

# Progression map: Biology



On our progression maps “→” indicates conceptual knowledge that a unit builds upon. This should be checked and consolidated before and during the teaching of new content. “+” indicates conceptual knowledge that is developed during the topic. To aid the development of students scheme we have organised our progression mapping around our five “big questions” for chemistry.

Unit	What are organisms made of?	How do organisms grow and reproduce?	Why do organisms depend on each other and their environment?	Why are organisms so diverse?	What keeps organisms healthy?
<b>Year 7</b>					
B1 Cells - the unit of life	<p><b>(KS2, Y2)</b> → All living things have characteristics in common (characteristics of living organisms).</p> <p><b>(KS2, Y6)</b> → Living things can be plants, animals or microorganisms</p> <p><b>(KS2)</b> → Humans are living things and contain organs</p> <p><b>(KS2)</b> → Plants are living things and are made of different parts (ie leaves, flowers)</p>				
	<p><b>Organisms in focus: humans &amp; onion plants</b></p> <ul style="list-style-type: none"> <li>+ All organisms are made of cells</li> <li>+ A cell is the smallest thing that can be alive</li> <li>+ Plant &amp; animal cells have different structures</li> <li>+ How microscopes are used to observe living things</li> <li>+ How cells get the substances they need from their surroundings (diffusion across cell membranes)</li> </ul>				
B2 Inheritance and the genome		<p><b>(KS2)</b> → Organisms can be plants, animals or microorganisms</p> <p><b>(KS2)</b> → Organisms can be classified in groups according to their characteristics</p> <p><b>(KS2)</b> → Organisms produce offspring of their own kind</p> <p><b>(KS2)</b> → Offspring vary and are not identical to their parents</p>			
		<p><b>Organisms in focus: humans</b></p> <ul style="list-style-type: none"> <li>+ Genome is all the genetic information in an organism.</li> <li>+ 50% of our genome is inherited from each of our parents</li> <li>+ variation is caused by genetic and environmental factors</li> <li>+ Our genome is stored on DNA in the nucleus of our cells</li> </ul>			

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B3: From cells to organ systems	<p><b>(KS2, Y3 &amp; 4)</b> → Main bones and role of skeleton, and main organs and functions of digestive systems (humans)</p> <p><b>(KS2, Y6)</b> → Main vessels and organs of circulatory system (humans)</p> <p><b>B1</b> → All organisms are made of cells</p> <p><b>B1</b> → A cell is the smallest thing that can be alive.</p> <p><b>B1</b> → How cells get the substances they need from their surroundings (diffusion across cell membranes)</p>				
	<p><b>Organisms in focus:</b> <i>humans (&amp; Onion plants)</i></p> <p>+ Levels of organisation in multicellular organisms (plants and humans)</p> <p>+ Every organ system has a specific function</p> <p>+ Organ systems work together to maintain the conditions of live for all cells</p> <p>+ How the digestive, gas exchange and circulatory systems work together to gain oxygen and glucose from surroundings and transport them to every cell for respiration</p>				
B4 Variation through time		<p><b>B2</b> → Genome is all the genetic information in an organism</p> <p><b>B2</b> → 50% of our genome is inherited from each of our parents</p> <p><b>B2</b> → variation is caused by genetic and environmental factors</p>		<p><b>(KS2, Y6)</b> → Living things have changed over time</p> <p><b>(KS2, Y6)</b> → Fossils provide evidence of how living things have changed over time</p>	
				<p><b>Organisms in focus:</b> <i>humans &amp; Trilobites</i></p> <p>+ Only parents of the same species can produce fertile offspring</p> <p>+ Genetic inheritance occurs over generations within a species</p> <p>+ Species have gradually changed over billions of years</p> <p>+ Biologists collect large scale data to study variation now &amp; use the fossil record to study variation over time</p>	

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B5: What keeps us healthy					<p><b>(KS2, Y3)</b> → Animals (and humans) need the right types and amounts of nutrition to stay healthy</p> <p><b>(KS2, Y2)</b> → Importance of exercise and hygiene to health</p> <p><b>(KS2, Y6)</b> → Diet, drugs and lifestyle can affect human health.</p>
					<p><b>Organisms in focus: humans</b></p> <ul style="list-style-type: none"> <li>+ The approximate amounts of different nutrient groups needed for a healthy diet</li> <li>+ What health, disease and fitness are</li> <li>+ Diseases can be caused by genetics pathogens, environment, or lifestyle</li> <li>+ How to measure fitness and how it effects health</li> <li>+ Food as a chemical store of energy</li> </ul>
B6 How do organisms grow and reproduce?		<p><b>(KS2, Y5)</b> → Describe the lifecycles of a mammal, amphibian, bird and insect</p> <p><b>(KS2, Y5)</b> → describe processes of reproduction in animals and plants (including sexual and asexual reproduction in plants)</p>			
		<p><b>Organisms in focus: humans, onion plants, coconut palm</b></p> <ul style="list-style-type: none"> <li>+ Multicellular organisms (Inc. humans) mainly grow by cell division</li> <li>+ Female (human) reproductive system and production of egg cells</li> <li>+ Male (human) reproductive system and development of sperm.</li> <li>+ Gestation of human babies</li> <li>+ Details of sexual reproduction and seed dispersal in plants</li> </ul>			

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B7 How do we classify living things				<p><b>(KS2)</b> → Organisms can be plants, animals or microorganisms</p> <p><b>(KS2)</b> → Organisms can be classified in groups according to their characteristics</p> <p><b>B4</b> → Only parents of the same species can produce fertile offspring</p> <p><b>B4</b> → Genetic inheritance occurs over generations within a species</p> <p><b>B4</b> → Fossils provide evidence of extinct species</p>	
				<p><b>Organisms in focus:</b> <i>humans, onion plants, mushroom, Paramecium and Lactobacillus</i></p> <p>+ Organisms are classified based on observable characteristics and cell structure</p> <p>+ Organisms are classified into five “kingdoms”</p> <p>+ Humans are part of the kingdom “animalia”</p> <p>+ The use of binomial names for species classification</p>	
B8 What is the chemistry of living things	<p><b>B1</b> → All organisms are made of cells</p> <p><b>B1</b> → How cells get the substances they need from their surroundings (diffusion across cell membranes)</p> <p><b>B3</b> → Organ systems work together to maintain the conditions of live for all cells</p> <p><b>B3</b> → How the digestive, gas exchange and circulatory systems work together to gain oxygen and glucose from surroundings and transport them to every cell for respiration</p>				
	<p><b>Organisms in focus:</b> <i>humans, marigold yeast</i></p> <p>+ Producers make glucose by photosynthesis</p> <p>+ All cells transfer energy from glucose by respiration</p> <p>+ Respiration occurs in all cells</p> <p>+ respiration with oxygen aerobic) transfers more energy than respiration without oxygen (anaerobic)</p>				

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B9 What are ecosystems		<p><b>B6</b> → Details of sexual reproduction and seed dispersal in plants</p>	<p><b>(KS2, Y4)</b> → Simple food chains  <b>(KS2, Y4)</b> → terms predator, producer and prey  <b>(KS2, Y2)</b> → Organisms live in different habitats  <b>(KS2, Y2)</b> → Animals and plants in the same habitat can depend on each other</p>		
			<p><b>Organisms in focus:</b> <i>brine shrimp (salt lake ecosystem)</i>  + What an ecosystem is  + all ecosystems depend on producers  + energy and biomass is passed up food chains  + sizes of different populations of organisms depend on each other.  + decomposers recycle materials in an ecosystem</p>		

**Year 9**