

Primary Specification



Science



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Trust Level

Children are matched against 'stage descriptors' (in other words what pupils are expected to know and be able to do in Science for their year group or phase) when being assessed by their teachers in their science lessons. Where appropriate, teachers will provide opportunities for children to embed essential skills acquired in English and Maths within science lessons.

School Level

Assessments will be administered in different ways depending on the school. E.g., gradings offered, end of unit mini assessments, knowledge review weeks, termly or half-termly assessment periods etc.

Schools will assess pupils informally in accordance with the school's guidelines. At school level the specification document for each subject will be supported by the school own planning documents/ portals which also include LTPs, MTPs, schemes of work and associated resources.

Long Term Plans provide leaders, teachers, students and parents with the overview of the learning journey that occurs yearly. These are available on the school website.

Medium Term Plans map the learning for each of the learning focusses of each half term in each year group. These provide detailed information into the steps to facilitate a differentiated approach. This ensures that knowledge and skills are covered. The number of activities / objectives covered may vary dependent on the length of a half term and the frequency of lessons in a given subject.

Schemes of Work may vary from subject to subject allowing the specialists in schools to develop suitable activities and topics ensuring ownership of planning for progress. Please note we do not follow external schemes of work prescriptively. When used, they are merely a starting point. This allows schools the freedom to adapt to the needs of their pupils.

SOW – Guiding Principles

- The school's curriculum is inclusive and meets the needs of all learners
- Knowledge and skills based
- Form part of the 'big picture' e.g., show progression over the 6 years in school
- Provide suggested resources
- Allow for teacher ownership and/or creativity of lessons within the framework of the agreed scheme
- Allow for appropriate differentiation

The National Curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- are equipped with the scientific knowledge required to understand the uses and implications of science today and for the future.

Objectives	
KS1	<p>The principle 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.</p> <ul style="list-style-type: none"> • be encouraged to be curious and ask questions about what they notice. • 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. • 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. • 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. • 'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. • should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at KS1.
LKS2	<p>The principle focus of science teaching in lower Key stage 2 is to enable pupils to broaden their scientific view of the world around them.</p> <ul style="list-style-type: none"> • be encouraged to do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments. • begin to develop their own ideas about function, relationships and interactions. • ask their own questions about what they observe and make their own 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 comparative and fair tests and finding things out using secondary sources of information. • draw simple conclusions.

- use scientific language, first to talk about, later to write about what they have found out.
- should read and spell scientific vocabulary correctly and with confidence using their growing word reading and spelling knowledge.

Objectives

UKS2

The principle 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.

- explore and talk about their ideas.
- ask their own questions about scientific phenomena.
- analyse functions, relationships and interactions more systematically.
- should encounter more abstract ideas and begin to recognise help them to understand and predict how the world operates.
- begin to recognise that scientific ideas change and develop overtime.
- 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 comparative and fair tests and finding things out using a wide range of secondary sources of information.
- draw conclusions based on their data and observations. Use evidence to justify their ideas.
- use their scientific knowledge and understanding to explain their ideas.
- should read, spell and pronounce scientific vocabulary correctly.

SCIENCE INTENT

Every child at Marus Bridge receives a high-quality science education that provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Our teachers ensure that every child is exposed to high quality teaching and learning experiences, which allow children to explore their outdoor environment and locality, thus developing their scientific enquiry and investigative skills. We immerse our children in scientific vocabulary, which aids their knowledge and understanding not only of the topic they are studying, but also of the world around them. In Early Years, we introduce our children to science through the 'Understanding of the World' area of the EYFS curriculum. Here the children are actively encouraged to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. We intend to provide all children regardless of ethnic origin, gender, class, aptitude or disability, with a broad and balanced science curriculum. At Marus Bridge, we aspire our children to become the great scientists of the future.

SCIENCE IMPLEMENTATION

At Marus Bridge, we use the Snap Science scheme to empower teachers to deliver high quality learning experiences, to create a positive attitude to science learning within their classrooms and reinforce an expectation that all children can achieve high standards in science.

Snap Science is a dynamic, comprehensive programme with a wide range of high quality resources. The scheme has been designed to help schools deliver outstanding, hands-on science lessons from the Early Years Foundation Stage to Key Stage 2 with a flexible bank of lesson plans, videos, slideshows, animations and built-in formative and summative assessment.

At Marus Bridge, our teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all children can achieve high standards in science.

Our planning provides problem-solving opportunities that allow children to find out for themselves. They are encouraged to ask questions and be encouraged to use their scientific skills and research to discover their answers. We celebrate this curiosity in our classrooms.

Our teachers plan engaging lessons using our wide range of quality resources to aid the understanding of conceptual knowledge. Teachers use a variety of formative assessments, including precise questioning, to test conceptual knowledge and skills and identify those children with gaps in their learning, ensuring they keep up.

