

Science



Moulton Chapel Primary School

1. To be able to read, write and speak with confidence and fluency.
2. To be able to use mathematical concepts to tackle problems and resolve them.
3. To be global citizens that have had cultural experiences beyond their normal lives.
4. To aspire our children to dream big in their career path.
5. Grow into responsible, respectful young people who value each other.

Intent

At Moulton Chapel Primary School, our school intent is for children to recognise the importance of Science in every aspect of their daily life. We aim to develop the children's natural curiosity, encourage respect for living things and the physical environment and provide opportunities for evaluation of evidence. We drive to build on their knowledge year on year within our Science curriculum that deepens their understanding and learning to enable them to become enquiry based learners and develops a passion for the subject that they may further investigate as they move through their education journey.

Implementation

The teaching and implementation of the Science Curriculum at Moulton Chapel Primary School is based on the National Curriculum and linked to topics to ensure a well-structured approach to this subject. Teachers use Snap Science to support planning, this ensures that there is a breadth of Science strands being taught and progression across the key stages is clear.

Whilst some of our Science work is taught in discreet sequences of lessons, we endeavour to link our topic work to the Science curriculum where possible to provide context and better understanding of concepts. Teaching of Science through the school has a focus on practical investigative opportunities for the children and is supported by cross curricular work where applicable. Attainment is assessed after a topic has been taught through assessment tasks and recording in children's assessment booklet.

In the EYFS children are assessed using Tapestry and have weekly challenges to complete that may have a science focus.

Impact

Our overall impact is measured by whether the children meet age related expectations and are able to retain the knowledge and skills they have learnt and apply these to new situations year on year.

We want our children to be able to question ideas and reflect and use their knowledge, to work collaboratively to investigate and experiment in order to find answers to their questions.

National Curriculum requirements:

EYFS requirements:

Understanding the World (The World)

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Physical Development (Health and Self-Care)

Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

Key Stage 1 National Curriculum

Working Scientifically

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:

- 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.

Year 1 Areas of study	Year 2 Areas of study
Plants	Living things and their habitats
Animals, including humans	Plants
Everyday materials	Animals, including humans
Seasonal change	Use of everyday materials

Lower Key Stage 2 National Curriculum

Working scientifically

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.*

Year 3 Areas of study	Year 4 Areas of study
<i>Plants</i>	<i>Living things and their habitats</i>
<i>Animals, including humans</i>	<i>Animals, including humans</i>
<i>Rocks</i>	<i>States of matter</i>
<i>Light</i>	<i>Sound</i>
<i>Forces and matter</i>	<i>Electricity</i>

Upper Key Stage 2 National Curriculum

Working scientifically

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 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*

Year 5 Areas of study	Year 6 Areas of study
<i>Living things and their habitats</i>	<i>Living things and their habitats</i>
<i>Animals, including humans</i>	<i>Animals, including humans</i>
<i>Properties and changes of materials</i>	<i>Evolution and inheritance</i>
<i>Earth and Space</i>	<i>Light</i>
<i>Forces</i>	<i>Electricity</i>

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Progression through the school

	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Working scientifically <i>Questioning and planning</i>	- Ask simple questions - Begin to recognise that questions can be answered in different ways	- Ask questions about the world around us - Recognise that questions can be answered in different ways	- Ask relevant questions and use different types of scientific enquiry to answer them. - Raise their own questions about the world around them. - Begin to develop their ideas about functions, relationships and interactions.	- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. - Explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically. - Begin to recognise more abstract ideas and begin to recognise how these help them to understand how the world operates. - Select the most appropriate ways to answer scientific questions.
Working scientifically <i>Observing & measuring</i> <i>Pattern seeking</i>	- Begin to observe closely. - Use simple observations and ideas to suggest answers. - To observe changes over time and begin to notice patterns. - To say what I am looking for and what I am measuring. - Use simple measurements and equipment with support (hand lenses and egg timers).	- Observe closely, using simple equipment. - Use observations and ideas to suggest answers to questions. - Observe changes over time and begin to notice patterns and relationships. - To know how to use simple equipment. - Begin to use standard units of measure.	- Make careful and systematic observations and take more accurate measurements using standard units. - Use a range of equipment to answer questions. - Begin to look for naturally occurring patterns and relationships and decide what data to collect. - Help to make decisions about their observations. - Learn to use new equipment appropriately. - Can see patterns in their results. - Can choose from a selection of equipment to use for an investigation. - Can observe and measure with increasing accuracy using standard units.	- Take measurements using a range of scientific equipment with increased accuracy and precision. - Identify patterns that might be found in the natural environment. - Make their own decisions about what observations to make, what measurements to take and how long to make them for and whether to repeat them. - Choose appropriate equipment for an investigation. - Can interpret data and patterns. - Can make a set of observations and say what the interval and range are. - Take accurate and precise measurements and record them appropriately.
Working scientifically <i>Investigating</i>	- Perform simple investigations with support. - Can discuss my ideas - Can begin to say what happened in my investigation.	- Can perform simple investigations. - Can discuss my ideas in more detail. - Can begin to say what happened in my investigation.	- Begin to set up simple practical enquiries, comparative and fair tests. - Recognise when a simple fair test is necessary and help to decide how to set it up. - Can think of more than one variable factor.	- Use test results to make predictions to set up further fair tests. - Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why. - Suggest improvements to methods and give reasons. - Decide when it is appropriate to do fair tests.
Working scientifically <i>Recording and</i>	- Gather and record data with some adult support. - Begin to record simple data. - Begin to communicate their	- Gather and record data to help in answering questions. - Record simple data. - Record and communicate their findings	- Gather, record, classify and present data in a variety of ways to answer questions. - Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts	- Record data and results of increasing complexity using scientific diagrams and labels, tables, keys and bar and line graphs. - Report and record findings from investigations.

