety of ways (TERM 3) • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (TERM 3) • Recognise that environments can change and that this can sometimes pose dangers and have an impact on living things (TERM 3) SCIENTIST: TU YOUYOU SCIENTIST: JOY ADAMSON	• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (TERM 1) • Describe the life process of reproduction in some plants and animals (TERM 1) SCIENTIST: JOSEPH DALTON HOOKER	• 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 (TERM 2) • Give reasons for classifying plants and animals based on specific characteristics (TERM 2) SCIENTIST: ROSALIND FRANKLIN SCIENTIST: OSWALD AVERY

		different sources of food (TERM 3) **SCIENTIST: RACHEL CARSON**				
Living Things and their Habitats Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• I can identify things that are living, dead and never lived. • I can describe how a specific habitat provides for the basic needs of things living there (plants and animals). • I can identify and name plants and animals in a range of habitats. • I can match living things to their habitat. • I can describe how animals find their food. • I can name some different sources of food for animals. • I can explain a simple food chain.		• I can group living things in different ways. • I can use classification keys to group, identify and name living things. • I can create classification keys to group, identify and name living things (for others to use). • I can describe how changes to an environment could endanger living things.	• I can describe the life cycle of different living things, e.g. mammal, amphibian, insect, bird. • I can describe the differences between different life cycles. • I can describe the process of reproduction in plants. • I can describe the process of reproduction in animals.	• I can classify living things into broad groups according to observable characteristics and based on similarities & differences. • I can describe how living things have been classified. • I can give reasons for classifying plants and animals in a specific way.

Living Things and their Habitats
Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• Living • Dead, • Habitat • Energy • Food chain • Predator • Prey • Woodland • Pond • Desert		• Vertebrates, • Fish • Amphibians • Reptiles • Birds, • Mammals • Invertebrates • Snails • Slugs • Worms • Spiders • Insects • Environment • Habitats • Ecosystem	• Mammal • Reproduction • Insect • Amphibian • Bird • Offspring	• Classification • Vertebrates • Invertebrates • Micro-organisms • Amphibians • Reptiles • Mammals • Insects

Plants
Need to Knows

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees (TERM 6) • Identify and describe the basic structure of a variety of common flowering plants, including trees (TERM 6)	• Observe and describe how seeds and bulbs grow into mature plants (TERM 5) • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy (TERM 5) SCIENTIST: JOHN RAY	• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers (TERM 5) • 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 (TERM 5)			

	SCIENTIST: BEATRIX POTTER		• **Investigate the way in which water is transported within plants (TERM 5)** • **Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (TERM 5)** **SCIENTIST: CARL LINNEUS**			
Plants Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• I can name a variety of common wild and garden plants. • I can name the petals, stem, leaf and root of a plant • I can name the roots, trunk, ranches and leaves of a tree.	• I can describe how seeds and bulbs grow into plants. • I can describe what plants need in order to grow and stay healthy (water, light & suitable temperature).	• I can describe the function of different parts of flowering plants and trees. • I can explore and describe the needs of different plants for survival. • I can explore and describe how water is transported within plants. • I can describe the plant life cycle, especially the importance of flowers.			

Plants
Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Leaves • Flowers (blossom) • Petals • Fruit • Roots • Bulb • Seed • Trunk • Branches • Stem	• Seeds • Bulbs • Water • Light • Temperature • Growth	• Air • Light • Water • Nutrients • Soil • Reproduction • Transportation • Dispersal • Pollination • Flower			

Evolution and Inheritance
Need to Knows

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						• **Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago (TERM 3)** • **Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents (TERM 3)** **(SCIENTIST: CHARLES DARWIN**

						• **Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution (TERM 6)** **SCIENTIST: GREGOR MENDEL**
Evolution and Inheritance Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						• I can describe how the earth and living things have changed over time. • I can explain how fossils can be used to find out about the past. • I can explain about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents). • I can explain how animals and plants are adapted to suit their environment. • I can link adaptation over time to evolution. • I can explain evolution.

Evolution and Inheritance
Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						• Fossils • Adaptation • Evolution, • Characteristics • Reproduction • Genetics

Seasonal Changes
Need to Knows

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• **Observe changes across the four seasons (TERM 3)** • **Observe and describe weather associated with the seasons and how day length varies. (TERM 3)** **SCIENTIST: ANDERS CELSIUS**					

Seasonal Changes
Skills

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• I can observe and comment on changes in the seasons. • I can name the seasons and suggest the type of weather in each season.					

