



The curriculum for this stage of students' education has been designed to build upon their prior knowledge from year 9 Physics. This course provides a worthwhile background for all students, whether or not they intend to go on to study Physics beyond GCSE. The course enables students to acquire a body of scientific knowledge and develop an understanding of the ideas and applications of Physics e.g. Energy, Forces and Motion, Waves and the Electromagnetic Spectrum. This is set in the context of knowing and understanding a body of scientific facts. Students acquire an understanding and experience of the methods used in science and of the application of experimental techniques in everyday life.

<p>HALF TERM 1: <u>Energy</u> STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • Changes in Energy Stores. • Energy and Work. • Kinetic and Gravitational Potential Energy. • Energy Efficiency. To understand the factors affecting efficiency and how to calculate percentage efficiency. • Energy and Power. • Energy Transfer by Conduction. <p>REQUIRED PRACTICAL 1 Investigation to determine the specific heat capacity of one or more materials.</p> <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 2: <u>Energy Cont.</u> STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • Infrared Radiation. To understand what infrared radiation is and how it is detected (T). • Heating and Insulation Buildings. (T). • Energy Demands. • Energy from Wind, Water, Sun and Earth. • Energy and the Environment. To understand how non-renewable energy sources affect our environment the impact of renewables on global resources. <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 3: <u>Forces and Motion</u> STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • Vectors and Scalars. • Forces between Objects. • Moments at Work (T). • Centre of Mass. How to determine the centre of mass. • Resolution of Forces. • Acceleration, Velocity and Distance Time Graphs. <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>
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<p>HALF TERM 4: <u>Forces and Motion Cont.</u> STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • Force and Acceleration. • Acceleration Investigation. To investigate the acceleration of a system with a constant mass and varying mass. • Braking Forces and Momentum. To understand the factors influencing the stopping distance of a car. • Weight and Terminal Velocity. To describe the motion of a falling object in a fluid under the effect of gravity. • Conservation of Momentum. (T). <p>HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 4: <u>Forces and Motion Cont.</u> STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • Forces and Elasticity. • Elasticity Investigation. • Pressure and Surfaces/Liquids (T). • Atmospheric Pressure(T). • Upthrust and Flotation (T). <p>REQUIRED PRACTICAL 7 – Investigate the relationship between force and extension for a spring. REQUIRED PRACTICAL 8 – Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>	<p>HALF TERM 6: <u>Waves</u> STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • The Nature and Properties of Waves. To be able to identify transverse and longitudinal wave and describe how they transfer energy using a particle motion model identifying wavelength and frequency to calculate the speed of a wave. • Reflection and Refraction. To be able to describe the effects of reflection and refraction. • Reflection Investigation. To investigate the law of reflection and how it applies to visual effects. • Sound and Seismic Waves (T). • Reflection and Refraction of Light (T). <p>REQUIRED PRACTICAL 6 – Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements. HOW THIS WILL BE ASSESSED: Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.</p>
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Embedding this knowledge can be supported at home by reviewing class notes, guided learning wider reading, exam practice questions, independent research and study, completing set independent study tasks, watching in scientific documentaries and understanding current issues in the scientific world. In addition, use the AQA website, BBC Bitesize and GCSEPOD in conjunction with suitable revision guides.



The curriculum for this stage of students' education has been designed to build upon their prior knowledge from year 9 GCSE Biology. This course provides a worthwhile background for all students, whether or not they intend to go on to study Biology beyond GCSE. The course enables students to acquire a body of scientific knowledge and develop an understanding of the ideas and applications of Biology e.g. how organisms obtain energy, how organisms control their internal environment and are affected by the external environment leading to adaptations and evolution of new species. This is set in the context of knowing and understanding a body of scientific facts. Students acquire an understanding and experience of the methods used in science and of the application of experimental techniques in everyday life

HALF TERM 1: Bioenergetics – Photosynthesis & Respiration

STUDENTS MUST KNOW:

- The photosynthesis reaction
- Factors that affect photosynthesis
- The uses of glucose from photosynthesis
- Aerobic & anaerobic respiration
- Responses to exercise
- The processes involved in metabolism
- investigate factors affecting the rate of photosynthesis

HOW THIS WILL BE ASSESSED:

Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.

