Progression of Knowledge and Skills in Science
EYFS-Upper KS2

Subject	Science						
	EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Knowledge and Conceptual objectives (substantive knowledge)	**Understanding the World (UW)** People, culture and communities (ELG) The Natural World (ELG) **Expressive Arts and Design (EAD)** Creating with materials (ELG) Being Imaginative and Expressive (ELG)	**Seasonal Change** (Autumn 1,2 + continuous provision throughout) **Everyday Materials** (Autumn 2) **Animals including humans** (Spring 1) **Plants** (Spring 2)	**Animals including Humans** (Autumn 1) **Uses of everyday materials** (Autumn 2) **Plants** (Spring 2) **Living things and their habitats** (Summer 2)	**Plants** (Autumn 1) **Animals and Humans** (Autumn 2) **Rocks and soils** (Summer 1) **Light** (Summer 2) **Forces and Magnets** (Spring 2)	**Living things and their habitats** (Autumn 1) **Animals including humans** (Spring 2 Summer 2) **States of matter** (Summer 1) **Sound** (Spring 1) **Electricity** (Autumn 2)	**Living things and their habitats** (Spring 1, Spring 2) **Animals including humans** (Spring 2) **Properties and changes in materials** (Summer 2) **Earth and Space** (Autumn 1) **Forces** (Autumn 2)	**Living things and their habitats** (Spring 1) **Animals including humans** (Spring 2) **Evolution and Inheritance** (Autumn 2) **Light** (Autumn 1) **Electricity** (Summer 2)

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Working Scientifically objectives (disciplinary knowledge)	Taught within and through the above knowledge objectives during adult directed and child initiated provision. Enhancements used throughout the academic year to further develop scientific enquiry. Investigation area/Exploring light box/seasonal changes/Forest School	Taught within and through the above knowledge objectives. **Animals including humans enquiry through beach school** (Summer 1) **Plants enquiry** (Summer 2) Link to seasonal changes/ sun safety/ introduce shadows and the sun being a source of light.	Taught within and through the above knowledge objectives ***Enquiry into Seasonal Change (programme of study Y1 revision)*** (Spring 1) **Plants enquiry through beach school** (Summer 1) Beach School- Lighthouses - uses for electricity/ first electric lighthouse- Souter Light is not a Y2 objective, but is tied to beach school Forces, not a Y2 objective, but (Link to materials – some materials can be changed by force)	Taught within and through the above knowledge objectives. ***Enquiry linked to chocolate, temperature, states of matter.*** (Spring 1)	Taught within and through the above knowledge objectives. **Enquiry linked to animals and humans** *(Summer 2)*	Taught within and through the above knowledge objectives. **Revision and enquiry unit** (Summer 1)	Taught within and through the above knowledge objectives. **Revision and enquiry unit** (Summer 1)
National Curriculum Progression/ Coverage							
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Biology	**Understanding the World** **Natural World:** **3-4Y**	**Frozen Planet/ Beach School:** **Animals including humans (Spring 1/ Summer 1):**	**Me, myself and I:** **Animals including humans. (Autumn 1)** Notice that animals,	**Rainforests:** **Plants (Autumn 1)** Identify and describe the functions of	**Honey Comb:** **Living things and their habitats (Autumn 1)**	**Coasts:** **Living things and their habitats (Spring 1)**	**Invasion: Living things and their habitats (Spring 1)** Describe how living

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	Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. **REC** Explore the natural world around them. Describe what they see, hear and feel whilst outside. Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense **Ship Ahoy/ Amazing Africa** **Plants** **(Spring 2/ Summer 2)** Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees **Art Attack + Toy Story: Seasonal**	including humans, have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. **Fire! Fire!** **Plants** **(Spring 2)** Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. **Beach School/ I'm a Survivor:** **Living things and their habitats** **(Summer 1/2)** Explore and compare the differences between things that are living, dead, and things that have never been alive.	different parts of flowering plants: roots, stem/trunk, leaves and flowers Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Yabadabado:** **Animals including humans** **(Autumn 2)** Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. **Anglo-Saxon Farm School:** **Animals including humans (Spring 2)** Construct and interpret a variety of food chains, identifying producers, predators and prey simple functions **Roman Around:** **Animals including humans (Summer 2)** Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals. **South Tyneside in WW2:** **Living things and their habitats (Spring 2)** Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals. **South Tyneside in WW2:** **Animals including humans** (Spring 2) Describe the changes as humans develop to old age. Draw a timeline to indicate the stages in growth and development of humans, including the changes experienced during puberty.	things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics **Animals including humans:** **Animals including humans (Spring 2)** Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans. **Man or beast:**

