




YEAR 13 TERM 1

'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Application of reproduction and genetics

Curriculum Intent	
Skills/National Curriculum Links	<p>Developing knowledge from GCSE Biology or GCSE Combined Science, pupils will be taught, following National Curriculum guidelines, the following this topic:</p> <ul style="list-style-type: none"> • The Human Genome Project and the 100K project • DNA sequencing in non-humans • Genetic fingerprinting • Genetic engineering • Genetically modified crops • Genetic screening • Gene therapy • Tissue engineering • Stem cells
Spiritual, moral, social, and cultural development	<p>SMSC: Ethics of genetic fingerprinting, gene therapy, genetic screening of pregnancy, Henrietta Lacks and the creation of stem cell lines without consent</p> <p>PSHE/British Values: Genetics vs insurance companies,</p> <p>Skills Builder: Practical work, independent investigation, data handling and analysis</p>
Numeracy	Base sequence analysis
Literacy	<p>Vocabulary Tier 2: malaria, embryo screening, DNA fingerprinting, DNA profiling, genetic engineering, stem cell, scaffold,</p> <p>Vocabulary Tier 3: genome, Sanger sequencing, nucleotide triphosphate, electrophoresis, polymerase chain reaction (PCR), DNA polymerase, transform, transgenic, recombinant DNA, vector, restriction enzymes, sticky ends, introns, plasmid, reverse transcriptase, clone, gene therapy, genetic screening, somatic cell therapy, Germ-line therapy, tissue engineering,</p> <p>Reading: Students are given opportunity to develop their skills in specified tasks that develop disciplinary literacy. Throughout the A Level Biology course they develop their understanding of the requirements of exam questions and the key terminology in questions. In addition, they read practical methodology and translate this to actions in laboratory tasks.</p> <p>Writing: Students construct answers independently and through class teaching. Their answers range from single word answers to the planning and writing of 9-mark "extended writing" tasks that require linking of multiple concepts from a topic or across topics. These often develop students' ability to construct written evaluations of contrasting situations, or data, where the use of comparative connectives are required.</p> <p>Oracy: Students are regularly given the opportunity to practice their scientific vocabulary in class discussion, through choral response, pair or group discussion and in giving instruction to others during practical activities.</p>
Becoming future ready	<p>Careers/Employability: A Level Biology students from Crompton House progress on to a wide range of undergraduate degrees, degree apprenticeships and into work. Opportunities to develop effective communication skills, concise written work, following written and verbal instructions as well as extending their problem solving skills are all key skills identified by business leaders for future success.</p>
Adaptation	Throughout this topic, quality first teaching will provide adaptive teaching accessible to all students:
QFT/SEND Provision	<p>By product: Assessments have opportunities for students to achieve all grades, with structured questions and opportunities for development of extended writing for all abilities.</p> <p>By Intervention: by providing different levels of supervision and support in theory and in practical lessons.</p> <p>By Progressive Questioning: exploring pupils' understanding through interactive dialogue.</p> <p>By Grouping: according to prior attainment, gender, social preference.</p> <p>By Task: Pupils are involved in the identification of targets which are meaningful to them and in the selection of an appropriate task to develop specific skills further.</p> <p>By Offering Optional Activities: In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>

Implementation Curriculum Delivery	 <p>To be able to:</p> <ul style="list-style-type: none"> • Describe the aims and achievements of the Human Genome and 100K projects • Describe the ethical concerns surrounding the use of this knowledge • Describe the potential of sequencing DNA from non-human organisms • Describe the processes and limitations of genetic fingerprinting and the polymerase chain reaction • Describe the role and impact of genetic profiling in society • Describe the use of recombinant DNA technology in bacteria • Describe examples of genetically modified crops and issues surrounding their use • Discuss the ethical issues surrounding gene therapy • Discuss the uses of genomics in healthcare and the implications for its use in the future • Describe the use of stem cells and their use in tissue engineering • Describe the ethical issues surrounding the use of stem cells <p>Red denotes interleaving; aspects of knowledge covered previously.</p>
Learning Outcomes (Knowledge)	
Current learning to be developed in the future within:	Biochemistry, biology, bioinformatics, biomedical sciences degree courses!
Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.