

What are the aims and intentions of this curriculum?

The aim of our Key Stage 4 Curriculum is to provide the foundations for understanding the material world. Scientific understanding is changing our lives and is vital to the world's future prosperity, and all students should be taught essential aspects of the knowledge, methods, processes and uses of science. They should be helped to appreciate how the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas relating to the sciences which are both inter-linked, and are of universal application.

Content covered by Separate Science Only is **bolded**

Highlighted in green are links to PSHE in the curriculum

Highlighted in blue are links to Careers in the curriculum

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	Physics <ul style="list-style-type: none"> Wave properties Electromagnetic waves Electromagnetism 	Students will learn about: <ul style="list-style-type: none"> The nature and properties of waves, reflection and refraction The electromagnetic spectrum, uses of electromagnetic waves Magnetic fields, magnetic fields of electric currents and the motor effect 	Students are able to: <ul style="list-style-type: none"> Explain longitudinal and transverse waves. Explain that sound waves are mechanical and light waves are examples of electromagnetic waves which travel very quickly. Perform calculations linking period, frequency, wave speed and wavelength. Explain the uses of electromagnetic waves in communications and in medicine. Demonstrate that magnets attract magnetic materials at a distance, and magnetism is a non-contact force. Use the corkscrew rule to determine the direction of the field around a current carrying wire. Apply Fleming's left hand rule to determine the direction of force acting on a conductor. <p>Possible careers are: Sound engineer, Musician, Audiologist, Medical careers, Optician.</p>	Required practical: investigating: <ul style="list-style-type: none"> plane waves in a ripple tank the reflection and refraction infrared radiation. <ul style="list-style-type: none"> Kerboodle end of chapter assessments (Higher and Foundation)

Autumn 2	Biology <ul style="list-style-type: none"> Organizing an ecosystem Biodiversity and ecosystems Mock exams 	<p>Students will learn about:</p> <ul style="list-style-type: none"> Feeding relationships, materials cycling and the carbon cycle. The human population explosion, land and water pollution, air pollution, deforestation and peat destruction, global warming, maintaining biodiversity. 	<p>Students are able to:</p> <ul style="list-style-type: none"> Explain in detail food chains/food webs as models to show feeding relationships, explain the decay cycle, water cycle, carbon cycle and their importance. Explain the causes and effects of land, water and air pollution and global warming. Describe and explain deforestation and the environmental effects of destroying peat bogs. Explain some of the ways to reduce the impact of human activities on ecosystems and maintain biodiversity. <p>Possible careers are:</p> <p>Farming and agriculture, Ecologist, Environmental field technician, Wildlife specialist, Sustainability consultant, Wildlife biologist, Environmental planner</p>	<ul style="list-style-type: none"> Mock exams
Spring 1	Revision Biology paper 1 Biology paper 2	<p>Students will learn about:</p> <ul style="list-style-type: none"> Cells and organization Disease and biogenetics Biological responses Genetics and reproduction, ecology 	<p>Students will develop various exam skills by practicing past exam questions.</p> <ul style="list-style-type: none"> Know about personal hygiene, germs including bacteria, viruses, how are they spread, treatment and prevention of infection. How to maintain healthy eating and the links between a poor diet and health risks. The benefits and importance of physical exercise on mental wellbeing and happiness. The facts and science relating to immunisation and vaccination. Know the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress. State the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including 	<p>End of term assessment – B1 and B2 Paper</p>

			<p>the links between inactive lifestyle and ill health, including Type 2 diabetes.</p> <ul style="list-style-type: none"> • Know how to maintain healthy eating and the links between a poor diet and health risks. • Recall some of the facts about reproductive health, including fertility, and the potential impact of lifestyle on fertility for men and women and menopause. • State the facts about some of the contraceptive choices, efficacy and options available. • Recall the facts around pregnancy. • Recall how the use of alcohol and drugs can lead to risky sexual behaviour. • Know the key facts about puberty, the changing adolescent body and menstrual wellbeing. • Recall the main changes which take place in males and females, and the implications for emotional and physical health. <p>Possible careers are: Medical careers (doctor, clinician, nurse), Physiotherapist, Counsellor, Nutritionist, Dietician, Horticulturist, Floral designer, Crop consultant, Environmental scientist, Entomologist, Soil scientist, Counsellor, Pharmacists, Pharmacologists, Dietician, Radiologist, Material engineer, Molecular scientist, Physiotherapist, Sports trainer, Biomedical scientist, Clinical research associate, Clinical scientist, Genomics, Genetic counsellor, Plant breeder/geneticist, Research scientist (life sciences).</p>	
Spring 2	Revision Chemistry paper 1 Chemistry paper 2	Students will learn about: <ul style="list-style-type: none"> • Atoms, bonding and mole • Chemical reactions and energy changes • Rates and, equilibrium 	Students will develop various exam skills by practicing past exam questions.	Mock exams

		<ul style="list-style-type: none"> Organic chemistry Analysis The Earth's resources 	<p>Possible careers are:</p> <p>Material Engineering, Chemical industry, Car mechanic, Analytical scientists, Chemical engineer, Electrolysis engineer, Quality control, Chemical engineer, Material engineer, Molecular scientist, Data analyst Environmental Scientist, Meteorologist for the National Weather Service, Weather analyst for industry, commerce, airlines, government, alternative energy companies, Military weather officer, Renewable Energy Siting and Forecasting, Airline/Boeing Meteorologists.</p>	
Summer 1	Revision Physics paper 1 Physics paper 2	Students will learn about: <ul style="list-style-type: none"> Energy and energy resources Particles at work Forces in action Waves Electromagnetism. 	<p>Students will develop various exam skills by practicing past exam questions.</p> <p>Possible careers are:</p> <p>Wind turbine technician, Environmental scientist, Sustainability engineer, Solar engineer, Environmental consultant, Air quality engineer, Electrician, Electrical engineer, Radiologist, Material engineer.</p>	GCSE Public examination