Curriculum Intent: Students continue to explore new subject content in physics, tackling more challenging concepts at a greater depth than they have done so previously. Students continue to develop scientific skills, directly linked to their required practicals including forming hypotheses, clear written methods, knowledge, and use of scientific equipment as well as presenting and analysing results. The Assessment outcomes are AO1: Demonstrate knowledge and understanding of scientific ideas, scientific techniques, and procedures. AO2: Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques, and procedures. AO3: Analyse information and ideas to interpret, evaluate, make judgements, draw conclusions, develop experimental procedures, and improve experimental procedures.

Year 10	HT1	HT2	HT3	HT4	HT5	HT6
Content, Knowledge & Skills	AQA physics unit 1 • Energy • Stores and systems • Power • Dissipation Concepts and Principles • The concept of energy emerged in the 19th century. The idea was used to explain the work output of steam engines and then generalised to understand other heat engines. It also became a key tool for understanding chemical reactions and biological systems. • A system is an object or group of objects. There are changes in the way energy is stored when a system changes. • Power is defined as the rate at which energy is transferred or	AQA physics unit 1 • Efficiency • Conservation Concepts and Principles • Energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed. • Limits to the use of fossil fuels and global warming are critical problems for this century AQA physics unit 2 • Electricity • Static electricity • Circuits • Resistors Concepts and Principles • When certain insulating materials are rubbed against each other they become electrically charged.	AQA physics unit 2 • Domestic uses of electricity • Energy transfers Concepts and Principles • Work is done when charge flows in a circuit. • Many circuits are powered with mains electricity, but portable electrical devices must use batteries of some kind. Electrical power fills the modern world with artificial light and sound, information and entertainment, remote sensing and control. AQA physics unit 3 • States of matter and the particle model • Density and internal energy	AQA physics unit 3 • Pressure Concepts and Principles • Changing the temperature of a gas, held at constant volume changes the pressure exerted by the gas. AQA physics unit 4 • Atoms • Ionising radiation Concepts and Principles • The basic structure of an atom is a positively charged nucleus composed of both protons and neutrons surrounded by negatively charged electrons. • Some atomic nuclei are unstable. The nucleus gives out radiation as it changes to become more stable. This is a random	AQA physics unit 4 • Uses of radiation • Radioactive decay equations • Nuclear fission and fusion Concepts and Principles • Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation. • Nuclear fission is the splitting of a large and unstable nucleus. Nuclear fusion is the joining of two light nuclei to form a heavier nucleus. AQA physics unit 5 • Scalar and vector • Gravity Concepts and Principles	AQA physics unit 5 • Work done and Energy transfer • Motion, Speed and Acceleration • Newton's laws • Moments Concepts and Principles • A force is a push or pull that acts on an object due to the interaction with another object. • The speed of a moving object is rarely constant. • The velocity of an object is its speed in a given direction. Velocity is a vector quantity. • The acceleration of an object can be calculated from the gradient of a velocity–time graph. • Newton's laws of motion are three physical laws that, describe the relationship between a body and the forces

	the rate at which work is done. • Energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed.	• A charged object creates an electric fi eld around itself. Electric charge is a fundamental property of matter everywhere. Understanding the difference in the microstructure of conductors, semiconductors and insulators makes it possible to design components and build electric circuits. • Electric current is the rate of flow of electrical charge.	• Specific Heat Capacity and Latent Heat <u>Concepts and Principles</u> The particle model is widely used to predict the behaviour of solids, liquids and gases and this has many applications in everyday life. • are physical changes which differ from chemical changes because the material recovers its original properties if the change is reversed. • Energy is stored inside a system by the particles (atoms and molecules) that make up the system. This is called internal energy. • If the temperature of the system increases, the increase in temperature depends on the mass of the substance heated, the type of material and the energy input to the system.	process called radioactive decay. Ionising radiation is hazardous but can be very useful.	• Scalar quantities have magnitude only. Vector quantities have magnitude and an associated direction. • Weight is the force acting on an object due to gravity. The force of gravity close to the Earth is due to the gravitational field around the Earth.	acting upon it, and its motion in response to those forces. • A force acting perpendicular to a pivot producing a turning force, called a moment

