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| **Long Term Plan** | | In year 11, 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. | | |
| **Learning Cycle** | **Key Concepts and Themes** | **Vocabulary** |
| **Year 11: Biology** | **HT1** | Homeostasis | * The nervous system * The brain\* * The eye\* * Control of body temperature * Hormonal control * Plant hormones\* * Water and nitrogen balance | Stimulus, Receptor, Reflex arc, Motor neuron, Sensory neuron, Relay neuron, Impulse, Effector, Muscles, Coordinator, Hypothalamus, Pituitary gland, Vasoconstriction, Vasodilation, Hormones, Auxin, Lens, Convex, Concave, Homeostasis, Kidneys, Filtration |
| **HT2** |
| **HT3** | Inheritance, variation  and evolution | * Variation and evolution * Genetics | Genes, DNA, Chromosome, Allele, Mutations, Code, Zygote, Punnett square, Heterozygous, Homozygous, Natural selection, Selective Breeding, Environmental, Mendel, Inheritance |
| **HT4** | Ecology | * Living and non-living factors in an ecosystem * Adaptations * Ecosystems * Cycling of materials | Biotic, Abiotic, Community, Population, Species, Fertile, Offspring, Predator, Prey, Competition, Intraspecific, Interspecific, Carbon, Respiration, Photosynthesis, Combustion, Decomposition |
| **HT5** | Ecosystems and the impact of humans | * Biodiversity * Trophic levels in an ecosystem\* * Waste management * Land use | Deforestation, biomass, trophic levels, sustainable, biotechnology |
| **HT6** |  | | |
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|  | | **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. | |

\*Triple only

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| **Long Term Plan** | | In year 11 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. | | |
| **Learning Cycle** | **Key Concepts and Themes** | **Vocabulary** |
| **Year 11: Chemistry** | **HT1** | Chemical Changes | * 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 |
| **HT2** | 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 |
| **HT3** | 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 |
| **HT4** | Organic Chemistry & Chemical Analysis | * The chemistry of carbon compounds, including how crude oil is separated using fractional distillation and the specific nature and reactions of alkanes, alkenes, alcohols and carboxylic acids * Addition and condensation polymerisation * How various chemical tests can be used to determine unknown substances, including gases, cations and anions. | Fractional distillation, crude oil, cracking, hydrocarbon, alkane, alkene, alcohol, carboxylic acid, addition polymerisation, condensation polymerisation, amino acid, polyester, fermentation  Flame test, pure, formulation, chromatography, stationary phase, mobile phase, solvent, hydroxide, carbonate, halide, sulfate,  flame emission spectroscopy |
| **HT5** | Chemistry of the atmosphere and Using resources | * The composition of the Earth’s atmosphere and how it has developed over   time, including ancient and recent.   * Climate change * Life cycle assessments * Potable water | Composition, greenhouse gas, anthropogenic, carbon footprint, sustainable, potable water, effluent |
| **HT6** |  | | |
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|  | | **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. | |

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| **Long Term Plan** | | In year 11 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. | | |
| **Learning Cycle** | **Key Concepts and Themes** | **Vocabulary** |
| **Year 11: Physics** | **HT1** | Waves | * Transverse and longitudinal waves * Electromagnetic waves * Lenses * Emission and absorption of infra-red * Perfect black bodies and radiation | Wave, Oscillations, Perpendicular, Frequency, Amplitude, Period, Transverse, Longitudinal, Emission, Absorption, Radiation, Medium |
| **HT2** | Space | * Our solar system * Life cycle of stars * Satellites * Red shift | Star, Planet, Dwarf Planet, Red Giant, Redshift, Supernova, Black Hole, Neutron Star, Recessional Velocity, Dark Matter, Dark Energy |
| **HT3** | Magnetism | * Magnetic fields and electromagnetism * Electric motors * Loudspeakers | Magnetic Field, Attract, Repel, Electromagnet, Induce, Transformer, Motor Effect, Magnetic Flux Density, Solenoid |
| **HT4** | Revision Programme |  | |
| **HT5** | Revision Programme |  | |
| **HT6** |  | | |
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|  | | **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. | |