



Springdale Primary School

Science Policy

POLICY WRITTEN BY MR R COWEN - 2021

DATE REVIEWED BY GOVERNORS: _____

Springdale Primary School

POLICY FOR SCIENCE

CONTENTS

1. Introductory Statement

- 1.1 Intent
- 1.2 Implementation
- 1.3 Impact

2. Impact and Assessment

3. Teaching and Learning

- 3.1 The contribution of science to teaching in other curriculum areas

4. Equal opportunities and inclusion

5. Resources

- Safety
- Covid 19
- Educational Visits

6. The Role of the Science Co-ordinator

APPENDICES

- A. Science Enquiry Cycle
- B. Example of 'Science Sparks' pupil targets
- C. NC Programme of study 2014 objectives.
- D. Objectives by year group

1.1 Introductory Statement

Science is a body of knowledge build up through experimental testing of ideas. Science is also a methodology, a practical way of finding reliable answers to questions we may ask about the world around us. At our school science is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation. Through our teaching we aim to stimulate and develop the child's natural curiosity about their world by providing opportunities for them to 'find out' and extend their knowledge and understanding. They will learn to think logically, communicate ideas effectively and use equipment safely and accurately. In a highly scientific and technological society the position of Science as a core subject within the curriculum is of major importance.

1.2 Intent

In teaching science at Springdale we aim to:

- Prepare our children for life in an increasingly scientific and technological world.
- Foster concern about, and active care for, our environment.
- Help our children acquire a growing understanding of scientific ideas.
- Help develop and extend our children's scientific concept of their world.
- Develop our children's understanding of the international and collaborative nature of science.

Attitudes:

- Encourage the development of positive attitudes to science.
- Build on our children's natural curiosity and developing a scientific approach to problems.
- Encourage open-mindedness, self-assessment, perseverance and responsibility.
- Build our children's self-confidence to enable them to work independently.
- Develop our children's social skills to work co-operatively with others.
- Provide our children with an enjoyable experience of science, so that they will develop a deep and lasting interest and may be motivated to study science further.

Skills:

- Give our children an understanding of scientific processes.
- Help our children to acquire practical scientific skills.
- Develop the skills of investigation – including observing, measuring, predicting, hypothesising, experimenting, researching, communicating, interpreting, explaining and evaluating.
- Develop the use of scientific language, recording and techniques.
- Develop the use of technology in investigating, researching and recording.
- Enable our children to become effective communicators of scientific ideas, facts and data.
- Provide opportunities for children to apply and develop their ICT skills through using appropriate ICT to support their learning in science.

1.2. Implementation

At Springdale Primary school, science is taught during one afternoon each week in both Key stage 1 and 2. In the Early years foundation stage (EYFS) science is taught as part of 'Understanding the World' helping children to make sense of their physical world and their community.

In the EYFS we provide a range of personal experiences, which increase the children's knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, children listen to a broad selection of stories, non-fiction, rhymes and poems that help to foster their understanding of our culturally, socially, technologically and ecologically diverse world.

Across school, from year 1 to year 6, children are taught using the objectives from the 2014 programme of study (see appendices). These are broken down into four subject areas in key stage 1 and five subject areas in Key stage 2. Language key to these subject areas is displayed in the class on the Science board so that children can refer to these words during each topic.

At Springdale children are given opportunities to work scientifically. Working scientifically focuses include:

- Observing over time
- Identifying and classifying
- Pattern seeking
- Research using secondary sources
- Fair testing.

Teachers model the skills of predicting, recording, presenting data, concluding and evaluating. Children are taught to think like scientists and apply these skills in investigations linked to the subject area. Class display boards incorporate the key skills of enquiry cycle and are referred to and used during each topic.

To ensure that children do not become overwhelmed by being expected to write too much in lessons, we rotate the recording of each aspect of an investigation. Children will use writing frames to support their prediction and conclusion recording. Floor books are used to evidence the various stages of the experiments completed within class.

