

Year 9 Science Long Term Plan

Term	Biology Intent	Biology Content	Chemistry Intent	Chemistry Content	Physics Intent	Physics Content	Method of assessment
1, 2 & 3	Cells are the basic unit of all forms of life.	In this section we explore how structural differences between types of cells enables them to perform specific functions within the organism. These differences in cells are controlled by genes in the nucleus. For an organism to grow, cells must divide by mitosis producing two new identical cells. If cells are isolated at an early stage of growth before they have become too specialised, they can retain their ability to grow into a range of different types of cells. This phenomenon has led to the development of stem cell technology. This is a new branch of medicine that allows doctors to repair damaged organs by growing new tissue from stem cells.	The periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties.	The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time as new evidence emerges. The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels. This units takes students prior knowledge from years 7 & 8 on particle arrangements to a greater depth and feeds forward to all further units.	The concept of energy emerged in the 19th century. The idea was used to explain the work output of steam engines and then generalised to understand other heat engines. It also became a key tool for understanding chemical reactions and biological systems.	Limits to the use of fossil fuels and global warming are critical problems for this century. Physicists and engineers are working hard to identify ways to reduce our energy usage. This topic builds on students prior learning on energy from year 7 & 8 and adds a mathematical reasoning component to it and feeds forward to the Particle Model and Waves unit in Year 10 and 11.	<ul style="list-style-type: none"> • Extended examination question for each discipline. • End of unit test for each discipline.

		This takes students prior knowledge on cells from year 7 & 8 to greater depths and feeds forward to the Variation and Evolution unit in Year 11.					
4, 5 & 6	In this section we will learn about the human digestive system which provides the body with nutrients and the respiratory system that provides it with oxygen and removes carbon dioxide.	In each case they provide dissolved materials that need to be moved quickly around the body in the blood by the circulatory system. Damage to any of these systems can be debilitating if not fatal. Although there has been huge progress in surgical techniques, especially with regard to coronary heart disease, many interventions would not be necessary if individuals reduced their risks through improved diet and lifestyle. We will also learn how the plant's transport system is dependent on environmental conditions to ensure that leaf cells are provided with the water and carbon dioxide that they need for photosynthesis.	Energy changes are an important part of chemical reactions.	The interaction of particles often involves transfers of energy due to the breaking and formation of bonds. Reactions in which energy is released to the surroundings are exothermic reactions, while those that take in thermal energy are endothermic. These interactions between particles can produce heating or cooling effects that are used in a range of everyday applications. Some interactions between ions in an electrolyte result in the production of electricity. Cells and batteries use these chemical reactions to provide electricity. Electricity can also be used to decompose ionic substances and is a	Electric charge is a fundamental property of matter everywhere.	Understanding the difference in the microstructure of conductors, semiconductors and insulators makes it possible to design components and build electric circuits. Many circuits are powered with mains electricity, but portable electrical devices must use batteries of some kind. Electrical power fills the modern world with artificial light and sound, information and entertainment, remote sensing and control. The fundamentals of electromagnetism were worked out by scientists of the 19th century. However, power stations, like all machines, have a limited lifetime. If we all continue to demand more	<ul style="list-style-type: none"> • Extended examination question for each discipline. • End of unit test for each discipline.

		<p>This unit takes students greater knowledge of cells and uses it explain how the body supplies materials and removes waste products from cells. This feeds forward to the Homeostasis unit in Year 11.</p>		<p>useful means of producing elements that are too expensive to extract any other way. This units takes students knowledge of chemical reactions and introduces a mathematical aspect to it. This feeds forward to the Rates of Reaction unit and Chemical Changes unit in Year 10.</p>		<p>electricity this means building new power stations in every generation – but what mix of power stations can promise a sustainable future? This unit takes prior knowledge on energy and looks at how electrical energy is produced to enable everyday life to continue. this feeds forward to the Magnetism unit in Year 11.</p>	
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