

Gresham Primary School's Science Curriculum

Mission Statement

To inspire curious minds to ask questions about the world around them and investigate them scientifically.

Intent

- To develop in children a lifelong curiosity and interest in the sciences.
- To provide children with the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them.
- For children to build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions.
- For children to have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS2.

Implementation

- The International Primary Curriculum is used as the foundation for Gresham's Science planning and teaching, alongside our own additions and adaptations. This covers and greatly enhances the learning as set out in the National Curriculum.
- The curriculum map ensures teachers know what children have encountered before and can make links to previous learning to support children making connections and building schema.
- The majority of science lessons are taught as part of structured science units which allow concepts to be developed and explored in depth. Some science lessons are taught as part of more cross-curricular themed units so that links with other subject areas can be made.
- Key concepts have been identified and are regularly returned to, gradually developing pupils' understanding of the most important ideas.
- Wherever possible, concepts are explored through practical investigation and children are given opportunities for hands on investigation and outdoor learning.
- Children develop their ability use scientific enquiry including: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.
- Science learning is presented in the context of its real-world relevance, in particular in children's own experience.
- 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. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that

Impact

Books, pupil voice, displays and collection of work to show the following:

- Pupils will have clear enjoyment of science.
- Pupils will feel increasingly aware of how to investigate questions scientifically.
- The large majority of pupils will achieve age related expectations in Science
- Pupils will show growing curiosity about Science with some exploring their questions further through reading and extracurricular activities.
- Pupils with SEND will be fully included and will progress well related to their starting points.
- Pupils from disadvantaged backgrounds will benefit from gaining foundational knowledge and vocabulary and will be well prepared for further study

	pupils build secure foundations by using discussion to probe and remedy their misconceptions.	
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The Essential Elements

The essential skills of science are the skills required for scientific investigation. These important skills are practised and developed in all areas of science. As children develop their investigative skills they should also be able to draw on an ever expanding knowledge of biology, chemistry and physics. Teachers will strive to give children hands on experiences of investigating topics scientifically while equipping them with the vocabulary to explain their knowledge.

Types of scientific enquiry

1. Modelling

A model can be used to help children understand how a process works, or to explain ideas or a concept. Some manufactured models can be useful, for example, you could use a cut-away model of an ear to find out how the ear works, and use musical instruments to find out how different sounds are produced. In this unit, we will be making our own models of the ear and eye, and we will be making a drum.

2. Pattern seeking

This method involves observing and recording natural events, or carrying out experiments where the variables can't easily be controlled. In pattern seeking, it is still important to note and record variables. The investigator needs to try to identify patterns that result from these variables. This method is well suited to studies of physical processes. For example, the children can observe the pattern of hearing a particular sound when an object vibrates.

3. Research

Researching in the scientific sense, involves gathering and analysing other people's opinions or scientific findings in order to answer a question or to provide background information to help explain observed events. In the primary school, this might mean searching in non-fiction books, using the internet and utilising experts in the community, for example, you could ask a musician to come in to school to talk to the children and to help them compose their own sounds and music.

4. Challenges

These sorts of investigations involve some kind of design task and/or a problem to solve. Challenges are most often suited to the study of materials and physical processes. In such situations children apply their scientific knowledge, skills and understanding to make (or design) something. Challenges can be very effective and motivating assessment tasks. In this unit, the children will be faced with the challenge of finding out where sound and light come from and how to make sounds using different materials and objects.

5. Fair testing

Fair testing finds relationships between factors (variables). A single variable is changed – this is the variable you are testing. All other variables are kept the same, which is why it is said to be fair. Any differences are said to be the result of the changed variable. So, if you wanted to test which material (metal, wood, plastic) makes the loudest sound, the variable you should change is the type of material. However, the way you carry out the test must be kept the same. Fair testing is particularly well suited to investigations that record measurements. The fair test planning board (see below) will be useful for this task.

Key Concepts

Big Ideas Revisited Across Units

Similarity and Difference	Similarity is sameness or a likeness between things and differences are a point or way in which people or things are dissimilar.
Changes	Changing from one material/state to another. Changes can be described as reversible or irreversible
Cause and effect	The relationship between events or things, where one is the result of the other or others. This is a combination of action and reaction.
Adaptation	The characteristics animals or plants have developed to help them survive and thrive in their habitat.
Fair test	An experiment that controls all but one variable when attempting to answer a scientific question. Only changing one variable allows the person conducting the test to know that no other variable has affected the results of the test.
Measuring	Measuring can involve accurately recording an aspect of something eg the size, temperature, speed, number, time, frequency etc
Observing	Watching an event/process closely to notice patterns and changes over time
Growth	The way something increases and develops over time.
Conditions	The context surrounding an event which could include temperature, speed, presence of other living things, amount of food, presence of other forces etc
Classifying	Organizing things into scientific categories based on their characteristics

EYFS Science Related Learning Goals

EYFS: Understanding the World (The World)

Children know 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 another. They make observations of animals and plants and explain why some things occur, and talk about changes.

EYFS: Physical Development (Health and Self-Care)

Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

Key Stage 1 Programme of Study

Year 1

Year 2

Everyday Materials

Pupils should be taught to:

- 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

Animals, including humans

Pupils should be taught to:

- 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 and 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

Seasonal Changes

Pupils should be taught to:

- observe changes across the 4 seasons
- observe and describe weather associated with the seasons and how day length varies

Plants

Pupils should be taught to:

- 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

Uses of everyday materials

Pupils should be taught to:

- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Animals, including humans

Pupils should be taught to:

- notice that animals, 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

Living things and their habitats

Pupils should be taught to:

- explore and compare the differences between things that are living, dead, and things that have never been alive
- 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 microhabitats
- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

Plants

Pupils should be taught to:

- 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

Working Scientifically

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests

- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

	Unit being taught...	Learners will be finding out...	Key Vocabulary...	Knowledge, Skills and Understanding...
EYFS				

