



Grange Moor Primary School

Science

Curriculum Map Document

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Work Hard, Aim High.

1. Statement of Intent

At Grange Moor Primary School, our vision is to give children a science curriculum which enables them to confidently explore and discover the world around them, so that they have a deeper understanding of the world we live in. We aim to create fun and stimulating science lessons that nurture children's natural curiosity and their on-going development. We aim to develop within our children; the ability to think and learn independently and raise questions about working scientifically, confidence and competence in a full range of practical skills, excellent scientific knowledge and understanding, the ability to undertake practical work in a variety of contexts- using Outdoor Learning wherever possible, the ability to work collaboratively with others and a passion for Science and its application in past, present and future technologies.

As a school we are acutely aware of the importance of ensuring Science has a prominent position in our curriculum and children follow a clear progression of skills that enable them to become competent and confident scientists. The Science curriculum is arranged in the following areas:

- Planning and Communication and Sources
- Enquiring and Testing
- Observing and Recording
- Considering Evidence and Evaluating

2. Science at Grange Moor an Overview

At Grange Moor Primary School, we implement a curriculum that is progressive throughout school. We use 'Science Bug' within Key stages 1 and 2 and this provides the structure and skill development for the science curriculum being taught. The Science topics are stand- alone units, but links between the overall class themes are made wherever possible.

The Science Curriculum is based on a two- year cycle and is taught within 3 classes; Years 1 and 2, Years 3 and 4 and Years 5 and 6. Whilst Science is not explicitly taught within the foundation stage, children experience Science- based activities through their work on Understanding the World. Within Science lessons, Key scientific language is modelled and taught throughout, enabling our children to be familiar with and use vocabulary accurately. We are committed to providing exciting, hands on and practical experiences and children are encouraged to think about their own understanding of the world, to ask questions and to explore ways in which these questions can be answered through investigation. Children are taught how to make predictions, plan investigations, communicate effectively with others, keep tests fair, use equipment safely, measure and record their results and draw conclusions.

In addition to weekly Science lessons, the children also take part in Science Week, enabling children to immerse themselves with scientific experiences. We also plan visits and enrichment experiences, such as Space Workshops, to enhance our children's learning experience when possible.

In order to promote Science further within school, we have a Science Reading Project, which encourages children to 'read Science for pleasure.' Our aim is to not only extend our pupils' knowledge and understanding, but also to excite their interest and imagination in the world of Science.

The impact of the Science curriculum will be that our pupils are fully equipped with scientific knowledge and understanding ready to take with them once they complete their primary education.

3. Whole School Long Term Plan – Science

Grange Moor Primary School

Cycle A



Long Term Plan: Science 2023 – 2024 (Revised)

CLASS	AUTUMN 1	AUTUMN 2	SPRING ONE	SPRING TWO	SUMMER ONE	SUMMER TWO
R	Weather and Seasons	Materials	The Senses	Food	Forces	Plants
Y1/2	Seasonal Changes (Y1) Re-cap and review Animals including Humans- All About Me (Year 1)	Exploring Everyday Materials 1 (Y1) Re-cap and review- Animals, including Humans- All About Animals (Year 1)	Exploring Everyday Materials 2 (Y1) Re-cap and review Animals Including Humans 1- Growth (Year 2)	Plants (Y1) Re-cap and review Animals, including Humans 2- Lifecycles (Year 2)	Uses of Everyday Materials (Y2) Re-cap and review Living Things and Their Habitats (Year 2)	Plants (Y2) Re-cap and review Living Things and Their Habitats- Habitats Around the World (Year 2)
Y3/4	Animals including Humans- (Y3) Re-cap and review Scientific Enquiry (Y3)	Forces and Magnets (Y3) Re-cap and Review Electricity (Year 4)	Animals including Humans (Y4) Re-cap and Review States of Matter (Year 4)	Living Things and their Habitats – (Y4) Re-cap and Review Sound (Year 4)	Living Things and their Habitats – Conservation (Y4) Re-cap and Review Light (Y3)	Plants (Y3) Re-cap and Review Rocks (Year 3)
Y5/6	Electricity (Year 6) Re-cap and Review Earth and Space	Changes of Materials (Y5) Re-cap and Review Living Things and Their habitats (Year 5)	Forces (Y5) Re-cap and Review Living Things and Their Habitats (Year 6)	Properties of Materials (Y5) Re-cap and Review Animals, including Humans (Year 5)	Light (Year 6) Re-cap and Review Animals, including Humans (Year 6)	Looking After Our Environment (Y6) Re-cap and Review Evolution and Inheritance (Year 6)

In Science, children are taught in the age groups as shown above



Long Term Plan: Science 2024 – 2025 (Revised)

CLASS	AUTUMN 1	AUTUMN 2	SPRING ONE	SPRING TWO	SUMMER ONE	SUMMER TWO
R	Weather and Seasons	Materials	The Senses	Food	Forces	Plants
Y1/2	Animals including Humans- All About Me (Year 1) Re-cap and review Seasonal Changes	Animals, including Humans- All About Animals (Year 1) Re-cap and review Exploring Everyday Materials 1 (Y1)	Animals Including Humans 1- Growth (Year 2) Re-cap and review Exploring Everyday Materials 2 (Y1)	Animals, including Humans 2- Lifecycles (Year 2) Re-cap and review Plants (Y1)	Living Things and Their Habitats (Year 2) Re-cap and review Uses of Everyday Materials (Y2)	Living Things and Their Habitats- Habitats Around the World (Year 2) Re-cap and review Plants (Y2)
Y3/4	Scientific Enquiry (Y3) Re-cap and review Animals including Humans- (Y3)	Electricity (Year 4) Re-cap and review Forces and Magnets (Y3)	States of Matter (Year 4) Re-cap and review Animals including Humans (Y4)	Sound (Year 4) Re-cap and review Living Things and their Habitats – (Y4)	Light (Y3) Re-cap and review Living Things and their Habitats – Conservation (Y4)	Rocks (Year 3) Re-cap and review Plants (Y3)
Y5/6	Earth and Space Re-cap and review Electricity (Year 6)	Living Things and Their habitats (Year 5) Re-cap and review Changes of Materials (Y5)	Living Things and Their Habitats (Year 6) Re-cap and review Forces (Y5)	Animals, including Humans (Year 5) Re-cap and review Properties of Materials (Y5)	Animals, including Humans (Year 6) Re-cap and review Light (Year 6)	Evolution and Inheritance (Year 6) Re-cap and review Looking After Our Environment (Y6)

