

Key Stage 3 Overview

<b>KS3 Module 1: Introduction to science (Year 7 Module 1 of 11 – Autumn term 1)</b>	<b>KS3 Module 2: Cells, Tissues, Organs and Organ Systems (Year 7 Module 2 of 11 – Autumn term 1)</b>	<b>KS3 Module 3: Acids and Alkalis (Year 7 Module 3 of 11 – Autumn term 2)</b>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Name important pieces of scientific equipment. Explain why hazard symbols are important.	<b>Knowledge:</b> Compare /contrast the structure of plant & animal cells including the different structures of plant and animal cells.	<b>Knowledge:</b> Explain how acids and alkalis react including acids & alkalis, acids & metals.
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> State ways in which to work safely during a science practical. Accurately take measurements using scientific equipment.	<b>Skills:</b> Safely produce a biological specimen and use a light microscope used to examine it.	<b>Skills:</b> Controlling risks plan for hazards and risks when carrying out experiments.
<b>KS3 Module 4: Forces (Year 7 Module 4 of 11 – Autumn term 2)</b>	<b>KS3 Module 5: Muscles and Bones (Year 7 Module 5 of 11 – Spring term 1)</b>	<b>KS3 Module 6: The Particle Model (Year 7 Module 6 of 11 – Spring term 1)</b>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Explain how forces (push/pull, stretch/squash, rub/friction) affect bodies in different situations including force – extension/Hooke’s Law.	<b>Knowledge:</b> Describe the structure, function and effects of the musculoskeletal system including muscles and bones working as antagonistic pairs.	<b>Knowledge:</b> Define particle theory and how can it be used to explain: the three states of matter, gas pressure and changes of state.
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> Recognise and select suitable SI units for an investigation.	<b>Skills:</b> Explain the difference between a scientific question and an ethical one	<b>Skills:</b> Identify scientific questions, hypotheses and predictions.

<p align="center"><b>KS3 Module 7: Current Electricity</b> <i>(Year 7 Module 7 of 11 – Spring term 2)</i></p>	<p align="center"><b>KS3 Module 8: Ecosystems</b> <i>(Year 7 Module 8 of 11 – Spring term 2)</i></p>	<p align="center"><b>KS3 Module 9: Energy</b> <i>(Year 7 Module 9 of 11 – Summer term 1)</i></p>
<p align="center"><b>Knowledge</b> <i>What pupils will know</i></p>	<p align="center"><b>Knowledge</b> <i>What pupils will know</i></p>	<p align="center"><b>Knowledge</b> <i>What pupils will know</i></p>
<p><b>Knowledge:</b> Explain the key concepts of electricity including current electricity, static electricity and electromagnetism.</p>	<p><b>Knowledge:</b> Explain what food chains and food webs show in an ecosystem.</p>	<p><b>Knowledge:</b> Describe energy transfers and energy stores.</p>
<p align="center"><b>Skill</b> <i>What pupils will be able to do</i></p>	<p align="center"><b>Skill</b> <i>What pupils will be able to do</i></p>	<p align="center"><b>Skill</b> <i>What pupils will be able to do</i></p>
<p><b>Skills:</b> Identify when physical or abstract models are being used.</p>	<p><b>Skills:</b> Present information as bar charts and scatter graphs and identify relationships using scatter graphs.</p>	<p><b>Skills:</b> Make a fair comparison of results including calculating ratios.</p>
<p align="center"><b>KS3 Module 10: Reproduction</b> <i>(Year 7 Module 10 of 11 – Summer term 1)</i></p>	<p align="center"><b>KS3 Module 11: Astronomy</b> <i>(Year 7 Module 11 of 11 – Summer term 2)</i></p>	<p align="center"><b>KS3 Module 12: Atoms, Elements and Molecules</b> <i>(Year 8 Module 1 of 10 – Autumn term 1)</i></p>
<p align="center"><b>Knowledge</b> <i>What pupils will know</i></p>	<p align="center"><b>Knowledge</b> <i>What pupils will know</i></p>	<p align="center"><b>Knowledge</b> <i>What pupils will know</i></p>
<p><b>Knowledge:</b> Describe the structure and function of the male &amp; female human reproduction system, including menstrual cycle, gametes, fertilisation, gestation, birth. Explain how plants reproduce including flower structure, wind &amp; insect pollination, fertilisation, seed and fruit formation and dispersal.</p>	<p><b>Knowledge:</b> Explain the origin of the Universe and how astronomers explore the night sky,</p>	<p><b>Knowledge:</b> Define an atom, element, mixture and a compound?</p>
<p align="center"><b>Skill</b> <i>What pupils will be able to do</i></p>	<p align="center"><b>Skill</b> <i>What pupils will be able to do</i></p>	<p align="center"><b>Skill</b> <i>What pupils will be able to do</i></p>
<p><b>Skills:</b> State the purpose of and the common steps in the scientific method. Use samples to calculate estimates.</p>	<p><b>Skills:</b> Draw accurate diagrams to represent astronomical events such as an eclipse, phases of the Moon and constellations.</p>	<p><b>Skills:</b> Draw, use and interpret tables, bar charts, pie charts and scatter graphs and identify the best way to present different types of data.</p>

