

Long Term Plan: Biology Year 10

Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Link to subject ethos and driver (rename)	Anticipated misconceptions	Links to previous KS	Links to future KS	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
One	Cells	<p>Prokaryotic compared to eukaryotic cells</p> <p>Microscopy</p> <p>The cell cycle, Although details of the stages of mitosis is not required</p> <p>The use of stem cells</p>	<p>Drawing and labelling scientific diagrams</p> <p>Changing the subject of, and substituting into, simple equations with three terms</p> <p>Extended writing</p>		<p>That all animal cells look like or similar to the model animal cell often used to teach this topic, teaching must be careful that students understand that most animal cells are specialised</p> <p>That people grow as their cells get bigger as opposed to replication of cells</p>	<p>A key stage three students to study the basic structure from animal plant and bacterial cells, including the function of most organelles</p> <p>At key stage three students studied cell specialisation</p> <p>Students carried out some basic work with microscopy at</p>	<p>The cell as the fundamental unit of life is studied in both applied human biology and A-level biology</p> <p>Both of these courses also include study of mitosis</p> <p>At A-level this will be extended to look at explaining cell differentiation, comparing yourself to viruses, and</p>	<p>Students to compare stem cells extracted from bone marrow and from embryos, looking at which kind of cells these can differentiate into and considering why</p>	<p>The ethics surrounding the use of stem cells in medical research and in the treatment of certain diseases such as dementia</p>	<p>students explore the ethical issues surrounding use stem cells, including why different people may hold different views on their use</p>	<p>As cells are fundamental to biology this unit opens doors to careers in any biological medical or ecological field</p>

						key stage three	also to comparing light and electron microscopy In the applied human biology course students will look at the cellular response to injury and stress including hypertrophy and hyperplasia				
Two	Infection and response	Pathogens and modes of transmission The function of key components of the immune system How vaccines work Antibiotics, painkillers and the development of new drugs	Interpreting data in graphical and tabular form Reading for comprehension Extended writing		That white blood cells “eat” invaders - students must refer to phagocytosis. Potential for confusion between antibody and antigen That bacteria “learn” rather than evolve to be resistant to antibiotics	Builds from the “Staying Healthy” unit at KS3, which laid the foundations of disease transmission and immune system function	The immune system and immunity forms the entirety of learning aim B, in the first unit of the Applied Human Biology course. In A-Level biology students will study Cell recognition, T-Cell and	Students could consider ideas of herd immunity and why it is important for those that can be vaccinated to be vaccinated. Students could consider how a white blood cell can tell if a cell is self or non-self	Staying healthy and good infection control The importance of vaccines The spread of MRSA	A general awareness of pandemics and how they can be controlled, both in the UK and world wide	Any healthcare based career Medical research Drugs research

							B-Cell Function, HIV and the use of monoclonal antibodies	Students could look at the rise of antibiotic resistant bacteria			
Three	Homoeostasis and response	<p>The definition of Homeostasis</p> <p>The nervous system and reflex arcs</p> <p>(Triple Only - The brain and eye)</p> <p>Negative feedback and the control of temperature, glucose and (Triple only) Water and Nitrogen</p>	<p>Drawing and labelling scientific diagrams</p> <p>Collecting recording accurate data</p> <p>Presenting and interpreting data in tabular and graphical form.</p> <p>Extended Writing</p>		Blood sugar - students often don't identify this with glucose.	<p>Builds from the study of nutrition and digestion in year 9, which explores how humans obtain the glucose they use for energy from their diet.</p> <p>Also builds from previous study of the circulatory system as a transport mechanism</p>	<p>Study of homeostasis and negative feedback loops is continued in greater depth in both A-Level biology and Applied Human Biology</p>	<p>Treatment of diabetes and comparison of type one and type two.</p> <p>Students can consider why negative feedback loops are suited to control of homeostasis</p>	<p>Healthy diet and risk factors for diabetes</p> <p>How people with diabetes manage their condition</p>		<p>Dietitian</p> <p>Any number of careers in the medical field</p>
Four	Homoeostasis and response	<p>Control of the menstrual cycle, including fertility treatment and hormonal contraception</p> <p>(Triple Only) Plant</p>	<p>Collecting recording accurate data</p> <p>Presenting and interpreting data in tabular and graphical form.</p> <p>Extended</p>		Students often confuse the three different hormones that control the menstrual cycle	<p>Previous work at KS3 on the circulatory system as transport mechanism</p> <p>(Triple Only) Plant growth, and xylem and phloem.</p>	<p>Study of homeostasis and negative feedback loops is continued in greater depth in both A-Level biology and Applied</p>	<p>Treatment of diabetes and comparison of type one and type two.</p> <p>Students can consider why negative feedback loops are</p>	<p>Appropriate usage of contraception, particularly hormonal options</p>	<p>How different communities feel about and use hormonal contraceptives</p>	<p>Fertility Adviser</p> <p>Family planning adviser</p> <p>Farmer</p> <p>Botanist</p>

		Hormones	Writing				Human Biology	suited to control of homeostasis			
Five	Inheritance variation and evolution	<p>The structure of DNA</p> <p>Genes and alleles; including the concepts of recessive alleles, dominant alleles, homozygous and heterozygous</p> <p>Sexual vs asexual reproduction</p> <p>Inheritance and punnet squares</p> <p>Inheritance of sex and genetic disorders</p>	<p>Calculation of simple probability</p> <p>Writing and interpreting tree charts</p> <p>Extended writing</p>		<p>Alleles as different genes rather than different versions of a gene</p> <p>Confusion between genotype and phenotype</p>	This unit builds on the study of heredity and evolution that is completed in year 8	Study of genetics forms the basis of an entire unit of study in both A-Level biology and Applied human Biology	<p>Sex linked traits</p> <p>Advantages and disadvantages of sexual be asexual reproduction and why organisms capable of both would chose a strategy</p>	Inherited disorders and issues around family planning	<p>Charles Darwin and the voyage of the beagle</p> <p>Historical debate around evolution</p>	<p>Medical research</p> <p>Family planning adviser</p> <p>Genealogist</p>
Six	Half term six is dedicated to preparation for the summer PPEs, followed by targeted intervention, review, DIRT and improvement work; which will be planned bespoke to each class depending on the data collected.										