

**EMMANUEL COLLEGE**  
**THE SCIENCE DEPARTMENT**

Year 8



<b>Year 8</b>	<b>Autumn Term</b>	<b>Spring Term</b>
<b>Unit Title</b>	Genes and Evolution	Ecosystems and Biological Processes
<b>Key Question(s)?</b>	What causes variation between organisms?	How do different organisms relate to and depend on one another?
<b>Threshold Concepts</b>	<p>There is variation between individuals of the same species. Some variation is inherited, some is caused by the environment, and some is a combination.</p> <p>Natural selection is a theory that explains how species evolve and why extinction occurs.</p> <p>Inherited characteristics are the result of genetic information, in the form of sections of DNA called genes, being transferred from parents to offspring during reproduction.</p>	<p>Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others.</p> <p>Plants and algae do not eat but use energy from light together with carbon dioxide and water to make glucose (food) through photosynthesis. They either use the glucose as an energy source, to build new tissue, or store it for later use.</p> <p>Respiration is a series of chemical reactions, in cells, that breaks down glucose to provide energy and form new molecules. Most living things use aerobic respiration but switch to anaerobic respiration, which provides less energy, when oxygen is unavailable.</p>
<b>Link to Prior Learning</b>	This unit builds on the knowledge on reproduction in humans which was introduced in Year 7.	This unit builds on the genes and evolution unit by looking at how variations across organisms affect ecosystems.
<b>Knowledge and Sequencing Rationale</b>	<p>In Year 8 we build on the core concepts that were introduced in Year 7. In Chemistry, we build on the nature of matter by looking at the chemical changes that take place based on the rearrangement of atoms. In Biology, we look at the variation of multicellular organisms, the causes of this variation and then focus on two of the most important biological processes that are used by multicellular organisms to survive. In Physics, we build on energy transfers by looking at the idea of waves. We build on electricity and forces by looking at the nature of electromagnetism and role of gravity in our solar system. In Year 8 we also introduce some more difficult ideas which help students make the transition to GCSE. This includes looking at genes in Biology, reaction properties in Chemistry and wave properties in Physics. In Year 8 we continue to alternate between the three subject areas of science every six weeks so as not to hit cognitive overload. At the end of each six-week topic, a week of study is dedicated to revision, recap and formative feedback.</p>	