

Science Scheme of Work – Lower Key Stage Two

Phase Three

Working Scientifically - Pupils should be taught to:

	<u>Covered</u>
Is able to ask relevant questions based on prior knowledge, using a range of question stems, with support.	
Use different types of scientific enquiries to answer questions posed by the teacher.	
Given a range of resources, children will gather, record, classifying and presenting data in a variety of ways to help in answering questions.	
To recognise, with support, when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	
To set up simple practical enquiries, comparative and fair tests to answer questions generated by the teacher.	
Children follow their plan in order to observe, classify, compare simple and fair tests in order to find patterns.	
Children sometimes decide how to record and present evidence, with support. Children are supported to present the same data in different ways.	
Children use their observations to answer their questions and the answers are consistent with the evidence.	
Children draw conclusions based on their evidence and subject knowledge.	
Children can ask further questions which can be answered by extending the same enquiry, with a teacher.	
Children begin to identify naturally occurring patterns and relationships.	

	<u>Covered</u>
<p>Working scientifically notes and guidance (non-statutory)</p> <ul style="list-style-type: none"> ○ Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. ○ They should; <ul style="list-style-type: none"> - start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions - recognise when a simple fair test is necessary and help to decide how to set it up - talk about criteria for grouping, sorting and classifying - use simple keys. ○ They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. ○ They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used ○ They should learn how to use new equipment, such as data loggers, appropriately. ○ They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. ○ With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. ○ With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. ○ They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. ○ Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences. 	

Plants – Middle - Pupils should be taught to:

	<u>Covered</u>
Can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	
Is able to 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 dispersal	
Key vocabulary for plants: roots, stem/trunk, leaves, flowers, bud, leaf, blossom, petals, fruit, vegetables, seed, deciduous, evergreen, life, growth, air, light, water, nutrients, soil, room, variations, life cycle, pollination, seed formation, seed dispersal, nutrition, support, reproduction (flowers), suitable, temperature.	

	<u>Covered</u>
Working scientifically notes and guidance (non-statutory)	
<ul style="list-style-type: none"> ○ Compare the effect of different factors on plant growth (e.g. the amount of light, amount of fertiliser. ○ Discover how seeds are formed by observing the different stages of plant life cycle over a period of time. ○ Look for patterns in the structure of fruits that relate to how seeds are dispersed. ○ Observe how water is transported in plants (e.g. putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers). 	

Animals including humans –Middle - Pupils should be taught to:

	<u>Covered</u>
Knows that animals, including humans, need the right types and amount of nutrition, Understands they cannot make their own food; they get nutrition from what they eat.	
Knows that humans and some other animals have skeletons and muscles for support, protection and movement.	
Key vocabulary for animals including humans: nutrition, nutrients, carbohydrates, protein, fats, fibre, water, vitamins, minerals, skeleton, bones, joints, endoskeleton, exoskeleton, hydrostatic, skeleton, support, protection, movement, vertebrate, invertebrate, contract, relax, muscles, ball joint, socket joint, hinge joint, gliding joint.	

Working scientifically notes and guidance (non-statutory)	
<ul style="list-style-type: none"> ○ Identify and group animals with and without skeletons and observe and compare their movement. ○ Explore ideas about what would happen if humans did not have skeletons. ○ Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. ○ Research different food groups and how they keep us healthy and design meals based on what they find out. 	

Rocks – Middle - Pupils should be taught to:

	<u>Covered</u>

Is able to compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	
Describes, in simple terms, how fossils are formed when things that have lived are trapped within rock.	
Recognises that soils are made from rocks and organic matter.	
Key vocabulary for rocks: appearance, physical, properties, hard/soft, shiny/dull, rough/smooth, absorbent/not absorbent, fossils, sedimentary, rocks, soils, organic matter, grains, crystals.	