Seasonal Changes Vocabulary						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Summer • Spring • Autumn • Winter • Sun • Day • Moon • Night • Light • Dark					
Materials and States of Matter Need to Knows						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Distinguish between an object and the material from which it is made (TERM 4) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock (TERM 4) • Describe the simple physical properties of a variety of everyday materials (TERM 4) • Compare and group together a variety of everyday materials on the basis of their simple physical properties (TERM 4)	• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses (TERM 1) • Describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching (TERM 1) SCIENTIST: MARIE CURIE		• Compare and group materials together, according to whether they are solids, liquids or gases (TERM 6) • 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) (TERM 6) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with	• 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 (TERM 2) SCIENTIST: NIKOLA TESLA • Recognise that some materials will dissolve in liquid to form a solution, and describe how to recover a substance	

	SCIENTIST: DANIEL FARENHEIT			temperature (TERM 6) SCIENTIST: ALFRED MOLINA	from a solution (TERM 6) • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating (TERM 6) • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. (TERM 2) • Demonstrate that dissolving, mixing and changes of state are reversible changes (TERM 2) • 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 (TERM 6) SCIENTIST: ROBERT BOYLE	

Materials and States of Matter
Skills

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• I can distinguish between an object and the material from which it is made • I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • I can describe the simple physical properties of a variety of everyday materials • I can compare and group together a variety of everyday materials on the basis of their simple physical properties	• I can identify and name a range of materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard. • I can suggest why a material might or might not be used for a specific job. • I can explore how shapes can be changed by squashing, bending, twisting and stretching.		• I can group materials based on their state of matter (solid, liquid, gas). • I can describe how some materials can change state. • I can explore how materials change state. • I can measure the temperature at which materials change state. • I can describe the water cycle. • I can explain the part played by evaporation and condensation in the water cycle.	• I can compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets). • I can describe how a material dissolves to form a solution; explaining the process of dissolving. • I can describe and show how to recover a substance from a solution. • I can describe how some materials can be separated. • I can demonstrate how materials can be separated (e.g. through filtering, sieving and evaporating). • I know and can demonstrate that some changes are reversible, and some are not. • I can explain how some changes result in the formation of a new material and that this is usually irreversible.	

					• I can discuss reversible and irreversible changes. • I can give evidenced reasons why materials should be used for specific purposes.	
Materials and States of Matter Vocabulary						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Wood • Plastic • Glass • Paper • Water • Metal • Rock • Hard • Soft • Bendy • Rough • Smooth	• Hard • Soft • Stretchy • Stiff • Shiny • Dull • Rough • Smooth • Bendy • Waterproof • Absorbent • Opaque • Transparent • Brick • Paper • Fabrics • Squashing • Bending • Twisting • Stretching • Elastic • Foil		• Solid • Liquid • Gas • Evaporation • Condensation • Particles • Temperature • Freezing • Heating	• Hardness • Solubility • Transparency • Conductivity • Magnetic • Filter • Evaporation • Dissolving • Mixing • Solute • Solvent • Soluble • Solution • Insoluble	
Electricity Need to Knows						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• **Identify common appliances that run**		• **Associate the brightness of a lamp or the volume of a**

				on electricity (TERM 4) • 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 (TERM 4) • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit (TERM 4) • Recognise some common conductors and insulators, and associate metals with being good conductors (TERM 4) SCIENTIST: JAMES WATT SCIENTIST: ALEXANDER GRAHAM BELL		buzzer with the number and voltage of cells used in the circuit (TERM 1) • 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 (TERM 1) • Use recognised symbols when representing a simple circuit in a diagram (TERM 1) SCIENTIST: SAMUEL MORSE SCIENTIST: NIELS BOHR

Electricity
Skills

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• I can identify and name appliances that require electricity to function. • I can construct a series circuit. • I can identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers). • I can draw a circuit diagram. • I can predict and test whether a lamp will light within a circuit. • I can describe the function of a switch in a circuit. • I can describe the difference between a conductor and insulators; giving examples of each.		• I can explain how the number & voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer. • I can compare and give reasons for why components work and do not work in a circuit. • I can draw circuit diagrams using correct symbols.

Electricity
Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• Cells • Wires • Bulbs • Switches • Buzzers • Battery • Circuit • Series • Conductors • Insulators		• Cells • Wires • Bulbs • Switches • Buzzers • Battery • Circuit • Series • Conductors • Insulators

						• Amps • Volts • Cell
Earth and Space Need to Knows						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• Identify the Earth from space. • Know that the Sun is a star. • Understand that the Moon orbits Earth. (TERM 6) SCIENTIST: TIM PEAKE			• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system (TERM 3) • Describe the movement of the Moon relative to the Earth (TERM 3) • 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 (TERM 3) SCIENTIST: EDWIN HUBBLE SCIENTIST: MAE JEMISON	

Earth and Space Skills

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• I can identify the Earth from space. • I can describe the Sun as a star. • I can explain that the Moon orbits Earth.			• I can describe and explain the movement of the Earth and other planets relative to the Sun. • I can describe and explain the movement of the Moon relative to the Earth. • I can explain and demonstrate how night and day are created. • I can describe the Sun, Earth and Moon (using the term spherical).	

