

Science at St John the Baptist RC Primary school - Dartmouth.

At St John's it is our intent to provide a meaningful science curriculum that shows progression and sequencing of knowledge and skills to aid and secure pupils' understanding of scientific concepts and skills.

Science teaches an understanding of natural phenomena. It aims to stimulate a child's curiosity in finding out why things happen in the way they do. It teaches methods of enquiry and investigation to stimulate creative thought.

The scientific process and pupils' problem-solving activities will be used to deepen their understanding of the concepts involved. Science in our school 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, as well as using and applying process skills. The main aspects of science to be studied will be determined by the National Curriculum.

Teachers use their knowledge of how Science progresses throughout the years to plan stimulating and engaging lessons that build on the children's previous learning. Possible scientific misconceptions are identified when planning and addressed during lessons.

As a staff at St John the Baptist school we created the school's principles for teaching and learning Science by reflecting on what good science at St John's would look like. This informs our planning, teaching and learning.

Teachers use a range of teaching and learning approaches for Science such as practical experimentation, real life contexts, demonstration, role play and cross curricular learning where children can apply the knowledge of scientific concepts they have learned and secure their understanding.



Our Science Principles are as follows:

Science should have:

- Awe and wonder!
- Active, curious, engaged and excited children.
- Children talking about science
- Questions, ideas and interests encouraged and explored.
- Independent thinkers and problem solvers.
- Practical and hands on activities.
- Learning outside the classroom using real life contexts
- Questions and answers to discover.
- Prior knowledge activated
- Forest Schools teaching.

Classroom

All classes have a focus on providing more 'hands on' practical science that takes advantage of the local area and environment. This will build on from knowledge and understanding of the scientific concepts learned. Opportunities for children to experience 'awe and wonder' to be taken whenever it arises, and cross curricular links to be made. Science is highly valued across the school and this will be evident in displays, around the school grounds, in good work assemblies and in the responses from the pupil voice questionnaires.

Reception

As the Reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in Development matters which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water. The Reception children in the EYFS are provided with opportunities to foster social skills and the development of scientific language and understanding. Teachers will support children in developing their knowledge and understanding of the world in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding.

Adult-led activities will focus on areas of skills that need to be developed. The learning environment and continuous provision will allow child initiated learning to take place using scientific skills across the curriculum.

Summary of Science in EYFS

Topic	3-4 year olds	Reception
Animals excluding Humans	Learn about the life cycles of animals Compare adult animals to their babies Observe how baby animals change over time	Name and describe animals that live in different habitats Describe different habitats
Humans	Learn about the life cycles of humans Learn about how to take care of themselves Learn about their senses	Describe people who are familiar to them Learn about how to take care of themselves
Plants	Explore the surrounding natural environment Explore natural objects from the surrounding environment Grow plants	Explore the plants in the surrounding natural environment Explore plants and animals in a contrasting natural environment
Seasonal changes		Play and explore outside in all seasons and in different weather Observe living things throughout the year
Materials	Explore a range of materials Shape and join materials Combine and mix ingredients Change materials by heating and cooling, including cooking	Explore a range of materials, including natural materials Make objects from different materials, including natural materials Observe, how materials change when heated and cooled Compare how materials change over time and in different conditions

Key Stage 1

The focus of science teaching in Key Stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them.

They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests and finding things out using secondary sources of information.

They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about Science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

Pupils should read and spell scientific vocabulary at a level consistent with their reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 - Years 3 and 4

The main focus of Science teaching in Lower Key Stage 2 is to enable pupils to broaden their scientific view of the world around them.

They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple fair tests and finding things out using secondary sources of information.

They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' must always be taught through and clearly related to substantive Science content in the programme of study.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing reading and spelling knowledge.

Upper Key Stage 2 - Years 5-6

The main focus of Science teaching in Upper Key Stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.

At Upper Key Stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer Science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out fair tests and finding things out using a wide range of secondary sources of information.

Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. Pupils should read, spell and pronounce scientific vocabulary correctly.

'Working and thinking scientifically' must always be taught through and clearly related to substantive Science content in the programme of study.

Strategy for implementation

Science is a core subject of the National Curriculum and pupils undertake a Science activity every week at both key stages. The work covered in Key Stage 1 builds on the nationally recognised curriculum for pupils aged under five. Pupils in reception develop their knowledge, understanding and skills through play activities and direct teaching from which the pupils undertake planned tasks. Planning takes into account that the school places a high emphasis on the development of pupils' skills of working scientifically.

The National Curriculum prescribes differing subject matter for each year group.

These are:

Year 1: Working scientifically, Plants, Animals (including humans), Everyday materials, Seasonal changes.