<p>Working scientifically notes and guidance (non-statutory)</p> <ul style="list-style-type: none"> ○ Link with work in Geography pupils should explore different kinds of rocks and soils, including those in the local environment. ○ Observe rocks (including those used in buildings and gravestones) and explore how they might have changed over time. ○ Use a hand lens or microscope to help them identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. ○ Pupils might research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. ○ Pupils could explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. ○ Investigate different soils and the effect more sand could have in a soil as water travels through. ○ They can raise and answer questions about the way soils are formed. 	
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Light – Middle - Pupils should be taught to:

	<u>Covered</u>
Recognises that they need light in order to see things and that dark is the absence of light.	
Investigates that light is reflected from surfaces.	
Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.	
Is able to find patterns in the way that the size of shadows change.	
Recognises that shadows are formed when the light from a light source is blocked by an opaque object.	
Key vocabulary for light: light, see, dark, reflect, surface, natural, star, Sun, Moon, shadow, blocked, opaque, solid, artificial, torch, candle, lamp, sunlight, dangerous, protection.	

<p>Working scientifically notes and guidance (non-statutory)</p> <ul style="list-style-type: none"> ○ Look for and measure shadows and find out how they are made and investigate how they can change. ○ Look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. ○ Explore what happens when light reflects off a mirror other reflective surface and play mirror games to help them answer questions about how light behaves. 	
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Forces and Magnets – Middle - Pupils should be taught to:

	<u>Covered</u>
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Recognises that some forces need contact between two objects, but magnetic forces can act at a distance.	
Is able to compare how things move on different surfaces.	
Observes how magnets attract or repel each other and attract some materials and not others	
Describes magnets as having two poles.	
Is able to predict whether two magnets will attract or repel each other, depending on which poles are facing.	
Compares and groups together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials	
Key vocabulary for forces and magnets: force, push, pull, open, surface, magnet, magnetic, attract, repel, magnetic poles, North, South.	

<p>Working scientifically notes and guidance (non-statutory)</p> <ul style="list-style-type: none"> ○ Compare how different things move and grouping them. ○ Raising questions and carrying out tests to find out how far things move on different surfaces and gathering and recording data to find answers to their questions. ○ Explore the strength of different magnets and find a fair way to compare them. ○ Sort materials into those that are magnetic and those that are not. ○ Look for patterns in the way that behave in relation to each other and what might affect this (e.g. the strength of the magnet or which pole faces another). ○ Identify how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. 	
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Phase Four

Working Scientifically - Pupils should be taught to:

	<u>Covered</u>
Is starting to independently ask relevant questions based on prior knowledge, using a range of question stems.	
Use different types of scientific enquiries to answer questions posed by the teacher or themselves.	
Given a range of resources, children will gather, record, classifying and presenting data in a variety of ways to help in answering questions and recognise the type of enquiry used.	
To recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	
To set up simple practical enquiries, comparative and fair tests to answer questions generated by the teacher or themselves.	
Children follow their plan in order to observe, classify, compare simple and fair tests in order to find patterns.	
Children sometimes decide how to record and present evidence. Children are supported to present the same data in different ways.	
Children use their observations to answer their questions, or those asked by others, and the answers are consistent with the evidence.	
Children draw conclusions based on their evidence and subject knowledge. They identify ways in which they adapted their method.	
Children can ask further questions which can be answered by extending the same enquiry.	

	<u>Covered</u>
<p>Working scientifically notes and guidance (non-statutory)</p> <ul style="list-style-type: none"> ○ Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. ○ They should; <ul style="list-style-type: none"> - start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions - recognise when a simple fair test is necessary and help to decide how to set it up - talk about criteria for grouping, sorting and classifying - use simple keys. ○ They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. ○ They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used ○ They should learn how to use new equipment, such as data loggers, appropriately. ○ They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. ○ With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. ○ With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. ○ They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. 	

○ Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.	
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Animals including humans –Middle - Pupils should be taught to:

Can describe the simple functions of the basic parts of the digestive system in humans.	
Is able to identify the different types of teeth in humans and their simple functions	
Can construct and interpret a variety of food chains, identifying producers, predators and prey	
Key vocabulary for animals including humans: digestive system, digestion, mouth, tongue (moistens, mixes, saliva), oesophagus, transports, stomach, acid, enzymes, small intestine (absorbs), water, vitamins, large intestine (compacts), colon, teeth, incisors (cutting, slicing), canines (ripping, tearing), molars (chewing, grinding), floss, brush, food chains, sun, producers, prey, predators, carnivore, herbivore, omnivore.	

