Curriculum intent (overview) – To deepen students' skills and knowledge through a broad and balanced curriculum which prepares students for adulthood.

11.1 - Navigator Curriculum - *Science/ 8 Lessons weekly*

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Year	2025 – 2026 Autumn 1	2025 – 2026 Autumn 2	2025 – 2026 Spring 1	2025 – 2026 Spring 2	2025 – 2026 Summer 1	2025 – 2026 Summer 2
	Topic: Physics 2 P12 EM waves, P13 Electromagnetism, C8 Rates and equilibrium. **Suggested Key Questions:** **How do forces affect thinking, braking and stopping distances?** **How is energy generated?** **Key Skills and Knowledge:** **P12** Students will be able to describe the electromagnetic spectrum in terms of different regions related to wavelength. The speed of electromagnetic waves in a vacuum has been described as constant allowing the use of the wave equation to link wavelength and frequency which as then been tied to the energy carried by	**Topic:** Chemistry 2 C9 Crude oil and fuels, C10 Chemical analysis, C11 The Earths atmosphere. **Suggested Key Questions:** **How can we predict products of chemical reactions?** **How can we control the rate of a reaction?** **What is equilibria?** **Key Skills and Knowledge:** **C9** Students will learn about hydrocarbons and been introduced to the alkanes. They should now be able to identify alkanes from their formulae, and be able to name and draw the displayed formula of the first four alkanes. Students have also learnt about some of the reactions of hydrocarbons, including combustion (both complete and incomplete) and	**Topic:** Chemistry 2 C12 The Earths resources, B10 The human nervous system. **Suggested Key Questions:** **How can processes and product production be improved?** **How are humans impacting on the environment?** **Key Skills and Knowledge:** **C12** Students will learn about the difference between finite and renewable resources. It is important that students understand that renewable resources are not an infinite supply, but are replaceable at a rate similar to the rate they are used up, whereas finite resources are used up faster than they can be replenished. Students understanding of finite and renewable	**Topic:** Biology 2 B11 Hormonal coordination, B13 Variation and evolution. **Suggested Key Questions:** **What are ecosystems?** **What do we mean by inheritance?** **What is evolution?** **Key Skills and Knowledge:** **B11** Students have studied the principles of hormonal control and the endocrine system. They should be able to identify the main parts of the endocrine system and recall the hormones they produce. Students should recall how blood-glucose concentration is controlled, including the role of insulin. Higher-tier students should also be able to explain the role of glucagon, and	**Topic:** Revision Revision directed by pupil needs/ requirements and outcome of mock exams. **EXAM'S** **Suggested Key Questions:** **What do I need to revisit/ revise?** **How can I prepare myself for my exams?** **What are exam techniques?** **Key Skills and Knowledge:**	**Topic:** Revision and Exams. **Suggested Key Questions:** **Key Skills and Knowledge:**

	the wave. Each of the regions of the electromagnetic spectrum has been described along with associated uses and students have investigated the relationship between surface colour, temperature, and the rate of emission of infra-red radiation. The use of radio waves in communications for television and mobile phones has been described along with outlining transmissions of signals through optical fibres. Higher tier students have also described the process of modulation of carrier waves to give a more complex picture of how information can be transmitted using waves. All students have described the application of ultra violet waves in phosphorescence and the damage these waves can cause to skin and eyes before describing the uses of X-rays and gamma rays in medical applications. The process of ionisation has been outlined and the cause of tissue damage and as a useful technique in killing bacteria or cancerous cells. Further details of the use of X-	cracking. All students should be able to write balanced symbol equations for the complete combustion of hydrocarbons and to describe the conditions of cracking. All students should be able to describe the test for alkenes (a product of cracking) but students studying *AQA GCSE Combined science: Trilogy* do not need to know the names of the alkenes produced. Students will also learn about crude oil as a source of hydrocarbons and the fractional distillation of crude oil. They should be able to describe how the size of the hydrocarbon molecule affects its properties, including viscosity, boiling point, and flammability. **C10** Students will learn about various techniques for analyzing substances. All students should now understand the difference between a pure substance, a mixture, and a formulation, and what is meant by purity. Students should also have built upon their understanding of chromatography experiments from *Chapter C1* and be able to analyse a chromatogram, both	resources should be applied to the need to reuse and recycle, and they should be able to describe and evaluate ways of reducing the use of finite resources, and carry out life cycle assessments on products. Students will look at specific resources that we use, including water and metals (in particular copper). Students should be able to describe the different ways that water is treated, both to create potable water and to remove waste products so it is safe to release into the environment. Students have already met metal-ore extraction and electrolysis, and higher-tier students should have applied that knowledge to the extraction of copper, as well as understanding alternative biological methods used to extract copper. **B10** Students have studied the principles of homeostasis, and should be able to give some examples and outline the control system involved. They should link this work with studies on enzyme action in B3.2 *The human digestive system* and B3.4 *Catalysts and enzymes*. Students	clearly distinguish between glucose, glycogen, and glucagon. All students should be aware of the causes and treatments of both type 1 and type 2 diabetes. They should link this with work in B2.3 *Stem cells* and with the effect of lifestyle on type 2 diabetes in B7.4 *Diet, exercise, and disease*. Higher-tier students should understand the process of negative feedback, particularly as applied to the hormones adrenaline and thyroxine. All students have studied hormones in human reproduction. They should recall the action of hormones in bringing about puberty. They should be aware of the role of oestrogen in the menstrual cycle in females, and of testosterone in males. Higher-tier students should have a more detailed understanding of how hormones interact to control the menstrual cycle. Students should understand how hormones are used in the control of fertility as applied to contraception, and for higher-tier students, to infertility treatments. **B13**		

