|  |  |
| --- | --- |
| **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** | Ecosystems and the impact of humans | * Biodiversity
* Trophic levels in an ecosystem\*
* Waste management
* Land use
 | Deforestation, biomass, trophic levels, sustainable, biotechnology |
| **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** | Classification | * Extinction
* Classification
 | , Natural disaster, New predator, Speciation, Linnaean system, Domain, Archaea, Kingdom |
| **HT5** | Exam technique development | * Past paper focus across paper 1 and 2 developing key skills required to access GCSE papers.
 | Independent, Dependant, Control, Reliable, Valid |
| **HT6** |  |
|  |
|  | **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

|  |  |
| --- | --- |
| **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** | Chemistry of the atmosphere and Quantitative Chemistry | * The composition of the Earth’s atmosphere and how it has developed over time, including ancient and recent.
* Climate change
* 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
 | Composition, greenhouse gas, anthropogenic, carbon footprint, Mole, Concentration, Avogadro’s Constant, Limiting Reactant, Concordant, Percentage Yield, Atom Economy, Relative Formula Mass, Reactant, Product  |
| **HT2** | Organic Chemistry | * 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 polymerization
 | Fractional distillation, crude oil, cracking, hydrocarbon, alkane, alkene, alcohol, carboxylic acid, addition polymerisation, condensation polymerisation, amino acid, polyester, fermentation  |
| **HT3** | Chemical Analysis | * How various chemical tests can be used to determine unknown substances, including gases, cations and anions.
 | Flame test, pure, formulation, chromatography, stationary phase, mobile phase, solvent, hydroxide, carbonate, halide, sulfate,flame emission spectroscopy |
| **HT4** | Using resources | * Obtaining reusable and finite resources, Life cycle assessments and sustainable development
* Potable water and water treatment
* Alternative methods for extracting metals such as copper
 | sustainable, potable water, effluent, sewage, finite, recycle, reuse, phytomining, bioleaching |
| **HT5** |  |  |  |
| **HT6** |  |
|  |
|  | **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 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** |  |
|  |
|  | **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.
 |