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| Year 11 Triple | **Topic: GCSE B7 - Ecology**  **GCSE C7 – Organic Chemistry**  **GCSE P6 – Waves**  **Period:** Autumn 1 |
| **Overview of topic:**  **B7 -** Ecosystems is the overriding theme of this topic. Students will look at the factors that affects organisms, biotic and abiotic, explaining how these impact on populations. Students will also learn how different organisms are adapted to different environments. Students will learn about the distribution of organisms and will investigate how to sample plants in a given area, explaining how factors may affect their distribution. Cycles will also be covered looking at the water cycle and nitrogen cycle. The topic will then move into discussions around biodiversity and the human impact on ecosystems and global warming. There will be a final focus on the positive impact that humans can have on ecosystems. Biology Only students will also study decomposition including an additional required practical investigating the effect of temperature on decomposition. The impact of environmental change will also be discussed. Students will also learn about trophic levels within an ecosystem and biomass. Finally, students will also learn about food production including food security and farming techniques including the role of biotechnology.  C7 - Students are introduced to crude oil, hydrocarbons and alkanes in this topic. Once a basic understanding has been gained students will then move into explaining how crude oil is separated through fractional distillation and describing how each fraction is used. Students will also be able to explain the trend in boiling points, viscosity and flammability of hydrocarbons. The cracking of hydrocarbons is also introduced where students also gain an understanding of alkenes. Students following the Chemistry Only pathway will also study the reactions of alkenes, alcohols and carboxylic acids. Students will also study polymers looking into addition polymerisation, condensation polymerisation and amino acids. DNA as a polymer will also be discussed.  P6 - Building on previous knowledge students will begin with transverse and longitudinal waves, looking into the properties of these waves calculating period and wave speed. Here there is a required practical using a ripple tank to measure the frequency, wavelength and speed of a wave. This topic will then move into electromagnetic waves containing a required practical investigating infrared radiation absorption. The uses and properties of all electromagnetic waves will be discussed within this topic. For Physics Only students there is further knowledge of the reflection of waves including an additional required practical investigating the reflection of light at different surfaces. There is also a further focus on sound waves and their uses. Additionally, there is more focus on visible light and lenses. Finally black body radiation is introduced. Students studying Biology Only will also discuss the advantages and disadvantages of sexual and asexual reproduction. There is also deeper knowledge of DNA structure learnt including protein synthesis. These students will also learn about cloning, the theory of evolution, speciation and an understanding of genetics. | |
| **Key** **knowledge:**  B7 – the cycling of nutrients within an ecosystem.  C7 – the basics of crude oil being used as a fuel stock.  P6 – the principles of waves and their uses specifically in communication and medicine.  **Key vocabulary:**   |  |  | | --- | --- | | **Tier 2** | **Tier 3** | | **Translate**  **Random**  **Abundance**  **Adapt**  **Transferred**  **Compost**  **Sustainable**  **Security**  **Fisheries**  **Modification** | **Interdependence**  **Prefix – bio**  **Quadrat**  **Combustion**  **Detritivore**  **Decay**  **Methane**  **Conservation**  **Pollution**  **Pollutant**  **Greenhouse Effect**  **Biomass** | | **Flammable**  **Addition** | **Crude**  **Fraction**  **Polymer**  **Combustion**  **Homologous**  **Carboxylic acid**  **Polymer**  **Condense** | | **Frequency**  **Application** | **Longitudinal**  **Wavelength**  **Transverse**  **Medium**  **Transmits** | | **Key skills:**  ***Know how to…***  ***B7 – Use quadrats and collect data to then make estimates.***  ***C7 – How to perform simple distillation.***  ***P6 – How to evaluate the uses and dangers of EM waves.*** |
| **Co-curricular opportunities:**  **B7 – An understanding of conservation and protection of species.**  **P6 – An understanding of the uses of waves in medical treatments.** | **Key reading skills taught are questioning and summarising and key texts:**  **B7- Conservation projects**  **C7 – Uses of alkanes and alkenes**  **P5 – Uses of EM waves**  **Wider Reading Opportunities/Links:**  **B7 -** [**https://www.wwf.org.uk/learn/wildlife/endangered-animals**](https://www.wwf.org.uk/learn/wildlife/endangered-animals)  **C7 -** [**https://en.wikipedia.org/wiki/Environmental\_impact\_of\_the\_petroleum\_industry**](https://en.wikipedia.org/wiki/Environmental_impact_of_the_petroleum_industry)  **P6 -** [**https://www.explainthatstuff.com/microwaveovens.html**](https://www.explainthatstuff.com/microwaveovens.html) |
| **How can I use this information at home?**   * Conversation starters with your children to discuss their learning * Support your child in carrying out independent research around the topic * Visit your local library (or BorrowBox), museums, or other locations to explore the topic * Promote books/other texts that explore this topic (see reading section) * Help your child to learn the key vocabulary | |