

Year 9 Biology Curriculum – 2020-21

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	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	New Technology		Turning Points in Biology		Turning Points in Biology	Detection
National Curriculum Knowledge & Understanding	<p style="text-align: center;">Genetics</p> <p>In this topic pupils will learn more about genes and how they determine our characteristics. They will look at the ways in which our current knowledge of genes can help us to calculate the probability of inheriting genetic disorders. They will see how selective breeding, genetic engineering and cloning can help us to produce more desirable organisms but also how technology is</p>	<p style="text-align: center;">Biotechnology</p> <p>In this topic pupils will learn about how enzymes are not just useful in the digestive system, but how they also have a role in biotechnology. It applies concepts learned from prior modules and enlightens pupils to how these can be incorporated into modern day applications and careers to improve our lives and the health of our planet. Pupils will select, plan and carry out the most</p>	<p style="text-align: center;">Cells and Systems</p> <p>This section of biology will enhance pupils understanding of specialised cells, specifically the role of white blood cells and their role in the body. Pupils will forge links with other concepts for example how antibiotic resistance is a consequence of evolution via natural selection. This topic will continue incorporating working scientifically aspects of the curriculum, as</p>	<p style="text-align: center;">Genes and Evolution</p> <p>Pupils will continue in their mastery of biological concepts relating to DNA, Charles Darwin and ensuring biodiversity is continued. They will be able to see the importance of peer review as scientists critically analyse each other's work. Pupils will develop practical skills and extract DNA.</p>	<p style="text-align: center;">Photosynthesis</p> <p>In this topic pupils will investigate the reactants in, and products of, photosynthesis. They will make predictions using scientific knowledge, select and plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate.</p>	<p style="text-align: center;">Working Scientifically in Careers</p> <p>In this topic pupils will make, and record observations and measurements using a range of methods for different investigations and suggest possible improvements. This will link directly to skills used within different careers for e.g. microscopy skills.</p>

	<p>enabling us to do so. Pupils have had many practical opportunities within biology. This section will enable pupils to revisit these key principles enabling them to secure skills, knowledge and to apply and answer scientific questions about the world around them by carrying out investigations into e.g Variation.</p>	<p>appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate. For example, they will plan out and investigate the effects of temperature on fermentation.</p>	<p>pupils will carry out and plan investigations to find out which antibiotic is the most effective. This topic will also be an introduction to KS4 Communicable Diseases.</p>			
Assessment	<p>Assessed project comprising of unit test, practical assessment of skills in while investigating techniques of cloning.</p>	<p>Assessed project comprising of end of unit test, practical assessment of skills in while investigating fermentation.</p>	<p>Assessed project comprising of unit test, practical assessment of skills in while investigating antibiotics.</p>	<p>Assessed project comprising of end of unit test, practical assessment of skills in while investigating DNA extraction.</p>	<p>Assessed project comprising of unit test, practical assessment of skills in while investigating photosynthesis.</p>	<p>Assessed project comprising of end of unit test, practical assessment of skills in while investigating microscopes.</p>

<p>Why this? Why now?</p>	<p>Pupils have prior understanding of Variation in terms of inheritance, chromosomes, genes, and DNA from year 7 and from year 8 where pupils studied Inheritance. These can now be incorporated together to unite abstract concepts which will later be applied to the topic Genes and Evolution while bridging the gap to study genetic engineering in greater depth at KS4.</p>	<p>Pupils have previously been introduced to the concept of biotechnology in year 8 when studying respiration. However, pupils will use understanding and knowledge and apply this to build a scientific investigation where results can be analysed. They will also look at other examples of how scientists can use biotechnology to our advantage e.g how cheese and yoghurt are made.</p>	<p>This is studied at this point as previously in year 7 pupils were introduced to the concept of specialised cells and that organisms are made up of systems. Pupils will now build on this knowledge to the fact that there are other specialised cells in the body and that the body also has an immune system. While incorporating aspects of the working scientifically curriculum, pupils will understand that scientific methods and theories develop as scientists modify earlier explanations to consider new evidence and ideas.</p>	<p>This topic is placed at this point as it uses understanding from Cells and Organisation module early in year 7, where pupils studied chromosomes; the Inheritance module later on in year 7 as the process by which genetic information is transmitted from one generation to the next was determined and finally in year 8, in the Inheritance module where the consequences of variation were studied. Pupils will use specific practical skills safely to observe genetic material within a specimen.</p>	<p>Photosynthesis is a fundamental principle at KS3 and KS4 in biology and chemistry as it allows pupils to make links between cross curricular areas of the Carbon Cycle and climate change. Pupils will have opportunities to carry out a range of scientific experiments for e.g. testing a leaf for starch whereby they can apply understanding of food tests from year 8 when they studied digestion to the leaf.</p>	<p>Connections between science and careers is a thread running through from the year 7 and year 8 curriculum. The focus at this point will be applying the practical skills from a variety of topics in biology to different careers. Some of these skills will be paramount to the curriculum at KS4 and serves as a bridge between KS3 and KS4. For e.g pupils have used microscopes in year 7, but now they will investigate the different types of microscopes, how they link to forensic science, which will also incorporate knowledge of genetics from earlier on in the year.</p>
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<p>Skills & Characteristics</p>	<p>Resilience Being able to look at practical results, identify anomalies and carrying out repeats are all essential skills to build resilience</p> <p>Collaboration Lessons involve practical group work to improve lab skills and communication. Pupils understand the importance of discussion and peer review in the scientific community.</p> <p>Creativity Application of knowledge and logical thinking skills are integral to scientific investigation</p>
<p>Aspirations & Careers</p>	<p>CEIAG Medical Experience days: These events link with scientific content and bring 'real-life', everyday experiences into the classroom which specifically link to human anatomy areas in the curriculum. Careers Fairs: Provides an opportunity to students to practice presenting themselves in front of potential employers. This is also a great way for students to compare employers, and find out what area of science/ scientific skills they need to focus on in the classroom in order to be considered for future posts. Work Experience: Students are introduced to different scientific skills by work colleagues during work experience which includes; the ability to problem solve, handling/ analysing data and communicate effectively. All skills which are used daily during day – to day lessons.</p> <p>Cultural Capital Pupils are encouraged to make links between current events, like plastic pollution and biodiversity and our biology learning in the classroom. All pupils take advantage of our excellent links with the Science Ambassadors and through trips and in class activities.</p> <p>Extracurricular Stem Club: Help to inspire, attract and develop STEM talents during school. The purpose of a STEM club is to raise student's engagement and achievement in these subject areas. Jeans for Genes assemblies: Brings awareness of life-altering genetic disorders which affect half a million UK children. This awareness helps bring relevance to the 'genetics' and both communicable and non-communicable topics in the curriculum. Young Health Champions: Provide students skills and knowledge to act as mentors with increased awareness of healthy lifestyles and overall 'health'. Again, this encourages students to understand the relevance for teaching health-based topics in biology.</p>