

## What are the aims and intentions of this curriculum?

AQA Combined Science Trilogy is taught at the Parkside Studio College as one of the core subjects at KS4. It equips students with skills and knowledge transferable to both educational and career settings and provides a worthwhile course for students of various ages and from diverse backgrounds in terms of general education and lifelong learning. The units covered in this scheme of work are unit two: chemistry, biology and physics. The knowledge and skills ascertained throughout the study of the course will prepare students for careers in STEM.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	The nervous system, hormonal coordination, homeostasis, Reproduction, Genetics,	<ul style="list-style-type: none"> <li>• Structure and function of the nervous system</li> <li>• Response to stimuli</li> <li>• Reflex action</li> <li>• Synapse</li> <li>• Homeostasis</li> <li>• Structure and function of the human endocrine system</li> <li>• Hormones</li> <li>• Control of blood glucose concentration</li> <li>• Hormones in human reproduction</li> <li>• Contraception</li> <li>• Hormones to treat infertility</li> <li>• Negative feedback mechanism</li> <li>• Sexual and asexual reproduction</li> <li>• Meiosis and sexual reproduction</li> <li>• Gametes and fertilization</li> <li>• Sex determination</li> <li>• DNA, chromosome, gene and genome</li> <li>• Genetic inheritance and inherited genetic disorder</li> <li>• Gamete, genotype, phenotype, homozygous, heterozygous, allele, dominant allele, recessive allele</li> <li>• Genetic engineering</li> <li>• Ethics and concerns about genetic engineering</li> </ul>	<p><b>Practical and enquiry skills:</b> Plan, analyses and present results from experiment relating to the nervous system</p> <p><b>Communication:</b> Role play the reflex arc</p> <p><b>Practical and enquiry skills:</b> Plan an experiment to test for diabetes and evaluate the old approach of doctors tasting urine to determine if patient has diabetes</p> <p><b>Communication:</b> Debate the ethics of contraception</p> <p><b>Scientific Communication:</b> Use models to explain the process of meiosis</p> <p><b>Scientific Communication:</b> Complete Punnett squares and genetic crosses. Interpret the results and describe the offspring.</p> <p><b>Communication:</b> Debate the ethics of genetic engineering</p> <p><b>Practical and enquiry skills:</b> Extract DNA from fruit</p> <p><b>Scientific Communication:</b> Use Punnett's squares to interpret results on progeny</p>	<p><b>Teacher:</b> End of Unit test, kerboodle test and quiz</p> <p><b>Self:</b> Past paper question, worksheet, project</p> <p><b>Peer:</b> Class worksheet, portfolio, assignment, presentations, models</p>

			<p><b>PSHE/RSE</b></p> <ul style="list-style-type: none"> <li>• Brooks Education workshop on contraception, sexual orientation and sexual health</li> <li>• Case study on the risk factors for type 2 diabetes</li> </ul> <p><b>Careers/Enrichment</b></p> <ul style="list-style-type: none"> <li>• Springpod Virtual work Experiences</li> <li>• STEM Toolkit</li> <li>• Research on STEM careers in neuroscience, genetic engineering, embryology.</li> <li>• Trip to the Science museum and natural history museum.</li> <li>• Trip to the Centre of the cell</li> <li>• STEM black history month presentation.</li> </ul>	
<p><b>Autumn 2</b></p>	<p>variation, evolution, organizing an ecosystem, biodiversity and ecosystem, forces in balance, motion, forces and motion</p>	<ul style="list-style-type: none"> <li>• Variation</li> <li>• Selective breeding</li> <li>• Evolution of species by natural selection</li> <li>• Mutations</li> <li>• Evidence for evolution – fossils and resistant bacteria</li> <li>• Extinction</li> <li>• Classification</li> <li>• Carl Linnaeus binomial system of naming organism</li> <li>• Carl Woese three domain system of classification</li> <li>• Ecosystem, community, interdependence, biotic factors, abiotic factors, competition, stable community, habitat</li> <li>• Distribution of species</li> <li>• Adaptations of organisms for survival</li> </ul>	<p><b>Practical and enquiry skills:</b> Class survey and report Measure variation in plant a species</p> <p><b>Scientific Communication:</b> Produce a model to represent selective breeding</p> <p><b>Communication: Write essay on the pros and cons of selective breeding</b></p> <p><b>Practical and enquiry skills:</b> Field investigation</p> <p><b>Scientific Communication:</b> Use models to describe material cycling</p>	<p><b>Teacher:</b> End of Unit test, kerboodle test and quiz, end of term examination</p> <p><b>Self:</b> Past paper question, worksheet, project</p> <p><b>Peer:</b> Class worksheet , portfolio, assignment, presentations, models</p>

- Extremophiles
- Levels of organization in an ecosystem
- Feeding relationship
- Material cycles
- Biodiversity
- Waste management
- Land use and deforestation
- Global warming
- Maintaining biodiversity
- Scalar and vector quantity
- Contact and non-contact forces
- Weight and gravitational field
- Calculating the weight of an object
- Resultant force
- Calculating resultant force for components acting at right angle
- Elastic and inelastic deformation
- Hooke's Law
- Distance and displacement
- Speed and velocity
- Calculating speed using formula
- Rearrange speed formula to find time or distance travelled
- Distance-Time graphs
- Acceleration
- Calculating acceleration using formula
- Velocity-Time graphs
- Equations of motion for uniform acceleration
- Falling under gravity
- Newton first law of motion
- Newton second law of motion
- Equation for newton second law of motion
- Inertial Mass
- Newton's third law of motion
- Thinking distance, braking distance, stopping distance
- Momentum
- Conservation of momentum

**Scientific Communication:** Use models and graphs to describe vector and scalar

**Practical and enquiry skills:** investigate contact and non-contact forces

**Practical and enquiry skills:** measure the weight and mass of an object and convert from mass to weight and weight to mass.