HALF TERM 2: Homeostasis & Response – Nervous system

STUDENTS MUST KNOW:

- What homeostasis is
- The structure & function of the human nervous system
- How reflexes aid the body
- The function of synapses
- The structure & function of the brain
- The structure & function of the eye
- How body temperature is regulated

HOW THIS WILL BE ASSESSED:

Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.

HALF TERM 3: Homeostasis & Response – Hormonal system

STUDENTS MUST KNOW:

- The location of the main endocrine glands
- How blood glucose levels are controlled
- How water and nitrogen levels are maintained in the body
- The causes, effects and treatment of type 1 & 2 diabetes
- The hormonal control of the human reproductive cycle & how contraception methods work, involving hormonal control of the reproductive cycle
- How fertility treatments work (HT)
- How negative feedback loops work (HT)
- How plant hormones regulate plant growth

HOW THIS WILL BE ASSESSED:

Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.

HALF TERM 4: Inheritance, Variation & Selection - 1

STUDENTS MUST KNOW:

- How sexual and asexual cell division occurs
- The advantages & disadvantages of sexual & asexual reproduction
- The structure of DNA and the genome
- How genetic inheritance occurs
- How genetic disorders are inherited
- How the sex of a child is determined
- How cloning is carried out & the ethics of cloning

HOW THIS WILL BE ASSESSED:

Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.

HALF TERM 6: Ecology

STUDENTS MUST KNOW:

- How organisms are adapted for survival
- How ecological communities are organised
- How abiotic and biotic factors affect organisms
- How ecosystems are organised
- How materials are recycled in ecosystems
- The process of decomposition
- Required practical upon decomposition
- The causes & effects of environmental change

HOW THIS WILL BE ASSESSED:

Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.

HALF TERM 6: Ecology

STUDENTS MUST KNOW:

- What biodiversity is and factors that affect it
- The causes & effects of global warming
- How biodiversity is maintained
- Required practical surveying organism distribution in a habitat

HOW THIS WILL BE ASSESSED:

Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.

Embedding this knowledge can be supported at home by using the AQA website, BBC Bitesize and GCSEPOD in conjunction with suitable revision guides.





The curriculum for this stage of students' education has been designed to ensure students understand how scientific methods and theories develop over time. Building on work done in Year 9, they will use representational, spatial, descriptive, computational and mathematical models to solve problems, make predictions and to develop scientific explanations and understanding. Students will appreciate the power and limitations of science and be able to consider ethical issues which may arise. They will be able to explain the technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments. Students will evaluate risks both in practical science and the wider societal context, while recognising the importance of peer review of results and of communicating results to a range of audiences.

HALF TERM 1: CHEMICAL CHANGES

STUDENTS MUST KNOW:

- pH and Neutralisation, Strong and Weak acids, Making Salts from Metals, Metal oxides, Metal Hydroxides, and Carbonates, Making and separating soluble and insoluble salts, The Reactivity Series and Metal reactions, Electrolysis, Writing Half-equations, Predicting the products of electrolysis (CuSO₄ and NaCl).

RP1- Making a soluble salt from insoluble oxide or carbonate

RP3 – Electrolysis of an aqueous solution

RP2 – Titrations.

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 2: ENERGY CHANGES AND RATES OF CHANGE

STUDENTS MUST KNOW:

- Monitoring Chemical Reactions, Exothermic and Endothermic reactions, Calculating Bond energies, Collision theory, Factors affecting the Rate of a Chemical reactions (Temperature, Concentration, Surface area, Catalysts), Reversible Reactions. Batteries and Hydrogen Fuel cells,

RP4 – Energy transfer of reactions

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 3: ENERGY CHANGES AND RATES OF CHANGE

STUDENTS MUST KNOW:

- Monitoring Chemical Reactions, Exothermic and Endothermic reactions, Calculating Bond energies, Collision theory, Factors affecting the Rate of a Chemical reactions (Temperature, Concentration, Surface area, Catalysts), Reversible Reactions.