<i>reporting findings</i>	<i>findings</i>	<i>in a range of ways.</i> Can show results in a table that my teacher has provided.	and tables. - Report on findings from enquiries, including oral and written explanations. - Use notes, simple tables and standard units to record and analyse their data. - Can record results in tables and charts.	- Decide how to record data from a choice of familiar approaches. - Can choose how best to present data.
Working scientifically <i>Identifying, grouping and classifying</i>	- Identify and classify with support. - Begin to observe and identify, compare and describe. - Begin to use simple features to compare objects, materials and living things	- Identify and classify. - Observe and identify, compare and describe. - Use simple features to compare objects, materials and living things and decide how to sort and group them.	- Identify differences, similarities or changes related to simple scientific ideas and processes. - Talk about criteria for grouping, sorting and classifying and use simple keys. - Compare and group according to behaviour or properties.	Use and develop keys and other information records to identify, classify and describe living things and materials.
Working scientifically <i>Research</i>	- Begin to use secondary sources to find answers. - To begin to find information to help me from books and computers with help.	- Use simple secondary sources to find answers. - Can find information to help me from books and computers with some help.	Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.	Recognise which secondary sources will be of most use to research their ideas.
Working scientifically <i>Conclusions</i>	- Begin to talk about what they have found. - Begin to say what happened in their investigation. - Can say whether they were surprised at results or not. - Begin to say what they would change about their investigation.	- Talk about what they have found out and how they found it out. - To say what happened in their investigation. - To say whether they were surprised at the results or not. - To say what they would change about their investigation.	- Using results to draw simple conclusions, make predictions, suggest improvements and raise further questions. - Use scientific evidence to answer questions. - Begin to look for patterns, similarities and differences in their data. - Begin to identify new questions arising from their data, make new predictions and find ways of improving what they have already done. - Can see patterns in their results. - Can say what they have found out beginning to link cause and effect. - Can say how I could make their investigation better.	- Report and present findings from enquiries including conclusions, relationships and explanations in oral and written forms. - Identify scientific evidence that has been used to support or refute ideas or arguments. - Draw conclusions based on their data and observations. - Use their evidence to justify their ideas using scientific knowledge and understanding. - Use test results to make predictions to set up further comparatives and fair tests. - Look for patterns, similarities and differences in their data. - Use their results to identify when further tests and observations are needed. - Can draw conclusions and identify scientific evidence. - Can use simple models. - Know which evidence proves a scientific point. - Use test results to make predictions to set up further comparative and fair tests.
Plants	- Identify and name a variety of common wild and garden plants. - Identify some common parts of flowers and plants.	- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. - Can identify some common parts of flowering plants, including trees. - 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.	- 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, water, light, nutrients from soil, and room to grow) and how they vary from plant to plant. - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	
Animals (including humans)	- Identify and name common animals - Identify some animals by whether they are carnivores, herbivores or	- Identify and name animals including, amphibians, reptiles, mammals and birds. - Identify a growing number of animals by whether they are carnivores, herbivores	- 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	- Describe the changes as humans develop to old age. - Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels

	omnivores. - Describe and compare the structure of common animals - Identify, name and label the basic body parts associated with the senses.	or omnivores. - Notice that animals, including humans, have offspring which grow into adults - Describe the basic needs of animals, including humans, for survival. - Describe the importance for humans of exercise, eating the right amount of different types of food.	have skeletons and muscles for support, protection and movement. - Describe the basic parts of the digestive system in humans. - Identify the different types of teeth in humans and their function. - Construct and interpret a variety of food chains, identifying producers, predators and prey.	- 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.
Living things and their habitats	- Begin to understand that animals, including humans, need a habitat (home) - Identify a variety plants and animals in their habitats.	- Explore and compare the differences between things that are living, dead and things that have never been alive. - Identify that most 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 a variety plants and animals in their habitats, including microhabitats.	- To 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.	- 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. - Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. - Give reasons for classifying plants and animals based on specific characteristics.
Materials	- Distinguish between an object and the material from which it is made. - Identify and name a variety of everyday materials	- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. - Identify and compare the suitability of different materials - 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 physical properties - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	- Compare how things move on different surfaces, notice that some forces need contact between two objects, but magnetic forces can act at a distance. - Observe how magnets attract to repel each other and attract some materials and not others. - Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. - Describe magnets as having two poles predict whether two magnets will attract or repel each other, depending on which poles are facing. - 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. - Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity and response to magnet. - 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 evaporation. - Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials. - Demonstrate that dissolving, mixing and changes of state are reversible. - Explain that some changes in the new formation of new materials, and that this kind of change is not reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Light			- Recognise that they need light in order to see things and that the 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 objects. - Find patterns in the way that the size of	- 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 shapes as the