<p>Brainwave: the brain The art and science of learning (Biology)</p>	<ul style="list-style-type: none"> The things we can do to make new connections or strengthen existing connections in our brains 	<p>Brain, learning, stress, memory, knowledge, skills, understanding, connections,</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.10 Be able to compare results</p>
<p>Treasure Island (Physics)</p>	<ul style="list-style-type: none"> How knowledge of the Earth, Sun and Moon helped navigation 	<p>Compass, navigation, sun, moon, equator, orbit</p>	<p>1.03 Understand that science provides evidence, not proof 1.48 Understand that the position of the sun in the sky appears to change during the course of a day 1.50 Know that the Sun, Earth and Moon are (approximately) spherical</p>
<p>Green Fingers Living things, plants and animals (Biology)</p>	<ul style="list-style-type: none"> Plants that grow in our local area The different parts of a plant What plants need in order to grow How to care for a plant Where flowers prefer to live and grow How and where seeds grow How to set up tests to discover how plants use water How to grow lots of different things How beans grow How plants and insects rely on each other 	<p>Plant, tree, flower, shrub, grass, photosynthesis, light, nutrients, glucose, absorb, leaves, flowers, seeds, energy, veins, deciduous, evergreen, stem, evaporate, pollination, fruit, dispersal</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.06 Be able to suggest independent variables to test in a guided investigation 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.13 Be able to suggest improvements to investigations 1.15 Know the names of the senses and the organs connected to them 1.16 Know that plants need light and water to grow 1.17 Know the names of the parts of plants 1.18 Know that seeds can grow into plants 1.19 Know some differences between living things and things that have never been alive 1.20 Be able to sort living things in simple ways by features and behaviours 1.23 Know what all living things need to survive 1.24 Understand that people share environments with other living things 1.25 Understand that different locations support different living things 1.29 Understand the interdependence between plants and animals, humans and animals & humans and plants</p>
<p>Time Travellers Materials – classifying by properties (Chemistry)</p>	<ul style="list-style-type: none"> Different materials in the world around us Properties of materials How materials change over time. Testing strengths of different materials 	<p>Materials, properties, metal, plastic, cloth, paper, solid, flexibility, strength, hardness, water-resistant</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.03 Understand that science provides evidence, not proof 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.30 Know the names and basic properties of a range of materials 1.31 Be able to sort materials into groups according to their observable properties</p>

				1.32 Understand that what we use materials for is dependent upon their properties
Year 2 (MP1)	<p>The Earth: Our Home Living things: plants and animals (Biology)</p>	<ul style="list-style-type: none"> • What living things need to survive. • Animal classification. • Habitats and living things we can find in our local area. • Different habitats around the world. • How living things are suited to the habitat in which they live. • How plants and animals depend on each other. • What a micro-habitat is and the living things we can find in them. • The nutrient cycle. 	<p>Adaptation, environment, habitat, conditions, seasons, weather, minibeasts, invertebrates, plants, nutrients, photosynthesis, absorb, glucose, pollen, pollination, seeds, fruits, dispersal, rainforest, deforestation, species, endangered,</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.05 Be able to connect scientific investigations to familiar contexts 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.14 Know the names of the main external body parts of humans and animals 1.16 Know that plants need light and water to grow 1.17 Know the names of the parts of plants 1.18 Know that seeds can grow into plants 1.19 Know some differences between living things and things that have never been alive 1.20 Be able to sort living things in simple ways by features and behaviours 1.22 Be able to sequence given food chains 1.23 Know what all living things need to survive 1.24 Understand that people share environments with other living things 1.25 Understand that different locations support different living things 1.27 Know about similarities and differences between humans and other creatures 1.29 Understand the interdependence between plants and animals, humans and animals & humans and plants 1.51 Know that the time taken for the Earth to orbit the Sun is equal to one year</p>
	<p>Brainwave: Metacognition – the art and science of learning</p>	<p>In Health and Wellbeing we'll be learning about:</p> <ul style="list-style-type: none"> • The brain • Metacognition and how it helps us learn • Thinking deeply when we read • Using prior knowledge • Philosophical thinking • Different types of questions • How emotions impact on learning • How different people learn 		<p>Health and wellbeing learning goals</p> <p>1.02 Know that maintaining personal space and boundaries is a basic right 1.03 Know that change and growth is inevitable 1.05 Understand that there are many factors that influence health and wellbeing 1.06 Be able to follow strategies for managing a range of social situations 1.07 Understand that people benefit from different relationships in different ways 1.08 Know that boys and girls are born physically different from each other 1.12 Understand that active participation in the Learning Process leads to progress 1.13 Know that emotions impact on learning 1.14 Know that the brain is a complex organ 1.15 Be able to apply metacognitive strategies to improve their own learning</p>

From A to B Inventions and Developments (Physics)	<ul style="list-style-type: none"> Air resistance 	Variable, fair test, friction, movement, air resistance,	1.06 Be able to suggest independent variables to test in a guided investigation 1.07 Be able to make predictions 1.09 Be able to make observations and take informal measurements 1.11 Be able to compare results with predictions 1.75 Understand how air resistance can slow or hinder movement
Super Humans Living things: humans (Biology)	<ul style="list-style-type: none"> The names of the main external parts of the body The five human senses and their related organs Memories and the senses How the brain connects to the senses Testing our senses Nutrition and healthy eating 	Brain, nerves, neurons, skeleton, bones, ligaments, joints, senses, sight, hearing, taste, smell, touch, diet, exercise, protein, carbohydrate, fat, vitamins, dairy	1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.03 Understand that science provides evidence, not proof 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.06 Be able to suggest independent variables to test in a guided investigation 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.10 Be able to compare results 1.12 Be able to describe the method and results 1.14 Know the names of the main external body parts of humans and animals 1.15 Know the names of the senses and the organs connected to them 1.20 Be able to sort living things in simple ways by features and behaviours 1.21 Know that eating food provides the body with energy 1.23 Know what all living things need to survive 1.27 Know about similarities and differences between humans and other creatures 1.28 Know the basic nutrient groups and example foods for each group 1.55 Know that food is a store of energy 1.67 Know that sounds are made when objects vibrate
Buildings Materials (Physics & Chemistry)	<ul style="list-style-type: none"> How to test the strength of structures How we can support structures and make them more stable Exploring materials and their properties 	Materials, properties, metal, plastic, cloth, paper, solid, flexibility, strength, hardness, water-resistant	1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.06 Be able to suggest independent variables to test in a guided investigation 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.13 Be able to suggest improvements to investigations 1.30 Know the names and basic properties of a range of materials 1.32 Understand that what we use materials for is dependent upon their properties 1.39 Be able to compare solids and liquids 1.40 Know that there are different ways to change materials 1.42 Be able to observe how things change when water is added 1.73 Know how pushes and pulls can move objects 1.74 Be able to create push and pulls of different strengths

