Curriculum Area Overview Science

Click this link to access Science I cans/steps/age related expectations for Years 1-9

Primary Science

At Mowbray School we believe that a high-quality science education provides the foundations for understanding the world. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of reasoning and develop a sense of excitement and curiosity about natural phenomena. Science in our school is about developing children's ideas and ways of working that enable them to make sense of the world in which they live through investigation, as well as using and applying processing skills. The staff at Mowbray School ensure that all pupils are exposed to high quality teaching and learning experiences, including exploring their outdoor environment, whilst developing their scientific enquiry and investigative skills. They are immersed in scientific vocabulary, which aids pupil's knowledge and understanding not only of the topic they are studying, but of the world around them. Children are encouraged to use their preferred method of communication to help them understand their world.

Through our Science Curriculum, we aim to develop and sustain our pupil's curiosity about the world, enjoyment of scientific activity and understanding of how natural phenomena can be explained. Science is taught consistently, once a week for up to two hours. Science is taught in our four pathways at Mowbray School. In our Early Years Science will be embedded into their Knowledge and Understanding and Expressive Arts areas of learning. In our Semi- Formal Pathway, it will be embedded through Understanding the world. In our Formal Pastoral and Formal Pathways, it will be taught as a weekly Science lesson

H Sturt

Secondary Science

'Science is synonymous with inquiry' - Jack Hassard

Children are inquisitive. They want to know 'what?', 'why?' and 'how?' A desire to understand the world around us is the start of the scientific journey for every child.
If we think of a world without scientific advances we must think of a world without medicines, without new materials, without space exploration; a world where crimes are rarely solved and where long distance communication is limited to hand-written letters.
Good scientists are thoughtful, imaginative, methodical and observant. They are co-operative, sharing ideas; they work safely and collaboratively and they push boundaries, asking "what if…."
At Mowbray school we learn about science not only because it promotes a sense of awe and wonder about the world around us, but because it teaches skills essential to becoming informed citizens and knowledgeable consumers in preparation for adulthood.

We encourage students to ask questions and think for themselves; to be independent enquirers, creative thinkers, skilled self-managers and effective team workers.

R Herbert

Our School Ethos and Values
Our school ethos is SURE and underpins all learning and values that parents, pupils and staff share and wish to promote and develop here. SURE stands for 'Achieving Success through Understanding, Respect and Endeavour'.

Our School Mission Statement
We provide the best education for all our children so that when they leave our school they have the skills, knowledge and aspirations to lead fulfilling lives as adults.

Our Vision
We believe that children thrive when encouraged and supported; they respond to being treated in a positive and nurturing manner. The principles that comprise SURE are valued by both children and staff. They reflect our desire to help children to understand their difficulties, support their wellbeing, develop respect for themselves and others and become successful in what they do and achieve throughout their time in school and into adulthood.

Mowbray Curriculum Intent
The intention of our curriculum is to create personalised learning opportunities based around individual EHCP outcomes and academic progress to successfully prepare our pupils for each stage of transition and life after school. At Mowbray School, we believe in providing our children with the best possible start to their education and that we establish the building blocks for their future learning from the moment they start with us. We have high expectations of all children and understand the vital role that early intervention has in providing aspirational outcomes into adulthood.

Curriculum Intent for Science

EYFS

Our curriculum will introduce children to science through encouraging every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. Our children will explore animals, people, plants and objects in their natural environments. They will observe and manipulate objects and materials to identify differences and similarities. They will also learn to use their senses, feeling dough or listening to sounds in the environment, such as sirens or farm animals. They will make observations of animals and plants and explain why some things occur and talk about changes.

- Science is also taught through the EYFS Statutory Framework. Through a broad range of teacher-led, child-initiated and continuous learning opportunities, children will be taught to;
- Use their senses to investigate a range of objects and materials.
- Find out about, identify and observe the different features of living things, objects and worldly events.
- Look closely at similarities, differences, patterns and change.
- Ask questions about why things happen and why things work.
- Develop their communication and co-operation skills.
- Talk about their findings, sometimes recording them.
- Science will be embedded into the Knowledge and Understanding and Expressive Arts areas of learning
- Children will be supported in their understanding by their total communication environment.

