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| Unit: Cell Biology | <ol style="list-style-type: none"> 1. Eukaryotes and prokaryotes 2. Animal and plant cells | <ol style="list-style-type: none"> 6. Chromosomes 7. Mitosis and cell cycle | <ol style="list-style-type: none"> 10. Mitosis and cell cycle 11. Stem cells |
| LESSONS | <ol style="list-style-type: none"> 3. Cell specialisation & differentiation 4. Microscopy (req prac) 5. Culturing microorganisms (req prac) | <ol style="list-style-type: none"> 8. Stem cells 9. Chromosomes | <ol style="list-style-type: none"> 12. Diffusion 13. Osmosis (req prac) 14. Active transport |
| Knowledge & Skills Development | <ul style="list-style-type: none"> • Classification of cells as pro/eukaryotes. • Identification of cells including organelles • Specialised cell examples. • Define stem cells and understand their importance in scientific advances. • Skills development in using a microscope. • Calculation of cell sizes, rearranging formula, orders of magnitude. • Details of binary fission and growth graph stages. • Practical skills; dilution factors, aseptic techniques, calculation of area, answers in standard form. | | <ul style="list-style-type: none"> • Knowledge of how DNA is packaged. • Collaborative nature of scientists including Watson & Crick. • Label stages of mitosis and define outcomes. • Explain the “normal” cell cycle and how the cell cycle links to cancer. • Definition of diffusion. Describe how cells obtain gases. • Osmosis definition. • Practical skills development osmosis: using a cork borer, measuring volumes and mass. • Calculation of averages and % mass changes. • Active transport definition. |
| Assessment / Feedback Opportunities | <p>Formative Assessment</p> <p>Teacher questioning Quizzes Exam style questions</p> | | <p>Summative assessment</p> <p>End of topic assessment Exam questions in future end of topic assessments to assess recall</p> |
| Key Vocabulary | <p>Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest</p> <p>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, agar, nutrient, binary fission, death phase, toxins, aseptic, inoculate.</p> | | |
| Literacy/Reading Opportunities | <p>Subject specific vocabulary introduced before reading of related texts</p> <p>Word etymology from Latin and Greek roots</p> <p>Reading of simple and complex sentences, paragraphs, articles</p> <p>Scientific writing including structuring methods, comparisons and evaluations</p> | | |
| Cross Curricular Themes | <p>Numeracy/Maths – averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators</p> | | |

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| Personal Development (Including British Values, RSE, Citizenship) | Ethics of using embryonic stem cells |
| Career Opportunities | Genetic councillor, geneticist, oncologist, research scientist, hospital pathology department |