	rays have been described including contrast media and detection devices such as the CCD and the concept of radiation dose. Higher tier students have compared the intensity of imaging and therapeutic X-rays. **P13** Students begin this chapter by reinforcing their knowledge of magnetism by looking at the magnetic fields around permanent magnets and the concept of induced magnetism in some materials. The students have been reminded of the techniques used to plot a magnetic field and the shape of the Earth's field. Students move on to examine the magnetic field produced by a current and investigate the factors that affect the direction and strength of this field. They compared the field shape of a solenoid to that produced by a simple bar magnet. All higher-tier students described how a current carrying wire placed in a magnetic field would experience the motor effect before going on to explain how this effect could be used to create an electric motor. The	qualitatively and quantitatively using *R*f values. Students should also be able to describe the different experimental tests for gases, including both the procedure and positive result. **C11** Students will learn about the Earth's atmosphere. Students only need to be able to describe the volcanic activity theory of the origin of the atmosphere, but they should be able to interpret evidence concerning other theories, and be able to evaluate them. To describe the history of the atmosphere students will need to have a sense of the timescales involved. Along with an understanding of the origins of the atmosphere, students should also understand how it has evolved over time. This includes both how the general composition of the atmosphere has changed and how the atmosphere is currently being affect by human activity. Students should be able to describe the human activities that are thought to cause global warming, and be able to explain some of the effects this has on	should recall details of the human nervous system and its structure and function. They should link this with work on nerve cells in B1.4 *Specialisation in animal cells*. They should be able to describe a reflex arc, with detail of synaptic transmission. Students should appreciate that receptors detect a change in a stimulus and not the stimulus itself. They should be able to describe an electrical impulse accurately.	All students should be able to outline asexual and sexual reproduction, and should be aware of the importance of meiosis, fertilisation, and variation in sexual reproduction. They should link this with work on chromosomes and mitosis and the cell cycle in B2 *Cell division*. All students have studied DNA and its role in inheritance. They should be aware of the genetic code and genomes, including how the data produced by genome research can be used. *AQA GCSE Biology* students should be able to outline DNA structure, with higher-tier students recalling the detailed structure of DNA and also studying protein synthesis, including how the genetic code is used to assemble amino acids into proteins. All students have studied inheritance, and should be able to use genetic terms and set out a genetic cross with the use of a Punnett square. They should be able to predict ratios of different phenotypes, and apply this to sex determination and family trees. Students should be able to		

	force produced on the motor was linked mathematically to the magnetic flux density of the magnetic field. Only those studying *GCSE Physics* at higher level looked at the generator effect and the factors which affect the current induced in a wire as it is moved through a magnetic field. These concepts were applied to the design of a practical generator and the a.c. waveform produced as the coil in the generator rotates. **C8** Students will learn about the factors that affect the rate of a reaction, including temperature, surface area, concentration, and pressure. Students should be able to explain the effect of each factor on the rate of reaction using collision theory – understanding that each factor increases the *frequency* of effective collisions, **not** just the number of collisions. They should also be able to explain the effect of catalysts on the rate of a reaction in terms of providing an alternative reaction pathway with a lower activation energy. Students will also learnt about reversible reactions and dynamic	the climate of the Earth. Students should also be able to explain the effect of other pollutants on the Earth, including carbon monoxide, sulfur dioxide, nitrogen oxides, and particulates.		describe the inheritance of genetic disorders as applied to polydactyly and cystic fibrosis. They should be aware of developments in genetic engineering with the aim of curing genetic disorders. Finally, students should be able to discuss screening for genetic disorders and the implications of using this technology.		

	equilibrium. Students should apply their knowledge on endothermic and exothermic reactions to equilibrium reactions to be able to predict the effect of temperature changes on the reversible reactions and the position of the equilibrium. Higher-tier students should also be able to use Le Châtelier's principle to explain the effect of temperature and pressure on the position of equilibrium.					
Links to Gatsby Benchmarks:	Benchmark 3 – Addressing the needs of the student and * - Personal Guidance Benchmark 4 – Linking Curriculum to learning Students to consider what skills are needed to be a sound engineer/ teacher/ astronomer … lead onto looking at what skills are needed for different roles they are interested in and what qualifications.	Benchmark 3 – Addressing the needs of the student and * - Personal Guidance Benchmark 4 – Linking Curriculum to learning Students to consider what skills are needed to be a sound engineer/ teacher/ astronomer … lead onto looking at what skills are needed for different roles they are interested in and what qualifications..	Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * - Personal Guidance Benchmark 5- Encounters with employers and employees Students to consider what skills are needed to access the opportunities they are interested in. Research.	Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * - Personal Guidance Students to consider what qualifications are needed to access the opportunities they are interested in. Research.	Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * - Personal Guidance Students begin consider how technology may shape the job market.	Benchmark 2, – Learning from the Career and Labor Market information. Benchmark 3 – Addressing the needs of the student and * - Personal Guidance Benchmark 4 – Linking Curriculum to learning Benchmark 8 – Personal Guidance Students to consider what skills are needed to access the opportunities they are interested in. Going into work places/remote visits. Research.