SCIENCE AT THE GROVE

INTENT

"The most important thing is to never stop questioning. Curiosity has its own reason for existing." Albert Einstein.

When children leave The Grove, they will be curious, critical thinkers, organized, focused, have good observational and communication skills and be able to form their own opinions. A strong level of knowledge and understanding will built upon in layers in order that they have real mastery and can channel this knowledge and understanding, making it a transferable skill. The Science Curriculum is based on the National Curriculum but is Child Led. Children will ask questions, make predictions, observe, test (including fair testing), and then communicate their findings. This will be achieved through FUN, ENGAGING, PROBLEM SOLVING, DISCOVERY activities that have been planned to meet the needs of, challenge and support individuals. Children will be encouraged to value and get excited by mistakes, to question and challenge validity and develop a strong Growth Mindset. Children will leave with a vocational understanding of how science impacts on real life and their worlds will be open to a life filled with science!

This progression grid can support any subject leader or teacher of science to ensure progression of skills and knowledge.

IMPLEMENTATION

Our curriculum is built around deep thinking and encourages learners to use a question as the starting point, considering different avenues for further research. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use scientific language to talk and write about what they have found out.

Each knowledge topic is planned to retrieve knowledge previously covered and then follow our 4 stage sequence of teaching; ignite and inspire, deep practice, mastery and showcase. Built into this is a pre topic and post topic assessment. Each key stage focuses on different themes to ensure continued interest in the subject as well as acquiring new knowledge. We have a balance between working scientifically and learning facts. We ensure that learning is progressive and continuous.

Each science topic begins with a 'wow' tasks that provides a hook for learning, developing a sense of excitement and curiosity for children – ignite and inspire. Teachers check on what children already know and then invite children to think of their own questions. During deep practice, children will be able to build on prior knowledge and link ideas together, enabling them to question and become enquiry based learners. Children will be supported through the mastery stage of the teaching sequence. Children will then have the opportunity to showcase their learning. This stage provides children with an opportunity to share their learning more widely with other children and parents through a variety of means e.g. learning presentations, talks, report writing etc.

Memorable knowledge and skills have been identified for each of the units to provide progressive acquisition of knowledge. This is supported by the use of 'sticky vocabulary and sticky knowledge' which are displayed on science working walls and subject specific knowledge organisers. Teachers regularly refer to this knowledge and key vocabulary with meanings so that it 'sticks'. This enables children to readily apply knowledge and vocabulary. Children learn about carefully chosen Famous Scientists within each unit, considering historical breadth, cultural, social, religious, gender and physical equality.

IMPACT

Science learning is loved by teachers and children across school. The successful approach to the teaching of science at The Grove School will result in a fun, engaging, high quality science education, that provides children with the foundations for understanding the world that they can take with them once they complete their primary education.

Assessment at The Grove School uses formal strategies (snowflake and sunshine tasks, quizzes) and informal strategies (use of concept maps, verbal/written outcomes, reflection tasks/presentations, retrieval practice games and activities) and summative tasks.

Formative assessment is used as the main tool for assessing the impact of Science at The Grove School as it allows for misconceptions and gaps to be addressed more immediately rather than building on insecure scientific foundations.

Children at The Grove School will:
- demonstrate a love of science work and an interest in further study and work in this field
- retain knowledge that is pertinent to Science with a real life context.
- be able to question ideas and reflect on knowledge.
- be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to science.
- demonstrate a high love of mathematical skills through their work, organising, recording and interpreting results.
- work collaboratively and practically to investigate and experiment.
- achieve age related expectations in Science at the end of their cohort year.

PROGRESSION

PROGRESSION IN WORKING SCIENTIFICALLY			
	KS1	**LKS2**	**UKS2**
	By the time children leave The Grove, they will be able to: • Evaluate their work and make suggestions for improvement. • Identify several variables and select the best one/s to investigate. • Say why equipment is appropriate to the task. • Make suggestions to control risks. • Decide which format is best to present data. • Use scientific conventions to explain abstract ideas. • Know the difference between scientific evidence and opinion. • Understand that people have different ideas about science. • Say how science affects them and other people in different ways. • Understand that science can be used in positive and negative ways. • Use more than one step to describe a process. • Explain scientific ideas in a clear and detailed way. • Identify strengths and weaknesses in science models and thoughts		
WORKING SCIENTIFICALLY	To use the following practical scientific methods, processes and skills……. Experience different types of science enquiry, including practical activities.	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions.	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions. Talk about how scientific ideas have developed over time.
QUESTIONING AND ENQUIRING PLANNING	Explore the world around them and raise their own simple questions.	Raise their own relevant questions about the world around them.	Use their scientific experiences to explore ideas and raise different

	Begin to recognise different ways in which they might answer scientific questions.	Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	kinds of questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. I can decide which types of variables to control.
OBSERVING AND MEASURING PATTERM SEEKING	Use simple equipment eg hand lenses Observe changes over time. Say what they are looking for and what they are measuring. Measure with non-standard units and begin to use simple standard units eg mm, cm, m, l, degrees C. With guidance, they should begin to notice patterns and relationships.	Make systematic and careful observations. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Observe and measure accurately using standard units using a range of equipment Mm, cm, m, ml, l, degrees C, seconds, minutes	Make their own decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat. Choose the most appropriate equipment and explain how to use it accurately. Make accurate and precise measurements: N, g, kg, mm, cm, m, mins, secs, km, h, pie, line, bar graph Identify patterns that might be found in the natural environment. Interpret data and find patterns. Look for different causal relationships in their data and