Curriculum Entitlement

Our curriculum will be broadened by:

- Teaching Strategies and Interventions:
- Jabadao
- Attention Autism
- TACPAC
- Rainbow Trail
- Forest School / Nature Area / Gardening / Farm
- Cooking
- Enrichment:

- School trips
- Visitors into school including
- Crafters, manufacturers and retailers
- Culture Days
- Whole School celebrations
- Learning through making and selling

Wherever possible, Science is linked to the topic of the half term to fully immerse the children in the themes and to enable the achievement of a greater depth of knowledge

Primary Semi-Formal	Primary Formal Pastoral	Primary Formal
Our curriculum will increase children's knowledge and understanding of science. We will build upon the learning and the skills developed in previous years through embedding science into Understanding the World area of learning. Children will be encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels or opening a mechanical toy to see how it works. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings. Through a broad range of teacher-led, child-initiated and continuous learning opportunities, children will be taught to; • Use their senses to investigate a range of objects and materials. • Find out about, identify and observe the different features of living things, objects and worldly events. • Look closely at similarities, differences, patterns and change.	**Our curriculum will** increase children's knowledge and understanding of science. We will build upon the learning and the skills developed in previous years. A small percentage of children working on the Formal Pastoral Pathway will be following the National Curriculum Programme of Study. They will be introduced to the scientific disciplines of biology, chemistry and physics and working scientifically will be a constant thread throughout the science curriculum. Through a broad range of teacher-led, child-initiated and continuous learning opportunities, children will be taught to; • Develop an understanding and communicate how and why things happen. • Explore collections of materials with similar and/ or different properties. • Communicate about differences they notice. • Begin to show an understanding of life cycles. • Develop an understanding of how plants and animals to grow.	Pupil's following our Formal Pathway will study the National Curriculum Programme of Study 2014. 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. There will be a focus on our children learning to be scientists; working scientifically will be a constant thread throughout the science curriculum. • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests

• Ask questions about why things happen and why things work. • Develop their communication and co-operation skills. • Talk about their findings, sometimes recording them.	• Begin to understand their behaviour can affect their environment. • Begin to understand the changing seasons. • Begins to explain in their own way their knowledge of the world and asks appropriate questions. • 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	• 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. The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.
Curriculum Entitlement		

Our curriculum will be broadened by: Teaching Strategies and Interventions: - Jabadao - Attention Autism - TACPAC - Rainbow Trail - Forest School / Nature Area / Gardening / Farm - Cooking Enrichment: - School trips - Visitors into school including crafters, manufacturers and retailers - Culture Days - Whole School celebrations - Learning through making and selling Wherever possible, Science is linked to the topic of the half term to fully immerse the children in the themes and to enable the achievement of a greater depth of knowledge	Our curriculum will be broadened by: Teaching Strategies and Interventions: - Jabadao - Attention Autism - TACPAC - Rainbow Trail - Forest School / Nature Area / Gardening / Farm - Cooking Enrichment: - School trips - Visitors into school including crafters, manufacturers and retailers - Culture Days - Whole School celebrations - Learning through making and selling Wherever possible, Science is linked to the topic of the half term to fully immerse the children in the themes and to enable the achievement of a greater depth of knowledge	Our curriculum will be broadened by:@ Teaching Strategies and Interventions: - Attention Autism - TACPAC - Rainbow Trail - Forest School / Nature Area / Gardening / Farm - Cooking Enrichment: - School trips - Visitors into school including crafters, manufacturers and retailers - Culture Days - Whole School celebrations - Learning through making and selling Wherever possible, Science is linked to the topic of the half term to fully immerse the children in the themes and to enable the achievement of a greater depth of knowledge
Secondary Semi-Formal	Secondary Formal Pastoral	Secondary Formal
Our curriculum will increase children's knowledge and understanding of science.	**Our curriculum will** increase children's knowledge and understanding of science. We will build upon the learning and the skills developed in previous years.	Students following the formal Pathway will study the National Curriculum Programme of Study 2014. By the end of key stage 3, pupils are expected to know, apply and understand the matters, skills and processes specified in the programme of study.

