Long Term Plan

In year 10, students will study Biology as a separate discipline building on the knowledge and skills gained at Key Stage 3. Biology is the study of the living world and students will learn about both animals and plants and how they co-exist. Learning how the human body functions and responds to disease helps students to understand key life lessons and their place within the living world.

Year 10: Biology

	Learning Cycle	Key Concepts and Themes	Vocabulary
HT1	The heart and non-communicable diseases	• Blood, the heart and circulation • Health, lifestyle and non-communicable diseases	blood vessel, double circulatory system, coronary, cardiovascular, risk factor, tumour
HT2	Plants	• Plant tissues, • Plant organ systems, e.g. leaf • Transpiration • Translocation	Xylem, phloem, stomata, lignin, elongation, evaporation
HT3	Communicable diseases and human defence systems	• How pathogens cause disease in plants and animals. • How diseases can be spread, prevented and treated	virus, bacteria, fungus, protist, malaria, symptom, treatment, phagocytosis, antibody, vaccination
HT4	Response to disease	• Development of drugs • Antibiotics and painkillers • Use of monoclonal antibodies • Plant diseases	double blind, placebo, lymphocytes, chlorosis, efficacy, antiviral, deficiency
HT5	Ecology	• Living and non-living factors in an ecosystem • Adaptations • Ecosystems • Cycling of materials	biotic factors, abiotic factors, quadrat, adaptation, extremophile, carbon cycle, water cycle, decomposition, detritivores
HT6	Ecosystems and the impact of humans	• Biodiversity • Trophic levels in an ecosystem • Waste management • Land use	Deforestation, biomass, trophic levels, sustainable, biotechnology

Skill Development	• Understand how scientific methods and theories develop over time. • Use a variety of models to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. • Evaluate methods and suggest possible improvements and further investigations.

Long Term Plan

In year 10 students will study chemistry as a separate discipline building on the knowledge and skills gained at Key Stage 3. Chemistry is the study of the material world and students will learn how scientific methods and theories have developed over time plus appreciate the power and limitations of science, considering any ethical issues which may arise.

Year 10: Chemistry

	Learning Cycle	Key Concepts and Themes	Vocabulary
HT1	Structure and Bonding Part 1	• That atoms can be arranged in a variety of ways, some of which are molecular while others are giant structures. • Theories of bonding are explained and linked to properties.	Ion, Ionic bond, Electrostatic attraction, Metal, Non-metal, Molecule, Macromolecular, Covalent bond, Metallic bond, Intermolecular forces, Delocalised electrons
HT2	Structure and Bonding Part 2	• How scientists use the knowledge of structure and bonding to engineer new materials with desirable properties.	Alloy, Fullerenes, Nanoparticles, Polymer, Graphene, Nanotechnology
HT3	The Reactivity of Metals and Metal Compounds	• The understanding of chemical changes by systematically organising results and predicting what new substances are formed in unfamiliar contexts. • The extraction of important resources from the Earth.	Acid, Electrode, Electrolysis, Electrolyte, Molten, Ore, Oxidation, Reactivity Series, Redox Reaction, Reduction, Salt
HT4	Exothermic and Endothermic Reactions	• How the interaction of particles often involves transfers of energy due to the breaking and formation of bonds. • These interactions between particles can produce heating or cooling effects that are used in a range of everyday applications such as the production of electricity.	Activation energy, Bond energy, Combustion, Endothermic, Energy level diagram, Exothermic, Reaction profile
HT5	Quantitative Chemistry	• That chemical equations provide a means of representing chemical reactions • How chemists use quantitative analysis to determine the formulae of compounds, the equations for • reactions and to monitor the yield from chemical reactions	Mole, Concentration, Avogadro's Constant, Limiting Reactant, Concordant, Percentage Yield, Atom Economy, Relative Formula Mass, Reactant, Product
HT6	Rates of chemical Reactions	• How chemical reactions can be manipulated in order to speed them up or slow them down. • That chemical reactions may be reversible and therefore the effect of different variables needs to be established in order to identify how to maximise the yield of desired product.	Catalyst, Enzyme, Collision theory, Surface area, Rate, Particle, Independent variable, Dependent variable, Control variable

Skill Development	• Understand how scientific methods and theories develop over time. • Use a variety of models to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. • Evaluate methods and suggest possible improvements and further investigations.

Long Term Plan

In year 10 students will study physics as a separate discipline building on the knowledge and skills gained at Key Stage 3. Physics seeks to understand the underlying rules which govern the way that objects interact. It also considers larger questions such as the origin and fate of the Universe, which will develop students' interest and curiosity.

Year 10: Physics

	Learning Cycle	Key Concepts and Themes	Vocabulary
HT1	Electricity	• In this topic we use models to help visualise what is happening in circuits so that we can understand everyday applications of electricity.	Diode, Potential Difference, Electric Field, Current, Filament Lamp, Light Dependent Resistor (LDR), Mains Electricity, Potential Difference, Resistance, Transformers, The National Grid, Thermistor
HT2	Particle Model of Matter	• The particle model is widely used to predict the behaviour of solids, liquids and gases and this has many applications in everyday life.	Thermal Energy, Condensation, Density, Evaporation, Freezing, Internal Energy, Latent Heat, Melting, Pressure, Specific Heat Capacity, Specific Latent Heat, Sublimation
HT3	Atomic Structure	• In this topic we track the development of models of the atom. This allows us to understand processes that occur in the nucleus of an atom, such as the emission of radiation.	Activity, Alpha Particle, Atomic Number, Background Radiation, Beta Particle, Chain Reaction, Energy Levels, Fission, Gamma Ray, Half-Life, Ions, Irradiation, Isotopes, Nuclear Fission, Nuclear Fusion, Nucleus, Radioactive Decay,
HT4	Forces 1	• Understanding forces allows us to analyse a wide variety of situations, such as the motion of a car or skydiver. Applications also include the analysis of structures like buildings and bridges.	Contact Forces, Gravity, Resultant force, Scalar, Vector, Weight, Work Done, Energy transfer, Elasticity, Hooke's Law, Non-contact forces, Electrostatic force
HT5	Forces 2	• Isaac Newton formulated the laws of motion which describe how objects move. Understanding these laws allow us to predict the movement of objects.	Acceleration, Displacement, Distance, Speed, Velocity, Equilibrium, Inertia, Newton's Laws, Resultant Force, Speed, Velocity, Weight, Terminal velocity
HT6	Forces 3	• Concepts such as momentum lead to an understanding of the forces on objects during collisions. This has applications such as improving car safety.	Stopping distance, Thinking distance, Momentum, Reaction time, Conservation of momentum, Braking distance, Collisions, Rate of change of momentum

Skill Development	• Understand how scientific methods and theories develop over time. • Use a variety of models to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. • Evaluate methods and suggest possible improvements and further investigations.