			identify evidence that refutes or supports their ideas.
INVESTIGATING	Carry out simple tests. Discuss ideas. Say what happened in an investigation.	Set up simple practical enquiries, comparative and fair tests. Recognise when a simple fair test is necessary and hep to decide how to set it up. Help decide which variables to keep the same and which to change.	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Suggest improvements to my test, giving reasons. Use test results to make predictions to set up further comparative and fair tests.
RECORDING AND REPORTING FINDINGS	Use simple measurements and equipment (eg hand lenses, egg timers) to gather data. Record simple data. With help, they should gather, record and communicate their findings in a range of ways and	Take accurate measurements using standard units. Learn how to use a range of (new) equipment, such as data loggers/thermometers appropriately. Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. Use relevant, simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different	Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate. Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas, use oral and written

	begin to use simple scientific language to help in answering questions. Show results in a table.	audiences, including written explanations, displays or presentations of results and conclusions.	forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results.
IDENTIFYING GROUPING AND CLASSIFYING	Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Identify and classify. Observe and identify, compare and describe.	Talk about criteria for grouping, sorting and classifying and use simple keys. Identify differences, similarities or changes related to simple scientific ideas and processes. Compare and group according to behaviour or properties based on testing.	Use and develop keys and other information records to identify, classify and describe living things and materials and other scientific phenomena. Identify patterns and changes that might be found in the natural environment.
RESEARCH	Ask people questions and use simple secondary sources to find answers. Find information to help me from books and computers with help.	Recognise how and when secondary sources might help them to answer questions that cannot be answered through practical investigations. Begin to decide when research will help in my enquiry. Carry out simple research on my own.	Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Carry out research independently.
CONCLUSIONS	Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out.	Use results to draw simple conclusions. Say what they have found out linking cause and effect in their explanations.	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written

	Say what happened in my investigation. Say whether they were surprised at the results or not. Say what they would change about their investigation.	With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should develop new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	forms such as displays and other presentations. Identify scientific evidence that has been used to support or refute ideas or arguments. Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed. Separate fact from opinion. Draw conclusions and identify scientific evidence. Use simple models. Know which evidence proves a scientific point.
VOCABULARY	Use simple scientific language and scientific words. Use comparative language.	Use some scientific language to talk and later write about what they have found out. Use relevant scientific language.	Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss,

		Use comparative and superlative language.	communicate and justify scientific ideas.
UNDERSTANDING	Talk about how science helps us in our daily lives. Begin to understand how science can be dangerous. SCIENTISTS.	Know which things in science have made our lives better. Understand there is some risk in science. SCIENTISTS.	Talk about how scientific ideas have changed over time. Explain the positive and negative effects on scientific development. See how science is useful in everyday life. Say which parts of our lives rely on science. Understand there is some risk in science. SCIENTISTS.
VOCABULARY	question, answer ,observe, observing equipment, identify, classify, sort, group record, diagram, chart, map, data, compare contrast, biology, chemistry, physics	research, questions, enquiry, comparative & fair test, systematic, careful, observation accurate measurements ,classify, present record, drawings, labelled diagrams, charts, tables, oral & written explanations, differences, similarities, changes, evidence, improve secondary sources, equipment, thermometer, data logger, data gather, conclusion,	plan, variables, measurements, display & presentation, evidence, support, refute ideas or arguments, accuracy, precision, repeat readings, scientific diagrams, labels, classification, keys, tables, scatter graphs, bar graphs, line graphs, patterns, systematic, quantitative measurements

		predictions, guides, keys, interpret, construct	
KS3 – FOR INFORMATION	Interpret data from a variety of formats and recognise inconsistencies. Give explanations for differences in repeated results. Draw valid conclusions that use more than one piece of supporting evidence.		

SCIENCE LONG TERM PLAN SHOWING KNOWLEDGE PROGRESSION

EYFS To be Year 1 ready, children in Foundation Stage will know:	By the end of EYFS, children at the expected level of development will: - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. - Explore the natural world around them, making observations and drawing pictures of animals and plants;		
YEAR	AUTUMN TERM – PHYSICS NB KS1 – BIOLOGY	SPRING TERM - CHEMISTRY	SUMMER TERM - BIOLOGY
Year 1 and 2 By the end of KS1, children will have the following knowledge:	Seasonal Changes Ongoing throughout the year.	Everyday materials and uses of everyday materials Children will know how to distinguish between an object and the material from which it is made. Children will know how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Children will know and be able to describe the simple physical	Living things and their Habitat Children know, explore and compare the differences between things that are living, dead, and things that have never been alive. Children know and 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

		properties of a variety of everyday materials. Children will know and be able to compare and group together a variety of everyday materials on the basis of their simple physical properties. Children will know how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	animals and plants, and how they depend on each other. Children know, identify and name a variety of plants and animals in their habitats, including microhabitats describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **YEAR A = SEASIDE YEAR B = AUSTRALIA** **SCIENTIST: Marie Curie**

	Animals 1st Half Term Children will know, identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Children will know, identify and name a variety of common animals that are carnivores, herbivores and omnivores. Children will know, describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) **YEAR A – PETS YEAR B – BRITISH WILDLIFE** 2nd Half Term Children will know and identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Children will know and notice that animals, including humans, have offspring which grow into adults Children will know and describe the basic needs of animals, including humans, for survival (water, food and air) Children will know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **YEAR A = FOOD AND HEALTH YEAR B = DOCTORS** **SCIENTIST: Year A = Beatrix Potter** **Year B = David Attenborough**	Children will know about and find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **YEAR A = TRAVEL, HOT AND COLD** **YEAR B = BUILDINGS** **SCIENTIST: Year A = Inge Lehmann** **Year B – Esther Conwell**	Plants Children know, identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, Children know, identify and describe the basic structure of a variety of common flowering plants, including trees. Children know, observe and describe how seeds and bulbs grow into mature plants. Children know, find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **SCIENTIST: Year A = Pasteur** **Year B = Anna Atkins**
Year 3 and 4 Year A By the end of LKS2,	Light Children know and recognise that they need light in order to see	Rocks Children will know, compare and group together different kinds of rocks on the basis of their	Living things and their Habitat Children know that living things can be grouped in a variety of ways.

