



	Lessons Sequence					
<b>TOPIC (S)</b> <b>Cell Biology</b>	1. Eukaryotes and prokaryotes 2. Animal and plant cells 3. Cell specialisation & differentiation 4. Microscopy (req prac) 5. <b>Culturing microorganisms (req prac)</b>	6. Chromosomes 7. Mitosis and cell cycle 8. Stem cells 9. Chromosomes	10. Mitosis and cell cycle 11. Stem cells 12. Diffusion 13. Osmosis (req prac) 14. Active transport			
<b>Knowledge &amp; Skills development</b>	<ul style="list-style-type: none"> <li>Classification of cells as pro/eukaryotes.</li> <li>Identification of cells including organelles</li> <li>Specialised cell examples.</li> <li>Define stem cells and understand their importance in scientific advances.</li> <li>Skills development in using a microscope.</li> <li>Calculation of cell sizes, rearranging formula, orders of magnitude.</li> <li><b>Details of binary fission and growth graph stages.</b></li> <li><b>Practical skills; dilution factors, aseptic techniques, calculation of area, answers in standard form.</b></li> </ul>			<ul style="list-style-type: none"> <li>Knowledge of how DNA is packaged.</li> <li>Collaborative nature of scientists including Watson &amp; Crick.</li> <li>Label stages of mitosis and define outcomes.</li> <li>Explain the “normal” cell cycle and how the cell cycle links to cancer.</li> <li>Definition of diffusion. Describe how cells obtain gases.</li> <li>Osmosis definition.</li> <li>Practical skills development osmosis: using a cork borer, measuring volumes and mass.</li> <li>Calculation of averages and % mass changes.</li> <li>Active transport definition.</li> </ul>		
<b>Assessment / Feedback Opportunities</b>	Targeted questioning throughout topic	Teacher assessment of practical skills during investigation - verbal	Knowledge recall quick quizzes	Topic test	Targeted exam questions	Deep marking of written task in students books
<b>Cultural Capital</b>	<ul style="list-style-type: none"> <li>Use of microscope</li> <li>Impact of religion on stem cell research and its results</li> <li>Possible visit of STEM ambassador who works in stem cell research/genetics</li> <li>Possible link with local university to observe genetics lecture/workshop</li> </ul>					
<b>SMSC / Promoting British Values</b> (Democracy, Liberty, Rule of Law, Tolerance & Respect)	<ul style="list-style-type: none"> <li>Debate on use of embryonic stem cells in research</li> <li>The impact of superbugs</li> <li>Working in groups during practicals or research tasks</li> <li>The impact of cancer incl advertising bans and efforts to increase public understanding of risk factors</li> </ul>					
<b>Recommended Reading</b>	<ul style="list-style-type: none"> <li>Newspaper articles on cancer rates, “Super Bugs”, stem cell advances</li> <li>Reading and following methods</li> <li>Recommended Read: Cells (Stephanie Herweck Paris)</li> </ul>					
<b>Key Vocabulary</b>	Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest					

	Sub-cellular structure, organelle, Nucleus, Cytoplasm, Cell membrane, Mitochondria, Ribosomes, Cell wall, Cellulose, Vacuole, Chloroplast, Prokaryotic, Eukaryotic, Plasmid, DNA, Chromosomes, Gene, Cell cycle, Mitosis, Undifferentiated, Stem cell, Electron microscope, Resolution Magnification, Diffusion, Concentration gradient, Surface area, Volume, Osmosis, Active transport, Water, ions, partially permeable, cancer, <b>agar, nutrient, binary fission, death phase, toxins, aseptic, inoculate.</b>
<b>Digital Literacy</b>	SharePoint resources including topic quizzes Possible use of excel to plot graphs and analyse data, powerpoint, word, etc to present information, internet for research
<b>Cross-Curricular Links</b>	PSHCE Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators
<b>Careers</b>	Genetic councillor, geneticist, oncologist, research scientist, hospital pathology dept.