<p>Live and Let Live Living things: plants and animals (Biology)</p>	<ul style="list-style-type: none"> • What animals and humans need to survive and grow • How living and non-living things are different • How humans and animals grow and change • How to carry out a survey of living things • How to attract wildlife to our environment 	<p>Feeding, moving, growing, reproducing, breathing, responding, waste, adaptation, camouflage, endangered species, extinction, metamorphosis, development</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.03 Understand that science provides evidence, not proof 1.05 Be able to connect scientific investigations to familiar contexts 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.13 Be able to suggest improvements to investigations 1.14 Know the names of the main external body parts of humans and animals 1.16 Know that plants need light and water to grow 1.17 Know the names of the parts of plants 1.18 Know that seeds can grow into plants 1.19 Know some differences between living things and things that have never been alive 1.20 Be able to sort living things in simple ways by features and behaviours 1.22 Be able to sequence given food chains 1.23 Know what all living things need to survive 1.24 Understand that people share environments with other living things 1.25 Understand that different locations support different living things 1.27 Know about similarities and differences between humans and other creatures 1.28 Know the basic nutrient groups and example foods for each group 1.29 Understand the interdependence between plants and animals, humans and animals & humans and plants 1.48 Understand that the position of the sun in the sky appears to change during the course of a day</p>
<p>The Magic Toymaker Material and physics</p>	<ul style="list-style-type: none"> • How to sort toys based on what they are made of • Which materials can be bent, squashed, twisted or stretched • Why different materials have particular uses • Pushes and pulls, and how toys move 	<p>Materials, metal, plastic, fabric, paper, durability, hardness, absorbent, softness, water resistant, strength, flexibility, force, weight, electricity, circuit, battery, wire, energy, magnets, north, south, attract, repel. Movement,</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.30 Know the names and basic properties of a range of materials 1.31 Be able to sort materials into groups according to their observable properties 1.32 Understand that what we use materials for is dependent upon their properties 1.40 Know that there are different ways to change materials 1.59 Know that a circuit has to be complete to work 1.60 Be able to build a simple circuit to make devices work 1.65 Know about some uses of magnets in society 1.73 Know how pushes and pulls can move objects</p>

	<p>Look and Listen (Biology and Physics)</p>	<ul style="list-style-type: none"> • Where sound and light come from • How we can make sounds with our body • What sounds we can make with objects • What happens when sounds enter our ears • How animals use their sense of sight and sound • How we can change sounds 	<p>Sound, vibration, ear drum, energy, wave, transmitter, molecules, echo, pitch, decibels, light, absorb, refract, reflect, opaque, transparent, eye, lens, retina,</p>	<p>1.01 Be able to identify ways of finding out about scientific questions in familiar contexts 1.03 Understand that science provides evidence, not proof 1.04 Be able to follow guided experiments to try to answer scientific questions 1.05 Be able to connect scientific investigations to familiar contexts 1.07 Be able to make predictions 1.08 Be able to use the senses safely to make observations 1.09 Be able to make observations and take informal measurements 1.10 Be able to compare results 1.11 Be able to compare results with predictions 1.12 Be able to describe the method and results 1.14 Know the names of the main external body parts of humans and animals 1.20 Be able to sort living things in simple ways by features and behaviours 1.27 Know about similarities and differences between humans and other creatures 1.31 Be able to sort materials into groups according to their observable properties 1.49 Know that the Moon is not a source of light 1.67 Know that sounds are made when objects vibrate 1.68 Understand how humans have made use of sound and light sources 1.69 Know that darkness is the absence of light 1.70 Be able to predict the shape of a shadow that blocks the passage of light from a source</p>
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Lower Key Stage 2 Programme of Study

Year 3

Plants

Pupils should be taught to:

- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
- investigate the way in which water is transported within plants
- explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

Animals, including humans

Pupils should be taught to:

- 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

Rocks

Pupils should be taught to:

- 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

Light

Pupils should be taught to:

- recognise that they need light in order to see things and that dark is the absence of light
- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- find patterns in the way that the size of shadows change

Forces and magnets

- compare how things move on different surfaces
- notice that some forces need contact between 2 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 2 poles

Year 4

Living things and their habitats

Pupils should be taught to:

- 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

Animals, including humans

Pupils should be taught to:

- 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
- construct and interpret a variety of food chains, identifying producers, predators and prey

States of matter

Pupils should be taught to:

- 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

Sound

Pupils should be taught to:

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases

Electricity

Pupils should be taught to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit

- predict whether 2 magnets will attract or repel each other, depending on which poles are facing
- recognise some common conductors and insulators, and associate metals with being good conductors

<p>Working Scientifically</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 		<ul style="list-style-type: none"> • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.
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Unit being taught...	Learners will be finding out...	Key Vocabulary...	Knowledge, Skills and Understanding...
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Please note: Year 3 2021 is moving to the update milepost 2020. The curriculum map reflects these changes.

Year 3 (MP2)	Brainwave: The Brain	<ul style="list-style-type: none"> • The different types of learning • The importance of practice when learning a skill • The brain and its connection to learning • How we can deepen our learning by making connections across different subjects • How positive thinking can help us to succeed. • Why it is important to learn from other children and cultures around the world. 	<p>Knowledge, Skills, Understanding,</p> <p>Metacognition, Neuron,</p>	<p>Health and Wellbeing</p> <p>2.12 Understand that there are different ways to improve learning</p> <p>2.13 Know that emotions can be managed to support learning</p> <p>2.14 Know that neuroscience is helping us to understand more about the brain</p> <p>2.15 Be able to apply metacognitive strategies and reflect on their effectiveness</p> <p>Science</p> <p>2.27 Know that there are physical similarities and differences between themselves and other people</p> <p>2.28 Know the role of the different nutrients in the body</p>
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	<ul style="list-style-type: none"> • How to look after our brain. 		
How Humans Work Living things: humans (Biology & Physics)	<ul style="list-style-type: none"> • How our eyes and ears work • The different jobs our teeth do • The digestive system • The Circulatory System • The Respiratory System • The skeleton and muscles • Why we should eat a range of different foods. 	Bone, Brain, Chyme, Heart, Incisor, Ligament, Lung, Muscle, Nerve, Neuron, Nutrient, Respiratory System, Saliva, Skeleton, Skin, Stomach, Tendon	<p>2.01 Be able to suggest ways of collecting evidence in response to a scientific question</p> <p>2.03 Understand the importance of collecting scientific evidence through observation and testing</p> <p>2.04 Be able to ask scientific questions</p> <p>2.05 Be able to connect scientific investigations to real life</p> <p>2.06 Be able to plan an investigation changing only one independent variable</p> <p>2.07 Be able to make informed predictions</p> <p>2.09 Be able to make and record observations and take formal measurements</p> <p>2.10 Be able to describe observations and results identifying possible patterns</p> <p>2.11 Be able to compare results to predictions and draw conclusions</p> <p>2.12 Be able to record and describe the method and results in a variety of ways.</p> <p>2.14 Know about the functions of skeletons and muscles in humans and some other animals</p> <p>2.15 Be able to describe the process of digestion</p> <p>2.27 Know that there are physical similarities and differences between themselves and other people</p> <p>2.28 Know the role of the different nutrients in the body</p> <p>2.67 Know how sounds are changed by altering the nature of vibrations</p> <p>2.69 Know that we see things because light travels from a source and reflects from an object into our eyes</p>
Bright Sparks (Physics – electricity)	<ul style="list-style-type: none"> • How to make different electrical circuits • Materials that conduct electricity • How to build more complex circuits • Using electricity to make a magnet. 	Circuit, Conductor, Electric current, through wires. Insulator, Switch, Wire	<p>2.01 Be able to suggest ways of collecting evidence in response to a scientific question</p> <p>2.04 Be able to ask scientific questions</p> <p>2.05 Be able to connect scientific investigations to real life</p> <p>2.06 Be able to plan an investigation changing only one independent variable</p> <p>2.07 Be able to make informed predictions</p> <p>2.08 Be able to identify potential risks in a planned investigation</p> <p>2.09 Be able to make and record observations and take formal measurements</p> <p>2.11 Be able to compare results to predictions and draw conclusions</p> <p>2.12 Be able to record and describe the method and results in a variety of ways</p> <p>2.13 Be able to compare investigations and results identifying possible anomalies</p> <p>2.30 Know a range of testable properties</p> <p>2.31 Be able to compare common materials and objects and their properties</p> <p>2.55 Know that heat, light, sound and movement are evidence of energy transfer taking place</p> <p>2.58 Know that electricity is something which is generated</p> <p>2.59 Know the names of the components and the related symbols in a circuit</p> <p>2.60 Be able to use electrical circuits to investigate the conductivity of various materials</p> <p>2.65 Know about the principles of magnets and how to test materials for magnetic properties</p>

