



Scheme of Work for Science

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because science links direct practical experience with ideas, it engages at many levels. Scientific method is about developing and evaluating expectations through experimental evidence and modelling. Through science, children understand how major scientific ideas contribute to technological change and recognise the cultural significance of science. Children learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.

Introduction

Throughout the key stages pupils are be taught to work scientifically by practical scientific methods, processes and skills through the teaching of the programme of study content in the specific disciplines of biology, chemistry and physics.

EY (NURSERY AND RECEPTION)

In the foundation stage science is included in the learning areas of knowledge and understanding and physical development.

Through out Early Years, children will be given opportunities:	KEY LANGUAGE
<ul style="list-style-type: none"> ➤ To show interest in why things happen and how things work ➤ To show curiosity, observe and manipulate objects ➤ To examine objects and living things to find out more about them ➤ To describe simple features of objects or events ➤ To sort objects by one function ➤ To talk about what is seen and what is happening ➤ To notice and comment on patterns ➤ To show an awareness of change ➤ To show an awareness of a range of healthy practices ➤ To observe the effects of activity on our bodies ➤ To show some understanding of good practices which contribute to good health 	<p>Sort plant animal natural size colour shape function hard soft rough smooth why how pattern change difference health</p>

By the end of Early Years most children will be able to:

Investigate objects and materials by using all their senses, looking closely at similarities, differences, patterns and change. Ask questions about why things happen and how things work. Find out about and identify some features of living objects and the events they observe. Recognise the importance of keeping healthy and those things which contribute to this. Recognise the changes that happen to their bodies when they are active.

KS1: YEARS 1 AND 2

During key stage 1, children build upon knowledge, skills, concepts and attitudes from the foundation stage. In addition:

<p><u>Year 1 and 2 Working scientifically</u> –During years 1 and 2, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>KEY LANGUAGE</p> <p>Plan compare question observe observation measure question</p>
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<p>Year 1 Plants Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem deciduous evergreen tree plant.</p>
<p>Year 1 Animals including humans Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Mammal bird amphibian reptile fish Carnivore herbivore omnivore Smell, taste touch sight, hearing head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth</p>
<p>Year 1 Everyday materials Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>shiny/dull rough/smooth; bendy/not bendy waterproof/not waterproof absorbent/not absorbent opaque/transparent.</p>
<p>Year 1 - Seasonal change Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ observe changes across the four seasons ▪ observe and describe weather associated with the seasons and how day length varies. 	<p>Summer winter autumn spring</p>
<p>Year 2 - Living things and their habitats Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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 micro-habitats ▪ describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. 	<p>habitat micro-habitat living dead predator prey food chain</p>
<p>Year 2 - Plants Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>germination, growth and survival, water light</p>

<p>Year 2 - Animals including humans</p> <p>Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep. baby, toddler, child, teenager, adult.</p>
<p>Year 2 – Uses of everyday materials</p> <p>Pupils are taught to:</p> <ul style="list-style-type: none"> • 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. 	<p>Materials Wood brick squashing, bending, twisting and stretching.</p>

The children follow a thematic skills based approach, allowing coverage of each topic area during the year. All lessons are differentiated to challenge and support pupils to make maximum progress.

Scheme of work

	Term 1	Term 2	Term 3
YR1	Seasonal change Animals including humans	Seasonal change Everyday materials	Seasonal change Plants
YR2	Animals including humans Living things and their habitats	Living things and their habitats Uses of everyday materials	Plants

By the end of Key Stage 1

Most children will be able to:

Explore the world around them and raise their own questions. Experience different types of scientific enquiries, including practical activities, and begin to recognise ways in which they might answer scientific questions. Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them, observe changes over time, and, with guidance and begin to notice patterns and relationships. Ask people questions and use simple secondary sources to find answers. Use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out. With help, record and communicate their findings in a range of ways and begin to use simple scientific language.

Observe how different plants grow. Know the requirements of plants for germination, growth and survival, as well as to the processes of reproduction and growth in plants. Explore and answer questions about animals in their habitat. Understand how to take care of animals taken from their local environment. Be familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those that are kept as pets. Know the names of common body parts (ie neck, arms, elbows) and use observations to compare and contrast animals, describing how they identify and group them.

Explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as: hard/soft; stretchy/stiff. Explore and experiment with a wide variety of materials, performing simple tests to explore questions, for example: 'What is the best material for an umbrella? Identify and discuss the uses of different everyday materials so that they become familiar with how some materials are used for more than one thing (metal can be used for coins, cans) or different materials are used for the same thing (spoons can be made from plastic, wood, metal, but not normally from glass). Think about the properties of materials that make them suitable or unsuitable for particular purposes and they be encouraged to think about unusual and creative uses for everyday materials.

KS2: YEARS 3,4,5 AND 6

During key stage 2 children build upon knowledge, skills, concepts and attitudes from key stage 1. They learn about a wider range of living things, materials and phenomena. Across the key stage working scientifically is integral to their understanding.

Lower Key Stage 2	
<p><u>Year 3 and 4 - Working scientifically</u></p> <p>During years 3 and 4, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</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 ▪ 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 	<p>KEY LANGUAGE</p> <p>Plan compare question observe observation measure prediction factor conclusion affect effect fair test equipment comparison significance Conclusion</p>
<p>Year 3 – Plants</p> <p>Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem germination seed dispersal pollination</p> <p>fertilizer life cycle nutrients</p>
<p>Year 3 Forces and Magnets</p> <p>Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ compare how things move on different surfaces ▪ notice that some forces need contact between two objects, but magnetic forces can act at a distance 	<p>attract repel poles north south gravity magnet</p>

<ul style="list-style-type: none"> ▪ observe how magnets attract or repel each other and attract some materials and not others ▪ compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials ▪ describe magnets as having two poles ▪ predict whether two magnets will attract or repel each other, depending on which poles are facing. 	
<p>Year 3 – Rocks Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Rocks fossil soil organic durable permeable</p>
<p>Year 3 – Light Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Light reflect opaque shadow dark</p>
<p>Year 4 - Living things and their habitats Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>flowering plants (including grasses) non-flowering plants, such as ferns and mosses insect vertebrate invertebrate mammal amphibian fish bird reptile environment</p>
<p>Year 4 – Animals including humans Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>mouth, tongue, teeth, oesophagus, stomach and small and large intestine</p>
<p>Year 4 – Sound Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ identify how sounds are made, associating some of them with something vibrating ▪ recognise that vibrations from sounds travel through a medium to the ear 	<p>Sound wave pitch vibration source volume</p>

<ul style="list-style-type: none"> ▪ 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. 	
<p>Year 4 – Electricity Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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 ▪ recognise some common conductors and insulators, and associate metals with being good conductors. 	<p>Battery bulb conductor insulator circuit switch buzzer</p>
<p>Year 4 – States of Matter Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>solids, liquids or gases change state when they are heated or cooled, and measure or research the temperature degrees Celsius (°C) evaporation and condensation water cycle</p>

The children follow the DFE-00182-2013 guidance specified areas of study for year groups linked where possible to foundation themes and topics. All lessons are differentiated to challenge and support to make maximum progress.

Scheme of Work

	Term 1	Term 2	Term 3
Year 3	Magnets and forces Animals including humans	Animals including humans Plants	Rocks Light
Year 4	Animals including humans Electricity	States of Matter	Living things and their habitats Sound

By the end of Lower Key Stage 2 (Year 4)

Most children will be able to:

Learn how to use new equipment, such as data loggers, appropriately. Collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. With help, look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. With support, identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and find ways of improving what they have already done. Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. Use relevant scientific language to discuss their ideas and communicate findings in ways that are appropriate for different audiences.

Know the relationship between structure and function of parts of a plant. Explore questions focusing on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction and observe how water is transported in plants. Use the local environment to identify and study plants and animals in their habitats. Explore ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Explore examples of human impact (both positive and negative) on environments.

Know the importance of nutrition and the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions. Know the main body parts associated with the digestive system, for example oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions. Compare the teeth of carnivores and herbivores, and suggesting reasons for differences; investigate what damages teeth and how to look after them.

