

Science department rationale

Welcome to the Millom School science department where you will find the teachers to be highly skilled specialists with a broad range of experience. Their aim is to enthuse students about the subject and its disciplines, biology, chemistry and physics; inspiring them to continue with their studies either at college or in employment. We hope they will gain an understanding of how science affects us all every day and come to realise how it is interwoven with our lives. For example, understanding the need for a balanced diet to being aware of the need for specific procedures when using electricity or chemicals. Science not only builds on mathematical and literacy skills covered by the other core subjects but problem solving, using critical thinking and evidence to create solutions and make decisions; essential skills required for many careers not only those of science, engineering and technology.

Key concepts (The big ideas underpinning the subject)

Develop a deeper and broader range of scientific knowledge and conceptual understanding through the subject disciplines of biology, chemistry and physics.

To relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations.

Understand that science is about working objectively, modifying explanations to take account of new evidence and ideas and subjecting results to peer review.

Work scientifically: be able to select the appropriate type of scientific enquiry and to develop a deeper understanding of factors to be taken into account when collecting, recording and processing data.

Understand the implications of using science today and in the future.

Topics

Year 7

Biology	Chemistry	Physics
Introducing science		
Cells & Reproduction	Substances & Particles	Forces
Ecosystems	Acids & Alkalis	Electricity & Magnetism

Year 8

Biology	Chemistry	Physics
The Skeleton & Digestion	Elements, mixtures and compounds	Waves
Health & Breathing	Earth science	Movement matters

Year 9

Biology	Chemistry	Physics
Photosynthesis and Respiration	Chemical reactions	Machines at work

Inheritance	Energetics & Materials	Electrical power
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Year 10 and 11

The topic titles are the same but there is a greater level of content within each unit for the triple award sciences.

Biology	Chemistry	Physics
Cells	Atmosphere	<u>Trilogy</u>
Organisation	Atomic structure	Energy & Matter
Transport	Structure & Bonding	Energy & Electricity
Photosynthesis & Respiration	Chemical changes	Forcec & Motion
Ecosystems	Quantitative	Waves & Electromagnetism
Infection & Response	Rates	<u>Triple</u>
Co-ordination and control	Energy changes	Energy & Matter
Inheritance, variation and evolution	Reversible reactions	Atoms & Energy
	Organic chemistry	Energy & Electricity
	Chemical Analysis	Forces & Equilibrium
	Using resources	Forces & Motion
		Radiation & The universe
		Magnets & Electromagnetism
		Gravity & Space

All year groups will develop skills in data handling and analysis, including calculating averages, graphing and drawing conclusions from the evidence provided and manipulating formulae.

Key capacities

Develop an understanding of the world built on current scientific theories.

Develop problem solving skills to allow students to draw conclusions based on data and evidence supplied, enabling them to find solutions and/or make decisions.

Apply techniques and learning covered in previous years and in other areas of study to aid the student in their understanding of new concepts.

Develop the ability to work independently or collaboratively with others.

Develop the confidence to discuss their work, concepts and ideas objectively with the teacher/peer group.

Develop their resilience to help them to persevere when met with challenges with their learning and not be afraid to ask for help.

Be able to identify their own strengths and weaknesses and carry out intervention activities.

Learning & Assessment

Individual, paired and small group work.

Experimental work, using investigative skills to hypothesise, plan, carryout, conclude and evaluate.

Discussion through question and answer sessions with teachers/peers and class.

End of topic tests.

Monitoring class and homework.

Teacher assessment through discussion and questioning in lessons.

Differentiated tasks to meet student requirements.

Formal end of year exam for Yr10, Yr11 mock exams.

Enrich knowledge and understanding of the subject

Offer positive encouragement about their work.

Encourage them to engage with their teachers.

Discuss science lessons with your child.

Help them with their homework.

Consider buying extra resources such as study guides and on-line revision apps.

Use Focus Learning and other linked resources found on the Millom School website.

Get involved in STEM activities.

Attend intervention sessions, see chill zone timetable.

Attend BAE systems and REACT foundation roadshows.