Throughout the school year regular events are planned that link to Science. An outdoor learning 'Wild Tribe' club is provided for children in both key stages to take part in, utilising the green spaces that we have access to on the school premises. During the summer term, as part of a whole school science week, extra topics are added to the curriculum, allowing children to opportunity to apply their enquiry

skills. In preparation for Science week year groups are given time to plan teams during a pre-arranged staff meeting. These lessons are planned with teachers ensuring that each element of the enquiry cycle is covered comprehensively. We also complete an annual 'Young inventors' competition, where the children can show off inventions and experiments that they have completed at home. Parents are invited into school to share their children's work with them. Back in class, children and teachers are able to vote for their favourite designs before a winner is announced.

1.3 Impact:

At Springdale we provide a fun and engaging science curriculum that provides all children with the foundations for understanding the world around them. Through first hand practical experiences, children are able to develop a wide range of enquiry skills to solve scientific questions. Through our curriculum provision, we endeavour to embrace a child's natural curiosity about the world around them, whilst promoting a respect for all living organisms and the environment. Children are given the opportunities to explore the outside green areas around school and learn to appreciate and understand our role as humans and our responsibility to maintain the natural world around us. Children at Springdale enjoy science, are highly motivated during lessons and have a sound scientific understanding as a result. We believe that an enriched science curriculum in primary school is imperative in inspiring children to study science further in the future and will therefore contribute to success in adult life.

2. Impact and Assessment

At Springdale Primary we use assessment to inform and develop our teaching. Topics commonly begin with an assessment of what children already know, and what they want to learn.

We believe that children learn by doing, therefore written recording is kept to a minimum. Evidence of active learning is recorded in individual Science books and directly linked to the teaching focus for that lesson. Evidence of Scientific Enquiry, which will be mainly group or whole class learning, can be found in each classes' floor book. Practical lessons will have a specific scientific focus, which the children will complete in their Science books. Aged related expectations prompt sheets for each year group will be used to help the children in recording the enquiry focus of that lesson.

We assess children's work in science by making informal judgements as we observe them during lessons. On completion of a piece of work, the teacher marks the work and comments as necessary. Where applicable, the teacher gives advice on the next steps for learning. It is important that progress is monitored and that children are informed of their progress. This is achieved through effective marking and questioning which:

- Aims to extend children's learning through positive and constructive feedback

- Links to the lesson objective
- Involves the children in self-assessment
- Is written as well as verbal

Pupil records are kept on individual pupil target sheets entitled 'Science Sparks' – which are based on the year group expected expectations from Year 1 to Year 6. These are bound to the back of the books so the children or teacher can tick off the targets they achieve as they go. Teachers use these sheets as the basis for assessing the progress of each child and pass this information on to the next teacher at the end of the year. For any gifted and talented scientists, the teacher can plan activities based on the next year group's age related expectations on the 'Science Sparks' sheet.

Assessment is seen as an essential part of the planning process as it ensures that tasks can be appropriately planned and differentiated to ensure progress. A report of general progress in science is reported termly through parent consultations and is written annually.

3. Teaching and Learning

3.1 The contribution of science to teaching in other curriculum areas

3.1.1 English

Science contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in Literacy are of a scientific nature. The children develop oral skills in science lessons through discussions (for example of the environment) and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information. Where possible links are made between Science and Literacy.

3.1.2 Mathematics

Science contributes to the teaching of mathematics in a number of ways. The children use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions. They also produce diagrams, charts and graphs using the data from real investigations.

3.1.3 Information and communication technology (ICT)

Children use ICT in science lessons where appropriate. They use it to support their work in science by learning how to find, select, and analyse information. Children use ICT (computer and ipads) to record, present and interpret data and to review, modify and evaluate their work and improve its presentation.

3.1.4 Personal, social and health education (PSHE) and citizenship

Science makes a significant contribution to the teaching of personal, social and health education. For example, children can apply what they have learnt about healthy lifestyles when considering their own health and wellbeing. They learn to care for their world, for example through recycling, and to become active global citizens. Children benefit from the nature of the subject in that it gives them opportunities to take part in debates and discussions. Science promotes the concept of positive citizenship.

3.1.5 Spiritual, moral, social and cultural development

Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.

4. Equal Opportunities and Inclusion

4.1 The differentiation of tasks and questioning techniques alongside a strong emphasis on supported group and paired work ensures that all children, regardless of race, gender or ability will have equal opportunities in Science and are encouraged to develop their understanding.

