Year 8 – Autumn Term

	BIOLOGY 8A – Nutrition & Digestion	CHEMISTRY 8E – Combustion & Oxidation	PHYSICS 8L - Fluids	BIOLOGY 8B – Plants & their Reproduction
Introduction Lesson	Introduction to laboratory practice; safety and practical skills. Overview of the philosophy of science, building empirical evidence via experimental data.			
Lesson 1 Learning intentions:	To understand what the term 'diet' means. That different species require different diets, e.g. carnivores, herbivores and omnivores. What constitutes a balanced & healthy human diet. Quick Quiz completed.	To recall the chemical definition of a 'fuel'. To know that most fuels contain carbon, and that hydrocarbon fuels are of global importance. To state the basic equation of combustion. Quick Quiz completed.	To review the three states of matter (solid, liquid & gas) and draw appropriate particle diagrams. To recall the definition of density and state several examples of high and low density materials. To complete the Quick Quiz.	To classify organisms into kingdoms based on characteristics. To explain how organisms are classified, using smaller and smaller groupings of shared characteristics. To identify the genus and species names from a binomial name.
Lesson 2 Learning intentions:	To describe a healthy diet comprising of 5 main categories – carbohydrates, proteins, lipids, fibre and vitamins. To explain the idea of energy balance and the problems of imbalance such as malnutrition and obesity.	To describe combustion as an oxidation reaction. Students will see a demonstration of the combustion giving chemical proof for the products of combustion. To recall the chemical tests for carbon dioxide and water.	To retain and apply the density equation. To know the SI units of density and perform simple density calculations. To successfully convert units of density, mass and volume into SI units. To describe how volume and mass of simple shapes are calculated.	To use a sample to calculate an estimate of population size. To plan an appropriate sample size. To explain the effects of too small and too big a sample size.

Lesson 3 Learning intentions:	To demonstrate how the three main food groups (fats, proteins and carbohydrates) can be detected using chemical analysis in the lab. To describe what both a positive and negative test result looks like and what the result implies about the chemical profile of the food tested.	To describe how metals react with oxygen, and recall common examples such as rusting. Students will conduct an experiment to determine the mass increase from combusting magnesium with oxygen. To state the chemical equation for producing magnesium oxide.	To describe changes of state using key science vocabulary. To know that state changes are both temperature and pressure dependent. To describe some common examples of state changes. To recall the SI unit of temperature and explain its molecular basis using the particle model.	To describe the main features of asexual and sexual reproduction To explain how inherited variation is caused (does not include genes). To explain the difference in outcomes of asexual and sexual reproduction in plants.
Lesson 4 Learning intentions:	To know what units of energy are used in food labels. To describe how a bomb calorimeter works to calculate the energy in foods. To know the diseases of vitamin/mineral deficiency and excess.	To understand fire safety in the home. To state and explain the fire triangle. To explain how various fire extinguishing methods work. To watch an example of a chip pan fire incorrectly extinguished.	To comprehend that a pure substance has a sharp melting & boiling point. To identify the points of state transition of a cooling curve. To be able to draw and label a cooling curve. To recognise that impure substances change state over a range of temperatures.	To describe how the structures of a flower are adapted to their functions. To describe how plants avoid self-pollination. To explain why plants try to avoid self-pollination. To explain how some pollen grains are adapted to their functions.
Lesson 5 Learning intentions:	To describe the main organs of digestion and their contribution to the digestive process. To be able to explain the sites of absorption for nutrient molecules and water. To look at some conditions of malabsorption.	To describe the difference between complete and incomplete combustion. To know that incomplete combustion produces all the products of complete combustion plus soot and carbon	To examine the ice-water anomaly of density. Students should be able to give a description for this using the particle model. To begin to comprehend the term 'latent heat' as applied to state change. To know that melting point	To explain the functions of the different parts of a seed.