Year 2: Working scientifically, Living things and their habitats, Plants, Animals (including humans), Everyday materials,

Year 3: Working scientifically, Plants, Animals (including humans), Rocks, Light, Forces and magnets.

Year 4: Working scientifically, Living things and their habitats, Animals (including humans), States of matter, Sound and electricity.

Year 5: Working scientifically, Living things and their habitats, Animals (including humans), Properties and changes in materials, Earth space and forces.

Year 6: Working scientifically, Living things and their habitats, Animals (including humans), Evolution and inheritance, Light and electricity.

Science Coverage

Class 1	Autumn Term	Spring Term	Summer Term
Year A	Animals including Humans	Plants - wildflowers	Everyday Materials
Year B	Humans – Ourselves	Plants - trees Animals including Humans – Animal groups	Everyday Materials Plants – growing food
Seasonal Changes to run throughout both years.			
Class 2	Autumn Term	Spring Term	Summer Term
Year A	Living things and their habitats	Uses of Everyday Materials	Plants
Year B	Animals including Humans	Forces and Magnets Light	Everyday Materials Rocks
Class 3	Autumn Term	Spring Term	Summer Term
Year A	States of matter - Magnets Earth and Space	Forces - air resistance, water resistance Animals incl Humans – circularity system	Animals including Humans Digestive system,
Year B	Electricity, Changing Circuits Light	Animals including humans – food chains Evolution and Inheritance	Living things and their habitats
Year C	Sound	Forces - friction,	States of matter – changing states

Teaching and Learning

Science will be taught in ways that are imaginative, purposeful, well managed and enjoyable. Teachers will provide clear and accurate explanations and offer skilful questioning.

All lessons have clear learning questions which are shared and reviewed with the pupils effectively. A variety of strategies, including questioning, discussion, concept mapping and marking are used to assess progress. The information is used to identify what is taught next.

Activities inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?".

Activities develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, and making comparisons and communicating results and findings.

Lessons make effective links with other curriculum areas and subjects, especially literacy, numeracy and computing. Activities are challenging, motivating and extend pupils' learning.

Pupils have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carry out activities safely and decide on the best form of communicating their findings.

Assessment and recording

Teachers analyse pupils' progress at the end of each school year to complete the annual report to parents.

The pupils' knowledge and understanding are assessed before each unit of work by question, discussion and observation. Individuals and groups complete elicitation tasks which summarise knowledge and understanding. The results of these are used to refine the starting

points and the level of challenge for the activities that follow. These tasks are revisited at the end of the unit and new knowledge and understanding are added.

Assessment of working scientifically relies on observation and/or the collection of written evidence of investigating skills.

Assessment for learning

This is achieved through discussion with pupils; observation of pupils; marking work; termly teacher assessment from Years 1 - 6.

Teachers will assess children's work in science by making informal judgements during lessons. On completion of a piece of work, the teacher assesses it, and uses this assessment to plan for future learning. Written or verbal feedback is given to the child to help guide his/her progress. Older children are encouraged to make judgements about how they can improve their own work. At the end of a unit of work the class teacher makes a summary judgement about the work of each pupil in relation to the National Curriculum levels of attainment.

Continuity and Progression

The school ensures curriculum continuity by following the two or three-year rolling programme of Science units of work and by close liaison between staff at the planning stage.

Progression of Science knowledge and Working Scientifically - see Appendix 1 and 2

Inclusion

The children undertake a broad and balanced programme that takes account of abilities, aptitudes and physical, emotional and intellectual development. Through Science the children learn a range of skills, concepts, attitudes and methods of working.

At our school we ensure that all pupils can engage with learning Science and develop as young Scientists irrespective of their race, cultural background, gender, religion, creed, level of intellectual ability or physical and emotional circumstances.

Ensuring differentiation is a fundamental and core element of inclusion. We recognise the fact that we have children of differing ability in all our classes, and so we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies which are differentiated by task, expected outcome and/or support from peers or adults. As such we plan and resource our learning, in line with our whole school policies, to enable all pupils to make good and sustained progress in Science including those with special educational needs, those with disabilities and those identified as pupil premium children and those with English as an additional language. Class teachers adapt enquiries to meet the needs of their class as each cohort is different. Assessment should be inclusive - where children struggle to write opportunities should be made for these children to share their knowledge and skills.

