

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

Year 8



| <b>Year 8</b>                             | <b>Autumn Term</b>   | <b>Spring Term</b>   |
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| <b>Unit Title</b>                         | Reactions 1  | Reactions 2  |
| <b>Key Question(s)?</b>                   | How are some chemicals classified in terms of their acidity and how do metals react?   | How do different substances react and interact with one another? What are some of the reactions that take place in everyday life and in natural processes?   |
| <b>Threshold Concepts</b>                 | <p>The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids.</p> <p>Mixing an acid and alkali produces a chemical reaction, neutralisation, forming salt and water.</p> <p>Acids have a pH below 7, neutral solutions have a pH of 7, alkalis have a pH above 7.</p> <p>Metals are good conductors of thermal energy, electrical energy and have high melting and boiling points. The reactivity of a metal can be described in terms of the reactivity series and its tendency to react with oxygen, water and acids.</p>  | <p>During a chemical reaction bonds are broken (requiring energy) and new bonds formed (releasing energy). If the energy released is greater than the energy required, the reaction is exothermic. If the reverse, it is endothermic.</p> <p>Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the earth's crust (such as photosynthesis and respiration) as well as human activities (burning fuels).</p> <p>Most metals are found combined with other elements, as a compound, in ores. The more reactive a metal, the more difficult it is to separate it from its compound.</p> |
| <b>Link to Prior Learning</b>             | Students will have used the particle model in Year 7 to see how atoms can rearrange during chemical reactions. This topic provides some examples of this.  | Students will have used the particle model in Year 7 to see how atoms can rearrange during chemical reactions. This topic provides some examples of this.  |
| <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 the variation of multicellular organisms, the causes of this variation and then focus 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 how 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.</p> <p>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> |  |