Key Vocabulary						
Assessment	AQA physics unit 1 • Describe all the changes involved in the way energy is stored when a system changes. • Calculate the amount of energy associated with a moving object, a stretched spring and an object raised above ground level. • Describe how in all system changes energy is dissipated, so that it is stored in less useful ways.	AQA physics unit 1 • Describe ways to increase the efficiency of an intended energy transfer. • Compare ways that different energy resources are used. AQA physics unit 2 • Explain how the transfer of electrons between objects can explain the phenomena of static electricity. • Explain the design and use of a circuit to measure the resistance of a component by measuring the current through, and potential difference across, the component • Describe the difference between series and parallel circuits • Use equations to calculate, voltage resistance and potential difference	AQA physics unit 2 • Describe and explain the function of each cable in a standard 3 cable flex. • Explain how a fuse protects users of appliances from harm • Use equations to calculate power and energy transfer AQA physics unit 3 • Explain the differences in density between the different states of matter. • Students should be able to interpret heating and cooling graphs that include changes of state. • Students should be able to distinguish between specific heat capacity and specific latent heat.	AQA physics unit 3 • Calculate the change in the pressure of a gas or the volume of a gas when either the pressure or volume is increased or decreased. • Explain how, in a given situation e.g. a bicycle pump, doing work on an enclosed gas leads to an increase in the temperature of the gas. AQA physics unit 4 • Describe the changes in the atomic model • Be able to use the names and symbols of common nuclei and particles to write balanced equations that show single alpha (α) and beta (β) decay • Explain the concept of half-life and how it is related to the random nature of radioactive decay.	AQA physics unit 4 • Draw/interpret diagrams representing nuclear fission and how a chain reaction may occur • Describe the uses of radioisotopes in a range of industrial or medical settings AQA physics unit 5 • Define the terms scalar and vector. List examples of both. • Use the value of acceleration due to gravity on Earth to calculate the weight of objects • Use the value of acceleration due to gravity on other locations in the Solar System to calculate the weight of objects	AQA physics unit 5 • Recognise forces and be able to calculate resultant forces. • Calculate work done. • Calculate speed, velocity and acceleration using equations and graphs. • Understand Newton's law of forces and apply the associated equations • Calculate the moment of a force • Use the principle of moments to calculate the force, or distance needed to bring an object to balanced equilibrium.

				• Compare the hazards associated with contamination and irradiation.		

Curriculum Intent: In their final year of study, Year 11 students will develop a deep understanding of scientific ideas making explicit links between topics studied. They will develop independence and gain confidence in working and thinking scientifically. Students continue to develop scientific skills, directly linked to their required practicals including forming hypotheses, clear written methods, knowledge, and use of scientific equipment as well as presenting and analysing results. The Assessment outcomes are AO1: Demonstrate knowledge and understanding of scientific ideas, scientific techniques, and procedures. AO2: Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques, and procedures. AO3: Analyse information and ideas to interpret, evaluate, make judgements, draw conclusions, develop experimental procedures and improve experimental procedures.