In Science, children are taught in the age groups as shown above

4. Progression of Skills

	Planning and Communication and Sources	Enquiring and Testing and Obtaining and Presenting Evidence	Observing and Recording	Considering Evidence and Evaluating
Y1	<ul style="list-style-type: none"> draw simple pictures talk about what they see and do use simple charts to communicate findings identify key features ask questions 	<ul style="list-style-type: none"> test ideas suggested to them say what they think will happen use first hand experiences to answer questions begin to compare some living things 	<ul style="list-style-type: none"> make observations using appropriate senses record observations communicate observations orally, in drawing, labelling, simple writing and using ICT 	<ul style="list-style-type: none"> make simple comparisons and groupings say what has happened say whether what has happened was what they expected
Y2	<ul style="list-style-type: none"> describe their observations using some scientific vocabulary use a range of simple texts to find information suggest how to find things out identify key features ask questions 	<ul style="list-style-type: none"> use simple equipment provided to aid observation compare objects, living things or events make observations relevant to their task begin to recognise when a test or comparison is unfair use first hand experiences to answer questions 	<ul style="list-style-type: none"> put forward own ideas about how to find the answers to questions recognise the need to collect data to answer questions carry out a fair test with support recognise and explain why it is a fair test with help, pupil begin to realise that scientific ideas are based on evidence 	<ul style="list-style-type: none"> say what has happened say what their observations show and whether it was what they expected begin to draw simple conclusions and explain what they did begin to suggest improvements in their work
Y3	<ul style="list-style-type: none"> use pictures, writing, diagrams and tables as directed by their teacher use simple texts, directed by the teacher, to find information record their observations in written, pictorial and diagrammatic forms select the appropriate format to record their observations 	<ul style="list-style-type: none"> put forward own ideas about how to find the answers to questions recognise the need to collect data to answer questions carry out a fair test with support recognise and explain why it is a fair test with help, pupils begin to realise that scientific ideas are based on evidence 	<ul style="list-style-type: none"> make relevant observations measure using given equipment select equipment from a limited range 	<ul style="list-style-type: none"> begin to offer explanations for what they see and communicate in a scientific way what they have found out begin to identify patterns in recorded measurements suggest improvements in their work evaluate their findings
Y4	<ul style="list-style-type: none"> record observations, comparisons and measurements using tables and bar charts begin to plot points to form a simple graph 	<ul style="list-style-type: none"> with help, pupils begin to realise that scientific ideas are based on evidence show in the way they perform their tasks how to vary one 	<ul style="list-style-type: none"> carry out measurement accurately make a series of observations, comparisons and measurements 	<ul style="list-style-type: none"> predict outcomes using previous experience and knowledge and compare with actual results

	<ul style="list-style-type: none"> • use graphs to point out and interpret patterns in their data • select information from a range of sources provided for them 	<ul style="list-style-type: none"> • factor while keeping others the same • decide on an appropriate approach in their own investigations to answer questions • describe which factors they are varying and which will remain the same and say why 	<ul style="list-style-type: none"> • select and use suitable equipment • make a series of observations and measurements adequate for the task 	<ul style="list-style-type: none"> • begin to relate their conclusions to scientific knowledge and understanding • suggest improvements in their work, giving reasons
Y5	<ul style="list-style-type: none"> • record observations systematically • use appropriate scientific language and conventions to communicate quantitative and qualitative data • select a range of appropriate sources of information including books and the internet 	<ul style="list-style-type: none"> • use previous knowledge and experience combined with experimental evidence to provide scientific explanations • recognise the key factors to be considered in carrying out a fair test 	<ul style="list-style-type: none"> • make a series of observations, comparisons and measurements with increasing precision • select apparatus for a range of tasks • plan to use apparatus effectively • begin to make repeat observations and measurements systematically 	<ul style="list-style-type: none"> • make predictions based on their scientific knowledge and understanding • draw conclusions that are consistent with the evidence • relate evidence to scientific knowledge and understanding • offer simple explanations for any differences in their results • make practical suggestions about how their working methods could be improved
Y6	<ul style="list-style-type: none"> • choose scales for graphs which show data and features • effectively identify measurements and observations which do not fit into the main pattern • begin to explain anomalous data • use appropriate ways to communicate quantitative data using scientific language 	<ul style="list-style-type: none"> • describe evidence for a scientific idea • use scientific knowledge to identify an approach for an investigation • explain how the interpretation leads to new ideas 	<ul style="list-style-type: none"> • measure quantities with precision using fine – scale divisions • select and use information effectively • make enough measurements or observations for the required task 	<ul style="list-style-type: none"> • make reasoned suggestions on how to improve working methods • show how interpretation of evidence leads to new ideas explain conclusions, showing understanding of scientific ideas

Reception – Knowledge and Understanding of the World

<p>Unit One: <i>Weather and Seasons</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Describe what clothes you need to wear in the rain • Explain the differences between rain, ice and water • Understand the role of clouds • Understand wind direction • Describe what causes wind • Recall that wind is the movement of air • Explain what snow is • Understand that snow melts when the weather gets warmer • Model and construct using different media • Identify objects which are the same colour as the colours in the rainbow • Understand how a rainbow is formed • Investigate how to make a rainbow • Understand seasonal changes • Explain what happens during each season • Describe what clothes you might need for each season • Understand seasonal changes • Explain what happens during each season • Describe what happens to a tree during the four seasons <p>Vocabulary rain, snow, winter, summer, spring, autumn, wind, sun</p>	<p>Unit Two: <i>Materials</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Identify something that is living • Identify something that is non-living • Explain what something living has to have • Explain what happens to chocolate when it starts to melt • Explain what happens to chocolate when it starts to become hard • Describe some materials that change shape • Use a mould to make an ice cube • Explain how ice is formed • Describe the best conditions for melting ice • Explain which material is the most absorbent • Explain which material is good for different clothing • Complete a simple test • Explain what I need to do to build the perfect sandcastle • Measure accurately to compare • Understand how to make a mixture <p>Vocabulary melt, wool, mirror, jumper, cold, freeze, ice, smooth</p>	<p>Unit Three: <i>The Senses</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Identify key senses of the human body • Describe what senses can help us to do • Name which parts of the body are linked by senses • Explain that different materials can make different sounds • Make a simple musical instrument • Explain how to change a sound being made • Understand sound as vibrations • Explain how I use my sense of hearing and sight • Draw items from memory using clues from my senses • Feel an object without seeing it and describe it in detail • Describe the taste of something • Understand the words feel and taste • Identify key senses of the human body • Describe what senses can help us to do • Name which parts of the body are linked by senses <p>Vocabulary sight, taste, touch, sound, hear, noise, trumpet, eye</p>
<p>Unit Four: <i>Food</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Understand the importance of staying healthy • Describe a balanced diet • Know the difference between healthy and unhealthy food • Explain where eggs come from • Understand stages of a chicken's life 	<p>Unit Five: <i>Forces</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Describe what happens when pushes and pulls oppose each other • Suggest examples of pushes and pulls • Identify if an action is a push or a pull • Group objects based on whether they sink or float • Explain what sink means 	<p>Unit Six: <i>Plants</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Explain why a plant is a living thing and what it needs to live • Describe the features of a living thing • Know the difference between a living and a non-living thing • Explain the life cycle of a plant • Label the key features of a plant