We will build upon the learning and the skills developed in previous years through embedding science into Understanding the World area of learning. Children will be encouraged to ask questions about why things happen and how things work. They might do activities such as increasing the incline of a slope to observe how fast a vehicle travels or opening a mechanical toy to see how it works. Children will also be asked questions about what they think will happen to help them communicate, plan, investigate, record and evaluate findings. Through a broad range of teacher-led, child-initiated and continuous learning opportunities, children will be taught to; Use their senses to investigate a range of objects and materials. Find out about, identify and observe the different features of living things, objects and worldly events. Look closely at similarities, differences, patterns and change. Ask questions about why things happen and why things work. Develop their communication and co-operation skills. Talk about their findings, sometimes recording them.	A small percentage of children working on the Formal Pastoral Pathway will be following the National Curriculum Programme of Study. They will be introduced to the scientific disciplines of biology, chemistry and physics and working scientifically will be a constant thread throughout the science curriculum. Through a broad range of teacher-led, child-initiated and continuous learning opportunities, children will be taught to; • Develop an understanding and communicate how and why things happen. • Explore collections of materials with similar and/ or different properties. • Communicate about differences they notice. • Begin to show an understanding of life cycles. • Develop an understanding of how plants and animals to grow. • Begin to understand their behaviour can affect their environment. • Begin to understand the changing seasons. • Begins to explain in their own way their knowledge of the world and asks appropriate questions. • 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	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. Formal Learners at KS4 will further develop the skills and knowledge acquired at KS3 and follow one of 2 routes: 1. The completion of AQA Entry Level Certificate in Science (Single Award) over the 2 year Key Stage 2. The completion of the Entry Level Certificate before Easter of Y10, followed by the AQA GCSE in Chemistry for the remainder of Y10 and 11.
Curriculum Entitlement		
Our curriculum will be broadened by;	Our curriculum will be broadened by;	Our curriculum will be broadened by

Teaching Strategies and Interventions: - Attention Autism - TACPAC - Rainbow Trail - Forest School / Nature Area / Gardening / Farm - Cooking Enrichment: - School trips - Visitors into school including crafters, manufacturers and retailers - Culture Days - Whole School celebrations Wherever possible, Science is linked to the topic of the half term to fully immerse the children in the themes and to enable the achievement of a greater depth of knowledge.	Teaching Strategies and Interventions: - AQA Unit awards - Forest School / Nature Area / Gardening / Farm - Cooking Enrichment: - School trips - Visitors into school including crafters, manufacturers and retailers - Culture Days - Whole School celebrations Wherever possible, Science is linked to the topic of the half term to fully immerse the children in the themes and to enable the achievement of a greater depth of knowledge.	Choice of AQA Unit awards in the summer term of Y11 for those pupils following route 1 above. Links to mathematical skills, reinforcement of reading and writing skills, accurate and precise use of scientific terminology (subject specific vocabulary and precision teaching) Centurytech Science – study nuggets assigned to all students. Discussions and links to PfA areas such as Teamwork, Personal Hygiene, Healthy eating, Safe relationships, Safety, Resilience and of course, Curiosity and Innovation. Science & Nature documentaries such as “Planet Earth” and “A Perfect Planet” shown in curriculum time. Research type Homeworks in Y10 & 11 For those pupils following route 2.

