



Scheme of Learning	Cell Structures	
Learning outcomes	Subject content:	Skill set:
	<p>Knowledge and understanding of</p> <ul style="list-style-type: none"> • How the main sub-cellular structures of eukaryotic cells (plants and animals) are related to their functions • How light microscopes and staining can be used to view cells • How the main sub-cellular structures of prokaryotic cells are related to their functions • How electron microscopy has increased our understanding of sub-cellular structures 	<ul style="list-style-type: none"> • Ability to create animal and plant slides and focus them under the microscope which requires development of practical microscopy skills • Ability to draw an accurate observations of specimens viewed under the microscope which requires development of observational and drawing skills. • Ability to calculate the magnification of an image provided, which requires development of mathematical skills.
Key Question	What is the function of the subcellular features of a cell and how do we know how big they are?	
Knowledge	Key concepts and skills	Key terminology
	<ul style="list-style-type: none"> • Functions of organelles within the cell • Differences between animal and plant cells as well as prokaryotes • Differences between electron and light microscopes. • Using a microscope to observe cells and how to make scientific drawings. • How to calculate magnification based on an image provided. 	<ul style="list-style-type: none"> ➤ Organelle ➤ Cell membrane ➤ Cytoplasm ➤ Nucleus ➤ Vacuole ➤ Ribosome ➤ Mitochondria ➤ Chloroplast Cell Wall ➤ Light microscope ➤ Electron microscope ➤ Magnification ➤ Resolution ➤ Eukaryote ➤ Prokaryote
Ongoing Assessment	Retrieval questions at the start of every lesson. These questions refer to previous knowledge of cells and microscopes from Y7 and 8 which will help them develop further knowledge in Y9.	



	<p>Assessment in the form of gap fill, questions and tasks in the topic book, including</p> <ul style="list-style-type: none"> ➤ Labelling cells and microscope diagrams ➤ Calculation of magnification questions. <p>Key misconception:</p> <ul style="list-style-type: none"> ➤ converting units x 10/100/1000 ➤ All cells are the same ➤ Nucleus is the 'powerhouse' of the cell <p>Homework:</p> <ul style="list-style-type: none"> ➤ Completing calculation sheet ➤ Completing scientific drawing <p>Revision checklist: Specification used as revision checklist in front of topic booklet.</p>
Key assessment	<p>Practical assessment:- Microscope drawings to assess the key skill of scientific drawings with formative feedback given.</p> <p>End of topic test combined with the topic of enzymes. Closed book 35 minutes.</p> <p>Test will assess key skills and content from specification of this unit:</p> <p>This is an in-class assessment which will be marked by teachers</p> <p>Data is analysed and a colour is given based on the spread of grades outlined in the T&L policy.</p>
Clear sequencing of content	<p>This is the first Biology topic in KS4 and recaps and builds upon some of the concepts covered at KS3 such as cells and some of the more simple organelles (not ribosomes and mitochondria) as well as specialised cells. This topic has been covered in Y7 in less detail. They also refine the microscope focussing skills and scientific drawing skills that they gain in Y7.</p> <p>The concepts from this topic will be built upon in future Y9 topics such as DNA and protein synthesis (function of nucleus and ribosomes), photosynthesis and respiration (function of mitochondria and chloroplasts).</p> <p>The concepts from this topic also underpin many topics beyond B1 such as B2- transport into and out of cells, specialised cells.</p>
Links to Careers	<p>Information is in the topic booklet which students receive</p> <p>Pathology: from investigating infertility to researching neurological disorders, pathology careers are incredibly diverse – each focusing on a different area of prevention, diagnosis and treatment of disease. Booklet provides articles on the day in the life of a pathologist and the role of a forensic pathologist.</p> <p>Links to the following careers via QR codes are also in the booklet</p>



	https://www.healthcareers.nhs.uk/explore-roles/healthcare-science/roles-healthcare-science/life-sciences/cellular-sciences https://www.rcpath.org/discover-pathology/careers-in-pathology.html https://nationalcareers.service.gov.uk/job-profiles/microbiologist https://www.stepintothenhs.nhs.uk/careers/pathologist#:~:text=A%20day%20as%20a%20pathologist&text=Since%20you%20specialise%20in%20chemical,check%20his%20progress%20and%20recovery.
Diversity and Inclusion	<p>Celebrating women in Science: Stretch and challenge article on Lynn Margulis and endosymbionts.</p> <p>Article in booklet on tissue typing and how certain groups face more difficulties in getting available matches.</p> <p>Discussion of mitochondrial DNA making embryos from 3 parents from same sex couples</p> <p>Should 'three-person babies' have the right to know their donors? - BBC Future</p>
Support	<p>Every student receives handout packs including specification</p> <p>PowerPoints for each lesson are on SharePoint to help catch up with missed lessons or for students to review content.</p> <p>Online revision GCSE Biology (Single Science) - OCR Gateway - BBC Bitesize</p> <p>Amoeba sisters videos</p>
Challenge Wider reading / research / super curricular activities	<p>Various science challenges-</p> <p>RSB Biology challenge for Y9/10</p> <p>The Homerton college Cambridge challenge</p> <p>The imperial college Faculty of Natural Sciences: Science and innovation competition</p> <p>BioArtAttack 3D</p> <p>BioArtAttack 2D</p> <p>2 stretch and challenge articles with questions to go alongside are provided at the back of the topic booklet.</p>