



St. Mary's Catholic Federation
Long Term Plan - Science - 2023-24



National Curriculum skills for scientific working are included in each topic through investigation or observation of scientific phenomena.

<u>LKS2 Science</u>	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
Year 3	<p><u>Light</u> Reflective surfaces, Dangers, shadows, Torches Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p>	<p><u>Forces and Magnets</u> Magnets, different metals, ramps, toy cars 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.</p>	<p><u>Animals, including humans</u> Animals, human, nutrition and skeletons 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>	<p><u>Rocks</u> Appearance, Properties, Fossils, soil Rock selection, fossil selection, magnifying glass Compare and group together different kinds of rocks based on 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>	<p><u>Plants</u> Function of plants - requirements Life cycles seeds identify and describe the functions of different parts of flowering plants. Identify and describe the structure of a variety of common flowering plants, including trees.</p>	<p><u>Plants (continuation)</u> Plants Life cycles fruit Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>
Year 4	<p><u>Animals, including humans</u> Describe digestive system identify the different types of teeth- construct and interpret a variety of food chains, key words: producers, predators, prey Skills: Ask relevant questions and use different types of scientific enquiries to answer them, make practical enquiries, inc comparative and fair tests <i>Resources: Tights, pasta, coke, eggs, jars, different liquids</i></p>	<p><u>Sound</u> Identify how sounds are made, 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, recognise that sounds get fainter as the distance from the sound source increases it Skills: make predictions, using straightforward scientific evidence to answer questions or to support their findings <i>Resources: instruments, water</i></p>	<p><u>Electricity</u> 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 Skills: reporting on findings from enquiries using results to draw simple conclusions, practical enquiries, comparative and fair tests</p>	<p><u>States of matter</u> 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 Skills: Practical enquiries, comparative and fair tests <i>Resources: water, oil, range of solid objects, foam, perfume, oobleck</i></p>	<p><u>States of matter (continuation)</u> Solids and Liquids: °C - Celsius evaporation and condensation in the water cycle and associate the rate of evaporation with temperature Skills: Practical enquiries, comparative and fair tests <i>Resources: water, oil, range of solid objects, foam, perfume, oobleck</i></p>	<p><u>Living things and their habitats</u> How they are grouped in a number of ways. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) Classification keys Living things and their habitats. - environments can change / pose dangers to living things Skills: Using observations to compare and contrast animals, identifying differences, similarities or changes related to simple scientific ideas and processes</p>

			Resources: crocodile clips, battery, buzzer, bulbs variety of materials			Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Resources: photos/ genie in a bottle book Collect leaves, go on a bug hunt, magnifying glasses
<u>UKS2 Science</u>	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
Year 5	Forces NC coverage: <ul style="list-style-type: none"> Explain the 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. 	Earth and Space NC coverage <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. Describe the movement of the Moon relative to the Earth Moon phases. Lunar month Cross curricular writing and research - Imaginary planet.	Animals including humans. Describe the changes in humans Development of old age. Review and consolidate Skills covered: Recording data using tables, bar and line graphs NC coverage <ul style="list-style-type: none"> Describe the changes as humans develop to old age. 	Living things and their habitats. NC coverage <ul style="list-style-type: none"> Describe differences in life cycle of flowering plant / non flowering plant. Life process of reproduction in some plants/animals Skills covered: reporting and presenting findings in oral and written forms such as displays and other presentations NC coverage: <ul style="list-style-type: none"> Describe the differences in the life cycle of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. Cross curricular - Biography of a famous naturalist E.g. David Attenborough, Jane Goodall, Steve Backshall, Charles Darwin.	Properties and changes materials Heating, mixing and dissolving. NC coverage <ul style="list-style-type: none"> Compare groups according to properties. Solution (know that some materials will dissolve in liquid to form a solution) Separation (filtering, sieving and evaporation) Reasons for use of materials every day. 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. Skills covered: planning different types of enquiries to answer questions take measurements, using a range of scientific equipment recording data using NC coverage: Properties of changing materials: Compare groups according to properties RSE link revisit life cycles	

Year 6	<p><u>Living things and their habitats</u> 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>	<p><u>Electricity</u> associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <p>use recognised symbols when representing a simple circuit in a diagram</p>	<p><u>Animals including humans</u></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><u>Evolution and inheritance</u> recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <p>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>	<p><u>Light</u> Recognise light travels in straight lines and objects can be seen because of light. Recognise why light sources create shadows. Outcome: determining variables in an experiment Resources: torches, light cubes, light box and generator, coloured prisms</p>	<p>Review and consolidate year's work.</p>
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Lower key stage 2 programme of study

Working scientifically

Statutory requirements

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:

- 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.

Notes and guidance (non-statutory)

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.

These opportunities for working scientifically should be provided across years 3 and 4 so that the expectations in the programme of study can be met by the end of year 4. Pupils are not expected to cover each aspect for every area of study.

Upper key stage 2 programme of study

Working scientifically

Statutory requirements

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:

- 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 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.

Notes and guidance (non-statutory)

Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. They should use their results to identify

Notes and guidance (non-statutory)

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 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; and 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.