	Shake it Changing Materials (Biology and Chemistry)	<ul style="list-style-type: none"> • Different kinds of milk • Solids, liquids and gases • How to make butter • Changes of state • Reversible and irreversible changes • Making ice cream • Adding air to liquids • Testing which solids dissolve in milk • Making a flavoured milkshake • Carrying out a fair test. 	Boiling point, Condense, Dissolve, Evaporate, Freeze, Freezing point, Gas, Insulator, Insoluble, Irreversible change, Liquid, Melt, Reversible change, Solid, Solidify, Soluble, Solution, Suspension, Water vapour	<p>2.01 Be able to suggest ways of collecting evidence in response to a scientific question</p> <p>2.03 Understand the importance of collecting scientific evidence through observation and testing</p> <p>2.04 Be able to ask scientific questions</p> <p>2.05 Be able to connect scientific investigations to real life</p> <p>2.06 Be able to plan an investigation changing only one independent variable</p> <p>2.07 Be able to make informed predictions</p> <p>2.08 Be able to identify potential risks in a planned investigation</p> <p>2.10 Be able to describe observations and results identifying possible patterns</p> <p>2.11 Be able to compare results to predictions and draw conclusions</p> <p>2.12 Be able to record and describe the method and results in a variety of ways.</p> <p>2.13 Be able to compare investigations and results identifying possible anomalies</p> <p>2.28 Know the role of the different nutrients in the body</p> <p>2.39 Be able to compare solids, liquids and gases</p> <p>2.40 Know that some changes are reversible and some are irreversible</p> <p>2.41 Know that some substances dissolve in liquids and others do not</p> <p>2.42 Be able to separate insoluble solids from liquids</p> <p>2.43 Know that heating or cooling can bring about a change of state</p> <p>2.73 Know how pushes and pulls can temporarily or permanently change the shape of an object</p> <p>2.80 Be able to identify simple machines in their environment.</p>
Year 4 (MP2)	Making Waves	<ul style="list-style-type: none"> • How sounds are made • How sounds can be changed • How sounds travel to the ear • How we see and hear things • What influences the volume of sound • Why we need light to see things • Colours in light • Differences between how light and sound travel. 	Absorption, Light spectrum Light wave, Organ, Absorption, Light spectrum, Pitch, Reflection, Shadow, Sonic boom, Sound wave, Variable, Vibrate	<p>2.01 Be able to suggest ways of collecting evidence in response to a scientific question</p> <p>2.03 Understand the importance of collecting scientific evidence through observation and testing</p> <p>2.04 Be able to ask scientific questions</p> <p>2.05 Be able to connect scientific investigations to real life</p> <p>2.06 Be able to plan an investigation changing only one independent variable</p> <p>2.07 Be able to make informed predictions</p> <p>2.09 Be able to make and record observations and take formal measurements</p> <p>2.10 Be able to describe observations and results identifying possible patterns</p> <p>2.11 Be able to compare results to predictions and draw conclusions</p> <p>2.12 Be able to record and describe the method and results in a variety of ways.</p> <p>2.55 Know that heat, light, sound and movement are evidence of energy transfer taking place</p> <p>2.67 Know how sounds are changed by altering the nature of vibrations</p> <p>2.68 Understand that light and sound travel at different speeds</p> <p>2.69 Know that we see things because light travels from a source and reflects from an object into our eyes</p> <p>2.71 Know the order of colours in the visible spectrum/rainbow</p>

	<p>Land Sea and Sky Habitats (Biology and Chemistry)</p>	<ul style="list-style-type: none"> • The water cycle and its connection to rivers • What is below the soil and land • Rocks and erosion • Water habitats • How fish are suited to a life underwater • Different birds that thrive in water habitats • The different ways birds fly • The life cycle of plants • Flowering plants on land and in the water • Food chains and food webs • Changes in habitats. 	<p>Climate, Condensation, Consumer, Deforestation, Ecosystem, Environment, Erosion, Evaporation, Food chain, Germination, Glide, Life cycle, Migration, Perennial, Photosynthesis, Pollination, Precipitation, Predator, Prey, Producer, Soar</p>	<p>2.01 Be able to suggest ways of collecting evidence in response to a scientific question 2.03 Understand the importance of collecting scientific evidence through observation and testing 2.04 Be able to ask scientific questions 2.05 Be able to connect scientific investigations to real life 2.06 Be able to plan an investigation changing only one independent variable 2.07 Be able to make informed predictions 2.08 Be able to identify potential risks in a planned investigation 2.09 Be able to make and record observations and take formal measurements 2.10 Be able to describe observations and results identifying possible patterns 2.11 Be able to compare results to predictions and draw conclusions 2.12 Be able to record and describe the method and results in a variety of ways. 2.14 Know about the functions of skeletons and muscles in humans and some other animals 2.16 Know about the functions of the major parts of a plant 2.17 Know how the parts of a plant may change over time 2.18 Know the lifecycle of various plants 2.20 Be able to sort animals into vertebrates and invertebrates 2.21 Know that the sun is the source of energy in all food chains 2.22 Be able to draw diagrams to illustrate simple food webs and chains in an ecosystem 2.23 Know how space and place impact on the health of living things 2.24 Understand the positive and negative impacts humans have on other living things 2.25 Understand how animals and plants are physically suited to particular environments 2.29 Understand the interdependence between all living things 2.30 Know a range of testable properties 2.31 Be able to compare common materials and objects and their properties 2.39 Be able to compare solids, liquids and gases 2.43 Know that heating or cooling can bring about a change of state</p>