Safe practice

Safe practice must be promoted at all times. The Association of Science Education publication, "Be Safe!", has been adopted by the school as its safety policy in Science. A copy is available in the staff room and every teacher has a summary of its contents. Teachers must also take into account the school's Health and Safety policy. Particular attention must be given to avoiding the use of anything that aggravates individual pupils' allergies. Safety issues should be identified in medium-term planning and risk assessments must be completed in weekly planning, when activities are identified that are unusual and beyond the scope of normal safety practice.

The contribution of science to other aspects of the curriculum

The teaching of literacy, numeracy and computing is promoted strongly in science as part of this school's drive to raise standards in English and mathematics. Science is used to extend and enable the pupils to practise the skills of language and literacy and numeracy.

Literacy

In particular, at Key Stage 1, the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. At Key Stage 2 the pupils are encouraged to develop their skills of writing to record their planning, what they observe and what they find out. In relation to science, they should be applying their literacy skills at levels similar to those which they are using in their English work.

Numeracy

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their numeracy skills at levels similar to those which they are using in their mathematics' lessons.

Computing

At both key stages pupils' should use computing to: locate and research information (internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using calculators, Chrome books and cameras.

Monitoring and Evaluation and the role of the Science Co-ordinator

All teachers at our school are responsible for monitoring standards in Science however the Science Co-ordinator will take a lead in this, supported by the Head Teacher. Monitoring activities are planned across the year and form part of the Science Co-ordinators schedule.

In summary, these are:

- Termly staff meetings to analyse samples of pupils' Science work to moderate standards (attainment and progress against outcomes and end of stage performance descriptors) to ensure consistency;
- The moderation of teachers' planning files once per term to monitor coverage and delivery of planned enquiries;
- Lesson observations to ensure that learning and teaching is appropriately engaging and challenging and that progress is being made by the pupils;
- Once per year the subject leader provides feedback to staff about the quality of Science being taught and uses the Science Portfolio of evidence to lead a discussion on standards being achieved within the subject.

The Science Co-ordinator has the responsibility to support the development of Science further across the school within the school's improvement plan and the use of resources. Teachers and educational support staff can expect informal support from the Science Co-ordinator, support arising from the school improvement plan and identified in performance management and induction programmes.

To develop staff confidence and competence in teaching Science:

- The Science Co-ordinator will attend subject professional development opportunities as they arise;
- Whole-school training needs are identified as a result of the monitoring and evaluation programme;
- Where necessary, the subject leader leads (or arranges) school-based subject improvement training for colleagues.
- Staff meeting to analyse samples of pupils' science work to evaluate standards (attainment and progress).
- Head teacher to analyse teachers' weekly planning files once per term to monitor coverage and balance of curriculum planned.
- Head teacher to undertake lesson observations.
- Head teacher to discuss with named governor the school's planning and developments in areas of school priority (these discussions arise from governors' planned visits).
- Head teacher monitors on-going displays and work in hand in classrooms by termly visits, outside of lesson time.
- Head teacher to analyse annual teacher assessments to sample the reliability of these in each class, using the school's portfolio once per year.
- Subject leader and head teacher to monitor results of statutory assessments annually
- The head teacher to monitor annual reports to parents.

Review

This policy will be reviewed annually in line with the school's policy review programme. The subject leader is responsible for reporting to the governors' curriculum committee about the quality of its implementation and its impact on standards. In the light of this, policy amendments may be made.

Appendix 1 – Progression of Science Knowledge

Science area:	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans	<p>Understanding the World 3 and 4 Year olds Understand the key features of the life cycle of a plant or animal Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Reception Describe what they see hear and feel whilst outside</p> <p>The Natural World ELG - Explore the natural world around them, making observations and drawing pictures of animals and plants; - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;</p>	<p>- identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>- identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>- 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>	<p>- notice that animals, including humans, have offspring which grow into adults</p> <p>- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>- 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</p> <p>identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p>-describe the simple functions of the basic parts of the digestive system in humans</p> <p>-Identify different types of teeth in humans and their simple functions</p> <p>-construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<p>-describe the changes as humans develop to old age</p>	<p>-identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>-recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>-describe the ways in which nutrients and water are transported within animals, including humans</p>

