Year Group: 11	Subject: Combined Science	Term: Spring 2020
Topic	**Key Learning points**	**Assessment**
Biology: Exchange and transport	*End Point: To understand how exchange surfaces in mammals enable efficient exchange of substances. To understand the process of respiration and how we can measure respiration rates.* • Understand the general features of exchange surfaces to include the idea of increased surface area, a short diffusion pathway and maintenance of a concentration gradient increasing the rate of diffusion. • Know how to calculate an object's surface area:volume ratio. • Understand that smaller organisms with a large SA:V can obtain reactants for chemical processes via simple diffusion whereas the larger an organism gets the smaller the SA:V is meaning they require specialised exchange surfaces. • Know the function and constituent parts of the circulatory system. • Know the aerobic and anaerobic respiration equation. • Be able to prepare and carry out an experiment to measure the rate of respiration of different organisms. Ethical considerations for working with live organisms must be considered.	Students will be formatively assessed during each topic by past paper question end of topic tests completed in lesson time. • Students will complete a variety of consolidation homework throughout the term • After each end of topic test there will be an opportunity for students to review their understanding • Teachers will provide students with targeted feedback, based on their test performance At the end of the term students will have a summative assessment. This will be a 60-mark exam paper (20 marks from each discipline), which will be marked by their teacher.
Chemistry: Fuels and Earth's atmosphere	*End Point: To understand where and how we obtain fuels and process them for use in the modern world. To understand the composition of our current atmosphere and how it changed over time.* • Know that crude oil and natural gas are hydrocarbons formed from organic material over millions of years. • Know how the process of fractional distillation allows us to obtain more useful mixtures of hydrocarbons from crude oil. • Understand the link between hydrocarbon chain length, volatility and applications in the real world. • Know the equations for complete and incomplete combustion including how products of incomplete combustion are often undesirable. • Know the different forms or pollution given off by combustion to include the effect of greenhouse gases and acid rain. • Know the composition of the Earth's atmosphere when it first formed. • Understand the processes that lead to the Earth's atmosphere changing over millions of years.	
Physics: Particle model, forces and matter	*End Point: To understand how the particle model explains the properties of matter and what happens when energy is transferred to or from a substance. .* • Know that substances can be represented at the atomic level with the use of particle diagrams. • Understand what is meant by the term density in terms of particles and be able to calculate density given the mass and volume of an object. • Know that changes of state require energy and that this means the temperature of a substance will remain constant whilst changing state. • Understand the term specific heat capacity as the amount of energy it takes to increase the temperature of 1 kilogram of the substance by 1^0C. • Know that solids can deform in an elastic or inelastic manner if a force is applied. • Know that there is a linear relationship between force and extension of a spring until the force applied exceeds the elastic limit of the spring. • Know how to calculate the spring constant of a spring given the force applied and the extension of the spring. To be able to calculate the work done by a spring using the spring constant.	