4.2 We teach science to all children, whatever their ability. We provide learning opportunities that are matched to the needs of children with learning difficulties. Our work in science takes into account the targets set in the children's Individual Education Plans (IEPs). The class teacher will be responsible in setting suitable learning challenges and responding to each child's individual needs.

4.3 To provide opportunities for children to develop the process skills associated with science education as well as develop a greater knowledge and understanding of life processes and living things, materials and their properties and physical processes as described in the National Curriculum for science.

4.4 To ensure all children's needs are recognised regarding the science curriculum and children are provided with relevant support and appropriate tasks and experiences.

- 4.5 To provide a teaching programme that builds upon experiences, skills and concepts as children progress throughout the school.
- 4.6 To foster positive attitudes such as curiosity, perseverance, willingness to use and appraise evidence, willingness to tolerate uncertainty, critical reflection and enthusiasm.
- 4.7 To help all children to experience pleasure, success and enjoyment in their scientific experiences in order to develop a positive attitude towards the subject.

5. Resources

Resources for Science are organised into 'units of study' and stored within the relevant year groups so that they are easily assessable. Within each box is a list of all resources that should be in the box and a list of general resources that the Co-ordinator can supply. It is the responsibility of each year group to manage these boxes. In addition to this, a wide range of equipment is stored in the PPA room. The ordering of resources is the responsibility of the Co-ordinator and it is therefore necessary for staff to inform the co-ordinator when supplies are low, or a specific resource is required. Children are taught to use equipment appropriately which helps to ensure they are well maintained.

5.1 Safety

All activities are organised to ensure that the children are safe. Possible risks will be assessed before any work is commenced and action will be taken to reduce them. Where in doubt we refer to the L.A.'s guidelines on safe practise or consult the Science or Health and Safety Co-ordinator.

5.2 Covid 19

Science is a practical subject and involves the handling of equipment. This equipment will be well cleaned after use and isolated prior to other year groups using it if possible.