<ul style="list-style-type: none"> Name the parts of a chicken Understand how milk can be used to keep us healthy Explain what a cow produces Explain where milk comes from Follow instructions accurately Understand the process in making dough Use materials to shape and cut Identify if a fruit tastes bitter or sweet Use clues to identify a fruit Identify and describe a range of fruit Understand which vegetables grow overground or underground Name several types of vegetables Identify three different types of vegetables Follow verbal instructions to make a mixture Describe the changes the batter mix goes through as it starts to cook Explain how to measure <p>Vocabulary cow, pig, chicken, sheep, wheat, milk, cheese eggs</p>	<ul style="list-style-type: none"> Explain what float means <p>Vocabulary push, pull, fast, slow, sink, float, press, suck</p>	<ul style="list-style-type: none"> Understand where plants come from Learn about how to look after plants <p>Vocabulary plant, seed, soil, water, stem, root, sunlight, garden</p>
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Year One and Two

<p>Unit One: Seasonal Changes (Year 1)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> Understand there are 4 seasons Name the 4 seasons Understand what changes the seasons bring 	<p>Unit Two: Exploring Everyday Materials 1 (Year 1)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> Understand what a material is Identify a variety of everyday materials Describe everyday materials 	<p>Unit Three: Exploring Everyday Materials 2 (Year 1)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> Identify and name some materials used in building a house Describe the simple physical properties of materials used in building a house
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<ul style="list-style-type: none"> • Understand that autumn is a season • Understand the different weather that happens in autumn • Understand that the days get shorter in autumn • Understand that winter is a season • Understand the different weather that happens in winter • Understand that the days are short in winter • Understand that spring is a season • Understand the different weather that happens in spring • Make comparisons between winter and spring • Understand that summer is a season • Understand the different weather that happens in summer • Make comparisons between winter and summer • Make comparisons about the amount of rainfall over 5 weeks • Draw a graph to show the amount of rainfall over 5 weeks • Draw a graph and write a conclusion explaining my results <p>Vocabulary season, spring, summer, autumn, winter, hibernate, temperature, weather</p>	<ul style="list-style-type: none"> • Understand that all objects are made from materials • Identify what material an object is made from • Understand that different objects can be made from the same material • Give simple descriptions of everyday materials • Describe the properties of everyday materials • Explain why materials are chosen for particular objects • Understand that some materials are natural and some are manmade • Identify natural and manmade materials • Understand that natural and manmade materials are used for different purposes • Understand that some objects float and some objects sink • Predict and identify if an object will float or sink • Predict and identify if an object will float or sink and explain if my prediction was correct • Understand that some materials soak up water • Compare materials that are absorbent and not absorbent • Understand that non-absorbent materials are used in objects that need to be waterproof <p>Vocabulary material, fabric, wood, plastic, metal, property, opaque, transparent</p>	<ul style="list-style-type: none"> • Understand the suitability of materials used in building a house • Understand what waterproof means • Know what materials are waterproof • Understand why the roof of a house needs to be waterproof • Understand that glass is transparent • Understand why glass is used to make windows • Explain why glass is the best material to use for windows and why other materials might be unsuitable • Understand the properties of fabric • Understand that a variety of materials are sometimes used to make one object • Understand why specific materials are used to make furniture • Understand that there are different types of fabrics • Understand that different fabrics have different properties • Understand that different fabrics have specific uses • Identify and name a variety of everyday materials • Describe the simple physical properties of a variety of everyday materials • Explain the uses of materials and why they are suitable <p>Vocabulary strong, clay, brick, roof, slate, window pane, window frame, cotton</p>
<p>Unit Four: Plants (Year 1) Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Identify a plant 	<p>Unit Five: Uses of Everyday Materials (Year 2) Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand what a material is 	<p>Unit Six: Plants (Year 2) Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Observe and talk about seeds and bulbs • Draw the inside of a seed and a bulb

- Explain how to plant a seed
- Predict what might happen to their seed
- Say what is the same and what is different between 2 flowering plants
- Correctly label the parts of a plant
- Correctly label the parts of a tree
- Make careful observations
- Group plants according to their features
- Record their ideas and provide explanations
- Know that deciduous trees change throughout the year
- Explain how a deciduous tree changes through the year
- Make comparisons between a deciduous tree and an evergreen tree
- Understand that plants are a source of food
- Make predictions
- Record their findings in a table
- Understand that plants grow over time
- Record the growth of a plant
- Measure the height of a plant and record how much it has grown

Vocabulary

seed, plant, stem, petal, deciduous, evergreen, fruit, vegetable

Know the properties of a variety of everyday materials

- Explain why some materials are suitable for specific uses
- Understand that some materials are stronger than others
- Compare the strength of different materials
- Understand that materials differ in strength and can be strengthened by changing their structure
- Understand that the shapes of objects can be changed by stretching
- Compare how the shapes of objects change when they are stretched
- Compare how some objects change after stretching while other objects return to their original form
- Understand that the shapes of objects can be changed by twisting, bending, squashing or stretching
- Compare how the shapes of objects change when they are twisted, bent, squashed or stretched
- Understand why bending, twisting, stretching or squashing objects is important in everyday life
- Know that some materials are suitable or unsuitable for particular purposes
- Understand the properties of materials that make them suitable or unsuitable for particular purposes
- Link the suitability of materials for particular purposes with the uses of everyday tools
- Understand that some materials can be melted
- Know that some materials can be melted to change their shape

- Explain the difference between a bulb and a seed
- Set up an experiment to find out what plants need to grow
- Make a prediction
- Set up a fair test
- Understand that plants need space, water, sunlight and a suitable temperature to grow
- Explain how a plant makes its own food through the process of photosynthesis
- Explain that plants use carbon dioxide, sunlight and water to create glucose
- Understand the life cycle of a plant
- Produce a diagram to explain the life cycle of a plant
- Provide scientific explanations of the life cycle of a plant
- Record results and write a simple conclusion
- Compare the results to their prediction
- Explain why their plant did or did not thrive using the control plant as a comparison
- Identify and sort plants according to their habitats
- Describe what conditions might be like for plants in their habitats
- Explain how plants adapt to suit their environment

Vocabulary

Photosynthesis, carbon dioxide, oxygen, glucose, pollination, germination, crop, forests

- Know that some materials can be melted and mixed with other materials to change their properties

Vocabulary
Material, property, obstacle, construction, stretchy, elastic, force, bend

Year Three and Four

Unit One: Animals, including Humans (Year 3)

Substantive knowledge to be taught

- Know that there are 5 key food groups
- Explain how many portions of food from different food groups we should eat in a day
- Explain how food from each food group is essential for human growth and health
- Understand that food labels give information on the ingredients in food
- Understand that food labels help us make healthy choices
- Understand that food labels give in depth information about the different food groups within a product
- Understand that animals have different types of skeletons
- Identify which animals have an endoskeleton, exoskeleton and a hydrostatic skeleton
- Explain how animals' skeletons help them to move and survive
- Explain the functions of the human skeleton
- Identify the main bones in the human body
- Explain the functions of the main parts of the human body
- Match animals to their skeletons