children will have the following knowledge:	things and that dark is the absence of light. Children know and notice that light is reflected from surfaces. Children know and recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Children know and recognise that shadows are formed when the light from a light source is blocked by a solid objects. Children know that there are patterns in the way that the size of shadows change. **SCIENTIST: Edison**	appearance and simple physical properties. Children will know and describe in simple terms how fossils are formed when things that have lived are trapped within rock. Children will know and recognise that soils are made from rocks and organic matter. **SCIENTIST: Mary Anning**	Children know, explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Children know and recognise that environments can change and that this can sometimes pose dangers to living things. **SCIENTIST: Jane Goodall**
	Electricity Children will know and identify common appliances that run on electricity Children will know about and be able to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Children will know, understand and be able to 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.		Plants Children know, identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Children know and 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. Children know and investigate the way in which water is transported within plants. Children know and explore the part that flowers play in the life cycle of flowering plants, including

	Children will know, understand and recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Children will know, understand and recognise some common conductors and insulators, and associate metals with being good conductors. **SCIENTIST: Faraday**		pollination, seed formation and seed dispersal. **SCIENTIST: Katherine Esau**
Year 3 and 4 Year B By the end of LKS2, children will have the following knowledge:	Sound Children will know and identify how sounds are made, associating some of them with something vibrating. Children will know and recognise that vibrations from sounds travel through a medium to the ear. Children will know what pitch is and find patterns between the pitch of a sound and features of the object that produced it. Children will know about volume and find patterns between the volume of a sound and the strength of the vibrations that produced it. Children will know and recognise that sounds get fainter as the distance from the sound source increases. **SCIENTIST: Alexander Graham Bell**	States of Matter Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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) Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **SCIENTIST: Einstein**	Animals including Humans Children will know and 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 Children will know and identify that humans and some other animals have skeletons and muscles for support, protection and movement. describe the simple functions of the basic parts of the digestive system in humans Children will know and identify the different types of teeth in humans and their simple functions Children will know, understand and construct and interpret a variety of food chains, identifying producers, predators and prey. **SCIENTIST: Sarah Boysen**

	Forces and Magnets Children will know and compare how things move on different surfaces. Children will know, understand and notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Children will know and observe how magnets attract or repel each other and attract some materials and not others. Children will know, 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. Children will know about and describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. **SCIENTIST: Isaac Newton and Archimedes**		
Year 5 and 6 Year A By the end of UKS2, children will have the following knowledge:	**Light** Children know and recognise that light appears to travel in straight lines. Children know and use the idea that light travels in straight lines to	**Properties and changes of Materials** Children know, compare and group materials together, according to	**Living things and their Habitat** Children know and describe the differences in the life cycles of a

	explain that objects are seen because they give out or reflect light into the eye. Children know and 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. Children know and use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them **SCIENTIST: Thomas Young**	whether they are solids, liquids or gases. Children know and 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). Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	mammal, an amphibian, an insect and a bird. Children know and describe the life process of reproduction in some plants and animals Children know and describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Children know and give reasons for classifying plants and animals based on specific characteristics **SCIENTIST: Linnaeus and Mendl**
	Electricity Children will know about and associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Children will know, 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 Children will know and use recognised symbols when representing a simple circuit in a diagram. **SCIENTIST: Tesla**		

Year 5 and 6 Year B By the end of UKS2, children will have the following knowledge:	Forces	Properties and changes of Materials	Animals including Humans
	Children will know and explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Children will know about and identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Children will know and recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect **SCIENTIST: Stephen Hawking and Bohr**	Children know, 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. Children know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Children know and use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Children give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Children know and demonstrate that dissolving, mixing and changes of state are reversible changes Children know and 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	Children know and describe the changes as humans develop to old age. Children know, identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Children know and recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Children know and describe the ways in which nutrients and water are transported within animals, including humans **SCIENTIST: William Harvey**

		action of acid on bicarbonate of soda **SCIENTIST: Gail Leese**	
	Earth and Space Children will know, understand and be able to describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Children will know and understand and be able to describe the movement of the Moon relative to the Earth. Children will know that the Sun, Earth and Moon are approximately spherical bodies Children will know about the Earth's rotation and be able to explain day and night, and the apparent movement of the sun across the sky. **SCIENTIST: Galileo and Aristotle**		**Evolution and Inheritance** Children will know and recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Children will know and recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Children will know and identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution **SCIENTIST: Darwin and Rosalind Franklin**

MEDIUM TERM PLANNING

Year 1 and 2: ANIMALS: YEAR A

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Explore the natural world around them, making observations and drawing pictures of animals and plants	Animals 1st Half Term Children will know, identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Children will know, identify and name a variety of common animals that are carnivores, herbivores and omnivores. Children will know, describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 2nd Half Term Children will know and identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Children will know and notice that animals, including humans, have offspring which grow into adults Children will know and describe the basic needs of animals, including humans, for survival (water, food and air) Children will know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **SCIENTIST: Year A = Beatrix Potter** **Year B = David Attenborough**	Animals including Humans Children will know and 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 Children will know and identify that humans and some other animals have skeletons and muscles for support, protection and movement. describe the simple functions of the basic parts of the digestive system in humans Children will know and identify the different types of teeth in humans and their simple functions Children will know, understand and construct and interpret a variety of food chains, identifying producers, predators and prey.	