	<p>Feel the Force (Physics)</p>	<ul style="list-style-type: none"> • What friction is and what the world would be like without it • How we use friction • How we can increase or reduce friction • The direction of forces • The strength of forces and how we can measure or compare them • Investigating gravity, air resistance and buoyancy. 	<p>Air resistance, Buoyancy, Drag, Force, Friction, Gravity, Mass, Newton</p>	<p>2.03 Understand the importance of collecting scientific evidence through observation and testing 2.05 Be able to connect scientific investigations to real life 2.06 Be able to plan an investigation changing only one independent variable 2.07 Be able to make informed predictions 2.08 Be able to identify potential risks in a planned investigation 2.09 Be able to make and record observations and take formal measurements 2.10 Be able to describe observations and results identifying possible patterns 2.11 Be able to compare results to predictions and draw conclusions 2.12 Be able to record and describe the method and results in a variety of ways. 2.13 Be able to compare investigations and results identifying possible anomalies 2.73 Know how pushes and pulls can temporarily or permanently change the shape of an object 2.74 Be able to compare forces, stating which is stronger 2.75 Understand why we need friction 2.77 Know that forces have a direction.</p>
	<p>Let's Plant it Living things, plants and animals (Biology)</p>	<ul style="list-style-type: none"> • Plants that grow near where we live • Growing healthy plants • The plant life cycle and seed dispersal • Different types of soil • The different parts of plants and their functions • Interdependence between plants and other living things. 	<p>Airtight, Botanist, Carbon dioxide, Compost, Compound leaf, Disperse, Fertiliser, Herbaceous, Lobed, Photosynthesis, Serrated, Shrub, Stomata, pores, Xylem</p>	<p>2.01 Be able to suggest ways of collecting evidence in response to a scientific question 2.03 Understand the importance of collecting scientific evidence through observation and testing 2.04 Be able to ask scientific questions 2.05 Be able to connect scientific investigations to real life 2.06 Be able to plan an investigation changing only one independent variable 2.07 Be able to make informed predictions 2.09 Be able to make and record observations and take formal measurements 2.10 Be able to describe observations and results identifying possible patterns 2.11 Be able to compare results to predictions and draw conclusions 2.12 Be able to record and describe the method and results in a variety of ways 2.13 Be able to compare investigations and results identifying possible anomalies 2.16 Know about the functions of the major parts of a plant 2.17 Know how the parts of a plant may change over time 2.18 Know the lifecycle of various plants 2.19 Know that a key difference between non-living and living things is that living things grow and reproduce 2.21 Know that the sun is the source of energy in all food chains 2.22 Be able to draw diagrams to illustrate simple food webs and chains in an ecosystem 2.23 Know how space and place impact on the health of living things 2.25 Understand how animals and plants are physically suited to particular environments 2.29 Understand the interdependence between all living things 2.30 Know a range of testable properties 2.31 Be able to compare common materials and objects and their properties 2.01 Be able to suggest ways of collecting evidence in response to a scientific question</p>

2.09 Be able to make and record observations and take formal measurements
 2.10 Be able to describe observations and results identifying possible patterns
 2.17 Know how the parts of a plant may change over time
 2.25 Understand how animals and plants are physically suited to particular environments

Upper Key Stage 2

Year 5

Living things and their habitats

Pupils should be taught to:

- 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

Animals, including humans

Pupils should be taught to:

- describe the changes as humans develop to old age

Properties and changes of materials

Pupils should be taught to:

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

Year 6

Living things and their habitats

Pupils should be taught to:

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics

Animals including humans

Pupils should be taught to:

- 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

Evolution and inheritance

Pupils should be taught to:

- 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

Earth and space

Pupils should be taught to:

- 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

Forces

Pupils should be taught to:

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Light

Pupils should be taught to:

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Electricity

Pupils should be taught to:

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram

Working Scientifically

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

Unit being taught...	Learners will be finding out...	Key Vocabulary...	Knowledge, Skills and Understanding...
Year 5 (MP3) Brainwave The art and science of learning	<ul style="list-style-type: none"> • About different methods of teaching and how we like to learn • About some of the different areas of the brain • How information gets into the brain 	Growth mindset, metacognition, memory, emotions, knowledge, skills, understanding, assessment, balanced diet, exercise, hydration, community	3.01 Know about some of the recent evidence and research into the brain and learning 3.02 Know about some of the different areas of the brain and their function 3.03 Understand the different ways that they can learn 3.04 Understand how they can improve their learning and their attitudes to learning 3.05 Understand the importance of cooperation and global awareness in their learning

		<ul style="list-style-type: none"> • How relaxation can help prepare us for learning • How we can improve our memory • How positive thinking can help us to succeed • How we can support each other to achieve our goals • How we can become more active global citizens 		
	Bake it Changing Materials (Chemistry)	<ul style="list-style-type: none"> • How live yeast grows • How carbon dioxide behaves • Which solids dissolve in water • About water vapour and evaporation • What happens when foods are heated • About the properties of water • About solids, liquids and gases • How we can group everyday materials according to their properties 	Atom, molecule, state of matter, solid, liquid, gas, changing state, reversible, irreversible, boiling point, condensing, conductivity, dissolving, evaporating, freezing, freezing point, hardness, insulator, insoluble, magnetic, melting, particles, soluble, suspension, transparency, water vapour	3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions 3.03 Be able to gather evidence from a variety of sources 3.04 Be able to discriminate between evidence and opinion 3.05 Understand the importance of using evidence to test scientific ideas 3.06 Understand some of the effects of what they learn on people's lives 3.31 Know the distinctive properties of different materials 3.32 Know about the principles of materials acting as thermal insulators 3.33 Know what happens when materials are heated and cooled 3.34 Know about the principles of condensation and evaporation 3.35 Know about differences between metals and other materials 3.36 Know that matter is made up of particles 3.37 Know about the different arrangements of particles in solids, liquids and gases 3.39 Be able to group and classify materials according to their properties 3.40 Be able to identify changes that are reversible or irreversible 3.41 Be able to separate simple mixtures 3.42 Be able to recover dissolved solids through evaporation 3.44 Know that heat can move from one object to another by conduction 3.45 Be able to represent electrical circuits in drawings using conventional symbols 3.46 Be able to construct circuits on the basis of drawings using conventional symbols

