

**Year 8 – Autumn Term**

	<b>PHYSICS</b> <b>7L Sound</b>	<b>BIOLOGY</b> <i>8A – Nutrition &amp; Digestion</i>	<b>CHEMISTRY</b> <i>8E – Combustion &amp; Oxidation</i>	<b>PHYSICS</b> <i>8L - Fluids</i>	<b>BIOLOGY</b> <i>8B – Plants &amp; their Reproduction</i>
<b>Intro Lesson</b>	Introduction to laboratory practice; safety and practical skills. Overview of the philosophy of science, building empirical evidence via experimental data.				
<b>Lesson 1 Learning intentions:</b>	<p><b><u>Moving Sounds</u></b></p> <p>Recognise that all matter consists of particles.</p> <p>Recall that sound travels through different materials by vibrations, and needs a medium.</p> <p>State the meaning of pitch, volume, intensity, frequency, amplitude.</p> <p>Describe how a sound changes as you get further from the source</p> <p>Use a model incorporating the idea of vibrations to explain how sound travels through different materials.</p> <p>Use the terms frequency, amplitude, speed to describe waves.</p> <p>Recall that waves transfer energy</p>	<p>To understand what the term 'diet' means.</p> <p>That different species require different diets, e.g. carnivores, herbivores and omnivores.</p> <p>What constitutes a balanced &amp; healthy human diet. Quick Quiz completed.</p>	<p>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.</p>	<p>To review the three states of matter (solid, liquid &amp; 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.</p>	<p>To classify organisms into kingdoms based on characteristics.</p> <p>To explain how organisms are classified, using smaller and smaller groupings of shared characteristics.</p> <p>To identify the genus and species names from a binomial name.</p>

	<p>without transferring matter. Explain why sounds are fainter further from the source in terms of the waves spreading out.</p> <p>Evaluate the use of a slinky as a model for sound waves.</p> <p>Explain why the intensity of sound decreases with increasing distance from a source in terms of the energy dissipating.</p>				
<p><b>Lesson 2 Learning intentions:</b></p>	<p><b><u>Speed of sound</u></b></p> <p>Identify a solid, liquid or gas from the arrangement of particles.</p> <p>Recall that sound does not travel as quickly as light.</p> <p>Draw the arrangement of particles in a solid, liquid and gas.</p> <p>Describe how fast sound is transmitted by solids, liquids, gases.</p> <p>Use quantitative data to compare the speed of sound in solids, liquids, gases.</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>

	<p>Calculate the speed of sound from data about echoes.</p> <p>Apply knowledge of sound to new situations.</p>				
<p><b>Lesson 3</b></p> <p><b>Learning intentions:</b></p>	<p><b><u>Detecting sound</u></b></p> <p>Recall that human hearing can be damaged by loud sounds.</p> <p>Name the parts of the ear.</p> <p>Describe the functions of the parts of the ear.</p> <p>Describe how microphones convert sound into electrical signals.</p> <p>Explain how human hearing can be damaged by sound.</p> <p>Explain how animals can detect the direction from which a sound is coming.</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>	<p>To describe the main features of asexual and sexual reproduction</p> <p>To explain how inherited variation is caused (does not include genes).</p> <p>To explain the difference in outcomes of asexual and sexual reproduction in plants.</p>
<p><b>Lesson 4</b></p> <p><b>Learning intentions:</b></p>	<p><b><u>Sound Proofing</u></b></p> <p>Recall that sounds can be detected by sound meters and microphones.</p> <p>Compare how sounds travel</p>	<p>To know what units of energy are used in food labels. To describe how a bomb calorimeter works to</p>	<p>To understand fire safety in the home. To state and explain the fire triangle. To explain how various fire extinguishing</p>	<p>To comprehend that a pure substance has a sharp melting &amp; boiling point. To identify the points of state transition of a</p>	<p>To describe how the structures of a flower are adapted to their functions.</p>

	<p>through different materials.</p> <p>Recall the units for loudness.</p> <p>Evaluate different materials used for soundproofing/sound insulation.</p>	<p>calculate the energy in foods.</p> <p>To know the diseases of vitamin/mineral deficiency and excess.</p>	<p>methods work.</p> <p>To watch an example of a chip pan fire incorrectly extinguished.</p>	<p>cooling curve.</p> <p>To be able to draw and label a cooling curve.</p> <p>To recognise that impure substances change state over a range of temperatures.</p>	<p>To describe how plants avoid self-pollination.</p> <p>To explain why plants try to avoid self-pollination.</p> <p>To explain how some pollen grains are adapted to their functions.</p>
<p><b>Lesson 5 Learning intentions:</b></p>	<p><b><u>Using Sounds</u></b></p> <p>Recall that different animals have different hearing ranges.</p> <p>State the meaning of: ultrasound, infrasound.</p> <p>Describe some uses of ultrasound.</p> <p>State the meaning of: absorb, transmit, reflect</p> <p>Explain how sonar and echolocation work.</p> <p>Calculate depth or distance from time and velocity of ultrasound</p>	<p>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.</p>	<p>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 monoxide. To describe how carbon monoxide is dangerous and how it can be detected in the home.</p>	<p>To examine the ice-water anomaly of density. Students should be able to give a description for this using the particle model.</p> <p>To begin to comprehend the term 'latent heat' as applied to state change.</p> <p>To know that melting point analysis can identify a chemical substance.</p>	<p>To explain the functions of the different parts of a seed.</p>
<p><b>Lesson 6 Learning</b></p>	<p><b><u>Comparing Waves</u></b></p>	<p>To be able to state the definition of an enzyme. To</p>	<p>Students should describe how the impurities in hydrocarbon</p>	<p>To describe pressure in a fluid using SI units. To be able</p>	<p>To explain the importance of seed dispersal.</p>

<p><b>intentions:</b></p>	<p>State the meaning of: transverse wave, longitudinal wave.</p> <p>Recall what sort of waves sound waves and waves on water are.</p> <p>Recall that waves transfer energy without transferring matter.</p> <p>Model transverse and longitudinal waves.</p> <p>Compare longitudinal and transverse waves.</p> <p>State the meaning of superposition, and give examples.</p> <p>Compare quantitatively how the intensity of sound waves and waves on water decrease with increasing distance from the source.</p>	<p>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.</p>	<p>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.</p>	<p>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 of hydraulic and pneumatic pressure.</p>	<p>To evaluate different methods of seed dispersal.</p>
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<p><b>Lesson 7 Learning intentions:</b></p>		<p>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.</p>	<p>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.</p>	<p>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.</p>	
<p><b>Lesson 8 Learning intentions:</b></p>		<p>Students should be able to describe how the small 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.</p>	<p>This lesson uses the topic of climate change and 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,</p>	<p>This lesson looks at drag and the physical basis of it. To be able to state what drag is and state some examples of drag. To know what a drag coefficient is and how to calculate a simple coefficient. To explain how the shape of objects subject to drag can be altered to either increase or decrease drag.</p>	

			dependent and control variables in an experiment.	To be able to describe how the surface area of an object relates to its drag co-efficient.	
<b>Lesson 9 Learning Intentions:</b>		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.	
<b>Lesson 10 Learning intentions:</b>		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.	
<b>Lesson 11 Learning intentions:</b>		Self-differentiated revision tasks to aid consolidation of the units' core	No lesson 11 in this unit.	No lesson 11 in this unit.	

		material. Teacher-led summary of threshold concepts. End of topic repeat of 'Quick Quiz' to check progression.			
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