Explore different kinds of rocks and soils, including those in the local environment. Explore what happens when light reflects off a mirror or other reflective surfaces. Know why it is important to protect eyes from bright lights. Observe that magnetic forces can act without direct contact.

Explore and identify the way sound is made through vibration in a range of different musical instruments; and find out how the pitch and volume of sounds can be changed in a variety of ways. Explore a variety of everyday materials and develop simple descriptions of the states of matter ie (solids hold their shape) and know water can be a solid, a liquid and a gas.

Construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Draw the circuit as a pictorial representation.

Upper Key Stage 2

Year 5 and 6 Working scientifically

During years 5 and 6, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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

Enquiry variables
prediction conclusion
Record data
classification present
findings identify

<p>readings when appropriate</p> <ul style="list-style-type: none"> ▪ 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 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. 	
<p>Year 5 Living things and their habitats Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Mammal amphibian insect bird reproduction plants</p>
<p>Year 5 Animals including humans Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ describe the changes as humans develop to old age. 	<p>Baby toddler adolescent adult</p>
<p>Year 5 Properties and changes of materials Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Solid liquid gas hardness solubility particles solubility soluble separated sieve filter evaporating metals wood plastics reversible irreversible dissolving mixing</p>
<p>Year 5 Earth and Space Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Earth sun moon orbit spherical rotation day night lunar</p>
<p>Year 5 Forces Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ explain that unsupported objects fall towards the Earth 	<p>Gravity air resistance water resistance friction force effort</p>

<p>because of the force of gravity acting between the Earth and the falling object</p> <ul style="list-style-type: none"> ▪ 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. 	
<p>Year 6 Living things and their habitats Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Characteristic habitat micro-organisms plants observable</p>
<p>Year 6 Animals including humans Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Circulatory heart blood vessels veins arteries lungs diet exercise nutrients water transported</p>
<p>Year 6 - Evolution and inheritance Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago ▪ recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ▪ identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. 	<p>Evolution inheritance evidence fossils offspring identical non identical adapted environment</p>
<p>Year 6 – Light Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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. 	<p>Light reflect source shadow</p>
<p>Year 6 - Electricity Pupils are taught to:</p> <ul style="list-style-type: none"> ▪ 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 	<p>Circuit wire bulb diagram buzzer motor switch diagram symbols Single</p>

- use recognised symbols when representing a simple circuit in a diagram.

Scheme of Work

	Term 1	Term 2	Term 3
Year 5	Properties and changes of materials	Animals including humans Forces	Earth and Space Living things and their habitats
Year 6	Living things and their habitats Evolution and inheritance	Electricity Animals including humans	Light

Throughout key stage 2 the children follow the DFE-00182-2013 guidance specified areas of study for year groups linked where possible to foundation themes and topics. All lessons are differentiated to challenge and support to make maximum progress.

By the end of Upper Key Stage 2 (Year 6)

Most children will be able to:

Use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. 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; choose the most appropriate equipment to make measurements and explain how to use it accurately. Decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. Use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

Find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. Draw a timeline to indicate stages in the growth and development of humans and learn about the changes experienced in puberty.

Understand how to group living things the classification system, understanding the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. Classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals) and discuss reasons why living things are placed in one group and not another. Investigate how living things on earth have changed over time and know that characteristics are passed from parents to their offspring, appreciating that variation in offspring over time can make animals more or less able to survive in particular environments.

Name the main body parts and internal organs (skeletal, muscular and digestive system) to explore how the circulatory system enables the body to function. Know how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.

Have a systematic understanding of materials from by exploring and comparing the properties of a broad range of materials. Explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes and that changes are difficult to reverse, for example, burning, rusting and vinegar with bicarbonate of soda.

Using models of the Sun and Earth pupils will explain day and night. Know the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune and understand that a moon is a celestial body that orbits a planet. Explore falling objects and raise questions about the effects of air resistance. Investigate the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. Investigate forces that make things begin to move, get faster or slow down and explore the effects of levers, pulleys and simple machines on movement.