MEDIUM TERM PLANNING

Year 1 and 2: EVERYDAY MATERIALS AND USES OF EVERYDAY MATERIALS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Everyday materials and uses of everyday materials Children will know how to distinguish between an object and the material from which it is made. Children will know how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Children will know and be able to describe the simple physical properties of a variety of everyday materials. Children will know and be able to compare and group together a variety of everyday materials on the basis of their simple physical properties. Children will know how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Children will know about and find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **SCIENTIST: Year A = Inge Lehmann Year B – Esther Conwell**	States of Matter Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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) Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **SCIENTIST: Einstein**	

MEDIUM TERM PLANNING

Year 1 and 2: LIVING THINGS AND THEIR HABITAT

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Explore the natural world around them, making observations and drawing pictures of animals and plants	Living things and their Habitat Children know, explore and compare the differences between things that are living, dead, and things that have never been alive. Children know and 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. Children know, identify and name a variety of plants and animals in their habitats, including microhabitats describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **SCIENTIST: Marie Curie**	Living things and their Habitat Children know that living things can be grouped in a variety of ways. Children know, explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Children know and recognise that environments can change and that this can sometimes pose dangers to living things. **SCIENTIST: Jane Goodall**	

MEDIUM TERM PLANNING

Year 1 and 2: PLANTS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Explore the natural world around them, making observations and drawing pictures of animals and plants	Plants Children know, identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, Children know, identify and describe the basic structure of a variety of common flowering plants, including trees. Children know, observe and describe how seeds and bulbs grow into mature plants. Children know, find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **SCIENTIST: Year A = Pasteur Year B = Anna Atkins**	Plants Children know, identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Children know and 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. Children know and investigate the way in which water is transported within plants. Children know and explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **SCIENTIST: Katherine Esau**	

MEDIUM TERM PLANNING

Year 3 AND 4: LIGHT

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Light Children know and recognise that they need light in order to see things and that dark is the absence of light. Children know and notice that light is reflected from surfaces. Children know and recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Children know and recognise that shadows are formed when the light from a light source is blocked by a solid objects. Children know that there are patterns in the way that the size of shadows change. **SCIENTIST: Edison**	Light Children know and recognise that light appears to travel in straight lines. Children know and 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. Children know and 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. Children know and use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them **SCIENTIST: Thomas Young**	

MEDIUM TERM PLANNING

Year 3 AND 4: ELECTRICITY

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Electricity Children will know and identify common appliances that run on electricity Children will know about and be able to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Children will know, understand and be able to 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. Children will know, understand and recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Children will know, understand and recognise some common conductors and insulators, and associate metals with being good conductors. **SCIENTIST: Faraday**	Electricity Children will know about and associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Children will know, 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 Children will know and use recognised symbols when representing a simple circuit in a diagram. **SCIENTIST: Tesla**	

MEDIUM TERM PLANNING

Year 3 AND 4: ROCKS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Rocks Children will know, compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Children will know and describe in simple terms how fossils are formed when things that have lived are trapped within rock. Children will know and recognise that soils are made from rocks and organic matter. **SCIENTIST: Mary Anning**	Properties and changes of Materials Children know, 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. Children know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Children know and use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Children give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Children know and demonstrate that dissolving, mixing and changes of state are reversible changes Children know and 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 **SCIENTIST: Gail Leese**	

MEDIUM TERM PLANNING

Year 3 AND 4: LIVING THINGS AND THEIR HABITATS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Living things and their Habitat Children know, explore and compare the differences between things that are living, dead, and things that have never been alive. Children know and 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. Children know, identify and name a variety of plants and animals in their habitats, including microhabitats describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. **SCIENTIST: Marie Curie**	Living things and their Habitat Children know that living things can be grouped in a variety of ways. Children know, explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Children know and recognise that environments can change and that this can sometimes pose dangers to living things. **SCIENTIST: Jane Goodall**	Living things and their Habitat Children know and describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Children know and describe the life process of reproduction in some plants and animals Children know and describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Children know and give reasons for classifying plants and animals based on specific characteristics **SCIENTIST: Linnaeus and Mendl**	

MEDIUM TERM PLANNING

Year 3 AND 4: PLANTS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Plants Children know, identify and name a variety of common wild and garden plants, including deciduous and evergreen trees, Children know, identify and describe the basic structure of a variety of common flowering plants, including trees. Children know, observe and describe how seeds and bulbs grow into mature plants. Children know, find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **SCIENTIST: Year A = Pasteur Year B = Anna Atkins**	Plants Children know, identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Children know and 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. Children know and investigate the way in which water is transported within plants. Children know and explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **SCIENTIST: Katherine Esau**	Living things and their Habitat Children know and describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Children know and describe the life process of reproduction in some plants and animals Children know and describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Children know and give reasons for classifying plants and animals based on specific characteristics **SCIENTIST: Linnaeus and Mendl**	

MEDIUM TERM PLANNING

Year 3 AND 4: SOUND

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Sound Children will know and identify how sounds are made, associating some of them with something vibrating. Children will know and recognise that vibrations from sounds travel through a medium to the ear. Children will know what pitch is and find patterns between the pitch of a sound and features of the object that produced it. Children will know about volume and find patterns between the volume of a sound and the strength of the vibrations that produced it. Children will know and recognise that sounds get fainter as the distance from the sound source increases. **SCIENTIST: Alexander Graham Bell**	NO UKS2 SOUND	