<b>KS3 Module 13: Mixtures and Separation</b> <i>(Year 8 Module 2 of 10 – Autumn term 1)</i>	<b>KS3 Module 14: Breathing and Respiration</b> <i>(Year 8 Module 3 of 10 – Autumn term 2)</i>	<b>KS3 Module 15: The Periodic Table</b> <i>(Year 8 Module 4 of 10 – Autumn term 2)</i>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Describe the difference between a pure substance and a mixture including the concept of dissolving.	<b>Knowledge:</b> Describe the two main types of cellular respiration and their purpose/effects on organisms.	<b>Knowledge:</b> Describe after input by Mendeleev and Dalton, why the modern Periodic Table of the Elements is arranged the way it is, including periods, groups; metals & non-metals.
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> Identify hazards and describe how to reduce risks when heating with a Bunsen burner to heat to dryness?	<b>Concept Skills:</b> Recall why means and ranges are used and how to calculate them.	<b>Concept Skills:</b> Identify anomalous results and the range of readings in data, giving reasons for the anomalies.
<b>KS3 Module 16: Unicellular Organisms</b> <i>(Year 8 Module 5 of 10 – Spring term 1)</i>	<b>KS3 Module 17: Metals and Their Uses</b> <i>(Year 8 Module 6 of 10 – Spring term 1)</i>	<b>KS3 Module 18: Energy Transfer</b> <i>(Year 8 Module 7 of 10 – Spring term 2)</i>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Describe the differences between unicellular and multicellular organisms, illustrated by structural adaptations of some unicellular organisms and the hierarchical organisation of multicellular organisms: cells/tissues/organs/organ systems/organism.	<b>Knowledge:</b> Describe the physical & chemical properties and uses of common metals and their oxides.	<b>Knowledge:</b> Explain energy transfers and stores including the calculation of fuel uses and costs in a domestic setting.
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> Interpret and draw pie diagrams.	<b>Skills:</b> Explain how to improve the quality of data collected during an investigation; so that it may be reliable, repeatable and reproducible.	<b>Skills:</b> State the meaning of accuracy and precision and how do we take account of systematic errors and avoid random errors.

<b>KS3 Module 19: Food and Nutrition</b> <i>(Year 8 Module 8 of 10 – Spring term 2)</i>	<b>KS3 Module 20: Combustion</b> <i>(Year 8 Module 9 of 10 – Summer term 1)</i>	<b>KS3 Module 21: Fluids</b> <i>(Year 8 Module 10 of 10 – Summer term 2)</i>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Describe the tissues and organs of the digestive system, including adaptations to function and how the digestive system digests food including enzymes as biological catalysts.	<b>Knowledge:</b> Describe how combustion/oxidation of fuels, represented by a word equation, can impact on global warming.	<b>Knowledge:</b> Describe and calculate density and pressure in fluids, explaining why an object floats or sinks.
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> Calculate areas of rectangles and cuboids and why is surface area important in science.	<b>Skills:</b> Identify control variables in an experiment and explain why it is important to carry out a fair test.	<b>Skills:</b> Describe the concept of density and calculate it for regular and irregular objects using a formula.
<b>KS3 Module 22: Light and Sound</b> <i>(Year 9 Module 1 of 10 – Autumn term 1)</i>	<b>KS3 Module 23: Genetics and Evolution</b> <i>(Year 9 Module 2 of 10 – Autumn term 1)</i>	<b>KS3 Module 24: Making Materials</b> <i>(Year 9 Module 3 of 10 – Autumn term 2)</i>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Describe the main properties of light waves and explain how the properties and simple ray diagrams be used to describe imaging in mirrors.  Describe the main properties and effects of energy transfer by sound waves.	<b>Knowledge:</b> Explain the concept of inherited genes explain the processes of natural selection and extinction.	<b>Knowledge:</b> Describe the properties of ceramics, polymers and composites (qualitative).
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> Use the correct names for rays plotted using ray tracing, reaching and leaving a mirror and the angles between them and the normal. Present information as line and scatter graphs, identifying relationships and describing what they show.	<b>Skills:</b> Calculate probabilities and display them in different form.	<b>Skills:</b> Describe the process of peer review including its advantages and disadvantages.