Unit Two: Forces and Magnets (Year 3)

Substantive knowledge to be taught

- Identify different types of forces
- Identify different types of forces and describe the effect they have on an object
- Identify different types of forces and explain how they impact the movement of an object
- Compare how things move on different surfaces
- Explain why some surfaces slow objects down
- Explain how friction can be increased or decreased
- Describe magnets as having two poles
- Name some different types of magnet
- Identify some everyday uses for magnets
- Understand how magnetic materials behave
- Identify a range of materials which are magnetic
- Compare and group materials based on their magnetic properties
- Observe how magnetic forces act at a distance
- Understand how magnetic forces can act at a distance
- Explain how magnetic forces act at a distance

Unit Three: Animals, including Humans (Year 4)

Substantive knowledge to be taught

- Identify the main organs of the human digestive system
- Create an accurate diagram of the main organs of the human digestive system
- Explain the role of the digestive system and the organs within it
- Describe the functions of the organs in the digestive system
- Use a model of the digestive system to explain the journey of food
- Explain how the equipment used in the model relates to the digestive system
- Identify the different types of human teeth
- Explain the functions of the different types of human teeth
- Explain why humans have 2 sets of human teeth
- Observe and record the effect of each liquid
- Draw conclusions from the investigation
- Explain how to care for your teeth
- Identify the key parts of a food chain
- Create a food chain within a chosen ecosystem
- Explain why it is important to keep food chains balanced

<ul style="list-style-type: none"> • Identify how animals' skeletons have adapted to help them move in their environment • Explain the functions of the bones within animal skeletons • Understand that we have voluntary and involuntary muscles • Become familiar with the names of some muscles in the human body • Explain how muscles work <p>Vocabulary vitamin, mineral, nutrition label, balanced, endoskeleton, exoskeleton, radius, tibia, rib cage, spine, hamstrings, biceps</p>	<ul style="list-style-type: none"> • Understand what a compass is and how it works • Understand what the four main compass points are • Explain how a compass works <p>Vocabulary force, friction, motion, texture, magnet, attract, repel, magnetic field, non-contact force, magnetism, compass, orienteering</p>	<ul style="list-style-type: none"> • Research living things within a chosen ecosystem • Create a food web for a chosen ecosystem • Identify threats to living things within their chosen ecosystem <p>Vocabulary digestive system, oesophagus, saliva, peristalsis, incisors, molars, enamel, fluoride, consumer, predator, tundra, hide</p>
<p>Unit Four: Living Things and their Habitats (Year 4) Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand that living things are suited to different environments • Group living things according to the environment they are suited to • Identify the similarities between animals that live in the same habitat • Describe habitats that are found in the UK • Research key facts about a habitat and report on the climate, temperature and type of soil and water they would typically find there • Research and describe habitats that are found in the UK and the threats that living things face • Identify different ways to classify animals into groups • Organise animals into different classification groups • Begin to organise animals into different classification groups and sub-groups 	<p>Unit Five: Living Things and their Habitats- Conservation (Year 4) Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand that ecosystems are affected by changes in the seasons • Understand that habitats around the world experience different seasons which changes their ecosystem • Understand that it is not just the seasons which cause ecosystems to change • Understand human impact on the environment through deforestation • Use scientific evidence to present your findings about deforestation • Explore the measures humans can take to protect the rainforests • Understand what air pollution is • Explore what contributes to air pollution • Identify the impact air pollution has on the environment and human health • Understand how water pollution is caused • Explain the impact of different kinds of water pollution • Identify how to prevent water pollution 	<p>Unit Six: Plants (Year 3) Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Plan and set up an experiment that compares the effect of different factors on the growth of a plant • Set up a fair test • Ask scientific questions and suggest different ways to answer them • Identify the parts of plant • Draw and label a diagram to show the parts of a plant • Describe the functions of a flowering plant • Understand how water is transported within plants • Create an observational drawing to show how water is transported through a plant • Describe how water is transported through a plant • Identify the reproductive parts in a flower • Explain the functions of the reproductive parts in a flower • Explain how flowering plants reproduce • Understand that seed dispersal is a way in which some plants reproduce

<ul style="list-style-type: none"> • Understand how to interpret a classification key • Create a classification key using a series of questions • Create a complex classification key using a series of questions that group animals into sub-groups before identifying the species • Understand that animals adapt to suit their environment • Describe how animals adapt to their environment • Apply knowledge of adaptations to create a classification key for a 'new' species • Name some plants that live in a pond habitat • Describe plants that live in a pond habitat • Classify and sort plants that live in a pond habitat <p>Vocabulary adapted, camouflage, coastal, grassland, classify, species, sub-group, classification key, region, blubber, ecosystem, oxygenised</p>	<ul style="list-style-type: none"> • Understand that it is important to conserve water • Suggest ways to conserve water • Explain how to conserve water and the consequences of water shortages • Understand that there are ways humans can protect the environment • Suggest ways in which humans can protect the environment • Explain how humans can protect the environment in our everyday life <p>Vocabulary migrate, monsoon, deforestation, biodiversity, emissions, pollution, pesticide, contaminate, drought, fresh water, marine sanctuaries, conservation areas</p>	<ul style="list-style-type: none"> • Provide an explanation, both written and verbal, to show how plants reproduce • Use scientific language to describe how plants reproduce • Explain the results of an experiment • Write up the results of an experiment • Provide a conclusion using scientific language and diagrams <p>Vocabulary fertiliser, potassium, chlorophyll, photosynthesis, xylem, phloem, anther, filament, stomata, transpiration, pollen, nectar</p>
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Year Five and Six