MEDIUM TERM PLANNING

Year 3 AND 4: FORCES AND MAGNETS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Forces and Magnets Children will know and compare how things move on different surfaces. Children will know, understand and notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Children will know and observe how magnets attract or repel each other and attract some materials and not others. Children will know, 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. Children will know about and describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. **SCIENTIST: Isaac Newton and Archimedes**	Forces Children will know and explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Children will know about and identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Children will know and recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect **SCIENTIST: Stephen Hawking and Bohr**	

MEDIUM TERM PLANNING

Year 3 AND 4: STATES OF MATTER

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Everyday materials and uses of everyday materials Children will know how to distinguish between an object and the material from which it is made. Children will know how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Children will know and be able to describe the simple physical properties of a variety of everyday materials. Children will know and be able to compare and group together a variety of everyday materials on the basis of their simple physical properties. Children will know how to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Children will know about and find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. **SCIENTIST: Year A = Inge Lehmann Year B – Esther Conwell**	States of Matter Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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) Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **SCIENTIST: Einstein**	Properties and changes of Materials Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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). Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	

MEDIUM TERM PLANNING

Year 3 AND 4: ANIMALS INCLUDING HUMANS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS	ASSESSMENT
Animals 1st Half Term Children will know, identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Children will know, identify and name a variety of common animals that are carnivores, herbivores and omnivores. Children will know, describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) 2nd Half Term Children will know and identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense Children will know and notice that animals, including humans, have offspring which grow into adults Children will know and describe the basic needs of animals, including humans, for survival (water, food and air) Children will know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **SCIENTIST: Year A = Beatrix Potter** **Year B = David Attenborough**	Animals including Humans Children will know and 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 Children will know and identify that humans and some other animals have skeletons and muscles for support, protection and movement. describe the simple functions of the basic parts of the digestive system in humans Children will know and identify the different types of teeth in humans and their simple functions Children will know, understand and construct and interpret a variety of food chains, identifying producers, predators and prey. **SCIENTIST: Sarah Boysen**	Animals including Humans Children know and describe the changes as humans develop to old age. Children know, identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Children know and recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Children know and describe the ways in which nutrients and water are transported within animals, including humans **SCIENTIST: William Harvey**	

MEDIUM TERM PLANNING

Year 5 AND 6: LIGHT

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
Light Children know and recognise that they need light in order to see things and that dark is the absence of light. Children know and notice that light is reflected from surfaces. Children know and recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Children know and recognise that shadows are formed when the light from a light source is blocked by a solid objects. Children know that there are patterns in the way that the size of shadows change. **SCIENTIST: Edison**	Light Children know and recognise that light appears to travel in straight lines. Children know and 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. Children know and 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. Children know and use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them **SCIENTIST: Thomas Young**	Know about the similarities and differences between light waves and waves in matter Know about light waves travelling through a vacuum; speed of light Know about the transmission of light through materials; absorption, diffuse, scattering and specular reflection at a surface Know about the use of ray model Light transferring energy Know about colour and the different frequencies of light.	

MEDIUM TERM PLANNING

Year 5 AND 6: ELECTRICITY

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
Electricity Children will know and identify common appliances that run on electricity Children will know about and be able to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Children will know, understand and be able to 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. Children will know, understand and recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Children will know, understand and recognise some common conductors and insulators, and associate metals with being good conductors. **SCIENTIST: Faraday**	Electricity Children will know about and associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit Children will know, 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 Children will know and use recognised symbols when representing a simple circuit in a diagram. **SCIENTIST: Tesla**	Know about current electricity – electric current and measurements, potential difference and resistance, difference in resistance between conducting and insulating components. Know about static electricity – the idea of electric field, separation of positive and negative charges.	

MEDIUM TERM PLANNING

Year 5 AND 6: PROPERTIES AND CHANGES OF MATERIALS YEAR A

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
States of Matter Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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) Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **SCIENTIST: Einstein**	Properties and changes of Materials Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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). Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Know about the particulate nature of matter. Know about atoms, elements and compounds. Know about pure and impure substances. Know about chemical reactions – various. Know about energetics. Know about the periodic table. Know about materials. Know about the earth and its atmosphere.	

MEDIUM TERM PLANNING

Year 5 AND 6: LIVING THINGS AND THEIR HABITAT

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
Living things and their Habitat Children know that living things can be grouped in a variety of ways. Children know, explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Children know and recognise that environments can change and that this can sometimes pose dangers to living things. **SCIENTIST: Jane Goodall**	Living things and their Habitat Children know and describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Children know and describe the life process of reproduction in some plants and animals Children know and describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Children know and give reasons for classifying plants and animals based on specific characteristics **SCIENTIST: Linnaeus and Mendl**	Know about interactions and interdependencies. Know about relationships in an ecosystem.	

MEDIUM TERM PLANNING

Year 5 AND 6: FORCES

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
Forces and Magnets Children will know and compare how things move on different surfaces. Children will know, understand and notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Children will know and observe how magnets attract or repel each other and attract some materials and not others. Children will know, 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. Children will know about and describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. **SCIENTIST: Isaac Newton and Archimedes**	Forces Children will know and explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Children will know about and identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Children will know and recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect **SCIENTIST: Stephen Hawking and Bohr**	Know about balanced forces – opposing forces and equilibrium; weight held by stretched spring or supported on a compressed surface. Know about forces and motion – stop, start, changing speed and direction and change depending on direction of force and its size.	

MEDIUM TERM PLANNING

Year 5 AND 6: PROPERTIES AND CHANGES OF MATERIALS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
States of Matter Children know, compare and group materials together, according to whether they are solids, liquids or gases. Children know and 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) Children know and identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **SCIENTIST: Einstein**	Properties and changes of Materials Children know, 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. Children know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Children know and use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Children give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Children know and demonstrate that dissolving, mixing and changes of state are reversible changes Children know and 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 **SCIENTIST: Gail Leese**	Know about the particulate nature of matter. Know about atoms, elements and compounds. Know about pure and impure substances. Know about chemical reactions – various. Know about energetics. Know about the periodic table. Know about materials. Know about the earth and its atmosphere.	

