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| **What will we be learning?****Year 13 Manipulating Genomes** | **Why this? Why now?**Previous Learning Future Learning Enquiry ProcessesAnalyse Patterns, Draw conclusions, Present data, Justify opinions, Collect data, Present data, Plan variables | **Key Words:****Amplification****Annealing****complementary DNA****DNA fingerprinting** **DNA hybridisation****DNA ligase****DNA ligase****DNA polymerase****DNA sequencing****Gel electrophoresis****Gene cloning****Gene marker****Gene probe****Gene therapy****Genetic screening****Genome****Hydrogen bond****in vitro cloning****in vivo cloning:** **Microsatellite****Palindrome****PCR (polymerase chain reaction)****Personalised medicine****Plasmid****Primers****Proteome****Recognition site****Recombinant DNA** **Restriction endonuclease****Restriction mapping****Reverse transcriptase****Reverse transcription****Sticky ends****Transformation****Vector** |
| **What will we learn?*** The principles of DNA sequencing and the development of new DNA sequencing techniques
* How gene sequencing has allowed for genome-wide comparisons between individuals and between species
* How gene sequencing has allowed for the sequences of amino acids in polypeptides to be predicted
* How gene sequencing has allowed for the development of synthetic biology
* The principles of DNA profiling and its uses
* The principles of the polymerase chain reaction (PCR) and its application in DNA analysis
* The principles and uses of electrophoresis for separating nucleic acid fragments or proteins
* The principles of, and techniques used in, genetic engineering
* The ethical issues (both positive and negative) relating to the genetic manipulation of animals (including humans), plants and microorganisms
* The principles of, and potential for, gene therapy in medicine

**Misconceptions in this topic** |
| **What opportunities are there for wider study?**CareersAgriculture Audiology Biochemistry Biotechnology Brewing Dentistry Dietetics Ecology Environmental Health Environmental science Fisheries Work Food Science Forensics Horticulture Laboratory Work Marine Biology Medicine Nursing Occupational Therapy Opthalmics and Orthoptics Paramedical Science Pharmacology Physiotherapy Prosthetics and Orthotics Psychiatry Radiography Speech Therapy Sports Science Teaching Veterinary Work ZoologySTE(A)M https://highcliffe.sharepoint.com/sites/LearnSTEM |
| **How will I be assessed?**End of topic assessment  |