<p>Unit One: Electricity (Year 6)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Create a simple electrical circuit • Identify components from their symbol and definition • Create an accurate circuit diagram • Create more complex electrical circuits • Use a voltmeter to measure voltage • Describe how the brightness of a bulb is affected by the voltage/number of cells in the circuit 	<p>Unit Two: Changes of Materials (Year 5)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Describe how evaporation can be used to get the salt back from salty water • Use the results of an evaporation experiment to explain which mystery liquid is a solution • Suggest a method to recover the water from a salt water solution and explain why this method works • Identify methods for reversing a physical change 	<p>Unit Three: Forces (Year 5)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Explore the life and work of Isaac Newton • Understand the influence gravity has on the universe • Investigate the relationship between mass and gravity • Understand how air resistance acts on objects • Design and test parachutes, using averages to get more accurate results
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<ul style="list-style-type: none"> • Identify problems in a circuit • Use technology to create online circuits • Explain how to fix issues in a circuit • Identify possible variables for an investigation • Design and conduct an investigation • Explain what affects the output of a circuit • Create a switch • Design and create a set of traffic lights • Explain how their traffic lights work • Identify electrical conductors and insulators • Follow instructions to create a loop and wire game • Explain how the loop and wire game works <p>Vocabulary Circuit, battery, electricity, resistor, variable resistor, dimmer switch, output, systematically, synchronised, signal, conductor, insulator</p>	<ul style="list-style-type: none"> • Describe how the method used to reverse a physical change works • Evaluate the strengths and weaknesses of the method chosen and suggest improvements • Name some irreversible changes • Use observations to describe how you can tell an irreversible change has taken place • Explain why the change is irreversible and what new products have been made • Identify rusting as an irreversible change • Plan an experiment to investigate rusting and include how to make it a fair test • Explain why rusting is an irreversible change, why it is a problem and how to prevent it • Identify the 3 factors a fire needs to burn • Describe and explain 3 methods for extinguishing a fire • Apply knowledge of the fire triangle to alternative extinguishing methods • Predict best substances used to make the fizzy rocket • Use experiment results to test a prediction and write a conclusion to show the best substances to make a fizzy rocket • Use measuring equipment to suggest ways to improve the accuracy of the observations made in the experiment <p>Vocabulary Solute, solvent, reversible, evaporate, chemical change, effervescence, fair test, corrosion, combustion, extinguish, reaction, carbon dioxide</p>	<ul style="list-style-type: none"> • Draw an accurate diagram of the forces acting on a parachute and explain their purpose • Understand how water resistance acts on objects • Describe the forces acting on an object floating in water • Identify the similarities and differences between air and water resistance • Understand how friction acts on objects • Accurately use a Newton meter to measure a force • Describe ways of changing the size of a frictional force • Name the forces acting on a range of objects • Describe the effect forces can have on an object • Explain how gears work and their purpose • Create a set of interacting gears • Notice patterns in the working of gears <p>Vocabulary Sir Isaac Newton, Gravity, Galileo Galilei, parachute, water resistance, streamlined, buoyant, upthrust, friction, newton, lever, pulley</p>
<p>Unit Four: Properties of Materials (Year 5) Substantive knowledge to be taught</p>	<p>Unit Five: Light (Year 6) Substantive knowledge to be taught</p>	<p>Unit Five: Looking After Our Environment (Year 6) Substantive knowledge to be taught</p>

- Group materials according to their properties
- Carry out a fair and comparative test to group materials according to their properties
- Use results from a fair and comparative test to explain how the properties of materials enable them to be suitable for a specific task
- Identify materials that are thermal conductors
- Carry out a fair and comparative test to test the thermal conductive properties of materials
- Use results from a fair and comparative test to explain how the thermal conductive properties enable them to be suitable for a specific task
- Investigate the hardness of materials
- Carry out a fair and comparative test to test the hardness of materials
- Use results from a fair and comparative test to explain how the hardness of materials enables them to be suitable for a specific task
- Understand what the term dissolve means
- Investigate and identify which materials are soluble and insoluble in water
- Using results of the investigation, consider which solutions could be reversed
- Ask questions that explore the solubility of a solute
- Design an investigation that tests the solubility of a solute
- Present the findings from an investigation that tests the solubility of a solute
- Identify the different separation methods
- Describe the processes of different separation methods

- Understand that light appears to travel in straight lines
- Understand how to draw a scientific diagram
- Understand how to draw a scientific diagram that helps support what you have found out
- Understand that light is reflected off of surfaces so that we can see it
- Understand how to set up a fair test and carry it out
- Understand how to draw conclusions based on findings
- Understand that light can be reflected off multiple surfaces so that we can see it
- Understand how to make a periscope to reflect an image
- Understand how to explain how an image can be seen that we cannot see using a scientific diagram
- Understand that shadows change length depending on how far they are away from a light source
- Understand how to collect data
- Understand how to display data to support findings
- Understand how to create a shadow
- Understand where to position the sun shades to create the most shade
- Understand how to feedback information based on findings
- Understand the basics behind how light is refracted, how a rainbow is made and what happens when light hits a bubble
- Understand how light is used other than for us to see
- Understand how our eyes respond to light

Vocabulary

- Describe the difference between climate and weather
- Explain the effects of climate change
- Explain how planting trees can help reduce climate change effects
- Understand what recycling is
- Understand what happens to waste that is sent to landfill
- Suggest ways in which the school can reduce the amount of waste that is sent to landfill
- Understand the energy that the UK uses comes from
- Understand the difference between renewable and non-renewable energy
- Suggest ways to reduce the amount of energy used
- Understand what the Industrial Revolution was
- Observe what happens when combustion takes place
- Explain how the Industrial Revolution played a part in climate change
- Understand what COP is and what they want to do
- Understand what was agreed at the last COP meeting
- Suggest ways to make sure that COP targets are met
- Identify the effects of climate change of animals and habitats
- Analyse the data that has been collected
- Use data comparisons to predict future trends

<ul style="list-style-type: none">• Explain the most effective separation methods for various materials <p>Vocabulary conductive, magnetic, thermal, conduction, hardness, force, dissolve, solute, solvent, substance, filtering, evaporation</p>	<p>light, light source, reflected, variable, angle, mirror, opaque, transparent, sunshade, rotate, optical, spectrum</p>	<p>Vocabulary weather, global warming, recycle, biodegrade, net zero, greenhouse gases, industrial revolution, combustion, COP, conference, species, habitat</p>
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Reception – Knowledge and Understanding of the World

<p>Unit One: <i>Weather and Seasons</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Describe what clothes you need to wear in the rain • Explain the differences between rain, ice and water • Understand the role of clouds • Understand wind direction • Describe what causes wind • Recall that wind is the movement of air • Explain what snow is • Understand that snow melts when the weather gets warmer • Model and construct using different media • Identify objects which are the same colour as the colours in the rainbow • Understand how a rainbow is formed • Investigate how to make a rainbow • Understand seasonal changes • Explain what happens during each season • Describe what clothes you might need for each season • Understand seasonal changes • Explain what happens during each season • Describe what happens to a tree during the four seasons <p>Vocabulary rain, snow, winter, summer, spring, autumn, wind, sun</p>	<p>Unit Two: <i>Materials</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Identify something that is living • Identify something that is non-living • Explain what something living has to have • Explain what happens to chocolate when it starts to melt • Explain what happens to chocolate when it starts to become hard • Describe some materials that change shape • Use a mould to make an ice cube • Explain how ice is formed • Describe the best conditions for melting ice • Explain which material is the most absorbent • Explain which material is good for different clothing • Complete a simple test • Explain what I need to do to build the perfect sandcastle • Measure accurately to compare • Understand how to make a mixture <p>Vocabulary melt, wool, mirror, jumper, cold, freeze, ice, smooth</p>	<p>Unit Three: <i>The Senses</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Identify key senses of the human body • Describe what senses can help us to do • Name which parts of the body are linked by senses • Explain that different materials can make different sounds • Make a simple musical instrument • Explain how to change a sound being made • Understand sound as vibrations • Explain how I use my sense of hearing and sight • Draw items from memory using clues from my senses • Feel an object without seeing it and describe it in detail • Describe the taste of something • Understand the words feel and taste • Identify key senses of the human body • Describe what senses can help us to do • Name which parts of the body are linked by senses <p>Vocabulary sight, taste, touch, sound, hear, noise, trumpet, eye</p>
<p>Unit Four: <i>Food</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Understand the importance of staying healthy • Describe a balanced diet • Know the difference between healthy and unhealthy food • Explain where eggs come from • Understand stages of a chicken's life 	<p>Unit Five: <i>Forces</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Describe what happens when pushes and pulls oppose each other • Suggest examples of pushes and pulls • Identify if an action is a push or a pull • Group objects based on whether they sink or float • Explain what sink means 	<p>Unit Six: <i>Plants</i> Substantive Knowledge to be taught</p> <ul style="list-style-type: none"> • Explain why a plant is a living thing and what it needs to live • Describe the features of a living thing • Know the difference between a living and a non-living thing • Explain the life cycle of a plant • Label the key features of a plant