Earth and Space Vocabulary

Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• Earth • Sun • Moon • Star • Space • Orbit			• Earth • Sun • Moon • Axis • Rotation • Day • Night • Phases of the Moon • Star • Constellation	

Forces and Magnets Need to Knows

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• **Compare how things move on different surfaces (TERM 4)**		• **Explain that unsupported objects fall towards the**	

			• Notice that some forces need contact between two objects, but magnetic forces can act at a distance • 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 (TERM 4) • Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing (TERM 4) SCIENTIST: MICHAEL FARADAY		Earth because of the force of gravity acting between the Earth and the falling object (TERM 4) • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces (TERM 4) • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect (TERM 4) SCIENTIST: ALBERT EINSTEIN	
Forces and Magnets Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• I can explore and describe how objects move on different surfaces. • I can explain how some forces require contact and some do not, giving examples. • I can explore and explain how objects attract and repel in		• I can explain what gravity is and its impact on our lives. • I can identify and explain the effect of air resistance. • I can identify and explain the effect of water resistance.	

			relation to objects and other magnets. • I can predict whether objects will be magnetic and carry out an enquiry to test this out. • I can describe how magnets work. • I can predict whether magnets will attract or repel and give a reason.		• I can identify and explain the effect of friction. • I can explain how levers, pulleys and gears allow a smaller force to have a greater effect.	
Forces and Magnets Vocabulary						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• Magnetic • Force • Contact • Attract • Repel • Friction • Poles • Push • Pull		• Air resistance • Water resistance • Friction • Gravity • Newton • Gears • Pulleys	
Light Need to Knows						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• **Recognise that he/she needs light in order to see things and that dark is the absence of light (TERM 2)** • **Notice that light is reflected from surfaces (TERM 2)** • **Recognise that light from the sun can be**			• **Recognise that light appears to travel in straight lines (TERM 4)** • **Use the idea that light travels in straight lines to explain that objects are seen because they give out or**

			dangerous and that there are ways to protect eyes • Recognise that light from the sun can be dangerous and that there are ways to protect eyes (TERM 2) • Find patterns in the way that the size of shadows change (TERM 2) SCIENTIST: PATRICIA BATH			reflect light into the eye (TERM 4) • 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 (TERM 4) • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them (TERM 4) SCIENTIST: ISAAC NEWTON
Light Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• I can describe what dark is (the absence of light). • I can explain that light is needed in order to see. • I can explain that light is reflected from a surface. • I can explain and demonstrate how a shadow is formed. • I can explore shadow size and explain. • I can explain the danger of direct sunlight and describe			• I can explain how light travels. • I can explain and demonstrate how we see objects. • I can explain why shadows have the same shape as the object that casts them. • I can explain how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.

			how to keep protected.			
Light Vocabulary						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• Light • Shadows • Mirror • Reflective • Dark • Reflection			• Refraction • Reflection • Light • Spectrum • Rainbow • Colour
Sound Need to Knows						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• **Identify how sounds are made, associating some of them with something vibrating (TERM 2)** • **Recognise that vibrations from sounds travel through a medium to the ear (TERM 2)** • **Find patterns between the pitch of a sound and features of the object that produced it (TERM 2)** • **Find patterns between the volume of a sound and the strength of the vibrations that produced it (TERM 2)**		

				• **Recognise that sounds get fainter as the distance from the sound source increases. (TERM 2)** **SCIENTIST: ALESSANDRO VOLTA**		
Sound Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• I can describe how sound is made. • I can explain how sound travels from a source to our ears. • I can explain the place of vibration in hearing. • I can explore the correlation between pitch and the object producing a sound. • I can explore the correlation between the volume of a sound and the strength of the vibrations that produced it. • I can describe what happens to a sound as it travels away from its source.		
Sound Vocabulary						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• Volume • Vibration • Wave • Pitch		

				• Tone • Speaker		
Rocks Need to Knows						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• **Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (TERM 3)** • **Describe in simple terms how fossils are formed when things that have lived are trapped within rock (TERM 3)** • **Recognise that soils are made from rocks and organic matter (TERM 3)** **SCIENTIST: MARY ANNING**			
Rocks Skills						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• I can compare and group rocks based on their appearance and physical properties, giving a reason. • I can describe how fossils are formed. • I can describe how soil is made.			

			• I can describe and explain the difference between sedimentary and igneous rock.			
Rocks Vocabulary						
Nursery and EYU	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• Fossils • Soils • Sandstone • Granite • Marble • Pumice • Crystals, • Absorbent			