Our science curriculum is progressive and as the children move up the school, it builds on the learning and skills development of the previous year.

Working Scientifically skills are embedded into lessons to ensure these are being developed.

Our teachers demonstrate how to use scientific equipment and the Working Scientifically skills in order to embed scientific understanding.

Every opportunity is explored to use our extensive school grounds, all year round, to develop the children's understanding of the world around them.

Scientific vocabulary is displayed on working walls and underpins every lesson. Key vocabulary is progressive throughout year groups.

Trips, visitors and annual Science weeks are used to further develop children's understanding of the world and their surroundings.

SCIENCE IMPACT

Our approach to science teaching at Marus Bridge results in a fun, engaging and rich experience for all our children.

It develops an innate sense of appreciation, wonderment and awe at the world around them.

Children at Marus Bridge will develop age related knowledge, which is organised into key points, and the scientific skills to equip them for everyday life.

As the children's knowledge and understanding increases and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

Children will have developed a rich scientific vocabulary, which will enable them to articulate their understanding of taught concepts.

Our engagement with the children's local environment ensures they learn through varied and first hand experiences of the world around them.

Through trips, visitors and interaction with experts, children have the understanding that science has changed our lives.

Summary of Subject Content

Science – Marus Bridge Primary School broadly follows the National Curriculum Scheme of Work and **Snap Science**. Each teacher is provided with log on details for the site. Additional materials can be found in the Science Folder on the shared server. The scheme supports best practice in primary science teaching and assessment , whilst encouraging professionalism and autonomy. Therefore, teachers have the professional flexibility to choose from a variety of suggested activities, adapt and modify the scheme to suit their children’s interests, current events, their own teaching style, the use of any support staff and the resources available.

However, any modification must not overlook any of the scientific skills that are in the Key Specification document. In addition, the scheme of work has clear skills and knowledge progression built in from the Early Years to Year 6. These must be taught to ensure a full and comprehensive coverage of the science curriculum is provided for our children.

Long Term Planning - overview

	AUTUMN	SPRING	SUMMER
YEAR 1	Everyday Materials Using our senses	Looking at Animals Everyday Materials	Plant Detectives Everyday Materials
Our Changing World	Plants Animals Antics Sensing Seasons	Plants Animals Antics Sensing Seasons	Plants Sensing Seasons
YEAR 2	Materials – Good Choices	Materials – Shaping up The apprentice gardener	Growing up Take care The apprentice gardener
Our Changing World	What is in your habitat?	What is in your habitat?	What is in your habitat?
YEAR 3	Amazing Bodies Can you see me?	Forces & Magnets	Light inc. reflections and shadows. Animals inc. humans with health and nutrition
Our Changing World	Our Changing World (Plants)	Our Changing World (Plants)	Our Changing World (Plants)
YEAR 4	Where does all that food go? In a state	Good Vibrations Electricity	Where does all that Food go? Who am I? In a state
Our Changing World	Our Changing World (Classification Keys – Trees)	Our Changing World (Classification Keys – Trees)	Our Changing World (Classification Keys – Trees)
YEAR 5	Get Sorted Every day materials Feel the Force	The Earth and beyond Circle of Life Reproduction in Plants and Animals	Reproduction in Plants and Animals Marvellous Mixtures Materials: All change!
Our Changing World		Our Changing World (Plants - life cycles)	Our Changing World (Plants – life cycles)
YEAR 6	Everything Changes Lighten up your world	Body Pump Danger! Low voltage	Nature Library Body health
Our Changing World	Our Changing World (Plants – their environments)	Our Changing World (Plants – their environments)	Our Changing World (Plants – their environments)

STAGE DESCRIPTORS

Return to and build on their previous learning, refining ideas and developing their ability to represent them:
Create collaboratively sharing ideas, resources and skills.

Expressive Arts & Design

Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Understanding the World

Explore the natural world around them.

Describe what they see, hear and feel whilst outside.

Recognise some environments that are different to the one in which they live.

Understand the effect of changing seasons on the natural world around them.

EYFS

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.

Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Year 1

Working Scientifically

- ask simple scientific questions
- use simple equipment to make observations
- carry out simple tests
- identify and classify things
- suggest what I have found out using everyday scientific words (Y1)
- use simple data to answer questions
- measure using non - standard units of measure, rulers and meter sticks.

Animals including Humans

I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.

I can classify and name animals by what they eat (carnivore, herbivore and omnivore).

I can describe and compare the structure of a variety of common sort animals (including fish, amphibians, reptiles, birds and mammals and pets).

I can identify, name, draw and label the basic parts of the human body that I can see and say which part of the body is associated with each sense.