Understand how light behaves, including light sources, reflection and shadows. Construct simple series circuits, to answer questions about what happens when they try different components, for example, switches, buzzers and motors, representing a simple circuit in a diagram using recognised symbols.

More able pupils might be able to:

Develop a mastery of the subject by describing how experimental evidence and creative thinking have been combined to provide a scientific explanation. When trying to answer a scientific question, identify an appropriate approach. Select from a range of sources of information. When the investigation involves a fair test, they identify key factors to be considered. Make predictions based on their scientific knowledge and understanding and select apparatus for a range of tasks and plan to use it effectively. Make a series of observations, comparisons or measurements with precision appropriate to the task. Begin to repeat observations and measurements and to offer simple explanations for any differences they encounter. Record observations and measurements systematically and use line graphs appropriately. Draw conclusions that are consistent with the evidence and begin to relate these to scientific knowledge and understanding. Make practical suggestions about how their working methods could be improved. Use appropriate scientific language and conventions to communicate effectively quantitative and qualitative data.

Pupils identified as gifted and talented will be able to:

Show a developed mastery of scientific understanding including being able to:
Describe evidence for some accepted scientific ideas and explain how the interpretation of evidence by scientists leads to the development and acceptance of new ideas. In their own investigative work, they use scientific knowledge and understanding to identify an appropriate approach. They select and use sources of information effectively. They make enough measurements, comparisons and observations for the task. They measure a variety of quantities with precision, using instruments with fine-scale divisions. They choose scales for graphs and diagrams that enable them to show data and features effectively.

They identify measurements and observations that do not fit the main pattern shown. They draw conclusions that are consistent with the evidence and use scientific knowledge and understanding to explain them. They make reasoned suggestions about how their working methods could be improved. They select and use appropriate methods for communicating qualitative and quantitative data using scientific language and conventions.

See Policy C21: MORE ABLE PUPILS.

Promoting children's spiritual, moral, social and cultural development through science.

Our science curriculum provide opportunities to promote

Spiritual development

Through children sensing the natural, material, physical world in which they live in, reflecting on their part in it.

Moral Development

The need to draw conclusions using observations as evidence

The recognition that some things can have beneficial and harmful effects

Social Development

Helping children to form their own opinions and decisions based on experimental evidence

Cultural development

Give children an understanding of how scientific discoveries have affected modern life

Promoting key skills through science

Science teaching at Ash Green encourages the following skills to be promoted from other areas of the curriculum

- Communication – encouraging children to use the correct vocabulary to explore facts, ideas and opinions
- Application of number – through collecting, considering and analysing first hand and secondary data
- ICT – the wide use of ICT equipment in science
- Improving own learning and performance, through reflecting on what they have done and evaluating what they have achieved
- Problem solving, through finding ways to answer scientific questions with creative solutions
- Speaking and listening, through the emphasis of clear answers using scientific vocabulary.

Promoting other aspects of the curriculum

Science provides opportunities to promote:

- thinking skills, through pupils engaging in the processes of scientific enquiry
- education for sustainable development, through developing pupils' skills in decision making on the basis of sound science and technology, and developing pupils knowledge and understanding of some key concepts, such as diversity and interdependence

Use of ICT in Science

1. Children are given opportunities to apply and develop their ICT capability through the use of ICT tools including data loggers to support their learning.
2. Children are given opportunities to support their work by being taught to:

- a. find things out from a variety of sources, selecting and synthesising the information to meet their needs and developing an ability to question its accuracy, bias and plausibility
- b. develop their ideas using ICT tools to amend and refine their work and enhance its quality and accuracy
- c. exchange and share information, both directly and through electronic media
- d. review, modify and evaluate their work, reflecting critically on its quality, as it progresses

Health and Safety

When working with tools, equipment and materials, in practical activities and in different environments, including those that are unfamiliar, pupils are taught:

- a. about hazards, risks and risk control
- b. to recognise hazards, assess consequent risks and take steps to control the risks to themselves and others
- c. to use information to assess the immediate and cumulative risks
- d. to manage their environment to ensure the health and safety of themselves and others
- e. to explain the steps they take to control risks

Reviewed and amended September 2017

A. Greenwood-Sole