

Year 9 Biology | Term 2

Key Question: How do substances transport in and out of cells?

Topic Overview: This term, students will explore the different ways in which particles can move in and out of cells. Diffusion, osmosis and active transport all take place inside living organisms, and students will explore when each of them occurs and why multicellular organisms need transport systems and cannot rely just on these methods at a cellular level.

	Lesson Exploration	Knowledge & Skills	Key Words
Week 1: Lesson 1	Assessment	Students should be able to complete a 60 Minute Assessment on Cell Structure & Division.	<ul style="list-style-type: none"> • Diffusion • Osmosis • Active Transport • Concentration Gradient • Surface Area • Volume • Ratio • Multicellular • Efficient • Ventilated
Week 2: Lesson 1	How does diffusion work?	Students should be able to explain how different factors affect the rate of diffusion.	
Week 3: Lesson 1	Try Now Lesson	Students should be able to close the gaps in their knowledge from the most recent assessment.	
Week 4: Lesson 1	How do we calculate surface area: volume ratio?	Students should be able to calculate and compare surface area to volume ratios.	
Week 5: Lesson 1	How do osmosis and active transport compare to diffusion?	Students should be able to: <ul style="list-style-type: none"> • use simple compound measures of rate of water uptake • describe how substances are transported into and out of cells by diffusion, osmosis and active transport • explain the differences between the three processes. 	
Week 6: Lesson 1	How are organ systems specialised for exchanging materials?	Students should be able to: <ul style="list-style-type: none"> • to explain the need for exchange surfaces and a transport system in multicellular organisms in terms of surface area to volume ratio 	

		<ul style="list-style-type: none"> explain how the small intestine and lungs in mammals, gills in fish, and the roots and leaves in plants, are adapted for exchanging materials. 	
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Literacy Links	Numeracy Links
<p><u>Reading list for the course:</u></p> <p><u>Books:</u></p> <ul style="list-style-type: none"> Sarah Brewer – The Human Body John Clancy – The Human Body Close-Up Martha Holmes – Life Keith Laidler – Animals David Macaulay – The Way We Work Steve Parker – The Human Body Alice M Roberts – The Complete Human Body Robert Sneddon – Living Things: Flower Denise Walker – Cells and Life Processes <p><u>Websites:</u></p> <ul style="list-style-type: none"> Young Scientist Journal - www.butrousfoundation.com/ysjournal School Science - www.schoolscience.co.uk Wellcome Trust: www.wellcome.ac.uk/ Human Genome Project: http://genome.wellcome.ac.uk/ Educational resources at the Natural History Museum: www.nhm.ac.uk/education/index.html BBC Science and Nature programmes: www.bbc.co.uk/sn/ 	<ul style="list-style-type: none"> Calculate surface area, volume and surface area: volume ratio. Use simple compound measures of rate of water uptake