MEDIUM TERM PLANNING

Year 5 AND 6: ANIMALS INCLUDING HUMANS

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
Animals including Humans Children will know and 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 Children will know and identify that humans and some other animals have skeletons and muscles for support, protection and movement. describe the simple functions of the basic parts of the digestive system in humans Children will know and identify the different types of teeth in humans and their simple functions Children will know, understand and construct and interpret a variety of food chains, identifying producers, predators and prey. **SCIENTIST: Sarah Boysen**	Animals including Humans Children know and describe the changes as humans develop to old age. Children know, identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Children know and recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Children know and describe the ways in which nutrients and water are transported within animals, including humans **SCIENTIST: William Harvey**	Know about cells and organisation. Know about the skeletal and muscular systems. Know about nutrition and digestion. Know about gas exchange systems. Know about reproduction. Know about health.	

MEDIUM TERM PLANNING

Year 5 AND 6: EARTH AND SPACE

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
NO SPECIFIC KNOWLEDGE Forces and Magnets Children will know and compare how things move on different surfaces. Children will know, understand and notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Children will know and observe how magnets attract or repel each other and attract some materials and not others. Children will know, 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. Children will know about and describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing. **SCIENTIST: Isaac Newton and Archimedes**	Earth and Space Children will know, understand and be able to describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Children will know and understand and be able to describe the movement of the Moon relative to the Earth. Children will know that the Sun, Earth and Moon are approximately spherical bodies Children will know about the Earth's rotation and be able to explain day and night, and the apparent movement of the sun across the sky. **SCIENTIST: Galileo and Aristotle**	Know and understand gravity forces. Know about our sun as a star, other stars in our galaxy and other galaxies. Know about the seasons. Know about the light year as a unit of astronomical distance.	

MEDIUM TERM PLANNING

Year 5 AND 6: EVOLUTION AND INHERITANCE

PREVIOUS LEARNING	KNOWLEDGE TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
NO SPECIFIC KNOWLEDGE Rocks Children will know, compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Children will know and describe in simple terms how fossils are formed when things that have lived are trapped within rock. Children will know and recognise that soils are made from rocks and organic matter. **SCIENTIST: Mary Anning**	Evolution and Inheritance Children will know and recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Children will know and recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Children will know and identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution **SCIENTIST: Darwin and Rosalind Franklin**	Know about inheritance, chromosomes, DNA and genes. Know about heredity. Know a simple model of chromosomes. Know about difference between species. Know about variations between individuals within a species. Know about variation between species. Know about adaptation. Know about biodiversity and its importance.	

MEDIUM TERM PLANNING

YEAR 1 AND 2: WORKING SCIENTIFICALLY: ALL TERMS

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
WORKING SCIENTIFICALLY	Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; - Know and understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. - Explore the natural world around them, making observations and drawing pictures of animals and plants;	To use the following practical scientific methods, processes and skills……. Experience different types of science enquiry, including practical activities.	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions.	
VOCABULARY	Use simple scientific language and scientific words. Use comparative language.	Use simple scientific language and scientific words. Use comparative language.	Use some scientific language to talk and later write about what they have found out. Use relevant scientific language. Use comparative and superlative language.	
VOCABULARY	question, answer ,observe, observing equipment, identify, sort, group, map, compare	question, answer ,observe, observing equipment, identify, classify, sort, group record, diagram, chart, map, data, compare contrast, biology, chemistry, physics	research, questions, enquiry, comparative & fair test, systematic, careful, observation accurate measurements ,classify, present record, drawings, labelled diagrams, charts, tables, oral & written explanations, differences, similarities, changes, evidence, improve secondary sources, equipment, thermometer, data logger, data gather, conclusion, predictions, guides, keys, interpret, construct	
UNDERSTANDING	Talk about how science helps us in our daily lives. Begin to understand how science can be dangerous. SCIENTISTS.	Talk about how science helps us in our daily lives. Begin to understand how science can be dangerous. SCIENTISTS.	Know which things in science have made our lives better. Understand there is some risk in science. SCIENTISTS.	

MEDIUM TERM PLANNING

YEAR 1 AND 2: WORKING SCIENTIFICALLY: AUTUMN TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
QUESTIONING AND ENQUIRING PLANNING	Explore the world around them and raise their own simple questions. Begin to recognise different ways in which they might answer scientific questions.	Explore the world around them and raise their own simple questions. Begin to recognise different ways in which they might answer scientific questions.	Raise their own relevant questions about the world around them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	
OBSERVING AND MEASURING PATTERM SEEKING	Use simple equipment eg hand lenses Observe changes over time. Say what they are looking for and what they are measuring. Measure with non-standard units and begin to use simple standard units eg mm, cm, m, l, degrees C. With guidance, they should begin to notice patterns and relationships.	Use simple equipment eg hand lenses Observe changes over time. Say what they are looking for and what they are measuring. Measure with non-standard units and begin to use simple standard units eg mm, cm, m, l, degrees C. With guidance, they should begin to notice patterns and relationships.	Make systematic and careful observations. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Observe and measure accurately using standard units using a range of equipment Mm, cm, m, ml, l, degrees C, seconds, minutes	
INVESTIGATING	Carry out simple tests. Discuss ideas. Say what happened in an investigation.	Carry out simple tests. Discuss ideas. Say what happened in an investigation.	Set up simple practical enquiries, comparative and fair tests. Recognise when a simple fair test is necessary and hep to decide how to set it up. Help decide which variables to keep the same and which to change.	

