

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.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
<p>Autumn 1</p>	<p>Physics</p> <ul style="list-style-type: none"> Wave properties Electromagnetic waves Electromagnetism 	<p>Students will learn about:</p> <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 	<p>Students are able to:</p> <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. Investigate plane waves in a ripple tank (required experiment) Explain the uses of electromagnetic waves in communications and in medicine. Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface. 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 	<ul style="list-style-type: none"> Kerboodle end of chapter assessments (Higher and Foundation)

	<p>Revision:</p> <ul style="list-style-type: none"> • Physics Paper 2 • Biology Paper 1 	<p>Students will learn about:</p> <ul style="list-style-type: none"> • Forces in action • Waves • Electromagnetism • Cells and organization • Disease and bioenergetics 	<p>determine the direction of force acting on a conductor.</p> <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 the links between inactive lifestyle and ill health, including Type 2 diabetes. • Know how to maintain healthy eating and the links between a poor diet and health risks. <p>Possible careers are: Sound engineer, Musician, Audiologist, Medical careers, Optician.</p>	
<p>Autumn 2</p>	<p>Chemistry</p> <ul style="list-style-type: none"> • Chemical analysis 	<p>Students will learn about:</p> <ul style="list-style-type: none"> • Purity, formulations, chromatography and the 	<p>Students are able to:</p> <ul style="list-style-type: none"> • Describe pure substances and mixtures • Analyse the chromatograms and 	<p>Trial exams – set 1:</p> <ul style="list-style-type: none"> • Physics Paper 2

	<ul style="list-style-type: none"> • The Earth's atmosphere • The Earth's resources <p>Revision:</p> <ul style="list-style-type: none"> • Chemistry Paper 2 	<p>identification of common gases.</p> <ul style="list-style-type: none"> • The composition and evolution of the Earth's atmosphere, carbon dioxide and methane as greenhouse gases, and common atmospheric pollutants and their sources. • Using the Earth's resources and obtaining potable water, treating waste water, extracting metals from ores, life cycle assessment and recycling. <p>Students will learn about:</p> <ul style="list-style-type: none"> • Organic chemistry • Analysis • The Earth's resources 	<p>calculate R_f values (required practical) and test the gases</p> <ul style="list-style-type: none"> • Debate that the Earth is getting warmer-this is called global warming. • Explain using symbol equations, how gases are formed in the atmosphere and how oceans are formed. • Evaluate the scale, risk and environmental impact of global climate change. • Explain the stages to make potable water. • Explain how and why waste water is processed before it is released into the environment. • Explain how phytomining and bioleaching extract metals. • Explain that useful products are made from the raw materials found on the Earth. • Analysing and purifying different water samples (required experiment) • Explain the importance of LCA and how it can be misused. <p>Possible careers are: 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>	<ul style="list-style-type: none"> • Biology Paper 1 • Chemistry Paper C2
<p>Spring 1</p>	<p>Biology</p> <ul style="list-style-type: none"> • Adaptation, interdependence and competition 	<p>Students will learn about:</p> <ul style="list-style-type: none"> • Distribution organisms in their environment, competition in plants and animals, adaptation in plants and animals 	<p>Students are able to:</p> <ul style="list-style-type: none"> • How to measure the distribution of living things using quadrats and transect. 	<ul style="list-style-type: none"> • Kerboodle end of chapter assessments (Higher and Foundation)

- Organizing an ecosystem
- Biodiversity and ecosystems

- 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

- Explain the factors that plants and animals compete in a habitat.
- Explain how organisms are adapted to survive in many different conditions.
- 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.

Possible careers are:

Farming and agriculture, Ecologist, Environmental field technician, Wildlife specialist, Sustainability consultant, Wildlife biologist, Environmental planner

Revision

Biology paper 2

Students will learn about:

- Biological responses
- Genetics and reproduction, ecology

Students will develop various exam skills by practicing past exam questions.

- 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.

			<ul style="list-style-type: none"> • 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 Physics Paper 1	Students will learn about: <ul style="list-style-type: none"> • Atoms, bonding and mole • Chemical reactions and energy changes • Energy and energy resources • Particles at work 	Students will develop various exam skills by practicing past exam questions. <p>Possible careers are: 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>	Trial exams – set 2: <ul style="list-style-type: none"> • Physics Paper 1 • Biology Paper 2 • Chemistry Paper C1

<p>Summer 1</p>	<p>Revision Biology Chemistry Physics</p>	<p>Students will learn about:</p> <ul style="list-style-type: none"> • Cells and organization • Disease and bioenergetics • Biological responses • Genetics and reproduction, ecology • Atoms, bonding and mole • Chemical reactions and energy changes • Rates and, equilibrium • Organic chemistry • Analysis • The Earth's resources • 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>GCSE Public examination</p>
----------------------------	--	--	---	--------------------------------