KS4 Curriculum Overview (Combined SCIENCE Trilogy)

YEAR 10

TERM 1 TOPIC/s	*Key Skills/Subject Links	*Career links & BV
Biology **Disease and bioenergetics:** **B6** Preventing and treating disease (continued) **B7** Non-communicable diseases **Chemistry** **Chemical reactions and energy changes:** **C6** Electrolysis (continued) **C7** Energy changes **Physics** **Particles at work:** **P4** Electric circuits	**Biology** Stages involved in testing and trialing new drugs. Evaluate the effect of lifestyle choices on diseases such as obesity, diabetes, cancer, and COPD. **Chemistry** Bond energy calculations. Identification of everyday applications of endothermic and exothermic reactions. **Physics** Circuit design. Calculations involving power, resistance p.d, current and charge flow. **Physics Link –** Ionising radiation, energy transfers. **PE Link –** Sports injuries, winter sports. **Health and Social Care –** Pregnancy. **Math Link –** subject of the formula, standard form, significant figures.	**Career links** Product design, Chrome plater, telecommunications industry. Electrician, product design, electronics, electrical engineer. **British Values** **Individual liberty:** Enforced/voluntary Isolation to prevent the spread of communicable diseases, e.g., Ebola, cholera, covid. **Rule of Law:** Regulations regarding development and use of new drugs. **Individual liberty:** Opportunity to discuss lifestyle choices and disease.

TERM 2 TOPIC/s	***Key Skills/Subject Links**	***Career links & BV**
Biology **Disease and bioenergetics:** **B7** Non-communicable diseases (continued) **B8** Photosynthesis **Chemistry** **Chemical reactions and energy changes:** **C7** Energy changes (continued) **Atoms, bonding, and moles:** **C4** Chemical calculations **Physics** **Particles at work:** **P5** Electricity in the home	**Biology** Practical skills: Investigating photosynthesis. Testing a leaf for starch. Evaluating the interaction of factors of photosynthesis. **Chemistry** Using balanced equations, to calculate reacting masses. Evaluating the effect of limiting reactants on products. Expressing concentrations. **Physics** Wiring a plug. Choosing a fuse. Comparing appliances that do the same job. **Biology Link –** Artificial heart. **Math Link –** manipulation of data, unit conversion.	**Career links** Food production industry, farming, horticulture. Pharmaceutical industry. Electrician, electrical engineer. **British Values** **Rule of Law:** Regulations regarding the National Grid and delivering energy to homes. Students follow laboratory rules for the safety of all.

TERM 3 TOPIC/s	***Key Skills/Subject Links**	***Career links & BV**
Biology **Disease and bioenergetics:** **B8** Photosynthesis (continued) **B9** Respiration **Biological responses:** **B10** The human nervous system **Chemistry** **Atoms, bonding, and moles:** **C4** Chemical calculations (continued) **Rates, equilibrium, and organic chemistry:** **C8** Rates and equilibrium **Physics** **Forces in action:** **P8** Forces in balance	**Biology** Practical skills: Investigating respiration Understanding and interpreting breathing rate and heart rate graphs. **Chemistry** Practical skills: Investigating rates of reaction. Understanding and interpreting rate of reaction graphs. Explain links between collision theory and the effect of surface area, temperature, concentration, pressure, and the effect of a catalyst. Application of Le Chatalier's Principle in equilibrium mixtures. **Physics** Application of math skills to situations where forces are in balance.	**Career links** Sports scientist, sports performance analyst, medical profession, sports medicine, personal fitness instructor. Analytical chemist, chemical manufacturer. Architect, mechanical engineer, gymnast, pilot, vehicle design. **British Values** **Rule of Law:** Students follow laboratory rules for the safety of all.

	PE Link – aerobic and anaerobic respiration, oxygen debt and lactic acid (sports performance). **Psychology Link –** The Human nervous system. **Math Link –** vectors and scalars, parallelogram of forces, resolution of forces.	
TERM 4 TOPIC/s	***Key Skills/Subject Links**	***Career links & BV**
Biology **Biological responses:** **B10** The human nervous system (continued) **B11** Hormonal coordination **Chemistry** **Rates, equilibrium, and organic chemistry:** **C8** Rates and equilibrium (continued) **Physics** **Forces in action:** **P9** Motion	**Biology** Compare the effectiveness of types of contraception. Explain and evaluate the role of artificial hormones in overcoming infertility. **Chemistry** See Term 3 above. **Physics** Drawing and interpreting motion graphs. Undertaking calculations involving velocity and acceleration. **Math Link –** calculating a gradient, area of regular shapes.	**Career links** Neurologist, Psychiatrist, Speech Pathologist. Food scientist, Environmental scientist, Analytical chemist, Pharmacologist. Forensic Road Traffic Accident Engineer, Racing car driver. **British Values** **Rule of Law:** Laws relating to age of consent, contraception, IVF, and speed limits. **Individual Liberty:** Opportunity to debate issues where students can share their opinions and listen to the views of others. For example, contraception and fertility, and the use of IVF.
TERM 5 TOPIC/s	***Key Skills/Subject Links**	***Career links & BV**

Biology **Biological responses:** **B11** Hormonal coordination (continued) **Genetics and reproduction:** **B12** Reproduction **Chemistry** **Rates, equilibrium, and organic chemistry:** **C8** Rates and equilibrium (continued) **Physics** **Forces in action:** **P9** Motion (continued)	**Biology** Construction of Punnett squares to determine sex inheritance. **Chemistry** See Term 4 above. **Physics** Drawing and interpreting motion graphs. Undertaking calculations involving velocity and acceleration.	**Career links** Agriculture, medicinal research, endocrinologist, Medical receptionist. Industrial chemist. Sonographer, midwife. **British Values** **Rule of Law:** Regulation of genetic technology engineering. **Individual Liberty:** Ethics of Genetically Modified (GM) food and Genetic engineering. **Mutual respect and tolerance:** Opportunities to consider conflict between religious beliefs and scientific understanding with respect and acceptance of people's values e.g., genetic engineering, cloning and gene editing of embryos.
TERM 6 TOPIC/s	***Key Skills/Subject Links**	***Career links & BV**
Biology **Ecology:** **B15** Adaptations, interdependence, and competition **Chemistry** **Rates, equilibrium, and organic chemistry:** **C9** Crude oil and fuels **Physics** **Forces in action:** **P10** Force and Motion	**Biology** Use of quadrats to measure the distribution of living things. **Chemistry** Carry out fractional distillation. Testing the products of combustion. Testing of unsaturated hydrocarbons. Recognise the general formula of alkanes and alkenes. **Physics** Practical skills: Investigating forces and	**Career links** Botanist, Biomedical engineer. Industrial chemist, petrochemical industry. Vehicle crash test engineer, Road safety data analyst, Car manufacturing. **British Values** **Rule of Law:** Students learn about the need to regulate road worthiness of vehicles (MOT), the need for speed limits and safety features e.g., seatbelts and airbags.

	elasticity, Graph plotting with lines of best fit. Identifying relationships between variables. **Math Link –** Mean, median and mode.	Regulations concerning oil refining and reduction of air pollution. **Mutual respect and tolerance:** The opportunity to debate the Importance of oil to society.