MEDIUM TERM PLANNING

YEAR 1 AND 2: WORKING SCIENTIFICALLY: SPRING TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
QUESTIONING AND ENQUIRING PLANNING	Explore the world around them and raise their own simple questions. Begin to recognise different ways in which they might answer scientific questions.	Explore the world around them and raise their own simple questions. Begin to recognise different ways in which they might answer scientific questions.	Raise their own relevant questions about the world around them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	

MEDIUM TERM PLANNING

YEAR 1 AND 2: WORKING SCIENTIFICALLY: SUMMER TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
IDENTIFYING GROUPING AND CLASSIFYING	Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Identify and classify. Observe and identify, compare and describe.	Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Identify and classify. Observe and identify, compare and describe.	Talk about criteria for grouping, sorting and classifying and use simple keys. Identify differences, similarities or changes related to simple scientific ideas and processes. Compare and group according to behaviour or properties based on testing.	
RESEARCH	Ask people questions and use simple secondary sources to find answers. Find information to help me from books and computers with help.	Ask people questions and use simple secondary sources to find answers. Find information to help me from books and computers with help.	Recognise how and when secondary sources might help them to answer questions that cannot be answered through practical investigations. Begin to decide when research will help in my enquiry. Carry out simple research on my own.	
CONCLUSIONS	Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out. Say what happened in my investigation. Say whether they were surprised at the results or not. Say what they would change about their investigation.	Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out. Say what happened in my investigation. Say whether they were surprised at the results or not. Say what they would change about their investigation.	Use results to draw simple conclusions. Say what they have found out linking cause and effect in their explanations. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should develop new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	

MEDIUM TERM PLANNING

YEAR 3 AND 4: WORKING SCIENTIFICALLY: ALL TERMS

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
WORKING SCIENTIFICALLY	To use the following practical scientific methods, processes and skills……. Experience different types of science enquiry, including practical activities.	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions.	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions. Talk about how scientific ideas have developed over time.	
VOCABULARY	Use simple scientific language and scientific words. Use comparative language.	Use some scientific language to talk and later write about what they have found out. Use relevant scientific language. Use comparative and superlative language.	Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.	
VOCABULARY	question, answer ,observe, observing equipment, identify, classify, sort, group record, diagram, chart, map, data, compare contrast, biology, chemistry, physics	research, questions, enquiry, comparative & fair test, systematic, careful, observation accurate measurements ,classify, present record, drawings, labelled diagrams, charts, tables, oral & written explanations, differences, similarities, changes, evidence, improve secondary sources, equipment, thermometer, data logger, data gather, conclusion, predictions, guides, keys, interpret, construct	plan, variables, measurements, display & presentation, evidence, support, refute ideas or arguments, accuracy, precision, repeat readings, scientific diagrams, labels, classification, keys, tables, scatter graphs, bar graphs, line graphs, patterns, systematic, quantitative measurements	
UNDERSTANDING	Talk about how science helps us in our daily lives. Begin to understand how science can be dangerous. SCIENTISTS.	Know which things in science have made our lives better. Understand there is some risk in science. SCIENTISTS.	Talk about how scientific ideas have changed over time. Explain the positive and negative effects on scientific development. See how science is useful in everyday life. Say which parts of our lives rely on science. Understand there is some risk in science. SCIENTISTS.	

MEDIUM TERM PLANNING

YEAR 3 AND 4: WORKING SCIENTIFICALLY: AUTUMN TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
QUESTIONING AND ENQUIRING PLANNING	Explore the world around them and raise their own simple questions. Begin to recognise different ways in which they might answer scientific questions.	Raise their own relevant questions about the world around them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	Use their scientific experiences to explore ideas and raise different kinds of questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. I can decide which types of variables to control.	
OBSERVING AND MEASURING PATTERM SEEKING	Use simple equipment eg hand lenses Observe changes over time. Say what they are looking for and what they are measuring. Measure with non-standard units and begin to use simple standard units eg mm, cm, m, l, degrees C. With guidance, they should begin to notice patterns and relationships.	Make systematic and careful observations. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Observe and measure accurately using standard units using a range of equipment Mm, cm, m, ml, l, degrees C, seconds, minutes	Make their own decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat. Choose the most appropriate equipment and explain how to use it accurately. Make accurate and precise measurements: N, g, kg, mm, cm, m, mins, secs, km, h, pie, line, bar graph Identify patterns that might be found in the natural environment. Interpret data and find patterns. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.	
INVESTIGATING	Carry out simple tests. Discuss ideas. Say what happened in an investigation.	Set up simple practical enquiries, comparative and fair tests. Recognise when a simple fair test is necessary and hep to decide how to set it up. Help decide which variables to keep the same and which to change.	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Suggest improvements to my test, giving reasons. Use test results to make predictions to set up further comparative and fair tests.	

MEDIUM TERM PLANNING

YEAR 3 AND 4: WORKING SCIENTIFICALLY: SPRING TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
QUESTIONING AND ENQUIRING PLANNING	Explore the world around them and raise their own simple questions. Begin to recognise different ways in which they might answer scientific questions.	Raise their own relevant questions about the world around them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	Use their scientific experiences to explore ideas and raise different kinds of questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. I can decide which types of variables to control.	