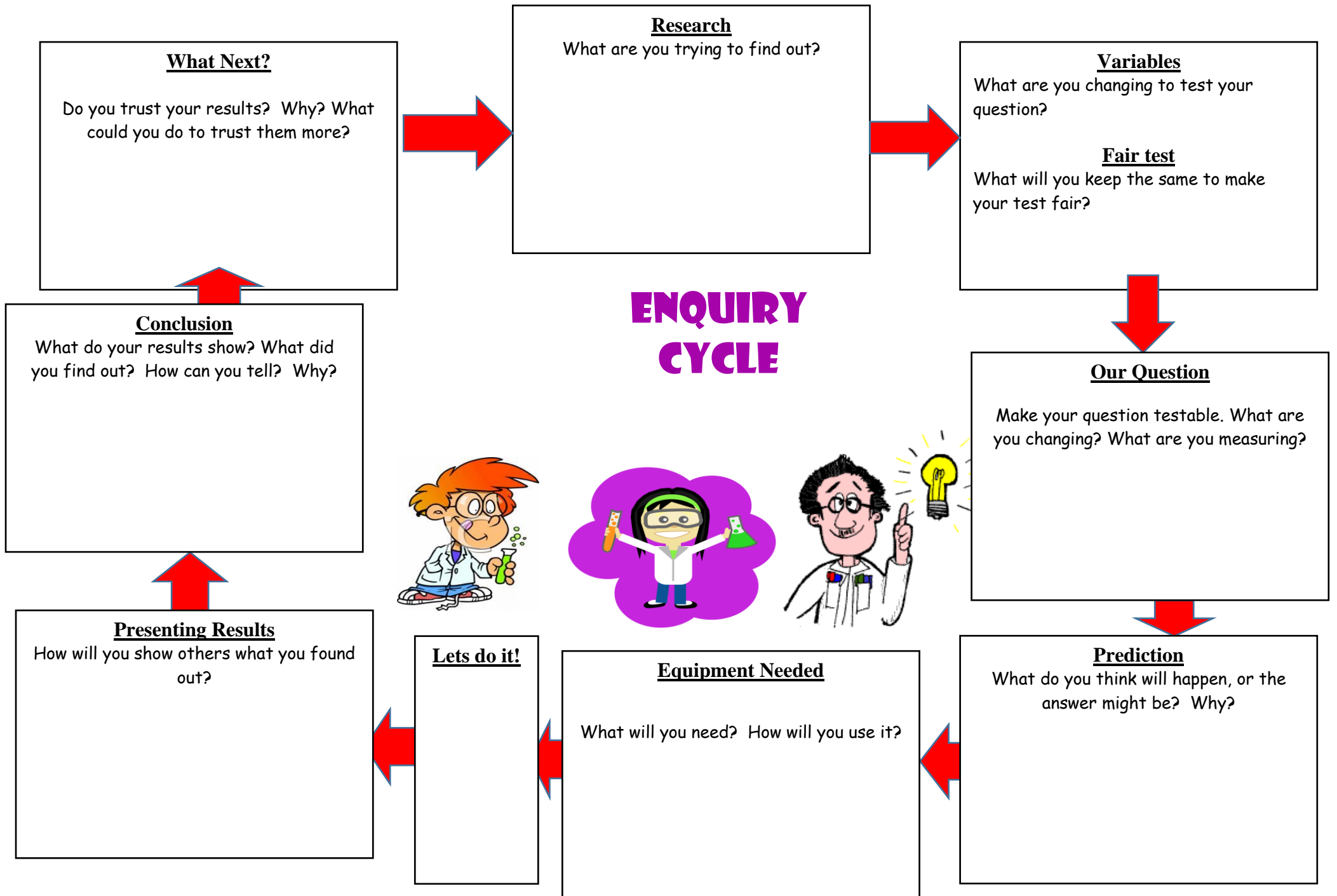
5.3 Educational Visits

We enable pupils to have access to the full range of activities involved in learning science. Where children are to participate in activities outside the classroom, for example, a trip to a science museum, we carry out a risk assessment prior to the activity on Evolve, to ensure that the activity is safe and appropriate for all pupils.

6. The Role of the Science Co-ordinator

The Co-ordinator:

- Reviews and develops school policy in consultation with staff
- Supports colleagues in the planning and delivery of school policy
- Identify needs in order to put policy into practise
- Monitors and evaluates progression in science.
- Liaises with outside agencies to develop and update provision
- Identifies INSET needs and organises their delivery
- Is responsible for the ordering and purchase of resources





Working Scientifically Year 5

Are you a science spark?

		A 1	A2	Sp1	Sp2	Su1	Su2
1	ARE 5	I can write/identify a question to be investigated that others could use.					
2		I can explain how to make a fair test and recognise which variables cannot be controlled and explain why.					
3		I can select information from a range of resources and explain why it is relevant.					
4		I can explain a prediction with evidence, abstract ideas and models.					
5		I recognise that we need larger sample sizes to get more reliable results					
6		I select apparatus for a range of tasks & plan to use it effectively					
7		I can make a series of observations, comparisons or measurements with precision appropriate to the task					
8		I always put my results in an appropriate format, e.g. line graphs, bar charts Venn or Carroll diagrams, tables					
9		Where appropriate, I can present data as line graphs					
10		I can use data to identify patterns.					
11		I draw conclusions based on evidence I have collected					
12		I suggest how and why my method should be changed or why results should be rejected.					

		A 1	A2	Sp1	Sp2	Su1	Su2
1	ARE 4	I can ask questions to investigate with scientific ideas.					
2		I can plan a fair test & decide which variables to measure, change & keep the same.					
3		I can choose texts to find information relevant to the topic.					
4		I can use a comparative sentence when writing a prediction.					
5		I can decide how to test something scientifically.					
6		I can use appropriate equipment safely.					
7		I can use measurements, observations & ICT to answer questions.					
8		I can decide a way of recording that suit the results.					
9		I can draw a bar chart & am beginning to plot a line graph.					
10		I can use graphs to identify & interpret patterns.					
11		I use patterns in results to help draw conclusions.					
12		I begin to consider whether to ignore any inaccurate or unsuitable results.					

