Year 10

Subject Name:	Science

Key Stage 4 - GCSE

Curriculum Intent Statement

As Science teachers, it is our intent is to provide a science curriculum, which will develop scientific knowledge, skills and conceptual understanding through the disciplines of Biology, Chemistry and Physics. Our teaching of science must encourage students to be scientifically literate, think critically about the world, so that in their futures they will recognise the impact of science on their everyday lives.

Autumn Term 1

Health and disease

- Pathogens and disease
- Preventing infections
- Viral diseases
- Bacterial diseases
- Diseases caused by fungi and Protists
- Human defence responses
- End of topic test

Vaccination

- Antibiotics and painkillers
- The discovery of penicillin
- RP: Investigating the effects of antibiotics on bacterial growth (T)
- Drugs from plants
- Developing drugs
- End of topic test

Non-communicable diseases

- Cancer
- Smoking and the risk of disease
- Diet, exercise and disease
- Alcohol and other carcinogens
- End of topic test

Autumn Term 2

Photosynthesis

- The rate of photosynthesis
- RP: investigate the effect of light intensity on the rate of photosynthesis
- How plants use glucose
- How different factors affect the rate of photosynthesis (T)
- End of topic test

Aerobic respiration

- The response to exercise
- Anaerobic respiration
- Metabolism and the liver
- End of topic test

The importance of communities

- Organisms and their environment
- Distribution and abundance
- RP: Measure the population size of a common species in a habitat
- Competition in animals
- Competition in plants
- Adapt and survive
- Adaptation in animals
- Adaptation in plants
- End of topic test

Spring Term 1

Density

- RP: calculating density of a solid and a liquid
- States of matter
- Changes of state
- Internal energy
- Specific latent heat
- Gas pressure and temperature
- Gas pressure and volume (T)
- End of topic test

Atoms and radiation

- The discovery of the nucleus
- Isotopes and radioactivity
- Alpha, beta and gamma
- Activity and half-life
- Nuclear radiation in medicine (T)
- Nuclear fission (T)
- Nuclear fusion (T)
- Nuclear issues (T)
- End of topic test

Vectors and scalars

- Forces between objects
- Resultant forces
- Centre of mass
- The parallelogram of forces
- Resolution of forces
- End of topic test

Magnetic fields (T)

- Magnetic fields of electric currents (T)
- Electromagnets in devices (T)
- The motor effect (T)
- The generator effect (T)
- The alternating current generator (T)
- Transformers (T)
- Step up and step down transformers (T)
- End of topic test

Spring Term 2

- Speed and distance time graphs
- Velocity and acceleration
- Velocity time graphs
- Analysing motion graphs
- End of topic test

- Forces and acceleration
- RP: investigate the relationship between force and acceleration
- Weight and terminal velocity
- Forces and braking
- Momentum
- Using the conservation of momentum (T)
- Impact forces (T)
- Safety in cars (T)
- Forces and elasticity
- RP: investigate the relationship between force and extension for a spring
- End of topic test

- The nature of waves
- The properties of waves
- Reflection and refraction
- RP: Investigating waves in a ripple tank
- End of topic test

- The Electromagnetic spectrum
- RP: Absorption and emission of infrared radiation
- Light, infrared, microwaves and radio waves
- Communications
- Ultraviolet, X-rays and gamma rays
- X-rays in medicine
- End of topic test

- Pressure and surfaces (T)
- Pressure in a liquid at rest (T)
- Atmospheric pressure (T)
- Upthrust and floatation (T)
- End of topic test

- Formation of the Solar system (T)
- The life history of a star (T)
- Planets, satellites and orbits (T)
- The expanding universe (T)
- The beginning and the future of the universe (T)
- End of topic test

Summer Term 1

- Electrolysis
- Changes at the electrodes
- The extraction of aluminium
- Electrolysis of aqueous solutions
- RP: Investigate electrolysis of a solution
- End of topic test

- Exothermic and endothermic reactions
- Using energy transfers from reactions
- RP: Investigating energy changes
- Reaction profiles
- Bond energy calculations
- Chemical cells and batteries (T)
- Fuel cells (T)
- End of topic test

- Rate of reaction
- Collision theory and surface area
- The effect of temperature
- The effect of concentration and pressure
- RP: Investigating the effect of concentration on the rate of reaction
- The effect of catalysts
- Reversible reactions
- Dynamic equilibrium
- Altering conditions
- End of topic test

- Hydrocarbons (T)
- Fractional distillation (T)
- Burning hydrocarbons (T)
- Cracking hydrocarbons (T)
- End of topic test

- Reactions of the alkenes (T)
- Structures of alcohols, carboxylic acids and esters (T)
- Reaction and uses of alcohol (T)
- Carboxylic acids and esters (T)
- End of topic test

Summer Term 2

- **Revision for end of year exam**

- Hydrocarbons
- Fractional distillation
- Burning hydrocarbons
- Cracking hydrocarbons
- End of topic test

- Pure substances and mixtures
- Analysing chromatograms
- Testing for gases
- Tests for positive ions (T)
- Tests for negative ions (T)
- RP: Use chemical tests to identify unknown compounds
- Instrumental analysis (T)
- End of topic test

- Addition polymerisation (T)
- Condensation polymerisation (T)
- Natural polymers (T)
- DNA (T)
- End of topic test