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	around them. **ELG** Explore the natural world around them, making observations and drawing pictures of animals and plants Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter	**Change (Autumn ½ continuous provision)** Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	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. Identify and name a variety of plants and animals in their habitats, including micro-habitats. 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.				**Evolution and Inheritance (Autumn 2)** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Chemistry	**Expressive arts and design:** **Creating with Materials**	**Toy Story** **Everyday Materials (Autumn 2)**	**Zoom:** **Uses of everyday materials.** **(Autumn 2)**	**Buried treasure:** **Rocks and soils** **(Summer 1)**	**Change Planets:** **States of matter** **(Summer 1)**	**Tudors:** **Properties and changes in materials** **(Summer 2)**	

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	3-4Y Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures. **REC** Return to and build on their previous learning, refining ideas and developing their ability to represent them. **ELG** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used.	Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties Describe in simple terms how fossils are formed when things that have lived are trapped within rock Recognise that soils are made from rocks and organic matter.	Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature .	Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic Demonstrate that dissolving, mixing and changes of state are reversible changes Explain that some changes result in the	

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						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.	
	EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Physics	**Expressive arts and design:** **Being Imaginative and Expressive** **3-4Y** Listen with increased attention to sounds. **REC** Listen attentively, move to and talk about music, expressing their feelings and responses. **ELG** Perform songs, rhymes, poems and stories with others, and (when appropriate) try to move in time with music. **Understanding the world:** **The Natural World 3-4 Y** Explore and talk about different forces they can feel. **REC**	Link to music: Sound		**Crime and punishment: Forces and Magnets (Spring 2)** Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance Observe how magnets attract or repel each other and attract some materials and not others Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials Describe magnets as having two poles	**Mighty Mountains: Sound (Spring 1)** Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it Recognise that sounds get fainter as the distance from the sound source increases **No place like home: Electricity (Autumn 2)** Identify common appliances that run on electricity	**Our Universe: Earth and Space (Autumn 1)** Describe the movement of the Earth, and other planets, relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. **Marine engineers: Forces (Autumn 2)** Explain that unsupported objects fall towards the Earth	**Ancient Greeks: Light (Autumn 1)** Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Extreme Earth: Electricity (Summer 2)** Associate the brightness of a lamp or

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	Explore the natural world around them. Describe what they see, hear and feel whilst outside. **ELG** Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.			Predict whether two magnets will attract or repel each other, depending on which poles are facing. **It was my Bright idea- who invented the light bulb?** **Light (Summer 2)** Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Recognise that shadows are formed when the light from a light source is blocked by a solid object Find patterns in the way that the size of shadows change.	Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit Recognise some common conductors and insulators, and associate metals with being good conductors.	because of the force of gravity acting between the Earth and the falling object Identify the effects of air resistance, water resistance and friction, that act between moving surfaces Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	the volume of a buzzer with the number and voltage of cells used in the circuit Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches Use recognised symbols when representing a simple circuit in a diagram.

Scientific Enquiry

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Skills Objectives (5 types of enquiry skills - observation over time, pattern seeking, identifying, classifying and grouping, Comparative and fair testing, Research using secondary sources)						
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Planning						
Having their own ideas– thinking of ideas; finding ways to solve problems; finding new ways to do things Making predictions Planning making decisions about how to solve a problem and reach a goal	*Ask simple questions when prompted* *Suggest ways of answering a question*	Ask simple questions Recognise that questions can be answered in different ways	*Ask relevant questions when prompted* *Set up simple and practical enquiries, comparative and fair tests* *Set up comparative tests*	Ask relevant questions Plan different types of scientific enquiries to answer questions Set up simple and practical enquiries, comparative and fair tests	*With prompting, plan different types of scientific enquiries to answer questions* *With prompting, recognise and control variables where necessary*	Plan different types of scientific enquiries to answer questions Recognise and control variables where necessary
Conducting Experiments						

