## **Key Stage 3: Year 7**

### **Overall Curriculum Goals**

These big ideas underpin the knowledge they will require for GCSE and beyond, but more importantly provide the students with a framework of knowledge that helps them to understand the world they live in. It encourages students to consider the world around them, the process and the materials that make up life and the universe, as well as the processes of science as a discipline.

Big Ideas in science:

- Forces
- Particles and matter
- Cells

- Energy
- Chemical reactions
- The human body

- Waves
- Materials

• Plants and environment

Throughout KS3 and KS4, working scientifically skills are woven into each topic. Students develop the skills required to design, implement and evaluate a scientific investigation, as well as an understanding of the universe. They will consider a range of careers linked to science in the universe. They will consider a range of careers linked to science.

shaping our understanding of the universe. They will consider ethical questions, and those questions that cannot be answered by science. Students will have the opportunity to consider a range of careers linked to science.						
Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6	
7K Forces		7C Muscles and bones		7B Reproduction (plant and human)		
7G Particles		7I Energy		7L Sound		
7A Cells		7H Chemical Reactions				
Key Vocabulary/Concepts/Ideas		Key Vocabulary/Concepts/Ideas		Key Vocabulary/Concepts/Ideas		
Forces builds on existing knowledge from KS2 to study and demonstrate forces in action, including developing ideas around resistive forces. Pupils will also explore proportional relationships through the context of Hooke's Law.  In Particles pupils gain an understanding of particles, states of matter and changes of state. Pupils will also have the opportunity to develop practical skills including the use and safe set-up of a Bunsen burner and scientific drawing, skills that will be integral to their science studies.  In Cells, pupils learn how scientific advances in microscopes allowed scientists to discover cells and cellular structure. Pupils also study how to use a microscope and prepare a slide		Rey Vocabulary/Concepts/Ideas  Pupils learn how cells work together to form some of the organ systems of the human body. This topic encourages pupils to understand how their own body systems work including movement of muscles and joints, breathing and circulation. They also look at the impact of drugs on body systems.  Pupils will explore the principle of conservation of energy through the model of energy stores and transfers. They will evaluate different types of fuel and discuss alternative sources of energy for the future.  Pupils will study the structure of the atom, the difference between elements and compounds and how to use the periodic table. Pupils will also study a range of reactions; including endothermic and exothermic reactions, examples of these are demonstrated using real-life examples such as chemical icepacks. They will have the opportunity to carry out investigations to collect continuous and categoric data.		Pupils will learn about the mechanisms of plant and animal reproduction. They discover the importance of insects in flower pollination and draw comparisons between plant and human reproduction. Pupils also study the human reproductive system and topics such as puberty, pregnancy and the menopause which are important for pupil wellbeing.  In sound, pupils will develop their understanding from primary phase of how sounds are made, to look at how sound travels, and the properties of sound waves. They will link back to their work on particles from the Autumn term to investigate how sound travels in solids, liquids and gasses.		
CIAG		CI	AG	CIAG		
Car designer / Product test	ing	Healthcare professions		Midwifery / Agriculture		
Manipulation of equipment		Working in the renewables	s sector	Audio engineering		
Biologist / Pathologist		Manipulation of equipment				

## **Key Stage 3: Year 8**

### **Overall Curriculum Goals**

These big ideas underpin the knowledge they will require for GCSE and beyond, but more importantly provide the students with a framework of knowledge that helps them to understand the world they live in. It encourages students to consider the world around them, the process and the materials that make up life and the universe, as well as the processes of science as a discipline.

- Big Ideas in science:

   Forces
- Particles and matter
- Cells

- Energy
- Chemical reactions
- The human body

- Waves
- Materials

• Plants and environment

Throughout KS3 and KS4, working scientifically skills are woven into each topic. Students develop the skills required to design, implement and evaluate a scientific investigation, as well as an understanding of the universe. They will consider a range of careers linked to science in shaping our understanding of the universe. They will consider a range of careers linked to science in the consider a range of careers linked to science in the universe.