<p>Plants</p>	<p>Understanding the World 3 and 4 Year olds Understand the key features of the life cycle of a plant or animal Plant seeds and care for growing plants Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Reception Describe what they see hear and feel whilst outside Understand the effect of changing seasons on the natural world around them</p> <p>ELG - Explore the natural world around them, making observations and drawing pictures of animals and plants; - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;</p>	<p>– 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>	<p>- 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>	<p>- 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>			
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<p>Everyday materials</p> <p>States of matter</p>	<p>Understanding the world 3 and 4 year olds Use all their senses in hands on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Talk about the differences between materials and changes they notice</p> <p>Reception Explore the natural world around them. ELG - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</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. 	<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>compare and group materials together, according to whether they are solids, liquids or gases</p> <ul style="list-style-type: none"> -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 	<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 	
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						associated with burning and the action of acid on bicarbonate of soda	
Living things and their habitats	<p>Understanding the World 3 and 4 Year olds Understand the key features of the life cycle of a plant or animal Plant seeds and care for growing plants Begin to understand the need to respect and care for the natural environment and all living things.</p> <p>Reception Describe what they see hear and feel whilst outside Understand the effect of changing seasons on the natural world around them</p> <p>ELG - Explore the natural world around them, making observations and drawing pictures of animals and plants; - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.</p>		<p>- explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>- 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</p> <p>- identify and name a variety of plants and animals in their habitats, including micro-habitats</p> <p>- describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and</p>		<p>-Recognise that living things can be grouped in a variety of ways</p> <p>-Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>-Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>-Describe the life process of reproduction in some plants and animals</p>	<p>-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</p> <p>-Give reasons for classifying plants and animals based on specific characteristics</p>

			name different sources of food.				
Forces and magnets	<p>Understanding the World 3 and 4 year olds Explore how things work. Explore and talk about different forces they can feel.</p> <p>Reception Explore the natural world around them.</p> <p>ELG Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>			<ul style="list-style-type: none"> - 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 -predict whether 2 magnets will attract or repel each other, depending on which poles are facing 		<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 	
Light				<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 			<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

				<ul style="list-style-type: none"> -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 			<ul style="list-style-type: none"> 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
Rock				<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 			
States of matter							<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

						<p>-know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>-use knowledge of solids, liquids and gases to decide</p> <p>how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>-give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>-demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>-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>	
Earth and space						<p>-describe the movement of the Earth and other planets relative to the sun in the solar system</p> <p>-describe the movement of the moon relative to the Earth</p>	

						<ul style="list-style-type: none"> -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 	
Sound					<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 		
Electricity					<ul style="list-style-type: none"> -identify common appliances that run on electricity -construct a simple series electrical circuit, identifying and naming its basic 	<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 	

					<p>parts, including cells, wires, bulbs, switches and buzzers</p> <ul style="list-style-type: none"> -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>how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <ul style="list-style-type: none"> -use recognised symbols when representing a simple circuit in a diagram
Evolution and inheritance							<ul style="list-style-type: none"> -recognise that living things have changed over time, fossils provide information about living things that inhabited the Earth millions of yrs 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

Appendix 2 - Progression of Scientific Skills - Working Scientifically

Working Scientifically					
		EYFS	Y1	Y2	Y3
Plan	Planning	Choose the resources they need for their chosen activities and say when they do or don't need help Generate a variety of ideas for testing (not always realistic/appropriate) Asks questions about aspects of their familiar world.	Asking simple questions and recognising that they can be answered in different ways.	Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum	Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests
	Observing obtaining evidence	General sensory observations of animals and plants. Looking at objects and pictures and discussing what they can see. Simple descriptions of the world around them. Measure by direct comparison. Non-standard units of measurement. Simple comparative vocabulary – bigger, smaller.	Observing closely, using simple equipment. Performing simple tests. Identifying and classifying.	Use simple equipment to observe closely including changes over time Perform simple comparative tests Identify, group and classify Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
Do	Recording	Talking about objects and events. Simple recording –pictures/images, design and technology, art, music, dance, role play and stories	Gathering and recording data to help in answering questions.	Gather and record data to help in answering questions including from secondary sources of information	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.
	Concluding	Noticing 'which worked best' – simple comparative statements. Answer initial question simply.	Using their observations and ideas to suggest answers to questions.	Using their observations and ideas to suggest answers to questions.	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.
Review	Evaluating				Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

		Working Scientifically		
		Y4	Y5	Y6
Plan	Planning	Ask relevant questions and use different types of scientific enquiries to answer them Set up simple practical enquiries, comparative and fair tests	Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	Plan different types of scientific enquiries to answer their own or others' questions, including recognising and controlling variables where necessary
	Observing obtaining evidence	Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.	Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
Do	Recording	Gather, record, classify and present data in a variety of ways to help in answering questions (Year 4 focus) Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
	Concluding	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.	Report and present 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
Review	Evaluating	Identify differences, similarities or changes related to simple scientific ideas and processes Use straightforward scientific evidence to answer questions or to support his/her findings	Use test results to make predictions to set up further comparative and fair tests. Identifying scientific evidence that has been used to support or refute ideas or arguments.	Use test results to make predictions to set up further comparative and fair tests. Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources Group and classify things and recognise patterns