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Testing their ideas. Children use everyday language as they explore to talk about size, weight, capacity. They explore characteristics of everyday objects and shapes Children explore different materials freely, to develop their ideas about how to use them. Return to and build on their previous learning. refining ideas and developing their ability to represent them.	*Make relevant observations* *Conduct simple tests, with support*	Observe closely, using simple equipment Perform simple tests	*Make systematic observations, using simple equipment* *Use standard units when taking measurements*	Make systematic and careful observations using a range of equipment, including thermometers and data loggers Take accurate measurements using standard units, where appropriate	*Select, with prompting, and use appropriate equipment to take readings* *Take precise measurements using standard units*	Take measurements using a range of scientific equipment Take measurements with increasing accuracy and precision Take repeat readings when appropriate
Recording Evidence						
Developing ideas of grouping , sequencing, cause and effect Children talk about the differences between materials and changes they notice	*With prompting, suggest how findings could be recorded*	Record and communicate their findings in a range of ways and begin to use simple scientific language	*Record findings in various ways* *With prompting, suggest how findings may be tabulated* *With prompting, use various ways of recording, grouping and displaying evidence*	Record findings using simple scientific language, drawings and labelled diagrams Record findings using keys, bar charts, and tables Gather, record, classify and present data in a	*Take and process repeat readings*	Record data and results of increasing complexity using scientific diagrams and labels

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				variety of ways to help to answer questions		
Reporting Findings						
Making links and noticing patterns <u>Speaking:</u> Learn new vocabulary. Use new vocabulary through the day. Articulate their ideas and thoughts in well formed sentences. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. <u>Understand the world:</u> Children can talk about the differences between materials and changes they notice.	*Recognise findings*	Identify and classify	*With prompting, suggest conclusions from enquiries* *Suggest how findings could be reported*	Report on findings from enquiries, including oral and written explanations, of results and conclusions Report on findings from enquiries using displays or presentations	*Record data and results* *Record data using labelled diagrams, keys, tables and charts* *Use line graphs to record data*	Report and present findings from enquiries, including conclusions and causal relationships Report and presents findings from enquiries in oral and written forms such as displays and other presentation Report and present findings from enquiries, including explanations of, and degree of, trust in results
Predictions and Conclusions						

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Checking how well their activities are going Changing strategy as needed Reviewing how well the approach worked <u>Understanding:</u> Understand 'why' questions, like: "why do you think the caterpillar got so fat?" Children can discuss similarities and differences between living things, objects and materials.	*Gather and record data* *Use observations to suggest answers to questions*	Gather and record data to help answer questions Use their observations and ideas to suggest answers to questions	*Suggest possible improvements or further questions to investigate*	Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support their findings Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	*Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships* *With support, present findings from enquiries orally and in writing* *Suggest further comparative or fair tests*	Identify scientific evidence that has been used to support or refute ideas or arguments Use test results to make predictions to set up further comparative and fair tests

	EYFS	**KS1**	**LKS2**	**UKS2**
Trips/ visitors:	Forest School (minibeast habitats, wildlife habitats, den building, fire making, seasonal changes) Visit from a local dentist (staying healthy, looking after our bodies) Christmas themes visit to West Boldon Lodge.	Williby Roc's Art Attack (links to everyday materials and seasonal changes) Discovery Museum (links to toys and everyday materials) West Boldon Lodge (animals and habitats) Beach School (living things and their habitats, animals and humans and seasonal change)	Winter Gardens (Living things and habitats) Farm School (living things and their habitats, plants, animals and humans- food chains and plants) Customs House Music Festival (sound, pitch) Jarrow School: (electricity, enquiry skills at comprehensive, experiencing science labs) Discovery Museum: (Forces and magnets)	Hancock Museum (Evolution and inheritance, animals and humans) Centre for Life: (Earth and space, enquiry skills, forces and magnets, space travel today) Nissan: (STEM, future aspirations, problem solving, testing hypothesis, properties of materials) Beach trip: living things and their habitats/coasts and rockpools)
Key	**Linked to observing over**	**Living things and their habitats:**	**States of Matter:**	**Electricity:**

