Science Year 11 – Summer Term 2021/2022

	What? **When?** **Why?**			
	PHYSICS **P14&15 Particle Model**	**BIOLOGY** **Revision**	**CHEMISTRY** **Revision**	**PHYSICS** **Revision**
Lesson 1 Learning intentions	**<u>Particles & density</u>** Use a simple kinetic theory model to explain the different states of matter (solids, liquids and gases) in terms of the movement and arrangement of particles. Recall and use the equation: density (kilograms per cubic metre, kg/m3) = mass (kilograms, kg) ÷ volume (cubic metres, m3) ρ = m/V Explain the differences in density between the different states of matter in terms of the arrangements of the atoms or molecules.	Revision will be student lead	Revision will be student lead	Revision will be student lead
Lesson 2 Learning intentions	**<u>Core Practical</u>** Core practical: Investigate the densities of solid and liquids.			

Lesson 3 Learning intentions	**<u>Energy and changes of state</u>** Use a simple kinetic theory model to explain the different states of matter (solids, liquids and gases) in terms of the movement and arrangement of particles. Describe that when substances melt, freeze, evaporate, boil, condense or sublimate mass is conserved and that these physical changes differ from some chemical changes because the material recovers its original properties if the change is reversed			
Lesson 4 Learning intentions	**<u>Specific Latent heat</u>** Explain how heating a system will change the energy stored within the system and raise its temperature or produce changes of state. Define the terms specific heat capacity and specific latent heat and explain the differences between them Use the equation: thermal energy for a change of state (joules, J) = mass (kilogram, kg) × specific latent heat (joules per kilogram, J/kg)			

	$Q = m \times L$			
Lesson 5 Learning intentions	**Specific heat capacity** Use the equation: change in thermal energy (joules, J) = mass (kilogram, kg) × specific heat capacity (joules per kilogram degree celsius, J/kg °C) × change in temperature (degree celsius, °C) $\Delta Q = m \times c \times \Delta\vartheta$ Explain ways of reducing unwanted energy transfer through thermal insulation.			
Lesson 6 Learning intentions	**Core Practical** Core Practical: Investigate the properties of water by determining the specific heat capacity of water and obtaining a temperature-time graph for melting ice.			
Lesson 7 Learning intentions	**Gas Pressure** Explain the pressure of a gas in terms of the motion of its particles			
Lesson 8 Learning intentions	**Gas Temperature** Explain the effect of changing the temperature of a gas on the velocity of its particles and hence on the pressure produced by a			

	fixed mass of gas at constant volume (qualitative only) Describe the term absolute zero, −273 °C, in terms of the lack of movement of particles. Convert between the kelvin and Celsius scales.			
Lesson 9 Learning intentions	**<u>Bending and stretching</u>** Explain, using springs and other elastic objects, that stretching, bending or compressing an object requires more than one force. Describe the difference between elastic and inelastic distortion.			
Lesson 10 Learning intentions	**<u>Extension & energy transfers</u>** Recall and use the equation for linear elastic distortion including calculating the spring constant: force exerted on a spring (newton, N) = spring constant (newton per metre, N/m) × extension (metres, m) $F = k \times x$ Use the equation to calculate the work done in stretching a spring: energy transferred in stretching (joules, J) = 0.5 × spring constant			

	(newton per metre, N/m) × (extension (metres, m))^2 $E = ½ \times k \times x^2$ Describe the difference between linear and non-linear relationships between force and extension			
Lesson 11 Learning intentions	**<u>Core Practical</u>** Core Practical: Investigate the extension and work done when applying forces to a spring.			