Please follow the link to the National Curriculum Programme of Study for Science.

https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study

Science **Primary** Curriculum Map						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key Stage 1 Year 1	Animals including humans		Living Things and their Habitats		Seasonal Changes	
Key Stage 1 Year 2	Animals including humans.		Plants	Everyday Materials	Plants	
Lower Key Stage 2 Year 1	Animals including humans		Living Things and their Habitats	Properties and Materials	Sound	Electricity
Lower Key Stage 2 Year 2	Animals including humans.	States of matter	Forces and Magnets	Light	Living Things and their Habitats	Properties and changes in materials
Upper Key Stage 2 Year 1	Animals including humans	Evolution and Inheritance	Living Things and their Habitats		Light	Electricity
Upper Key Stage 2 Year 2	Animals including humans.	Climate Change and conservationism.	Forces	Earth and Space	Plants	Rocks

Science **Formal KS3** Curriculum Map						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1- Theme overview and key content	Reproduction and Health	States of Matter/Separating mixtures	Space	Cells and Organisation	Acids and Alkalis (Chemical Reactions)	Energy & Energy Resources
Year 2- - Theme overview and key content	Gas exchange, respiration & photosynthesis	Earth & Atmosphere	Electricity & Magnetism	Relationships in Ecosystems	Forces & Motion	Materials
Year 3- - Theme overview and key content	Atoms Elements and Compounds, Periodic Table	Skeletal & Muscular Systems	Nutrition & Digestion	Genetics & Evolution	Light	Sound

Higher Science Formal KS4 Curriculum Map						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2

Year 1- Theme overview and key content	AQA Entry Level Certificate in Science Module 1 (Biology) "The Human Body"	AQA Entry Level Certificate in Science Module 3 (Physics) "Energy, Forces, and the Structure of Matter"	AQA Entry Level Certificate in Science Module 2 (Chemistry) "Elements, Mixtures & Compounds"	Completion of AQA Entry Level Certificate in Science - Coursework	AQA GCSE Chemistry Topics 1&2	AQA GCSE Chemistry Topics 2&3
Year 2- - Theme overview and key content	AQA GCSE Chemistry Topics 4&5	AQA GCSE Chemistry Topics 5&6	AQA GCSE Chemistry Topics 6&7	AQA GCSE Chemistry Topics 8&9	AQA GCSE Chemistry Topics 10 and Revision/Exam preparation	GCSE Exams

Lower Science Formal KS4 Curriculum Map						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1- Theme overview and key content	AQA Entry Level Certificate in Science Module 1 (Biology) "The Human Body" (Including Module exam and Module coursework)			AQA Entry Level Certificate in Science Module 2 (Chemistry) "Elements, Mixtures & Compounds" (Including Module exam and Module coursework)		
Year 2- - Theme overview and key content	AQA Entry Level Certificate in Science Module 3 (Physics) "Energy, Forces, and the Structure of Matter" (Including Module exam and Module coursework)			AQA Unit Awards in Science. (Topics to be chosen by pupils based on their interests and further education/career choices)		

KS4/KS3 Formal Pastoral Curriculum Map						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1- Theme overview and key content	Body parts-human skeleton		Earth and space AQA unit award 115347 PHYSICS (UNIT 1): SPACE	Acids and Alkalis	Living things and their habitats AQA unit award 111720 LIVING THINGS AND THEIR HABITATS	Plants AQA unit award 117357 BIOLOGY (UNIT 7): PLANTS
Year 2- - Theme overview and key content	Light	Electricity		Separating Materials	Forces and magnets AQA unit award 117330 STARTING TO EXPLORE FORCES	Sound
Year 3- - Theme overview and key content		Changing Materials	Variation and food chains	Lifecycles		

KS4/KS3 Semi-formal Curriculum Map						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1- Theme overview and key content	Body parts-humans	Materials and their properties	Our senses	Earth and space	Living things and their habitats	Plants

	Working Scientifically	Working Scientifically	Working Scientifically	Working Scientifically	Working Scientifically	Working Scientifically
Year 2- - Theme overview and key content	Light Working Scientifically	Electricity Working Scientifically	Food, drink and exercise Working Scientifically	Separating Materials Working Scientifically	Forces and magnets Working Scientifically	Sound Working Scientifically
Year 3- - Theme overview and key content		Changing Materials Working Scientifically		Lifecycles and Growth Working Scientifically