		monoxide. To describe how carbon monoxide is dangerous and how it can be detected in the home.	analysis can identify a chemical substance.	
Lesson 6 Learning intentions:	To be able to state the definition of an enzyme. To know why enzymes are needed in digestion. To describe the role of three stated enzymes in the digestion of starch, proteins and lipids and how they enable large and insoluble foods to become small and soluble molecules that can be absorbed into the blood.	Students should describe how the impurities in hydrocarbon fuels cause air pollution. To state that sulphur dioxide and nitrogen oxides can cause acid rain, smog and impair health. To explain how catalytic converters in vehicles reduce the emission of these gasses.	To describe pressure in a fluid using SI units. To be able to convert between common SI units of pressure. To describe how simple altimeters and barometers function, plus the utility of barometers in predicting weather conditions. To know weather is partly dependent of atmospheric pressure. To recall the use oh hydraulic and pneumatic pressure.	To explain the importance of seed dispersal. To evaluate different methods of seed dispersal.
Lesson 7 Learning intentions:	This is a laboratory lesson examining by experimentation the effect of three variables (temperature, pH and concentration) on the rate of starch breakdown by the enzyme amylase. Students should know how the internal condition of the body is optimised to maintain the rate of starch breakdown at maximum.	To look at the effect on the climate of greenhouse gasses, particularly carbon dioxide, from burning fossil fuels. To describe how carbon dioxide acts as a greenhouse gas. To be able to state some strategies to mitigate the deleterious effects of greenhouse gas emissions, and reduce the amount produced.	To describe why certain objects float and sink in water. Students should be able to define the term 'displacement' as relating to floating or sinking. To study the development of boats and be able to explain how an iron boat can float. To describe the utility of a Plimsoll line on boats. To describe how hot-air balloons float in air.	
Lesson 8 Learning intentions:	Students should be able to describe how the small	This lesson uses the topic of climate change and	This lesson looks at drag and the physical basis of it.	

	intestine is adapted to absorb nutrient molecules through anatomical modifications of its surface. To explain the role of bile in lipid absorption. To examine the anatomy of the gallbladder and liver.	greenhouse gas emissions as a segway into climate science. Students should be able to distinguish high quality data from low quality data; the peer-reviewed article is used as a gold standard of quality. Students should be able to distinguish between independent, dependent and control variables in an experiment.	To be able to state what drag is and state some examples of drag. To know what a drag co-efficient is and how to calculate a simple co-efficient. To explain how the shape of objects subject to drag can be altered to either increase or decrease drag. To be able to describe how the surface area of an object relates to its drag co-efficient.	
Lesson 9 Learning Intentions:	To be able to state the definition of diffusion and how nutrients move through the intestinal wall into the blood via diffusion. To know how the circulatory system delivers nutrient molecules to the tissues and the role of diffusion in that process.	Extended writing task designed to integrate the learning journey into a unified whole. The task is to compare and contrast the benefits and disadvantages of fuel cells to power vehicles, compared to a conventional internal combustion engine.	Extended writing task designed to integrate the learning journey into a unified whole. This task uses The Titanic as a model object and the student must describe why it floated and how it sunk, using all the key concepts investigated in this unit.	
Lesson 10 Learning intentions:	Extended writing task designed to integrate the learning journey into a unified whole - 'Journey of a cheese sandwich'.	Self-differentiated revision tasks to aid consolidation of the units' core material. Teacher-led summary of threshold concepts. End of topic repeat of 'Quick Quiz' to check progression.	Self-differentiated revision tasks to aid consolidation of the units' core material. Teacher-led summary of threshold concepts. End of topic repeat of 'Quick Quiz' to check progression.	

| Lesson 11 Learning intentions: | Self-differentiated revision tasks to aid consolidation of the units' core material. Teacher-led summary of threshold concepts. End of topic repeat of 'Quick Quiz' to check progression. | No lesson 11 in this unit. | No lesson 11 in this unit. | |