

Long-term planning
Science - Biology - Year 9

	Autumn term 1	Autumn term 2	Spring term 1	Spring term 2	Summer term 1	Summer term 2
Topic	Biology: Cells and Cell Transport					
Year 9 Themes	Cell Structure			Cell transport		
	<ul style="list-style-type: none"> • Eukaryotes and prokaryotes • Animal and plant cells • Cell specialisation • Cell differentiation • Microscopy 			<ul style="list-style-type: none"> • Diffusion • Osmosis • Active transport 		
	Vocabulary and the concepts they link to					
	Active transport, algae, alveoli, bacteria, cell membrane, cell wall, cellulose, chlorophyll, chloroplasts, cytoplasm, diffusion, eukaryotic cells, hypertonic (osmosis), hypotonic (osmosis), isotonic (osmosis), Mitochondria, Nucleus, Osmosis, partially permeable membrane, permanent vacuole, Phloem, Plasmolysis, prokaryotic cells, resolving power, Ribosomes, Sperm, Stomata, Turgor, Ventilated, xylem					
	Assessment					
	End of unit assessment Key piece x2			End of unit assessment Key piece x2		
	Diversity & development of cultural capital					
	Cell Structure <ul style="list-style-type: none"> • Highlight contributions of diverse scientists, such as Ernest Everett Just and Camillo Golgi, and discuss the history of cell theory's development. • Connect cell biology to global medical advances, such as vaccines, cancer research, and stem cell therapy. 			Transport in Cells <ul style="list-style-type: none"> • Discuss the global significance of osmosis and diffusion in medical technologies like dialysis. • Compare cultural methods of hydration and nutrition with cell transport processes. • Explore ethical and global implications of biotechnology, such as GMO development and water-use efficiency. 		

- Explore traditional medicine and its links to cellular biology, like natural remedies affecting cellular function.

Cross-curricular opportunities and enrichment

Cross-Curricular Opportunities

Cell Structure

1. History: Study the development of microscopes and cell theory in the context of scientific revolutions.
2. Art and Design: Create 3D cell models or detailed drawings of organelles to visualise cell structure.
3. Ethics and Religious Studies: Debate ethical issues like stem cell research from philosophical perspectives.

Transport in Cells

1. Geography: Examine natural processes like water movement and their connection to cell transport mechanisms.
2. Physics: Explore principles of diffusion, osmosis, and the impact of temperature on molecular motion.
3. Design and Technology: Develop experiments or devices to demonstrate transport processes, such as osmosis chambers.

Enrichment Opportunities

Cell Structure

1. Field Trips: Visit research labs or science museums with exhibits on microscopy and cell biology.
2. Practical Workshops: Conduct experiments using microscopes to observe cells and their structures.
3. Competitions: Encourage participation in STEM contests like the British Biology Olympiad.

Transport in Cells

1. Experiments: Investigate osmosis using practical experiments like potato cylinders in salt solutions.
2. Problem-Solving Projects: Link cell transport processes to solutions for challenges like clean water access.
3. Media and Clubs: Organise a biology club or encourage students to create educational videos on transport mechanisms.