			<i>shadows change.</i>	<i>objects that cast them.</i>
Forces	▪	▪	▪ 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 and 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.	▪ 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 greater effect.
Electricity	▪	▪	▪ 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 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.	▪ 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.
Rocks	▪	▪	▪ 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	▪
Sound	▪	▪	▪ 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 that 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.	▪
Earth and Space	▪	▪	▪	▪ 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.
Evolution and Inheritance	▪	▪	▪	▪ 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.

Whole School Overview

	<i>Autumn 1</i>	<i>Autumn 2</i>	<i>Spring 1</i>	<i>Spring 2</i>	<i>Summer 1</i>	<i>Summer 2</i>
<i>KS1 - A</i>	<i>Living things and their habitats</i>		<i>Healthy Me</i>	<i>Forces</i>	<i>Everyday materials and their uses</i>	
<i>KS1 - B</i>	<i>Plants</i>		<i>Animals (including humans)</i>		<i>Seasonal change</i>	
<i>Y3/4 - A</i>	<i>Electricity</i>	<i>Rocks</i>	<i>Animals (including humans)</i>	<i>Living things and their habitats</i>	<i>Forces and magnets</i>	<i>States of matter</i>
<i>Y3/4 - B</i>	<i>Sound</i>	<i>Light</i>	<i>Living things and their habitats</i>	<i>Plants</i>	<i>Animals (including humans)</i>	
<i>Y5/6 - A</i>	<i>All living things and their habitats</i>		<i>Evolution and inheritance</i>	<i>Light</i>	<i>Properties and changes of materials</i>	
<i>Y5/6 - B</i>	<i>Animals (including humans)</i>		<i>Forces</i>	<i>Earth and Space</i>		<i>Electricity</i>

Science specific vocabulary

EYFS & Year 1&2

Working scientifically	Plants	Animals (including humans)	Everyday materials and uses	Seasonal change	Living things and their habitats
Question answer equipment gather measure results sort group test observe compare describe similar different patterns identify data classify results	Deciduous evergreen leaves flowers (blossom) petals roots fruit bulb seed trunk branches stem water light growth temperature	Fish reptile mammals birds amphibian herbivore omnivore carnivore leg arm elbow head ear nose back wings beak survival water air food adult baby offspring kitten calf puppy exercise hygiene	Wood plastic glass paper water metal rock hard soft bendy rough smooth stretchy stiff shiny dull waterproof absorbent opaque transparent brick fabric squashing twisting elastic foil	Sumer spring autumn winter sun day moon night light dark	Living dead habitat energy food chain predator prey woodland pond desert

Year 3 & 4

Working scientifically Previous vocabulary +	Plants Previous vocabulary +	Animals (including humans)	Rocks	Light	Forces and magnets
Scientific enquiry changes over time secondary sources comparative tests fair tests accurate observations record evidence keys bar charts tables conclusions predictions support thermometers decrease increase relationships appearance	Air nutrients soil preproduction transportation dispersal pollination	Movement muscles bones skull nutrition skeletons mouth tongue teeth oesophagus stomach small intestine large intestine canine incisor molar herbivore omnivore carnivore	Fossils soils sandstone granite marble pumice crystals absorbent	Light shadows mirror reflective dark reflection	Magnetic force contact attract repel friction poles push pull
	Living things and their habitats		States of matter	Sound	Electricity
	Living dead habitat energy food chain predator prey woodland pond desert		Solid liquid gas evaporation condensation particles temperature freezing heating	Volume vibration wave pitch tone speaker	Cells wires bulbs switches buzzers battery circuit series conductors insulators

Year 5 & 6

Working scientifically Previous vocabulary +	Living things and their habitats Previous vocabulary +	Animals (including humans)	Properties and change of materials	Earth and Space	Forces
Independent variable dependent variable controlled variable accuracy precision classification keys scatter graphs line graphs opinion fact	Mammal reproduction insect amphibian bird offspring classification vertebrates invertebrates micro- organisms reptiles	Foetus embryo womb gestation baby toddler teenager elderly growth development puberty circulatory heart blood vessels veins arteries oxygenated deoxygenated valve exercise respiration	Hardness solubility transparency conductivity magnetic filter evaporation dissolving mixing	Earth sun moon axis rotation day night phases of the moon star constellation	Air resistance water resistance friction gravity newton pulleys gears

			<i>Evolution and inheritance</i> <i>Fossils adaptation evolution characteristics reproduction genetics</i>	<i>Light</i> <i>Refraction reflection light spectrum rainbow colour</i>	<i>Electricity</i> <i>Cells wires bulbs switches buzzers battery circuit series conductors insulators amps volts</i>
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