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questioning	**time:** What can we see? Where can we find minibeasts? How can we care for the minibeasts and keep them safe in our forest school? What do we need to make a fire? How do we stay safe when near a fire? How can you make a den with your friends? Can we make it even better? How?	What animals might you find in a rock pool habitat? Can you name 3 types of plant that we might find in our local environment? Can you name a type of tree that we might find in our local environment? Can you describe the food chain of a fox? **Materials:** What toys are made out of wood? What is the best material to make a superhero costume out of? What is the best material for a bookshelf? Can you describe what a window is made out of and what it is like? How many different things can you name that are made out of metal? Which materials would be suitable for making a coat hanger out of? Which materials would not? Which toys do you have at home that could be recycled? What types of materials can be stretched? **Materials:** What materials can we build a tower with? What is the best material for a tent? How many different types of buildings can you name? Why would an absorbent material not be suitable for making a tent? What could you build a tower out of that could also be recycled? **Plants:** What is the difference between an evergreen tree and a deciduous tree? Can you name three types of garden plants? Can you name 3 types of wild plants? Can you name 4 key parts of a plant? What conditions does a plant need to grow and be healthy? What types of plants is it safe to eat? How do plants reproduce? **Seasonal Change:** What is the weather normally like in	Can you describe what the particles in a liquid are like? What is the name of the process which turns liquid to ice? What temperature does water freeze at? What temperature does what begin boiling? **Electricity:** Can you name 3 appliances in your house that require electricity to work? What does a circuit need to work? Can you name a good conductor of electricity? Can you name a good insulator? **Forces and magnets:** What force pulls objects to the ground? Can you name three surfaces which would create high levels of friction for a cyclist riding a bike? How would you devise an experiment to test the strength of 3 different magnets? Can you explain what motion is? **Living things and their habitats:** What is similar about a duck and a fish? What is different? Can you give 3 examples of vertebrates and 3 examples of invertebrates? What are the 7 life processes? How can humans have a negative impact on the environment? How can humans have a positive impact on the environment? **Rocks:** What types of rock might you find on Marsden Beach? What happens if you rub two types of rock together? How is soil formed? What might a fossil tell us? Plants: Why are leaves so important to plants? Can you explain 2 functions of the stem? Can you explain 2 functions of the roots? How does pollination occur in different plants? Why might different plants need different amounts	What will happen if a second bulb is added to a working circuit? Would there be an effect if the wires in a working circuit were shortened? Can you explain what a conductor would do if it was added to a working circuit? What is the function of an ammeter in a circuit? **Forces/ Space:** What is the name of the force which slows down a moving object? Can you describe 2 examples of animals with streamlined bodies?How does this help them? How could you set up an experiment to test the effectiveness of two different types of parachutes? Why might you repeat the experiment more than once? How might a 100m sprinter reduce the impact of air resistance on his moving body? **Forces:** Can you explain how a pulley might work? Can you show how a lever would work to help a person lift a heavy object? Can you name a machine or device which uses gears to work? What factors impact the force with which a spring bounces back? **Living things and their habitats:** What is the difference between sexual reproduction and asexual reproduction? How does pollination normally happen in a flowering plant? Can you describe the life cycle of a frog? What is the anther and what is its function? Why is a platypus difficult to classify? Who was Carl Linnaeus and why was he important? Can you explain one difference between an amphibian and a fish? What type of microorganism might be found in your house? Evolution and inheritance: What is adaptation?