Seasonal Changes

I can observe and comment on changes across the four seasons.

I can name the seasons and describe the weather associated with the seasons and how day length varies.

I can keep a nature diary across the year (include all four seasons, pictures, notes, observations, examples of leaves/flowers, photos).

Plants

I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

I can identify and describe the basic structure of a variety of common flowering plants, including trees.

Everyday Materials

I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.

I can distinguish between an object and the material from which it is made.

I can describe the simple physical properties of a variety of everyday materials.

I can compare and group together a variety of everyday materials on the basis of their simple physical properties.

Year 2

Working Scientifically

- ask simple scientific questions
- use simple equipment to make observations
- carry out simple tests
- identify and classify things
- record what I have found out using everyday scientific words
- use simple data to answer questions
- measure using non - standard units of measure, rulers and meter sticks.

Animals including Humans

I can recognise that animals, including humans have offspring that grow into adults.

I can describe the basic needs of humans and animals for survival (water, food and air).

I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Living Things and Their Habitats

I can explore and compare the differences between things that are living, things that are dead and things that have never been alive.

I can 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.

I can identify and name a variety of plants and animals in their habitats, including micro-habitats.

I can describe how animals obtain food from plants and other animals, using the idea of simple food chain and identify and name different sources of food.

I can observe living things in their habitats during different seasonal changes (keep a nature diary).

Plants

I can observe and describe how seeds and bulbs grow into mature plants.

I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

Everyday Materials

I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.

I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Year
3

Scientifically Working

- ask relevant scientific questions
- use simple equipment, including thermometers and data loggers to make measurements
- use observations and knowledge to answer scientific questions
- set up a simple enquiry to explore a scientific question
- set up a test to compare two things
- set up a fair test and explain why it is fair
- make careful and accurate observations, including the use of standard units
- gather data in different ways to answer scientific questions
- record data in different ways to answer scientific questions
- classify data in different ways to answer scientific questions
- present data in different ways to answer scientific questions
- use diagrams, keys, bar charts and tables to represent scientific data
- report my findings using scientific vocabulary (including oral and written explanations)
- draw conclusions from my findings
- suggest improvements
- make a prediction with a reason
- identify differences, similarities and changes in results

Animals including Humans

I can 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.

I can explain why an adequate and varied diet is beneficial to health (along with a good supply of air and clean water).

I can explain why regular and varied exercise is beneficial to health.

I can identify that humans and some other animals have skeletons and muscles for support, protection and movement.

Plants

I can identify, locate and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

I can 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.

I can investigate the way in which water is transported within plants.

I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

I can observe life cycles of plants across the year/seasons. (Our Changing World Modules)

Rocks

I can compare and group together different kinds of rocks based on their appearance and simple physical properties.

I recognise that soils are made from rocks and organic matter.

I can describe in simple terms how fossils are formed when things that have lived are trapped within rock.

Light including reflection and shadows

I recognise that we need light in order to see things and that dark is the absence of light.

I notice that light is reflected from surfaces and explore how light behaves

I recognise that light from the sun can be dangerous and that there are ways to protect my eyes.

I recognise that shadows are formed when the light from a light source is blocked by a solid object.

I can find patterns, when measuring, in the way that the size of shadows can change.

Forces and Magnets

I notice that some forces need contact between two objects, but magnetic forces can act at a distance.

I can compare how some things move on different surfaces.

I can compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.

I can observe how magnets attract or repel each other and only attract some materials.

I can describe magnets as having two poles (like and unlike poles).

I can predict whether two magnets will attract or repel each other, depending on which poles are facing

Year 4

Working Scientifically

- ask relevant scientific questions
- use simple equipment, including thermometers and data loggers to make measurements
- use observations and knowledge to answer scientific questions
- set up a simple enquiry to explore a scientific question
- set up a test to compare two things
- set up a fair test and explain why it is fair
- make careful and accurate observations, including the use of standard units
- gather data in different ways to answer scientific questions
- record data in different ways to answer scientific questions
- classify data in different ways to answer scientific questions
- present data in different ways to answer scientific questions
- use diagrams, keys, bar charts and tables to represent scientific data
- report my findings using scientific vocabulary (including oral and written explanations)
- draw conclusions from my findings
- suggest improvements
- make a prediction with a reason
- identify differences, similarities and changes in results

Electricity

I can identify common appliances that run on electricity

I can construct a simple series electrical circuit, identify and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

I can 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.

I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

I can recognise some common conductors and insulators and associate metals with being good conductors.

Sound

I can identify how sounds are made, associating some of them with something vibrating.

I can recognise that vibrations from sound travel through a medium to the ear.

I can find patterns between the volume of a sound and the strength of the vibrations that produce it.

