



Lessons Sequence						
<b>TOPIC (S)</b> <b>INHERITANCE, VARIATION &amp; EVOLUTION</b>	<ol style="list-style-type: none"> <li>1. Sexual &amp; asexual reproduction</li> <li>2. Meiosis</li> <li>3. <b>Advantages &amp; disadvantages of sexual &amp; asexual reproduction.</b></li> <li>4. DNA &amp; The Genome</li> <li>5. Genetic inheritance, sex determination.</li> <li>6. <b>DNA structure &amp; protein synthesis.</b></li> </ol>	<ol style="list-style-type: none"> <li>7. Inherited disorders</li> <li>8. Variation</li> <li>9. Evolution</li> <li>10. Selective breeding</li> <li>11. Genetic engineering</li> <li>12. <b>Cloning</b></li> <li>13. <b>Theory of evolution</b></li> <li>14. <b>Speciation</b></li> </ol>	<ol style="list-style-type: none"> <li>15. <b>Understanding of genetics</b></li> <li>16. Evidence for evolution</li> <li>17. Fossils</li> <li>18. Extinction</li> <li>19. Resistant bacteria</li> <li>20. Classification &amp; evolutionary trees</li> </ol>			
<b>Knowledge &amp; Skills development</b>	<ul style="list-style-type: none"> <li>• Outline the differences between sexual &amp; asexual reproduction.</li> <li>• State and explain the stages in meiosis. What is produced during meiosis and the advantage of meiosis.</li> <li>• Advantages and disadvantages of types of reproduction.</li> <li>• Outline the structure of DNA including mutations</li> <li>• Define the Human Genome Project and the importance of it to future generations.</li> <li>• Complete genetic diagrams to show inheritance of eye colour, hair colour, flower colour and sex.</li> <li>• Understanding of Polydactyl and cystic fibrosis symptoms, treatments and mode of inheritance.</li> <li>• Define variation and explain how variation is produced.</li> <li>• Define evolution including the differing views of theories of evolution and how/why they have changed. To include natural selection and the mechanism.</li> <li>• Define, explain and give examples of selective breeding including the advantages and disadvantages.</li> <li>• Define genetic engineering. Outline the stages involved using examples such as insulin, fluorescence. Advantages and disadvantages of GE.</li> <li>• Explain the steps of tissue culture, cuttings, embryo transplants and adult cell cloning.</li> </ul>			<ul style="list-style-type: none"> <li>• Describe a scenario when each method of cloning would be used.</li> <li>• The work of Charles Darwin on evolution including natural selection. Knowledge of the book “On the Origin of Species”. Reasons Darwins theory was only gradually accepted.</li> <li>• The work of Alfred Russel Wallace and the collaboration with Charles Darwin.</li> <li>• The work of Gregor Mendel including why the importance of his discovery was not recognised until after his death.</li> <li>• The fossil record as evidence for evolution, including details of how fossils are formed. Problems with the fossil record.</li> <li>• Methods organisms become extinct including conservation methods revisited. Theories explored of how the dinosaurs became extinct.</li> <li>• Natural selection revisited with a focus on antibiotic resistant bacteria.</li> <li>• Detail the different methods of classifying organisms, including why the methods have changed over time. Why we use the binomial system around the world to classify organisms.</li> <li>• Describe what evolutionary trees show, interpret graphs to show ancestral relationships.</li> </ul>		
<b>Assessment / Feedback Opportunities</b>	Targeted questioning throughout topic	Teacher assessment of practical skills during investigation - verbal	Knowledge recall quick quizzes	Deep marking of written task in students books	Topic Test	Targeted exam questions – teacher or self-assessed

<b>Cultural Capital</b>	<ul style="list-style-type: none"> <li>• Different cultures and sacred animals</li> </ul>
<b>SMSC / Promoting British Values</b> (Democracy, Liberty, Rule of Law, Tolerance & Respect)	<ul style="list-style-type: none"> <li>• Supermarkets and GM food – Iceland won't sell GM</li> <li>• The importance of the Human Genome Project to future advances in medicine</li> <li>• The ethics surrounding selective breeding</li> <li>• Role of humans in extinction events</li> <li>• Working in groups during practicals or research tasks</li> </ul>
<b>Recommended Reading</b>	<ul style="list-style-type: none"> <li>• Factfile of key scientists in topic: Darwin, Lamarck, Linnaeus, Woese and Mendel.</li> <li>• Newspaper articles about fossil finds</li> <li>• Newspaper articles about "Superbugs".</li> <li>• Recommended Read: Infection and response, Inheritance, Variation and Evolution Snap Revision (Collins GCSE)</li> <li>• Recommended Read: Inheritance and Variation of Traits (Spotlight on Ecology and Life Science) (Rose Pemberton)</li> </ul>
<b>Key Vocabulary</b>	<p>Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest</p> <p>Chromosomes, DNA, Gene, Meiosis, Variation Genetic engineering, restriction enzyme, plasmid, bacteria, Selective breeding, Genetically modifies (GM), <b>Clone, Cuttings, Tissue culture, Surrogate</b>, Allele, Genotype, Phenotype, Dominant, Recessive, Homozygous, Heterozygous, Monohybrid, inheritance, Punnett square, Polydactyly, Cystic fibrosis, Sex Chromosomes, XX chromosomes, XY chromosomes, Sexual reproduction, Asexual reproduction, Gamete, Evolution, Natural Selection, Fossils, Lamarck, Darwin, Offspring, Binomial System, Genus, Species, Three-domain system Extinct, Speciation, Population, Carl Woese, Carl Linnaeus, Phylum, Class, Order, Family, <b>DNA, Chromosomes, Gene, Genome, Polymer, Nucleotide, Mutation, factors, peas, Gregor Mendel, speciation. DNA, Chromosomes, Gene, Genome, Polymer, Nucleotide, Mutation</b></p>
<b>Digital Literacy</b>	<p>SharePoint resources including topic quizzes.</p> <p>Possible use of excel to plot graphs and analyse data, powerpoint, word, etc to present information, internet for research</p>
<b>Cross-Curricular Links</b>	<p>PHSCE, Geography. Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators</p>
<b>Careers</b>	<p>Geneticist, nursing, genetic councillor, farming, horticulture, vet, vet nurse, journalist, palaeologist, conservationist, politician</p>