RP5-How concentration affects rate of reaction (HCl and Thiosulphate)

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 4: ORGANIC CHEMISTRY I

STUDENTS MUST KNOW:

- The development of Crude Oil, Fractional distillation, Properties and uses of Crude oil fractions, Alkanes and Alkenes, Complete and Incomplete combustion, Cracking, Cells,

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 5: CHEMICAL ANALYSIS

STUDENTS MUST KNOW:

- What defines Purity and a Formulation, Conducting paper chromatography and calculating R_f, How the R_f is used in analysis, Testing for Gases (Cl₂, O₂, CO₂ and H₂), Types of Analysis (Qualitative and Quantitative), Conducting Flame tests and NaOH tests, Testing for Anions, Instrumental methods of analysis (Spectroscopy).

RP7-Chemical tests to identify ions in unknown compounds

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

HALF TERM 6: CHEMISTRY OF THE ATMOSPHERE

STUDENTS MUST KNOW:

- Evolution of the atmosphere, The Greenhouse Gases and their effect on Global warming and Climate change, Reducing Carbon footprints, Atmospheric pollutants and their effects.

HOW THIS WILL BE ASSESSED:

A Progress Test halfway through the topic to address misconceptions, followed by an assessment completed at the end of each topic.

Embedding this knowledge can be supported at home by completion of homework, reviewing topics found on BBC Bitesize (AQA Chemistry), GCSE pod and reading scientific articles in newspapers, magazines, scientific journals and periodicals. **Books of interest:** The Science of Everyday Life: Why Teapots Dribble, Toast Burns and Light Bulbs Shine (Hardback) Marty Jopson ISBN-10: 1782434186. Further enrichment activities could include trips to the Big Bang Science Fair, Science Live or the Thinktank.



The curriculum for this stage of students' education has been designed to build upon their prior knowledge from key stage 3 Science. This course provides a worthwhile background for students who intend to go on to study Biology beyond GCSE. The course enables students to acquire a body of scientific knowledge and develop an understanding of the ideas and applications of Biology e.g. how diseases are spread and treated, the functioning of our digestive system and the importance of a balance diet. This is set in the context of knowing and understanding a body of scientific facts. Students acquire an understanding and experience of the methods used in science and of the application of experimental techniques in everyday life.

<p>HALF TERM 1: Bioenergetics – Photosynthesis & Respiration</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • The photosynthesis reaction • Factors that affect photosynthesis • The uses of glucose from photosynthesis • Aerobic & anaerobic respiration • Responses to exercise • The processes involved in metabolism • Required practical investigating factors that affect the rate of photosynthesis <p>HOW THIS WILL BE ASSESSED: Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.</p>	<p>HALF TERM 2: Homeostasis & Response – Nervous system</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • What homeostasis is • The structure & function of the human nervous system • How reflexes aid the body • The function of synapses <p>HOW THIS WILL BE ASSESSED: Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.</p>	<p>HALF TERM 3: Homeostasis & Response – Hormonal system</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • The location of the main endocrine glands • The role of hormones in the body • How blood glucose levels are controlled • The causes, effects and treatment of type 1 & 2 diabetes • The hormonal control of the human reproductive cycle • How contraception methods work, involving hormonal control of the reproductive cycle • How fertility treatments work (HT) • How negative feedback loops work (HT) • Required practical investigating human reaction times <p>HOW THIS WILL BE ASSESSED: Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.</p>
<p>HALF TERM 4: Inheritance, Variation & Selection - 1</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • How sexual and asexual cell division occurs • The structure of DNA and the genome • How genetic inheritance occurs • How genetic disorders are inherited • How the sex of a child is determined <p>HOW THIS WILL BE ASSESSED: Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.</p>	<p>HALF TERM 5: Ecology</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • How organisms are adapted for survival • How ecological communities are organised • How abiotic and biotic factors affect organisms • How ecosystems are organised • How materials are recycled in ecosystems <p>HOW THIS WILL BE ASSESSED: Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.</p>	<p>HALF TERM 6: Ecology</p> <p>STUDENTS MUST KNOW:</p> <ul style="list-style-type: none"> • What biodiversity is and factors that affect it • The causes & effects of global warming • How biodiversity is maintained • Required practical surveying organism distribution in a habitat <p>HOW THIS WILL BE ASSESSED: Assessments will be completed at the end of each topic and one main assessment will occur during each term to assess progress.</p>



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