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		summer/spring/autumn/winter? How long are the days in summer/spring/autumn/winter? What things might you see on an autumn walk? What foods might you eat in the winter? What things might you see on a spring walk? What happens to the temperature in spring and summer? How do you keep safe in the sun? What activities might you do in the summer? **Animals including humans:** What is a life cycle? What do all animals need to survive? What does the word offspring mean? What do fish, birds and reptiles have in common? How do animals, including humans stay healthy? What do humans need to survive? Can you name the 5 senses? What do these 5 senses help humans do?	of water or space? How are seeds dispersed ina dandelion? **Sound:** How does sound travel? What does the pitch of a sound describe? What happens when a sound hits the ear? What happens if you move closer to a sound? **Light:** How many different electrical sources can you name? How are shadows formed? What happens to a shadow if a light source is very close to an object? How can we protect our eyes from the sun? **Animals including humans:** How do animals including humans get the correct amount of nutrition they need? There are seven types of nutrients? What are these and how do they help keep humans healthy? Can you get more than one nutrient from one type of food? Why do animals including humans need a skeleton? What would happen if you did not have a skeleton? What is an endoskeleton and an exoskeleton? How do muscles work? Why do we need to look after our teeth and what is decay? What are the three types of teeth that humans have? What is saliva and why do animals including humans need this to eat? Where does the digestive system begin? How does food travel from the mouth to the stomach? Which part of the body absorbs the nutrients? What happens to food that the body no longer needs? Why is exercise so important? **Food chains:**	What did Charles Darwin's work on finches tell us? What type of information can we learn from a fossil? What characteristics might we inherit from our parents?What do we not inherit from our parents? **Properties and changes in materials:** What would be the best material to wrap an ice cube in to stop it from melting? What is a variable in an investigation? Can you think of two changes that are irreversible? Can you explain the difference in particle structure between solids, liquids and gasses? How does this impact their behaviour? **Earth and space:** Can you name all of the planets in order of their distance from the sun? What is a solar eclipse and why does it occur? How long does it take for the earth to orbit the sun? What causes day and night? Why do we have high and low tides? **Light**: How many objects can you see in the classroom that are opaque? Can you explain in 3 sentences how we see an object? How do mirrors make it possible to see things through a periscope? Can you give another example of how mirrors are useful to humans? **Animals and humans:** How is the circulatory system made up? How does your pulse change when you exercise? What are the main stages of the human life cycle? What changes might be expected during puberty? Why do humans take so long to walk following birth compared to other animals?

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			What is a producer? What is a predator? Can you describe an animal that might be both predator and prey?	
More Able Challenge & End Points Mastery	Children know that the environment and living things are influenced by human activity. They can describe some actions which people in their own community do that help to maintain the area they live in. They know the properties of some materials and can suggest some of the purposes they are used for. They are familiar with basic scientific concepts such as floating, sinking, experimentation. Awareness of Influence of human activity Application of scientific knowledge base Children need to have experiences that look beyond labelling but give children a real context to ask questions why/when How to achieve this: • Talk to children and drip feed in scientific vocabulary as they explore the environment, MTYT, stretch	Over time and in a range of contexts, pupils can: • **Recall and explain their knowledge from the biology, chemistry and physics strands.** • ask relevant questions. • set up simple practical enquiries, comparative and fair tests. • make accurate measurements using standard units, using a range of • use equipment, for example thermometers and data loggers. • gather, record, classify and presenting data in a variety of ways to help in answering questions. • record findings using simple scientific language, drawings, labelled • diagrams, bar charts and tables. • report on findings from enquiries, including oral and written explanations, • displays or presentations of results and conclusions. • use results to draw simple conclusions and suggest improvements, new • ask questions and make predictions for setting up further tests • identify differences, similarities or changes related to simple scientific • ideas and processes. How to achieve this: • Adapt questioning around the children's results to encourage the more able to recognise that they can answer in different ways. • Encourage self-assessment. Have you answered the enquiry? How do you know?	Over time and in a range of contexts, pupils can: • **Recall and explain their knowledge from the biology, chemistry and physics strands.** • plan enquiries, including recognising and controlling variables where necessary. • take measurements, using a range of scientific equipment, with increasing accuracy and precision. • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. I can report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • present findings in written form, displays and other presentations. • use test results to make predictions to set up further comparative and fair tests. • use simple models to describe scientific ideas. • identify scientific evidence that has been used to support or refute ideas or arguments. How to achieve this: • Uplevel questioning to challenge the children's methods of enquiry results to encourage the more able to recognise that they can answer in different ways and adapt their resources and enquiries to further their knowledge.. • Encourage self-assessment. Have you answered the enquiry? How do you know?	Over time and in a range of contexts, pupils can: • **Recall and explain their knowledge from the biology, chemistry and physics strands.** • ask questions and develop lines of enquiry based on observations. • make predictions using scientific knowledge and understanding. • plan and design investigations and experiments to make observations and test predictions. • identify independent, dependent and control variables and other factors to be taken into account when collecting evidence and data. • select appropriate techniques, apparatus, and materials during fieldwork and laboratory work, working safely. • make and record observations and measurements using a range of methods for different investigations. • evaluate the reliability of methods and suggest possible improvements. • present observations and data using appropriate methods, including tables and graphs. • interpret observations and data. I can present reasoned explanations. • evaluate data, showing awareness of potential errors. I can identify questions arising from results of investigations. How to achieve this: • Children to be involved in the planning of the type of scientific enquiry that they will use to answer given questions / investigations, with choices available to help make the best