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Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
8L Earth and Space		8F Periodic Table		8E Combustion	
7E Pure and Impure		8A Food and Nutrition		8I Fluids	
7D Ecosystems		8I Energy Transfers		8D Unicellular Organisms	
7J Current Electricity					
•					
Key Vocabulary/Concepts/Ideas		Key Vocabulary/Concepts/Ideas		Key Vocabulary/Concepts/Ideas	
Students will build on learning about space from KS1 and KS2 to think about the Earth's place in space, what causes the seasons and the role of gravity in keeping the solar system together. They will explore the process of science when looking at how ideas about the observable universe have changed, and will look beyond our solar system into the wider universe for signs of extra-terrestrial life.  Students will practically explore pure and impure substances, developing a range of practical techniques such a filtration, chromatography and distillation to separate mixtures.  Pupils look at variation within populations, including collecting continuous and categoric data. They then study how variation leads to organisms being well-adapted to their habitats, including undertaking some fieldwork to sample organisms in local habitats. Finally they investigate the effect of changes in the habitat on populations of organisms.  Students will link back to their prior learning on electricity, familiarising themselves with the more complex equipment to build circuits and with the circuit symbol notation. They will explore patterns in how circuits behave, and consider the validity of a range of models to represent how circuits work.		Students will explore the process of science by studying how the modern periodic table came into being. They will then learn about the typical properties and uses of some of the groups within the periodic table.  This topic considers nutrition, and the requirements of a balanced diet. It builds on prior learning on organ systems to explore the function of each organ in the digestive system. Finally students will learn about the possible health concerns resulting from unhealthy or disordered eating.  Developing ideas about heat transfer, students will explore conduction convection and radiation through models and practical experiments. They will then apply their learning to develop ideas that will inform housing designs for super-insulated, energy efficient homes.		Students look at typical combustion reactions, the process of oxidation and fire safety. They then explore the detriments of combustion reactions including air pollution, global warming and the more local impacts of moorland fires.  In the fluids topic, students link back to their prior learning about the particle model and use it to explain differences in density of materials, including taking appropriate measurements to calculate density. They then learn about pressure in fluids, and how this affects buoyancy. In this topic students will learn about microscopic organisms including bacteria, fungi and protoctists. They will study the role of decomposers as part of the wider carbon cycle.	
CIAC	G	CIAG		CIAG	
<b>Astronomer / Space scientist</b>	t / Cosmologist	Materials scientist		Fire fighter / environmental scientist	
Forensic science / Materials scientist		Electrical engineer		Marine engineering / Commercial shipping	
Forensic science / Materials	scientist	Liceti icai crigiricci		maine engineering / eo	miner ciai simpping
Forensic science / Materials Architect / Engineer	scientist	Food Scientist / dietician / s	school nurse / sports	Pathologist	innercial shipping

# **Key Stage 3: Year 9**

### **Overall Curriculum Goals**

These big ideas underpin the knowledge they will require for GCSE and beyond, but more importantly provide the students with a framework of knowledge that helps them to understand the world they live in. It encourages students to consider the world around them, the process and the materials that make up life and the universe, as well as the processes of science as a discipline.

Big Ideas in science:

- Forces
- Particles and matter
- Cells

- Energy
- Chemical reactions
- The human body

- Waves
- Materials

Plants and environment

Throughout KS3 and KS4, working scientifically skills are woven into each topic. Students develop the skills required to design, implement and evaluate a scientific investigation, as well as an understanding of the process of science in shaping our understanding of the universe. They will consider ethical questions, and those questions that cannot be answered by science. Students will have the opportunity to consider a range of careers linked to science.

shaping our understanding of the universe. They will consider ethical questions, and those questions that cannot be answered by science. Students will have the opportunity to consider a range of careers linked to science.						
Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6	
8C Gas Exchange	9B Plant Growth	9A Inheritance and variation	n	See KS4 Curriculum Map		
8G Metals and their uses	9E Making Materials	9F Reactivity				
8J Light	9I Forces and Motion	9J Fields and electromagne	ts			
Key Vocabulary/Concepts/Ideas	Key Vocabulary/Concepts/Ideas	Key Vocabulary/Concepts/Ideas	Key Vocabulary/Concepts/Ideas	Key Vocabulary/Concepts/Ideas	Key Vocabulary/Concepts/Ideas	
Students will deepen their knowledge of the respiratory system by learning about how the lungs are optimised for gas exchange. They will investigate the reaction of respiration and consider the process of anaerobic respiration.  In this primarily geology unit, students look at the characteristics of different types of rock, and rock formation. They will explore the reactions of acids with different materials, and link the impact of acid rain with chemical weathering. The uses of metals and how they react with acids. This also links to weathering and how iron can form rust. The topic discusses what we can do to help prevent rusting or metal oxidation.  In the Light topic students complete practical investigations into the behaviour of light when it meets surfaces. They explore pin hole cameras as models of the functionality of the eye, and look at colour mixing and colour filters.	Students learn about photosynthesis and respiration in plants, and how plants are adapted to their environments. They will then consider the nutrients plants need to grow, before exploring the benefits and drawbacks to arable farming.  In this topic students study composite materials. They are introduced to ideas about how plastics are made via polymerisation. This topic looks at the extraction and uses of metals, and other materials including ceramics, polymers and composites. Students explore ideas around sustainability and the need to conserve and recycle materials. Students learn about the effect of forces on moving objects, including acceleration and maximum speeds. They will link to their maths work on calculating speed and plotting distance-time graphs, before finally looking at the turning effects of forces using pulleys and levers.	Students investigate inherited and ran and then learn about the role of DNA learn about the theory of natural selececosystem can lead to extinction.  This topic looks at the reactivity series reactions in extracting metals from the from the 8F periodic table topic and 8 Building on work in Y7 and Y8 on force non-contact forces including gravity, e Students learn how to build and election problem-solving skills in designing the	in inheriting characteristics. They ction, and how changes to an and the uses of displacement eir ores. It builds on prior knowledge G with metals and their uses. es, students explore a wider range of electrostatic force and magnetism. romagnet, and develop their			
CIAG	CIAG	CIAG	CIAG	CIAG	CIAG	

Sports scientist /	Farming	Ecologist / Conservationist	
healthcare	Geologist / materials	Product design / Miner / Metalworker	
Geologist / materials	scientist	Automotive and aeronautical engineering	
scientist	Space scientist		
Optician / Optometrist /			
Photographer / Lighting			
engineer			