I can recognise that sounds get fainter as the distance from the sound increases.

I can find patterns between pitch of a sound and the features of the object that produces it

States of matter

I can compare and group materials together, according to whether they are solids, liquids or gases.

I can 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).

I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Environment – living things and their environment

I can recognise that environments can change and this can sometimes pose dangers to living things.

I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

Animals – teeth, eating and digestion

I can describe the simple functions of the basic parts of the digestive system in humans.

I can identify the different types of teeth in humans and their simple functions.

I can construct and interpret a variety of food chains identifying producers, predators and prey.

I can recognise that living things can be grouped in a variety of ways.

Working Scientifically

- plan different types of scientific enquiry
- control variables in an enquiry
- measure accurately and precisely using a range of equipment
- record data and results using scientific diagrams and labels (Y5&6)
- record data and results using classification keys (Y5&6)
- record data and results using tables (Y5&6)
- record data and results using scatter graphs (Y6)
- record data and results using bar graphs (Y5)
- record data and results using line graphs (Y6)
- use test results to make predictions
- set up further comparative fair tests
- report findings
- explain a conclusion
- explain causal relationships
- use evidence to support or refute a scientific argument or theory

Earth and Space

I can describe the movement of the Earth and other planets, relative to the Sun in the Solar System.

I can describe the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

I can describe the movement of the Moon relative to the Earth

I can describe the sun, moon and Earth as approximately spherical bodies.

Forces

I can identify the effects of air resistance, water resistance and friction, which act between moving surfaces.

I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.

I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Living Things and Life Cycles

I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

I can describe the life processes of reproduction in some plants and animals.

I can describe the changes as humans develop to old age

Materials and their Properties

I can compare and group together everyday materials based on evidence from comparative and fair tests, including hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.

I can give reasons, based on evidence from comparative and fair tests, for specific uses of everyday materials, including metals, wood and plastic.

Materials – Changing State

I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.

I know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.

I can demonstrate that dissolving, mixing and changes of state and reversible changes.

I can 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.

Working Scientifically

- plan different types of scientific enquiry
- control variables in an enquiry
- measure accurately and precisely using a range of equipment
- record data and results using scientific diagrams and labels (Y5&6)
- record data and results using classification keys (Y5&6)
- record data and results using tables (Y5&6)
- record data and results using scatter graphs (Y6)
- record data and results using bar graphs (Y5)
- record data and results using line graphs (Y6)
- use test results to make predictions
- set up further comparative fair tests
- report findings
- explain a conclusion
- explain causal relationships
- use evidence to support or refute a scientific argument or theory

Animals – Exercise, health and the Circulatory System

I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.

I can describe the ways in which nutrients and water are transported within animals, including humans.

I recognise and can describe the impact of diet, exercise, drugs and lifestyle on the way bodies function.

Living Things and Their Habitats – - Classification

I can 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.

I can give reasons for classifying plants and animals based on specific characteristics.

Living Things and Their Habitats – Evolution and Inheritance

I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.

I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

I can recognise that living things on earth have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.

Light – How Light Travels

I can explain that we see things because the light travels from light sources to our eyes or from light sources to objects and then to our eyes (and represent this in simple diagrammatic form).

I can recognise that light appears to travel in straight lines and 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.

I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Electricity

I can use recognised symbols (at least: cells, wires, switches, bulbs, buzzers and motors) when representing a simple circuit in a diagram.

I can compare the functions of different components giving reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.

I can associate and explain the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

I can use/interpret circuit diagrams to construct a variety of more complex circuits predicting whether they will 'work'.

Assessment Criteria

What we do

1. We implement an inclusive curriculum so that all children, including those with SEND, can make progress and demonstrate success in a range of ways.
2. We conduct baseline assessments, checking the pupils' existing knowledge and skill level.
3. We review and re-cap prior learning and link it to new and current study. We identify curriculum links so that learning can be applied and assessed in new contexts.
4. Teachers use a range of assessment activities in their class, including the review of knowledge organisers, mini assessments, sketch books, independent tasks, work in books, pupil chats in lessons. We incorporate longitudinal study where appropriate, including geography and history to assess long term knowledge retention.
5. To meet the expected standard, pupils should demonstrate a broad understanding of the key facts in the end points for that year (as outlined in the subject key specification document). In addition, they retain key knowledge from prior learning.
6. At the greater depth standard, pupils demonstrate knowledge and understanding of every aspect of the key specification to the highest degree.
7. We enter a mid-year and end of year attainment grade onto FFT. Subject leaders analyse the data and report to governors annually.
8. Bi-annual peer audits provide quality assurance, moderation of standards and training across trust schools.



Our logo was carefully chosen to represent the children, young people and adults in our learning community who strive for excellence through high aspiration and high expectation.