<p>Look Hear Sound and Light (Biology & Chemistry)</p>	<ul style="list-style-type: none"> • How we hear sounds and see light • How the human ear and eye works • How sound and light waves travel • How a string telephone works • How we can change the pitch of sounds • About echoes and acoustics 	<p>Amplitude, decibels, echo, frequency, hertz, loudness, pitch, noise, resonance, sound wave, wavelength, vibration, volume/amplitude, light, absorbed, refracted, reflected, iris, lens, periscope, prism, pupil, rainbow, retina</p>	<p>3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions 3.03 Be able to gather evidence from a variety of sources 3.04 Be able to discriminate between evidence and opinion 3.05 Understand the importance of using evidence to test scientific ideas 3.06 Understand some of the effects of what they learn on people's lives 3.16 Know the functions of the major internal and external parts of the human body 3.31 Know the distinctive properties of different materials 3.52 Know that light travels in a straight line until it strikes an object 3.53 Know that light can be reflected, refracted or absorbed 3.54 Know that light travels through some materials and not through others 3.55 Know that we see things when light from them enters our eyes 3.56 Know how sounds are changed by altering the nature and frequency of the vibrations 3.57 Know that vibrations from sound sources travel through a medium to reach the ear 3.58 Be able to identify the effects and uses of light and sound</p>
<p>Existing, Endangered, Extinct Living Things, plants and animals (Biology)</p>	<ul style="list-style-type: none"> • How and why living things are classified • How a vertebrate and an invertebrate are different • How to classify local plants and animals • About the effects of food chains in our locality • About friendly and unfriendly micro-organisms • How fungi are different from plants and animals • Why composting is good for the environment 	<p>Amphibian, arthropod, bird, fish, insect, invertebrate, life cycle, mammal, metamorphosis, reptile, vertebrae, endangered, species, adaptation, classification, food web/chain, reproducing, oxygen, carbon-dioxide, micro-organisms, cells, fungi</p>	<p>3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions 3.03 Be able to gather evidence from a variety of sources 3.04 Be able to discriminate between evidence and opinion 3.05 Understand the importance of using evidence to test scientific ideas 3.06 Understand some of the effects of what they learn on people's lives 3.07 Know about the major classifications of living things 3.08 Know about the effects of food chains in a variety of environments 3.09 Know that changes in the environment have effects on living things 3.10 Know about the nature, functions and effects of micro-organisms 3.11 Be able to recognise and name the major plants and animals in the host country 3.12 Be able to classify locally occurring plants and animals according to their features 3.13 Be able to recognise and name the major plants and animals in their home country 3.14 Understand the relationship between living things and the environment in which they live 3.15 Know about the structure of the human body 3.17 Know about similarities and differences between humans and other creatures 3.25 Know about the functions of the major parts of a plant</p>

				3.26 Know about factors that affect the growth of plants
Year 6 (MP3)	Space Scientists Earth and Space	<ul style="list-style-type: none"> • How we can prove that Earth is a sphere • What our planet is made of • If the Earth is a magnet • About the Earth's atmosphere • Why we need the Sun • How the Sun, Earth and Moon are connected • Why the Earth's rotation results in day and night • How to make a shadow clock • How the tilt of Earth's axis gives us the seasons • How the Moon affects the Earth • If there is a better place to live than Earth 	Earth, big bang, star, sun, solar system, galaxy, gravity, sphere, orbit, mass, moon, crust, mantle, core, seismic waves, earthquakes, volcanoes, magma, vapour, atmosphere, greenhouse gas, pressure, lunar/solar eclipse, tide, satellite, asteroid, comet, meteorite, milky way, planet, probe, universe,	3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions 3.03 Be able to gather evidence from a variety of sources 3.04 Be able to discriminate between evidence and opinion 3.05 Understand the importance of using evidence to test scientific ideas 3.06 Understand some of the effects of what they learn on people's lives 3.14 Understand the relationship between living things and the environment in which they live 3.26 Know about factors that affect the growth of plants 3.31 Know the distinctive properties of different materials 3.33 Know what happens when materials are heated and cooled 3.34 Know about the principles of condensation and evaporation 3.35 Know about differences between metals and other materials 3.36 Know that matter is made up of particles 3.37 Know about the different arrangements of particles in solids, liquids and gases 3.38 Be able to compare and group rocks and soils according to their properties 3.48 Know about the nature and effect of gravitational force 3.49 Be able to identify the effects of physical forces 3.50 Be able to measure forces 3.51 Be able to identify the direction of forces 3.52 Know that light travels in a straight line until it strikes an object 3.53 Know that light can be reflected, refracted or absorbed 3.54 Know that light travels through some materials and not through others 3.59 Know about the relationship between the Earth and the rest of the solar system 3.60 Know that day and night are related to the Earth spinning on its axis 3.61 Know about the time taken for the Earth to orbit the Sun and for the Moon to orbit the Earth 3.62 Know about the effects caused by the Earth moving 3.65 Know about the major sources of energy
	Fascinating Forces (Physics)	<ul style="list-style-type: none"> • How a ball flies through the air • What friction is and how it helps us • How different objects fall 	Gravity, mass, friction, magnetism, attract, repel, electricity, flight, uplift, floating, upthrust, aerodynamics, buoyancy, drag, weightlessness,	3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions

	<ul style="list-style-type: none"> • What gravity is and how it pulls on objects • How air resistance affects moving objects • How water pushes up on floating objects • Why some objects float and others sink 		<p>3.03 Be able to gather evidence from a variety of sources 3.05 Understand the importance of using evidence to test scientific ideas 3.06 Understand some of the effects of what they learn on people's lives 3.48 Know about the nature and effect of gravitational force 3.49 Be able to identify the effects of physical forces 3.50 Be able to measure forces 3.51 Be able to identify the direction of forces 3.59 Know about the relationship between the Earth and the rest of the solar system</p>
<p>Being Human Living Things, humans (Biology)</p>	<ul style="list-style-type: none"> • How humans are different from other animals • About the brain and the nervous system • About the bones and muscles in the body • How the human heart works • How we breathe and what the lungs do • What we inherit from our parents • How our environment affects us • How the body uses food and water • About the latest medical research 	<p>Brain, neurons, nervous system, hemisphere, sensory, motor, skeletal system, ligaments, cartilage, bone, joint, circulatory system, blood, cells, heart, respiratory system, cell, digestive system, senses, sight, hearing, taste, smell, protein, carbohydrate, fat, vitamin, mineral, dairy, bladder, bone, marrow, brain, lung, muscle, nerve, skin, stomach</p>	<p>3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions 3.03 Be able to gather evidence from a variety of sources 3.04 Be able to discriminate between evidence and opinion 3.05 Understand the importance of using evidence to test scientific ideas 3.06 Understand some of the effects of what they learn on people's lives 3.15 Know about the structure of the human body 3.16 Know the functions of the major internal and external parts of the human body 3.17 Know about similarities and differences between humans and other creatures 3.18 Know about the effect of exercise on the human pulse rate 3.19 Know about the effect of drug misuse on the human body 3.20 Know about the ways in which humans and other animals reproduce 3.21 Know that some characteristics of humans and other animals are inherited from their parents 3.22 Know that some characteristics of humans are influenced by their environment 3.23 Understand the importance of an appropriate diet for the health of humans and other animals</p>
<p>Full Power Electricity & Energy</p>	<ul style="list-style-type: none"> • How to make an electrical circuit • How we can change a circuit 	<p>Amber, battery, charge, component, conductor, contact, current, diode, electron, energy,</p>	<p>3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them 3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and</p>