MEDIUM TERM PLANNING

YEAR 3 AND 4: WORKING SCIENTIFICALLY: SUMMER TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
IDENTIFYING GROUPING AND CLASSIFYING	Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying). Identify and classify. Observe and identify, compare and describe.	Talk about criteria for grouping, sorting and classifying and use simple keys. Identify differences, similarities or changes related to simple scientific ideas and processes. Compare and group according to behaviour or properties based on testing.	Use and develop keys and other information records to identify, classify and describe living things and materials and other scientific phenomena. Identify patterns and changes that might be found in the natural environment.	
RESEARCH	Ask people questions and use simple secondary sources to find answers. Find information to help me from books and computers with help.	Recognise how and when secondary sources might help them to answer questions that cannot be answered through practical investigations. Begin to decide when research will help in my enquiry. Carry out simple research on my own.	Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Carry out research independently.	
CONCLUSIONS	Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out. Say what happened in my investigation. Say whether they were surprised at the results or not. Say what they would change about their investigation.	Use results to draw simple conclusions. Say what they have found out linking cause and effect in their explanations. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should develop new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	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. Identify scientific evidence that has been used to support or refute ideas or arguments. Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed. Separate fact from opinion. Draw conclusions and identify scientific evidence. Use simple models. Know which evidence proves a scientific point.	

MEDIUM TERM PLANNING

YEAR 5 AND 6: WORKING SCIENTIFICALLY: ALL TERMS

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
WORKING SCIENTIFICALLY	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions.	To use the following practical scientific methods, processes and skills…… Have a range of scientific experiences including different types of science enquiries to answer questions. Talk about how scientific ideas have developed over time.	Pay attention to objectivity and concern for accuracy, precision, repeatability and reproductivity. Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review. Evaluate risks.	
VOCABULARY	Use some scientific language to talk and later write about what they have found out. Use relevant scientific language. Use comparative and superlative language.	Read, spell and pronounce scientific vocabulary correctly. Use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.		
VOCABULARY	research, questions, enquiry, comparative & fair test, systematic, careful, observation accurate measurements ,classify, present record, drawings, labelled diagrams, charts, tables, oral & written explanations, differences, similarities, changes, evidence, improve secondary sources, equipment, thermometer, data logger, data gather, conclusion, predictions, guides, keys, interpret, construct	plan, variables, measurements, display & presentation, evidence, support, refute ideas or arguments, accuracy, precision, repeat readings, scientific diagrams, labels, classification, keys, tables, scatter graphs, bar graphs, line graphs, patterns, systematic, quantitative measurements		
UNDERSTANDING	Know which things in science have made our lives better. Understand there is some risk in science. SCIENTISTS.	Talk about how scientific ideas have changed over time. Explain the positive and negative effects on scientific development. See how science is useful in everyday life. Say which parts of our lives rely on science. Understand there is some risk in science. SCIENTISTS.		

MEDIUM TERM PLANNING

YEAR 5 AND 6: WORKING SCIENTIFICALLY: AUTUMN TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS – KS3	ASSESSMENT
QUESTIONING AND ENQUIRING PLANNING	Raise their own relevant questions about the world around them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	Use their scientific experiences to explore ideas and raise different kinds of questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. I can decide which types of variables to control.	Ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience Make predictions using scientific knowledge and understanding Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety	
OBSERVING AND MEASURING PATTERM SEEKING	Make systematic and careful observations. Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. Observe and measure accurately using standard units using a range of equipment Mm, cm, m, ml, l, degrees C, seconds, minutes	Make their own decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat. Choose the most appropriate equipment and explain how to use it accurately. Make accurate and precise measurements: N, g, kg, mm, cm, m, mins, secs, km, h, pie, line, bar graph Identify patterns that might be found in the natural environment. Interpret data and find patterns. Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.	Measurement Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques.	
INVESTIGATING	Set up simple practical enquiries, comparative and fair tests. Recognise when a simple fair test is necessary and hep to decide how to set it up. Help decide which variables to keep the same and which to change.	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Suggest improvements to my test, giving reasons. Use test results to make predictions to set up further comparative and fair tests.	Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements Apply sampling techniques	

MEDIUM TERM PLANNING

YEAR 5 AND 6: WORKING SCIENTIFICALLY: SPRING TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
QUESTIONING AND ENQUIRING PLANNING	Raise their own relevant questions about the world around them. Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions. Use different types of scientific enquiry to answer questions.	Use their scientific experiences to explore ideas and raise different kinds of questions about scientific phenomena. Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions. I can decide which types of variables to control.	Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate	

MEDIUM TERM PLANNING

YEAR 5 AND 6: WORKING SCIENTIFICALLY: SUMMER TERM

FOCUS AREA	PREVIOUS LEARNING	SKILLS TO BE TAUGHT	NEXT STEPS	ASSESSMENT
IDENTIFYING GROUPING AND CLASSIFYING	Talk about criteria for grouping, sorting and classifying and use simple keys. Identify differences, similarities or changes related to simple scientific ideas and processes. Compare and group according to behaviour or properties based on testing.	Use and develop keys and other information records to identify, classify and describe living things and materials and other scientific phenomena. Identify patterns and changes that might be found in the natural environment.		
RESEARCH	Recognise how and when secondary sources might help them to answer questions that cannot be answered through practical investigations. Begin to decide when research will help in my enquiry. Carry out simple research on my own.	Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Carry out research independently.		
CONCLUSIONS	Use results to draw simple conclusions. Say what they have found out linking cause and effect in their explanations. With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, they should develop new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.	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. Identify scientific evidence that has been used to support or refute ideas or arguments. Draw conclusions based on their data and observations, use evidence to justify their ideas, use scientific knowledge and understanding to explain their findings. Use their results to make predictions and identify when further observations, comparative and fair tests might be needed. Separate fact from opinion. Draw conclusions and identify scientific evidence. Use simple models. Know which evidence proves a scientific point.	Apply mathematical concepts and calculate results Present observations and data using appropriate methods, including tables and graphs Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions Present reasoned explanations, including explaining data in relation to predictions and hypotheses Evaluate data, showing awareness of potential sources of random and systematic error Identify further questions arising from their results.	