<b>KS3 Module 25: Forces, Motion and Space</b> <i>(Year 9 Module 4 of 10 – Autumn term 2)</i>	<b>KS3 Module 26: Plant Growth</b> <i>(Year 9 Module 5 of 10 – Spring term 1)</i>	<b>KS3 Module 27: Reactivity</b> <i>(Year 9 Module 6 of 10 – Spring term 1)</i>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<p><b>Knowledge:</b> Explain how arrows used in diagrams in one dimension to calculate resultant forces.</p> <p>Explain how to use the equation <math>\text{speed} = \text{distance} / \text{time}</math>, including calculating the gradient of a distance time graph.</p> <p>Explain our place in the Universe and the effects of space physics on the Earth including the concepts of weight, seasons and day length that we experience.</p>	<p><b>Knowledge:</b> Describe the dependence of almost all life on Earth on the ability of photosynthetic organisms such as plants and algae to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere.</p>	<p><b>Knowledge:</b> Use the reactivity series to compare the reactivity of metals including predicting and explaining displacement reactions.</p>
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<p><b>Skills:</b> Draw and interpret distance-time graphs. Calculate the gradient of a line. Compare things numerically including calculating percentages and expressing one number as a percentage of another.</p>	<p><b>Skills:</b> Explain whether something is valid including identification and explanation of bias.</p>	<p><b>Skills:</b> Express one number as a percentage of another. Calculate percentage gain or loss.</p>

<b>KS3 Module 28: Forces and Fields</b> <i>(Year 9 Module 7 of 10 – Spring term 2)</i>	<b>KS3 Module 29: The Rock Cycle</b> <i>(Year 9 Module 8 of 10 – Spring term 2)</i>	<b>KS3 Module 30: Science Revision Unit</b> <i>(Year 9 Module 9 of 10 – Summer term 1)</i>
<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>	<b>Knowledge</b> <i>What pupils will know</i>
<b>Knowledge:</b> Describe how different types of force field are used to describe electromagnetism and static electricity.	<b>Knowledge:</b> Describe the main processes involved in the rock cycle.	<b>Knowledge:</b> Assess the activity of an enzyme. Predict and test which variables affect the amount of copper produced by the electrolysis of copper sulfate solution. Explain how different variables affect the acceleration of an object.
<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>	<b>Skill</b> <i>What pupils will be able to do</i>
<b>Skills:</b> Round numbers to a given number of decimal places or significant figures.	<b>Skills:</b> Describe how the scientific method is used by scientists including collected evidence to disprove a theory.	<b>Skills:</b> Collect valid primary data by carrying out a fair test, identifying and explaining any anomalies in the data. Identify risks and reduce risks by using appropriate safety precautions. Plan a scientific enquiry to test a prediction, including identifying independent, dependent and control variables.
<b>KS3 Module 31: Transition to GCSE</b> <i>(Year 9 Module 10 of 10 – Summer term 2)</i>		
<b>Knowledge</b> <i>What pupils will know</i>		
<b>Knowledge:</b> Estimate the abundance and distribution of an organism. State what the median and quartiles of a set of data tells us. Explain how variables affect the rate of a reaction (e.g. marble chips and hydrochloric acid). Recognise and use numbers in standard form, converting to and from standard form.		

Describe how variables can be related mathematically, including force-extension; Hooke's law as a special case.

**Skill** *What pupils will be able to do*

**Skills:** Calculate the median, quartiles and interquartile range of a simple data set.  
Interpret the use of quartiles in comparing variation in a large continuous data set.  
Recognise and use numbers with units and indices.  
Covert numbers to and from standard form.  
Use the formula for a straight line to help interpret graphs.  
Use gradients to interpret distance-time and speed-time graphs.  
Calculate distances from the area under a speed-time graph.