(Physics and Chemistry)	<ul style="list-style-type: none"> • How to draw a circuit diagram • How to build circuits from diagrams • About different kinds of circuits • How to make an electric wire-loop game • About electricity and heat • About the dangers of electricity 	<p>generator, insulator, LED, leyden jar, motor, socket, static electricity, switch, terminal, turbine, voltage, watt</p>	<p>accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions</p> <p>3.03 Be able to gather evidence from a variety of sources</p> <p>3.05 Understand the importance of using evidence to test scientific ideas</p> <p>3.06 Understand some of the effects of what they learn on people's lives</p> <p>3.31 Know the distinctive properties of different materials</p> <p>3.35 Know about differences between metals and other materials</p> <p>3.39 Be able to group and classify materials according to their properties</p> <p>3.43 Know that heat is often produced as a by-product when one form of energy is converted to another</p> <p>3.44 Know that heat can move from one object to another by conduction</p> <p>3.45 Be able to represent electrical circuits in drawings using conventional symbols</p> <p>3.46 Be able to construct circuits on the basis of drawings using conventional symbols</p> <p>3.47 Be able to vary an electrical circuit to change its effect</p> <p>3.65 Know about the major sources of energy</p> <p>3.68 Know how energy sources are used</p> <p>3.69 Know the basic principles of renewable and sustainable energy</p>
<p>Out of Africa Evolution and Inheritance (Biology)</p>	<ul style="list-style-type: none"> • How life began in the sea then came out of the sea • How fossils provide information about living things from the past • Why the dinosaurs died out • About the classification of plants and animals • How plants and animals reproduce • How living things evolve and change over time • How plants and animals are adapted to their environment • How adaptation leads to evolution 	<p>Food web/chain, classification, monerans, protists, plants, fungi, animals, vertebrates, invertebrates, ancestors, fossils, algae, DNA, adapt, evolve, cell, chromosome, survival, variation, species, artificial selection, reproduce, generation, environment, descended, homo sapien, geological time,</p>	<p>3.01 Know that the study of science is concerned with investigating and understanding the animate and inanimate world around them</p> <p>3.02a Be able to conduct scientific investigations posing scientific questions 3.02b Be able to choose an appropriate way to investigate a scientific issue 3.02c Be able to make systematic and accurate measurements from their observations 3.02d Be able to explain and justify their predictions, investigations, findings and conclusions 3.02e Be able to record and communicate their findings accurately using the most appropriate medium and the appropriate scientific vocabulary and conventions</p> <p>3.03 Be able to gather evidence from a variety of sources</p> <p>3.04 Be able to discriminate between evidence and opinion</p> <p>3.05 Understand the importance of using evidence to test scientific ideas</p> <p>3.06 Understand some of the effects of what they learn on people's lives</p> <p>3.07 Know about the major classifications of living things</p> <p>3.08 Know about the effects of food chains in a variety of environments</p> <p>3.09 Know that changes in the environment have effects on living things</p> <p>3.10 Know about the nature, functions and effects of micro-organisms</p> <p>3.11 Be able to recognise and name the major plants and animals in the host country</p> <p>3.12 Be able to classify locally occurring plants and animals according to their features</p> <p>3.13 Be able to recognise and name the major plants and animals in their home country</p> <p>3.14 Understand the relationship between living things and the environment in which they live</p> <p>3.15 Know about the structure of the human body</p> <p>3.16 Know the functions of the major internal and external parts of the human body</p> <p>3.17 Know about similarities and differences between humans and other creatures</p> <p>3.19 Know about the effect of drug misuse on the human body</p> <p>3.20 Know about the ways in which humans and other animals reproduce</p>

		<ul style="list-style-type: none">• Whether there is life on other planets		<p>3.21 Know that some characteristics of humans and other animals are inherited from their parents 3.22 Know that some characteristics of humans are influenced by their environment 3.23 Understand the importance of an appropriate diet for the health of humans and other animals 3.24 Know that some characteristics of plants are inherited from their parents 3.25 Know about the functions of the major parts of a plant 3.26 Know about factors that affect the growth of plants 3.27 Know about the function of roots in anchoring and feeding plants 3.28 Know about ways in which plants reproduce 3.29 Know about the effects of seed dispersal 3.30 Know about the conditions needed for germination</p>
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Key Vocabulary

	EYFS, Years 1 and 2	Year 3 and 4	Year 5 and 6
	<p>Brain, learning, stress, memory, knowledge, skills, understanding, connections, Compass, navigation, sun, moon, equator, orbit Plant, tree, flower, shrub, grass, photosynthesis, light, nutrients, glucose, absorb, leaves, flowers, seeds, energy, veins, deciduous, evergreen, stem, evaporate, pollination, fruit, dispersal Materials, properties, metal, plastic, cloth, paper, solid, flexibility, strength, hardness, water-resistant Adaptation, environment, habitat, conditions, seasons, weather, minibeasts, invertebrates, plants, nutrients, photosynthesis, absorb, glucose, pollen, pollination, seeds, fruits, dispersal, rainforest, deforestation, species, endangered, Variable, fair test, friction, movement, air resistance, nerves, neurons, skeleton, bones, ligaments, joints, senses, sight, hearing, taste, smell, touch, diet, exercise, protein, carbohydrate, fat, vitamins, dairy Feeding, moving, growing, reproducing, breathing, responding, waste, adaptation, camouflage, endangered species, extinction, metamorphosis, development strength, flexibility, force, weight, electricity, circuit, battery, wire, energy, magnets, north, south, attract, repel. Movement, Sound, vibration, ear drum, energy, wave, transmitter, molecules, echo,</p>	<p>Knowledge, Skills, Understanding, Metacognition, Neuron, Bone, Brain, Chyme, Heart, Incisor, Ligament, Lung, Muscle, Nerve, Neuron, Nutrient, Respiratory System, Saliva, Skeleton, Skin, Stomach, Tendon Circuit, Conductor, Electric current, through wires. Insulator, Switch, Wire Boiling point, Condense, Dissolve, Evaporate, Freeze, Freezing point, Gas, Insulator, Insoluble, Irreversible change, Liquid, Melt, Reversible change, Solid, Solidify, Soluble, Solution, Suspension, Water vapour Absorption, Light spectrum Light wave, Organ, Absorption, Light spectrum, Pitch, Reflection, Shadow, Sonic boom, Sound wave, Variable, Vibrate Climate, Condensation, Consumer, Deforestation, Ecosystem, Environment, Erosion, Evaporation, Food chain, Germination, Glide, Life cycle, Migration, Perennial, Photosynthesis, Pollination, Precipitation, Predator, Prey, Producer, Soar Air resistance, Buoyancy, Drag, Force, Friction, Gravity, Mass, Newton Airtight, Botanist, Carbon dioxide, Compost, Compound leaf, Disperse, Fertiliser, Herbaceous, Lobed, Photosynthesis, Serrated, Shrub, Stomata, pores, Xylem</p>	<p>Growth mindset, metacognition, memory, emotions, knowledge, skills, understanding, assessment, balanced diet, exercise, hydration, community Atom, molecule, state of matter, solid, liquid, gas, changing state, reversible, irreversible, boiling point, condensing, conductivity, dissolving, evaporating, freezing, freezing point, hardness, insulator, insoluble, magnetic, melting, particles, soluble, suspension, transparency, water vapour Amplitude, decibels, echo, frequency, hertz, loudness, pitch, noise, resonance, sound wave, wavelength, vibration, volume/amplitude, light, absorbed, refracted, reflected, iris, lens, periscope, prism, pupil, rainbow, retina Amphibian, arthropod, bird, fish, insect, invertebrate, life cycle, mammal, metamorphosis, reptile, vertebrae, endangered, species, adaptation, classification, food web/chain, reproducing, oxygen, carbon-dioxide, micro-organisms, cells, fungi Earth, big bang, star, sun, solar system, galaxy, gravity, sphere, orbit, mass, moon, crust, mantle, core, seismic waves, earthquakes, volcanoes, magma, vapour, atmosphere, greenhouse gas, pressure, lunar/solar eclipse, tide, satellite, asteroid, comet, meteorite, milky way, planet, probe, universe, Gravity, mass, friction, magnetism, attract, repel, electricity, flight, uplift, floating, upthrust, aerodynamics, buoyancy, drag, weightlessness,</p>