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	words and model vocabulary pronunciation. • Ensure that there are opportunities for children to record their findings when in the natural environment of forest school or the outdoor space, such as drawing, writing, making a model or photographing. • Share stories which will help children to link ideas and make sense of different environments. • Provide stimuli and resources for children to create simple maps and plans, paintings, drawings and models of observations of known and imaginary landscapes. • 'How' and 'Why' question stems	What have you observed? Can you explain that to a friend so that they understand your findings? • Correct scientific vocabulary and encourage children to explain scientific vocabulary to their friends. • Promote engagement in extracurricular STEM activities	What have you observed? Can you explain that to a friend so that they understand your findings? Can you make new predictions based on your conclusions? • Correct scientific vocabulary and encourage children to explain scientific vocabulary to their friends. • Work independently to create relevant mathematical charts to quantify their data, such as bar charts, diagrams and tables. • Promote engagement in extracurricular STEM activities and competitions	choices possible. • Uplevel questioning to challenge the children's methods of enquiry results to encourage the more able to recognise that they can answer in different ways and adapt their resources and enquiries to further their knowledge.. • Encourage self-assessment. Have you answered the enquiry? How do you know? Can you repeat the experiment and get the same results? If yes, what does that prove? If no, what does that mean? Is your test fair? Is your test comparative? What have you observed? Can you explain that to a friend so that they understand your findings? Can you make new predictions based on your conclusions? • Correct scientific vocabulary and encourage children to explain scientific vocabulary to their friends. • Work independently to create relevant mathematical charts to quantify their data, such as bar charts, diagrams, scatter graphs, classification keys, line graphs and tables. • Promote engagement in extracurricular STEM activities and competitions
Support for Least Able & End Points	Pupils can: • Show awareness about places, objects, materials and living things. • They demonstrate knowledge about the features of their own immediate environment and how environments might vary from one another by responding to experiences, questions and visual prompts using	Pupils can: • Talk about similarities and differences in relation to places, objects, materials and living things. • They talk about the features of their own immediate environment and how environments might vary from one to another. • They make observations of animals and plants and explain why some things occur, and talk about changes. • Understanding is shown through · investigative, experiential learning,	Pupils can: • **Recall some key knowledge from the biology, chemistry and physics strands.** • Ask simple questions and recognise that questions can be answered in different ways • Observe closely, using simple equipment to perform simple tests • Record and communicate their findings in a range of ways and begin to use simple scientific language • Identify and classify	Pupils can: • **Recall some key knowledge from the biology, chemistry and physics strands.** • Ask relevant questions • Plan different types of scientific enquiries to answer questions • Set up simple and practical enquiries, comparative and fair tests • Make systematic and careful observations using a range of equipment, including thermometers and data loggers