		A 1	A2	Sp1	Sp2	Su1	Su2
1	ARE 6	I can use my science experiences to explore ideas & raise different kinds of questions					
2		I recognise when & how to set up fair tests.					
3		I recognise which secondary sources will be most useful.					
4		I can explain a prediction with evidence, abstract ideas & models					
5		I can explain how my method/approach is best.					
6		I decide on the most appropriate equipment to use					
7		I take repeated readings when necessary.					
8		I decide how to record my data from a variety of choices					
9		I know that only continuous data can be presented as a line graph.					
10		I look for causal relationships in my data.					
11		I identify evidence that supports/refutes my ideas					
12		I explain reject results & differences of reject observations					

	Working Scientifically	Living things and their habitats	Plants	Animals, including humans
Year 1	<p>During years 1 and 2, pupils should be 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>Pupils should be 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>Pupils should be 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
Year 2		<p>Pupils should be 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 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 	<p>Pupils should be 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>Pupils should be 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
Year 3	<p>During years 3 and 4, pupils should be 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 or to support their findings. 		<p>Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
Year 4		<p>Pupils should be 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>Pupils should be 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
Year 5	<p>During years 5 and 6, pupils should be 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"> 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 	<p>Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age
Year 6		<p>Living things and their habitats</p> <ul style="list-style-type: none"> 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 		<p>Pupils should be 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

	Materials	Seasonal Changes	Light	Forces and magnets
Year 1	<p>Everyday materials Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> observe changes across the 4 seasons observe and describe weather associated with the seasons and how day length varies 		
Year 2	<p>Uses of everyday materials Pupils should be 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 			
Year 3	<p>Rocks Pupils should be 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>Pupils should be 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 a solid object find patterns in the way that the size of shadows change 	<p>compare how things move on different surfaces</p> <ul style="list-style-type: none"> 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 predict whether 2 magnets will attract or repel each other, depending on which poles are facing
Year 4	<p>States of matter Pupils should be 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 			
Year 5	<p>Properties and changes of materials Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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
Year 6			<p>Pupils should be 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 	

	Sound	Electricity	Earth and Space	Evolution and inheritance
Year 1				
Year 2				
Year 3				
Year 4	<p>Pupils should be 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 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>Pupils should be 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 		
Year 5			<p>Pupils should be 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 	
Year 6		<p>Pupils should be 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 use recognised symbols when representing a simple circuit in a diagram 		<p>Pupils should be 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

	Working Scientifically	Plants	Animals, including humans	Materials	Seasonal Changes
Year 1	<p>During years 1 and 2, pupils should be 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>Pupils should be 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>Pupils should be 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>Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies.

	Working Scientifically	Living things and their habitats	Plants	Animals, including humans	Materials
Year 2	<p>During years 1 and 2, pupils should be 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>Pupils should be 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 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 	<p>Pupils should be 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>Pupils should be 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>Pupils should be 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

	Working Scientifically	Plants	Animals, including humans	Materials	Light	Forces and magnets
Year 3	<p>During years 3 and 4, pupils should be 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 or to support their findings. 	<p>Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> -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 	<p>Rocks</p> <p>Pupils should be 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>Pupils should be 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 a solid object -find patterns in the way that the size of shadows change 	<p>compare how things move on different surfaces</p> <ul style="list-style-type: none"> - 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 predict whether 2 magnets will attract or repel each other, depending on which poles are facing

	Working Scientifically	Living things and their habitats	Animals, including humans	Materials	Sound	Electricity
Year 4	<p>During years 3 and 4, pupils should be 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 or to support their findings. 	<p>Pupils should be 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>Pupils should be 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>Pupils should be 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>Pupils should be 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 - 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>Pupils should be 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

	Working Scientifically	Living things and their habitats	Animals, including humans	Materials	Forces and magnets	Earth and Space
Year 5	<p>During years 5 and 6, pupils should be 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"> 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 	<p>Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe the changes as humans develop to old age 	<p>Properties and changes of materials</p> <p>Pupils should be 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>Pupils should be taught to:</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be 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

	Working Scientifically	Living things and their habitats	Animals, including humans	Light	Electricity	Evolution and inheritance
Year 6	<p>During years 5 and 6, pupils should be 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"> 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 	<p>Living things and their habitats</p> <ul style="list-style-type: none"> 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 	<p>Pupils should be 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>Pupils should be 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>Pupils should be 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 use recognised symbols when representing a simple circuit in a diagram 	<p>Pupils should be 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