<ul style="list-style-type: none"> Name the parts of a chicken Understand how milk can be used to keep us healthy Explain what a cow produces Explain where milk comes from Follow instructions accurately Understand the process in making dough Use materials to shape and cut Identify if a fruit tastes bitter or sweet Use clues to identify a fruit Identify and describe a range of fruit Understand which vegetables grow overground or underground Name several types of vegetables Identify three different types of vegetables Follow verbal instructions to make a mixture Describe the changes the batter mix goes through as it starts to cook Explain how to measure <p>Vocabulary cow, pig, chicken, sheep, wheat, milk, cheese eggs</p>	<ul style="list-style-type: none"> Explain what float means <p>Vocabulary push, pull, fast, slow, sink, float, press, suck</p>	<ul style="list-style-type: none"> Understand where plants come from Learn about how to look after plants <p>Vocabulary plant, seed, soil, water, stem, root, sunlight, garden</p>
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Year One and Two

<p>Unit One: <i>Animals, including Humans- All About Me (Year 1)</i></p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> Identify the basic parts of the human body Identify the different parts of the human body 	<p>Unit Two: <i>Animals, including Humans- All About Animals (Year 1)</i></p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> Name a variety of common animals Identify the 5 groups of animals Describe the key characteristics of the 5 animal groups 	<p>Unit Three: <i>Animals, including Humans 1- Growth (Year 2)</i></p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> Understand the basic needs of animals, including humans
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<ul style="list-style-type: none"> • Identify the different parts of the human body and explain what they are used for • Understand that our eyes allow us to see • Know the basic parts of the eye • Know the basic parts of the eye and their functions • Understand that our ears allow us to hear • Know that our ears help us tell the direction sound is coming from • Understand that sound is made up of vibrations • Understand that our tongue allows us to taste • Describe a range of different flavours • Understand why our sense of taste is important • Understand that our skin helps us to feel • Know that our fingertips are sensitive to touch • Understand that our sense of touch can identify different textures • Know that our nose allows us to smell • Understand that we can smell many different flavours • Know that our sense of smell helps to keep us safe <p>Vocabulary head, body, brain, pupil, ear, sound, tongue, taste</p>	<ul style="list-style-type: none"> • Name a variety of common birds and mammals • Name and describe a variety of common birds and mammals • Name, describe and compare a variety of common birds and mammals • Name a variety of common amphibians, reptiles and fish • Name and describe a variety of common amphibians, reptiles and fish • Name, describe and compare a variety of common amphibians, reptiles and fish • Understand that animals eat different things • Group animals based on their diet • Explain the difference between herbivores, carnivores and omnivores • Know that some animals are wild and some are kept as pets • Sort animals into those that are wild and those that are suitable for a pet • Describe the needs of a pet • Draw and label an animal and talk about its characteristics • Draw and label an animal and write about its characteristics • Draw and label an animal and write about its characteristics, using some scientific language <p>Vocabulary Fish, amphibian, reptile, mammal, bird, warm- blooded, cold, blooded, herbivore</p>	<ul style="list-style-type: none"> • Explain the basic needs of animals, including humans • Explain how animals adapt and survive by ensuring their basic needs are met • Understand what humans need to survive • Explain what humans need to survive • Know the difference between basic human needs and the things humans want • Name the 5 food groups • Sort food into the 5 food groups • Explain why the 5 food groups are important for human health • Understand the importance of a balanced diet • Give examples of foods that form part of a healthy diet • Understand that eating pre-cooked or processed food is not always a healthy choice • Understand that exercising regularly is important for our health • Know how exercise impacts our bodies • Understand how regular exercise keeps us healthy • Understand that we need good hygiene to remain healthy • Explain how to have a good hygiene routine • Explain how a good hygiene routine can stop the spread of germs <p>Vocabulary nutrition, healthy, protein, carbohydrate, dairy, fat, exercise, hygiene</p>
<p>Unit Four: <i>Animals, including Humans 2-Lifecycles (Year 2)</i></p>	<p>Unit Five: <i>Living Things and their Habitats (Year 2)</i></p>	<p>Unit Six: <i>Living Things and Their Habitats- Habitats Around the World (Year 2)</i></p>

Substantive knowledge to be taught

- Order the stages of a human life cycle
- Identify each stage of a human life cycle
- Draw the human life cycle
- Match descriptions of each stage of the human life cycle
- Describe each stage of the human life cycle
- Compare two stages of the human life cycle
- Match offspring with their parents
- Identify features inherited from a parent
- Explain why some animals are more challenging to match
- Compare the life cycle of a chicken and human
- Create a bar chart
- Predict the height of a chick
- Name the different stages of a butterfly's life
- Describe how a butterfly moves between the stages in its life cycle
- Explain the life cycle of a butterfly and the process of metamorphosis
- Name the stages of a frog's life cycle
- Describe how a frog moves between the stages in its life cycle
- Compare some similarities and differences between the life cycle of a frog and other animals

Vocabulary
lifecyle, foetus, womb, offspring, reproduction, transformation, metamorphosis, froglet

Substantive knowledge to be taught

- Understand that there are things that are living, dead or have never been alive
- Identify and classify objects into living, dead or never been alive
- Understand the 7 characteristics of living things
- Know the difference between a habitat and a microhabitat
- Identify and name a range of microhabitats
- Understand that living things depend on each other for survival
- Understand that living things need certain conditions to survive
- Design a microhabitat where living things could survive
- Explain why an animal may or may not be suited to certain conditions
- Understand that all animals need to eat to survive
- Find out what specific animals eat through research
- Ask diverse questions to find out what animals eat and where they find their food
- Explain what could affect a food chain
- Show how all animals and humans relate to each other in a food chain
- Describe what a food chain is
- Understand that food we eat comes from a natural source
- Identify different foods that come from the same natural source
- Explain how foods have changed from their natural source