Year 11	HT1	HT2	HT3	HT4	HT5	HT6
Content, Knowledge & Skills	<u>AQA physics unit 5</u> • Levers and gears • Momentum and safety • Moments and Pressure <u>Concepts and Principles</u> • Levers use the principle of moments to multiply force or distance • Momentum is the product of mass and velocity. Momentum is also a vector quantity • Modern vehicles and road safety rules use the principle of momentum to increase safety <u>AQA physics unit 6</u> • Waves – longitudinal and transverse	<u>AQA physics unit 6</u> • Reflection and refraction Electromagnetic waves • Sound waves • Seismic waves • Images and magnification <u>Concepts and Principles</u> • Waves may be either transverse or longitudinal. • Different substances may absorb, transmit, refract or reflect electromagnetic waves in ways that vary with wavelength. • Electromagnetic waves are transverse waves that transfer energy. Electromagnetic waves form a continuous spectrum and all types of electromagnetic wave travel at the same	<u>AQA physics unit 6</u> • Absorption and emission of intra-red waves • Temperature of the earth <u>Concepts and Principles</u> • Different materials absorb and emit infra-red radiation differently • The Earth maintains a relatively stable atmospheric temperature due to the greenhouse effect <u>AQA physics unit 7</u> • Magnetism • Magnetic fields • Electromagnets <u>Concepts and Principles</u> • The region around a magnet where a force acts on another magnet or on a	<u>AQA physics unit 7</u> • Motors and generators <u>Concepts and Principles</u> • Electromagnetic effects are used in a wide variety of devices. Engineers make use of the fact that a magnet moving in a coil can produce electric current and also that when current flows around a magnet it can produce movement. <u>AQA physics unit 8</u> • The solar system and the universe • Life cycle of a star • Artificial satellites <u>Concepts and Principles</u> • Within our solar system there is one star, the Sun, plus the eight planets and	<u>AQA physics unit 8</u> • Red shift and the Big Bang Theory <u>Concepts and Principles</u> • There is an observed increase in the wavelength of light from most distant galaxies. The further away the galaxies, the faster they are moving and the bigger the observed increase in wavelength. This effect is called red-shift. <u>End of course revision</u> • GCSE Physics Triple Content • Practicing Maths in Science • Re-visit Physics RPAs	

		velocity through a vacuum (space) or air • Lenses use the refraction of visible light to form images	magnetic material (iron, steel, cobalt and nickel) is called the magnetic field. • When a current flows through a conducting wire a magnetic field is produced around the wire. The strength of the magnetic field depends on the current through the wire and the distance from the wire. • When a conductor carrying a current is placed in a magnetic field the magnet producing the field and the conductor exert a force on each other.	the dwarf planets that orbit around the Sun. Natural satellites, the moons that orbit planets, are also part of the solar system. A star goes through a life cycle. The life cycle is determined by the size of the star. Gravity provides the force that allows planets and satellites (both natural and artificial) to maintain their circular orbits.		

Key Vocabulary						
Assessment	AQA physics unit 5 • Calculate the multiplied force or distance of a lever • Determine the type of lever • Explain, using the idea of force, momentum and time, the function of a range of road safety equipment. AQA physics unit 6 • Describe the features of transverse and longitudinal waves • Use the wave equation to calculate values for waves .	AQA physics unit 6 • Describe a method to measure the speed of sound waves in air and ripples on a surface. • Show how changes in velocity, frequency and wavelength, in transmission of sound waves from one medium to another, are inter-related. • Describe the effects of reflection, transmission and absorption of waves at material interfaces • Give brief explanations why each type of electromagnetic wave is suitable for the practical application. • Construct ray diagrams to illustrate the similarities and differences between convex and concave lens	AQA physics unit 6 • Explain how the interaction between greenhouse gases and electromagnetic radiation leads to the greenhouse effect. AQA physics unit 7 • Draw the magnetic field pattern of a bar magnet showing how strength and direction change. • Draw the magnetic field pattern for a straight wire carrying a current and for a solenoid • Show that Fleming's left-hand rule represents the relative orientation of the force, the current in the conductor and the magnetic field. • Explain how the effect of an alternating current in one coil in inducing a current in another is used in transformers.	AQA physics unit 7 • Explain how the force on a conductor in a magnetic field causes the rotation of the coil in an electric motor • Explain the function of a generator AQA physics unit 8 • Explain how, at the start of a star's life cycle, the dust and gas drawn together by gravity causes fusion reactions. • Describe the similarities and distinctions between the planets, their moons, and artificial satellites.	AQA physics unit 8 • Describe how red-shift provides evidence for the Big Bang Model End of course revision • Practicing extended writing answers, especially those related to required practicals. • Opportunity to fi ne-tune exam skills. • Re-visit content as informed by March Progress Exams. • Re-visit calculations within the Physics curriculum.	