	<p>pitch, decibels, light, absorb, refract, reflect, opaque, transparent, eye, lens, retina,</p>		<p>Brain, neurons, nervous system, hemisphere, sensory, motor, skeletal system, ligaments, cartilage, bone, joint, circulatory system, blood, cells, heart, respiratory system, cell, digestive system, senses, sight, hearing, taste, smell, protein, carbohydrate, fat, vitamin, mineral, dairy, bladder, bone, marrow, brain, lung, muscle, nerve, skin, stomach Amber, battery, charge, component, conductor, contact, current, diode, electron, energy, generator, insulator, LED, leyden jar, motor, socket, static electricity, switch, terminal, turbine, voltage, watt Food web/chain, classification, monerans, protists, plants, fungi, animals, vertebrates, invertebrates, ancestors, fossils, algae, DNA, adapt, evolve, cell, chromosome, survival, variation, species, artificial selection, reproduce, generation, environment, descended, homo sapien, geological time,</p>
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Curriculum Expectations and Guidance

What pupils should know, be able to do and understand

	Years 1 and 2	Years 3 and 4	Years 5 and 6
Asking Questions and Carrying Out Fair and Comparative Tests	<p>KS1 Science National Curriculum</p> <p>Asking simple questions and recognising that they can be answered in different ways.</p> <p>Performing simple tests. Children can:</p> <ul style="list-style-type: none"> a explore the world around them, leading them to ask some simple scientific questions about how and why things happen; b begin to recognise ways in which they might answer scientific questions; c ask people questions and use simple secondary sources to find answers; d carry out simple practical tests, using simple equipment; e experience different types of scientific enquiries, including practical activities; talk about the aim of scientific tests they are working on. 	<p>Lower KS2 Science National Curriculum</p> <p>Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p>Setting up simple practical enquiries, comparative and fair tests.</p> <p>Children can:</p> <ul style="list-style-type: none"> a start to raise their own relevant questions about the world around them in response to a range of scientific experiences; b start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c recognise when a fair test is necessary; d help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; e set up and carry out simple comparative and fair tests. 	<p>Upper KS2 Science National Curriculum</p> <p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p>Children can:</p> <ul style="list-style-type: none"> a with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; b with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; c explore and talk about their ideas, raising different kinds of scientific questions; d ask their own questions about scientific phenomena; e select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; f make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; g plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; h use their test results to identify when further tests and observations may be needed; i use test results to make predictions for further tests.
Observing and Measuring Changes	<p>KS1 Science National Curriculum</p> <p>Observing closely, using simple equipment.</p> <p>Children can:</p> <ul style="list-style-type: none"> a observe the natural and humanly constructed world around them; b observe changes over time; c use simple measurements and equipment; d make careful observations, sometimes using equipment to help them observe carefully. 	<p>Lower KS2 Science National Curriculum</p> <p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Children can:</p> <ul style="list-style-type: none"> a make systematic and careful observations; b observe changes over time; c use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe; 	<p>Upper KS2 Science National Curriculum</p> <p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>Children can:</p> <ul style="list-style-type: none"> a choose the most appropriate equipment to make measurements and explain how to use it accurately; b take measurements using a range of scientific equipment with increasing accuracy and precision; c make careful and focused observations;

		<p>e where appropriate, take accurate measurements using standard units using a range of equipment.</p>	<p>d know the importance of taking repeat readings and take repeat readings where appropriate.</p>
Identifying, Classifying, Recording and Presenting Data	<p>KS1 Science National Curriculum</p> <p>Identifying and classifying.</p> <p>Gathering and recording data to help in answering questions. Children can:</p> <ul style="list-style-type: none"> a use simple features to compare objects, materials and living things; b decide how to sort and classify objects into simple groups with some help; c record and communicate findings in a range of ways with support; d sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. 	<p>Lower KS2 Science National Curriculum</p> <p>Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Children can:</p> <ul style="list-style-type: none"> a talk about criteria for grouping, sorting and classifying; b group and classify things; c collect data from their own observations and measurements; d present data in a variety of ways to help in answering questions; e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. 	<p>Upper KS2 Science National Curriculum</p> <p>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p>Children can:</p> <ul style="list-style-type: none"> a independently group, classify and describe living things and materials; b use and develop keys and other information records to identify, classify and describe living things and materials; c decide how to record data from a choice of familiar approaches; d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.
Drawing Conclusions, Noticing Patterns and Presenting Findings	<p>KS1 Science National Curriculum</p> <p>Using their observations and ideas to suggest answers to questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; g talk about their findings to a variety of audiences in a variety of ways. 	<p>Lower KS2 Science National Curriculum</p> <p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Children can:</p> <ul style="list-style-type: none"> a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; f report and present their results and conclusions to others in written and oral forms with increasing confidence. 	<p>Upper KS2 Science National Curriculum</p> <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.</p> <p>Children can:</p> <ul style="list-style-type: none"> a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; h independently report and present their conclusions to others in oral and written forms.

Lower KS2 Science National Curriculum

Identifying differences, similarities or changes related to simple scientific ideas and processes.

Using straightforward scientific evidence to answer questions or to support their findings.

Children can:

- a make links between their own science results and other scientific evidence;
- b use straightforward scientific evidence to answer questions or support their findings;
- c identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;
- d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Upper KS2 Science National Curriculum

Identifying scientific evidence that has been used to support or refute ideas or arguments.

Children can:

- a use primary and secondary sources evidence to justify ideas;
- b identify evidence that refutes or supports their ideas;
- c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;
- d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;
- e talk about how scientific ideas have developed over time.