Vocabulary

reproduce, excrete, respire, habitat, microhabitat, survive, producer, consumer

Substantive knowledge to be taught

- Explore what a habitat is
- Understand that living organisms are suited to live in one or more habitats
- Identify which animals might live in a range of habitats
- Appreciate that environments are constantly changing
- Identify what you can do to help reduce the impact humans have on a habitat
- Know what you can do to care for a habitat
- Understand why rainforests are important
- Identify how rainforests are endangered
- Plan a campaign to help protect a rainforest
- Learn about different ocean life
- Understand an ocean habitat
- Learn about the blue whale
- Identify the differences between the Arctic and Antarctic
- Identify the animals which live in both polar habitats
- Describe the Arctic and Antarctic climates
- Understand what animals are best suited to live in desert, underground and ocean habitats
- Investigate, measure and record soil habitats
- Learn how to compare results and identify species more suited to living in damp soils

Vocabulary

organism, rainforest, endangered, biodiversity, ocean, ecosystem, desert, Arctic

Year Three and Four

Unit One: Scientific Enquiry (Year 3)

Substantive knowledge to be taught

- Give a prediction to a scientific question
- Pose a scientific question and give a prediction
- Design a scientific investigation with more than one variable and give a plausible prediction
- Take careful measurements and record results in a table
- Take careful, systematic measurements and record results in a table and, with support, use data to draw a graph
- Use data collected from an investigation to produce a graph to show results
- Write a method for a scientific investigation
- Write a comprehensive method for a scientific investigation and use it to carry out practical work
- Evaluate the effectiveness of the method after the practical investigation has been carried out
- Explain what happened during an investigation
- Explain what happened during an investigation and give scientific evidence to support the findings
- Explain scientifically the results of an investigation and suggest further lines of enquiry that could be tested
- Understand what a control test is
- Understand what a control test is and suggest variables to compare
- Understand what a control test is and carry out a fair test, varying only one aspect at a time

Unit Two: Electricity (Year 4)

Substantive knowledge to be taught

- Identify common appliances that run on electricity
- Understand the dangers of using electrical appliances
- Understand how to keep safe when using electrical appliances
- Identify electrical components
- Create a simple electrical circuit
- Explain how a simple electrical circuit works
- Create a simple electrical circuit
- Predict if a simple electrical circuit will work
- Know the difference between a complete and an incomplete circuit
- Understand the difference between an insulator and a conductor
- Investigate which objects are conductors and which are insulators
- Give examples of insulators and conductors in everyday appliances
- Understand how a switch works
- Explain how an electrical switch works
- Apply knowledge of how a switch works to create a switch
- Pose an investigation question and make a prediction
- Set up an investigation to prove or disprove a prediction
- Set up an investigation to prove or disprove a prediction and provide a detailed conclusion

Vocabulary

Unit Three: States of Matter (Year 4)

Substantive knowledge to be taught

- Identify the 3 states of matter
- Describe the properties of the 3 states of matter
- Classify substances based on their state of matter
- Describe how particles behave in each state of matter
- Explain how substances change state
- State the temperature at which water changes state
- Understand melting points
- Observe and accurately record the temperature at which food changes state
- Predict the melting point of different foods
- Describe freezing and boiling points
- Create an accurate bar chart
- Research freezing and boiling points
- Define evaporation and condensation
- Investigate the effect of temperature on the rate of evaporation
- Raise further questions to be investigated
- Order the stages of the water cycle
- Identify the importance of evaporation and condensation within the water cycle
- Describe the water cycle in detail

Vocabulary

Thermometer, melting point, boiling point, freezing point, solid, liquid, gas, evaporation, particles, condensation, water vapour, substance

<ul style="list-style-type: none"> • Write a conclusion for a scientific investigation • Write a conclusion for an investigation and use a scientific explanation to support the evidence • Using results and the evidence gathered from an enquiry, pose a new question that further extends the investigation <p>Vocabulary scientific investigation, prediction, plausible, record, data, method, control experiment, equipment, enquiry, practical, conclusion, fair test</p>	<p>Electricity, batteries, circuit, voltage, current, bulb, conductor, insulator, switch, control, turbines, hydropower</p>	
<p><i>Unit Four: Sound (Year 4)</i></p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand that sound is created by vibrations • Explain how sound is created and how it travels from an object to the ear • Explain how sound is created, travels and is interpreted by the brain • Understand that sounds can travel through air, liquids and solids • Explain how sound waves travel through air, liquids and solids • Compare how sound waves travel through air, liquids and solids • Understand that some materials absorb sound and some materials reflect sound • Understand that materials that absorb sound are sound insulators • Explain why some materials absorb sound • Understand that the volume of sound is measured in decibels • Understand that the volume of a sound is dependent on how much energy or power the sound source is given 	<p><i>Unit Five: Light (Year 3)</i></p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Identify light sources • Understand the difference between natural and artificial sources of light • Explain why certain objects are sources of light and why others are not • Understand that sunlight can damage our skin and our eyes • Observe the effectiveness of suncream as protection against the sunlight • Using scientific evidence, explain the effectiveness of suncream as protection against the sunlight • Understand that some objects are a light source and some are reflectors • Identify materials that are good reflectors • Explain why some materials are better reflectors than others • Understand that a shadow is formed when an object blocks the light • Explain how a shadow is formed when an opaque object blocks the light • Understand that the size of a shadow changes when it is moved further from the light 	<p><i>Unit Six: Rocks (Year 3)</i></p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand that igneous rocks come from beneath the Earth's surface • Explain how igneous rocks are formed on Earth's surface • Explain the difference between intrusive and extrusive igneous rock • Know the three types of rock that are formed on Earth • Identify the properties of rocks by carrying out tests • Explain the difference between igneous, sedimentary and metamorphic rocks following an investigation • Identify the different types of weathering • Define the different types of weathering and know the effects they have on rocks • Explain the effects weathering have on rocks and evaluate the best type of rocks to use for certain tasks • Understand that water can cause rocks to erode • Explain how water causes rocks to erode

<ul style="list-style-type: none"> • Understand that as the volume of sound increases so too does the amplitude, or height, of the sound waves • Understand that pitch is how low or high a sound is • Understand that pitch is caused by the speed of the sound source's vibrations • Understand how a sound wave is different for a high pitch and a low pitch • Understand that sound fades as it travels • Understand why sound fades as it travels • Explain the relationship between distance and volume <p>Vocabulary Vibration, source, medium, energy, reflect, materials, volume, decibels, pitch, instruments, particles, sound source</p>	<ul style="list-style-type: none"> • Understand that shadows change throughout the day • Explain how shadows change throughout the day • Explain how and why shadows change throughout the day • Understand that the size and shape of a shadow can change • Know how to change the size and shape of a shadow • Explain why the size and shape of a shadow can change <p>Vocabulary light, reflect, vitamin D, ultraviolet rays, fluorescent, high visibility, shadow, ray, cast, position, shape, puppet</p>	<ul style="list-style-type: none"> • Explain how water causes rocks to erode and why it is important to understand this • Understand what a fossil is • Understand how a fossil is created • Explain how a fossil is created • Name some different types of soil • Describe the properties of different soils • Research which type of soil certain flowers and vegetables grow better in <p>Vocabulary igneous rocks, intrusive igneous rocks, extrusive igneous rocks, magma, sedimentary rock, metamorphic rock, weathering, acid rain, erosion, fossil, decompose, fragments</p>
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Year Five and Six