**Practical and enquiry skills:** Plan experiment to calculate speed of an object

**Practical and enquiry skills:** required practicals on acceleration

**Communication:** represent forces using diagrams

**Practical and enquiry skills:** required practical on Hooke's law

**Communication:** represent the motion of objects on graphs

**Practical and enquiry skills:** Design a parachute for free falling object

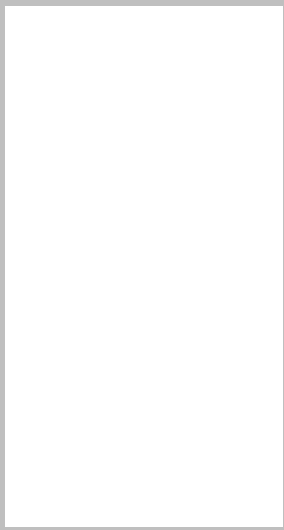
#### PSHE/RSE

- **Research the effect drugs and alcohol on thinking and stopping distances.**
- **Analyse case study on motor vehicle accidents due to drugs and alcohol use.**

#### Careers/Enrichment

- **Springpod Virtual work Experiences**
- **STEM Toolkit**
- **Science Museum**
- **Jeremy king Engineering Project**

<p><b>Spring 1</b></p>	<p>Wave properties Electromagnetic waves Magnetism Electromagnetism Crude oil and fossil fuel Chemical analysis</p>	<ul style="list-style-type: none"> <li>• Features of transverse and longitudinal waves</li> <li>• Properties of waves</li> <li>• Amplitude, frequency, period, peak, trough, wavelength</li> <li>• Wave equation</li> <li>• Electromagnetic spectrum</li> <li>• Radio waves, gamma waves, X-ray, microwaves and ultraviolet waves</li> <li>• Uses of Electromagnetic waves</li> <li>• Magnetic force</li> <li>• Magnetic material</li> <li>• Magnetic field</li> <li>• Magnetic field around a current carrying wire</li> <li>• Magnetic field around a solenoid</li> <li>• The motor effect</li> <li>• Flemming's left hand rule</li> <li>• Crude oil</li> <li>• Hydrocarbon</li> <li>• Fractional distillation</li> <li>• Flammability, boiling point, viscosity and volatility of hydrocarbons</li> <li>• Alkanes</li> <li>• Cracking</li> <li>• Alkene</li> </ul>	<p><b>Scientific Communication:</b> Draw diagram of waves</p> <p><b>Practical and enquiry skills:</b> investigate waves in a ripple tank</p> <p><b>Practical and enquiry skills:</b> find the speed of sound using echo</p> <p><b>Practical and enquiry skills:</b> investigate infrared radiation</p> <p><b>Communication:</b> draw ray diagrams</p> <p><b>Scientific Communication:</b> Research electromagnetic waves</p> <p><b>Practical and enquiry skills:</b> investigate the magnetism</p> <p><b>Practical and enquiry skills:</b> Use molymods to make models of hydrocarbons</p> <p><b>Practical and enquiry skills:</b> Investigate cracking of hydrocarbon</p> <p><b>Practical and enquiry skills:</b> investigate the products of combustion</p>	<p><b>Teacher:</b> End of Unit test, kerboodle test and quiz</p> <p><b>Self:</b> Past paper question, worksheet, project</p> <p><b>Peer:</b> Class worksheet portfolio, assignment, presentations, models</p>
<p><b>Spring 2</b></p>	<p>The Earth's atmosphere, The Earth's resources, using our resource</p>	<ul style="list-style-type: none"> <li>• Proportion of gas in the atmosphere</li> <li>• Theory on the early Earth's atmosphere</li> <li>• Greenhouse effect</li> <li>• Greenhouse gases</li> <li>• Carbon footprint</li> <li>• Atmospheric pollutants</li> <li>• Use of Earth's resources</li> <li>• Finite and infinite resources</li> <li>• Pure water and potable water</li> <li>• Sewage treatment</li> </ul>	<p><b>Scientific Communication:</b> Make models to show the proportion of gases in the atmosphere</p> <p><b>Scientific Communication:</b> Use posters to represent theories of early Earth</p> <p><b>Communication:</b> write an essay putting forward arguments for and against global climate change</p> <p><b>Practical and enquiry skills:</b> Analysis and purification of water sample</p>	<p><b>Teacher:</b> End of Unit test, kerboodle test and quiz, end of term examination</p> <p><b>Self:</b> Past paper question, worksheet, project</p> <p><b>Peer:</b> Class worksheet , portfolio,</p>



- Metal ores
- Life cycle assessment

**Communication:** research water purification

**Communication:** research metal ores and the extraction of metal from low grade ore

**Careers/Enrichment**

- Springpod Virtual work Experiences
- STEM Toolkit
- Thames water workshop
- Science museum

assignment,  
presentations, models