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	their words, pictures or actions. How to achieve this: • Share stories which will help children to link ideas and make sense of different environments. MTYT with scientific vocabulary, supporting and modelling pronunciation and high expectations • Use the local area for exploring both the built and the natural environment. • Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs. • Provide play maps and small world equipment for children to create their own environments. • Teach skills and knowledge in the context of practical activities, e.g. learning about the characteristics of liquids and solids by involving children in melting chocolate or cooking eggs.	discussing what is seen and discovered using their words, pictures and actions How to achieve this: • Ask simple questions with multi-choice answers to support children's reasoning skills. • Pre-teach lesson where children are introduced to key scientific vocabulary that will be used within the science lesson to ensure that they understand what is being discussed. Scientific vocabulary mats, wall displays and tool kits available. • Work as a team to set up and complete a scientific enquiry. • Have questions written on worktops to encourage children to stay on task. What can you see? What can you hear? What can you smell? What are you observing?	• Gather and record data to help answer questions • Use their observations and ideas to suggest answers to questions How to achieve this: • Ask simple questions with multi-choice answers to support children's reasoning skills. • Pre-teach lesson, introducing children key scientific vocabulary that will be used within the science lesson to ensure that they understand what is being discussed. Scientific vocabulary mats, wall displays and tool kits available. • Have visual prompts alongside written instructions on how to set up an enquiry using scientific equipment. • Work as a team to set up and complete a scientific enquiry. Within the team and / with adult support, create relevant mathematical charts to quantify their data, such as bar charts, diagrams and tables. • Have questions written on worktops to encourage children to stay on task. What can you see? What can you hear? What can you smell? What are you observing?	• Take accurate measurements using standard units, where appropriate • Record findings using simple scientific language, drawings and labelled diagrams • Record findings using keys, bar charts, and tables • Gather, record, classify and present data in a variety of ways to help to answer questions • Report on findings from enquiries, including oral and written explanations, of results and conclusions • Report on findings from enquiries using displays or presentations • Identify differences, similarities or changes related to simple scientific ideas and processes • Use straightforward scientific evidence to answer questions or to support their findings • Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions How to achieve this: • Children to be involved in the planning of the type of scientific enquiry that they will use to answer given questions / investigations, with choices available to help make the best choices possible. Discuss with children why they have chosen this with an adult to support their choice and guide them where necessary. • Uplevel questioning to challenge the children's methods of enquiry results to encourage high expectations and critical thinking in less able children to recognise that they can answer in different ways and adapt their resources and enquiries to further their knowledge.

				• Have visual prompts alongside written instructions on how to set up an enquiry using scientific equipment. • Encourage self-assessment as a team. Have you answered the enquiry? How do you know? Can you repeat the experiment and get the same results? If yes, what does that prove? If no, what does that mean? Is your test fair? Is your test comparative? What have you observed? Can you explain that to your group that they understand your findings? Can you make new predictions based on your conclusions? Discuss with your group and an adult. • Pre-teach lesson, introducing children key scientific vocabulary that will be used within the science lesson to ensure that they understand what is being discussed. Scientific vocabulary mats, wall displays and tool kits available. • Have questions written on worktops to encourage children to stay on task. What can you see? What can you hear? What can you smell? What are you observing? • Correct scientific vocabulary and encourage children to explain scientific vocabulary to their friends. • Work as a group to create relevant mathematical charts to quantify their data, such as bar charts, diagrams, scatter graphs, classification keys, line graphs and tables.
SEND: Engagement Model	For children with severe, profound and/or multiple learning difficulties working below National Curriculum standards and not engaged in subject specific study, the 'Engagement Model' will be used for assessment. The five areas of engagement are: • Exploration • Realisation • Anticipation • Persistence			

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	• Initiation This model will be used alongside children's individual EHCP and Pupil Progress Plans to plan for and assess children's progression across the bespoke curriculum that they are able to access in line with their strengths and needs.

Identifying **end-points**
These **end-points**, the foundational knowledge on which our **curriculum** is built, may be derived from the assessment objectives or learning outcomes for that subject as defined by Ofqual and awarding bodies, or may be the key concepts that the teachers of that subject deem most important.

What is the understanding of mastery and where do the most able children end?

- Children should understand that science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.
- Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.
- Children should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.
- Children should develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Children will develop an understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Science lessons should ensure that children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.
- Science is important across the curriculum and reflects the importance of children's spoken language, cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

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“Play is the highest form of research.” Albert Einstein.

” I have not failed……I have just found 10,000 ways that won’t work!” Thomas Edison