<p>Unit One: Earth and Space (Year 5)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Name key characteristics of a planet • Understand the order of the planets from the Sun • Describe the Sun, Earth, moon and other celestial bodies as spheres • Understand the differences between a heliocentric and geocentric model of the solar system • Understand how attitudes and knowledge can change and adapt over time • Represent visual characteristics of a planet • Understand how Earth moves in space • Understand how the Sun transitions across the sky • Understand how night and day happen 	<p>Unit Two: Living Things and Their Habitats (Year 5)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand what plants need to grow strong and healthy • Understand that plants can reproduce sexually and asexually • Understand that plants are living things • Understand that not all mammals have the same life cycle • Know the 3 types of mammal • Understand what a life cycle is • Understand the life cycle of an amphibian • Understand the life cycle of an insect • Compare the process of metamorphosis in amphibians and insects 	<p>Unit Three: Living things and their habitats (Year 6)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Explain how living things are classified by designing their own chart and comparing their size • Describe how to classify a range of living animals and plants • Identify ways to differentiate living things • Explain a key feature or member of each animal kingdom • Understand MRS GREN and how a living organism follows these rules • Know that living organisms can be arranged into kingdoms • Explain how different organisms can be classified using the Linnaean System • Understand how an animal can be classified depending on its characteristics
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<ul style="list-style-type: none"> • Understand that time can be different in various parts of the world • Understand how time can be recorded using a 'solar clock' • Understand how the Sun transitions across the sky • Describe how the Earth and Moon move relative to the Sun • Describe the movement of the Moon relative to the Earth • Explain that the Moon orbits the Earth, not the Sun • Create a representation of their knowledge of the planets and space using their imagination • Describe the characteristics of a planet • Understand that all planets are different to one another <p>Vocabulary heliocentric, geocentric, solar system, astronomy, terrestrial planet, gas giants, axis, orbit, moon, phase, waxing, waning</p>	<ul style="list-style-type: none"> • Recall key facts about the structure of an egg • Describe the differences between a mammal and a bird or reptile life cycle • Understand the life cycle of birds and reptiles • Understand the importance of documenting living things and highlighting their decline in the world • Identify important facts about 2 key members of the scientific community • Understand the importance of studying living organisms • Suggest ideas for conservation of living or imaginary life • Represent key information about a chosen living organism • Represent knowledge learnt about life cycles <p>Vocabulary living organism, naturalist, primatologist, metamorphosis, endangered, asexual, reproduction, fertilisation, placental mammal, monotreme mammal</p>	<ul style="list-style-type: none"> • Use research to help classify a living organism • Represent research and data in a creative way to summarise knowledge • Know and explain that microorganisms are both helpful and harmful • Understand that microorganisms are microscopic and cannot be seen with the naked eye • Explain the difference between fungi and other organisms • Outline the similarities between plants and fungi • Identify that fungi are a separate kingdom to plants • Describe, represent and present data about a living organism • Describe and represent data about a member of the animal kingdom <p>Vocabulary Classification, microorganism, habitat, living organism, species, microscopic, ecosystem, kingdom, Linnaean System, cell</p>
<p>Unit Four: Animals, including Humans (Year 5)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Name the key stages of a mammal's life cycle • Identify developments during each stage of a life cycle • Compare the human life cycle with another mammal • Understand what gestation is • Learn some differences between the gestation periods of mammals 	<p>Unit Five: Animals, including Humans (Year 6)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Describe the structure and function of the heart • Identify oxygenated and deoxygenated blood • Describe how blood moves around the heart • Define the function of different blood vessels • Explore issues surrounding restricted arteries 	<p>Unit Six: Evolution and Inheritance (Year 6)</p> <p>Substantive knowledge to be taught</p> <ul style="list-style-type: none"> • Understand that some characteristics are inherited • Explain why offspring look similar but not identical to their parents • Understand that variations in species can be due to environmental factors • Describe how an animal is adapted to its environment

- Explore reasons behind extreme gestation periods
- Understand the stages during pregnancy
- Accurately create and plot points on a line graph
- Compare the mass and length lines
- Understand all children grow
- Learn some ways that the growth of children is measured.
- Begin to link data with scientific thinking on growth
- Understand all children go through puberty
- Identify changes that take place during puberty
- Compare the changes experienced by boys and girls
- Know some key signs of ageing in humans
- Recognise that humans age differently depending on their lifestyle
- Suggest ways to stay healthy in old age

Vocabulary

offspring, foetus, dependent, adolescent, puberty, gestation, pregnant, toddler, prenatal, breeding, embryo, hormones

- Explain the movement of blood through the heart
- Describe and explain the composition of the blood
- Explain the function of cells within the blood
- Explain how water and nutrients are transported
- Accurately measure pulse
- Design an investigation associated with heart rate, diet and exercise
- Define and explain the importance of osmosis and diffusion
- Describe how lifestyle choices can affect health
- Define the uses of different drugs
- Describe the impact of drugs and alcohol on health
- Describe some drugs used to support the circulatory system

Vocabulary

circulatory system, BPM, diet, pulse, oxygenated, deoxygenated, atrium, ventricle, vessel, valve, diffusion, osmosis

- Explain how an animal's adaptation helps it to survive in the habitat
- Predict how an animal would have to adapt to suit a different habitat
- Describe how a plant is adapted to its environment
- Explain how plants adaptation helps it to survive in the habitat
- Create a new plant that is perfectly adapted to survive in a habitat
- Understand that fossils provide information about living things that are now extinct
- Using evidence from fossils, compare extinct animals with those that are living and identify adaptations
- Use evidence from fossils to suggest some conclusions about life in the past
- Identify how living things have changed over time
- Describe how natural selection causes living things to evolve over time
- Explain why the theory of evolution was not accepted at first
- Identify differences in human ancestors
- Describe how humans have evolved
- Compare and contrast neanderthals and homo sapiens

Vocabulary

inherit, adaptation, epiphytes, fossil, Mary Anning, palaeontologist, ichthyosaurus, Charles Darwin, evolved, natural selection, ancestor, Homo sapiens

4. Assessment

Assessment of Science at Grange Moor Primary School is teacher based. The children are assessed on both their knowledge of the topic studied and their scientific enquiry skills. Assessment is recorded by teachers using the Science Bug programme.