	<u>Covered</u>
Working scientifically notes and guidance (non-statutory)	
<ul style="list-style-type: none"> ○ Compare the teeth of carnivores and herbivores and suggest reasons for difference. ○ Find out what damages teeth and how to look after them. ○ Draw and discuss their ideas about the digestive system and compare them to models or images. ○ Digestive system experiment using different foods, fizzy drink (acid), and tights to replicate system. 	

Living things and their habitat – Middle - Pupils should be taught to:

	<u>Covered</u>
Recognises that living things can be grouped in a variety of ways	
To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	
To recognise that environments can change and that this can sometimes pose dangers to living things	
Key vocabulary for living things and their habitat: environment, flowering, non-flowering, grasses, ferns, mosses, plants, animals, invertebrate (snails, slugs, worms, spiders and insects), vertebrate (fish, amphibians, reptiles, birds and mammals), environment, dangers, human impact, positive influence (nature reserves, ecologically planned parks, garden ponds), negative influence (population and development, litter and deforestation).	

	<u>Covered</u>
Working scientifically notes and guidance (non-statutory)	
<ul style="list-style-type: none"> ○ Using and making simple guides or keys to explore and identify local plants and animals. ○ Making a guide to local living things. ○ Raising and answering questions based on their observations of animals and what they have found out about other animals they have researched. 	

States of Matter – Middle - Pupils should be taught to:

	<u>Covered</u>
Is able to compare and group materials together, according to whether they are solids, liquids or gases	
Observes 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)	
To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	
Key vocabulary for states of matter: solid, solidify, iron, ice, melt, freeze, liquid, evaporate, condense, gas, container, changing state, heated, heat, cooled, cool, degrees Celsius, thermometer, water cycle, evaporation, condensation, temperature, melting, warm/cool, water, water vapor.	

	<u>Covered</u>
Working scientifically notes and guidance (non-statutory) <ul style="list-style-type: none"> ○ Explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape, liquids form a pool, gases escape from an unsealed container). ○ Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. ○ Group and classify a variety of different materials. ○ Exploring the effect of temperature on substances such as chocolate, butter, cream (e.g. make chocolate crispy cakes and ice-cream for a party). ○ Research the temperature at which materials change state (e.g. when iron melts or oxygen condenses into a liquid). ○ They might observe and record evaporation over a period of time (e.g. a puddle in the playground or washing on a line and investigate the effect of temperature on washing drying or snow/ice melting). 	

Sound – Middle - Pupils should be taught to:

	<u>Covered</u>
To identify how sounds are made, associating some of them with something vibrating	
To recognise that vibrations from sounds, travel through a medium to the ear	
Is able to find patterns between the pitch of a sound and features of the object that produced it	
Recognises that sounds get fainter as the distance from the sound source increases	
Is able to find patterns between the volume of a sound and the strength of the vibrations that produced it	
Key vocabulary for sound: vibrates, vibration, vibrating, air, medium, ear, hear, sound, volume, pitch, faint, fainter, loud, louder, string, percussion, woodwind, brass, insulate.	

	<u>Covered</u>
Working scientifically notes and guidance (non-statutory) <ul style="list-style-type: none"> ○ Explore and identify the way sound is made through vibration in a range of different musical instruments from around the world. ○ Find out how the pitch and volume of sounds can be changed in a variety of ways. ○ Find patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thickness. ○ Children might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. ○ Make and play their own instruments by using what they have found out about pitch and volume. 	

Electricity – Middle - Pupils should be taught to:

	<u>Covered</u>
Is able to identify common appliances that run on electricity	
Is able to construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	
Is able to 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	
Recognises that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit	
Is able to recognise some common conductors and insulators, and associate metals with being good conductors	
Key vocabulary for electricity: appliances, electricity, electrical circuit, cell, wire, bulb, buzzer, danger, electrical safety, sign, insulators (wood, rubber, plastic, glass), conductors (metal, water), switch (open, closed).	

	<u>Covered</u>
<p>Working scientifically notes and guidance (non-statutory)</p> <ul style="list-style-type: none"> ○ Pupils should construct simple series circuits, trying different components (e.g. bulbs, buzzers, motors, switches) and use these to create simple devices. ○ Pupils should draw the circuit as a pictorial representation. ○ Observe patterns <ul style="list-style-type: none"> - e.g. that bulbs get brighter if more cells are added - that metals tend to be conductors of electricity - that some materials can and some cannot be used to connect across a gap in a circuit. 	