



# DHAHRAN BRITISH GRAMMAR SCHOOL

## IGCSE Biology (4BIO) Medium Term Plan



Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
1a	<b>Section 1: The nature and variety of living organisms</b> a) Characteristics of living organisms	Students will be assessed on their ability to:  1.1 understand that living organisms share the following characteristics: <ul style="list-style-type: none"><li>• they require nutrition</li><li>• they respire</li><li>• they excrete their waste</li><li>• they respond to their surroundings</li><li>• they move</li><li>• they control their internal conditions</li><li>• they reproduce</li><li>• they grow and develop.</li></ul>	<b>Activities:</b> <ul style="list-style-type: none"><li>• Produce poster to describe and illustrate the basic characteristics.</li><li>• Marty the Martian activity</li></ul>	Edexcel International GCSE Biology Student Book Pages 1–13  Edexcel International GCSE Biology Revision Guide Page 1-5
1b	<b>Section 1: The nature and variety of living organisms</b> b) Variety of living organisms	Students will be assessed on their ability to:  1.2 describe the common features shared by organisms within the following main groups: plants, animals, fungi, bacteria, protocists and viruses, and for each group describe examples and their features as follows (details of life cycle and economic importance are not required):  Plants: these are multicellular organisms; their cells contain chloroplasts and are able to carry out photosynthesis; their cells have cellulose cell walls; they store carbohydrates as starch or sucrose  Examples include flowering plants, such as a cereal (for example maize), and a herbaceous legume (for example peas or beans)	<b>Activity:</b> <ul style="list-style-type: none"><li>• Table to compare plants and animals.</li></ul> <b>Class practical:</b> <ul style="list-style-type: none"><li>• Pictures/specimens to place into correct main groups.</li></ul>	Edexcel International GCSE Biology Student Book Pages 16–17  Edexcel International GCSE Biology Revision Guide Page 5-8



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		<p>Animals: these are multicellular organisms; their cells do not contain chloroplasts and are not able to carry out photosynthesis; they have no cell walls; they usually have nervous coordination and are able to move from one place to another; they often store carbohydrate as glycogen</p> <p>Examples include mammals (for example humans) and insects (for example housefly and mosquito)</p>		
2(a)	<p><b>Section 1: The nature and variety of living organisms</b></p> <p><b>b) Variety of living organisms</b></p>	<p><b>1.3</b> recall the term 'pathogen' and know that pathogens may be fungi, bacteria, protoctists or viruses</p> <p>Fungi: these are organisms that are not able to carry out photosynthesis; their body is usually organised into a mycelium made from thread-like structures called hyphae, which contain many nuclei; some examples are single-celled; their cells have walls made of chitin; they feed by extracellular secretion of digestive enzymes onto food material and absorption of the organic products; this is known as saprotrophic nutrition; they may store carbohydrate as glycogen</p> <p>Examples include <i>Mucor</i>, which has the typical fungal hyphal structure, and yeast which is single-celled</p> <p>Bacteria: these are microscopic single-celled organisms; they have a cell wall, cell membrane, cytoplasm and plasmids; they lack a nucleus but contain a circular chromosome of DNA; some bacteria can carry out photosynthesis but most feed off other living or dead organisms</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>ActiveBook – find out more about viruses, bacteria and fungi</li> <li>Consider current or recent appropriate news items relating to viruses, for example swine flu or bird flu, or to bacteria.</li> </ul> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li><a href="#">Cells Alive – size of micro-organisms.</a></li> </ul> <p><b>Class practicals:</b></p> <ul style="list-style-type: none"> <li>Pictures/specimens to place into correct main groups</li> <li>Observe <i>Amoeba</i> movement – using microscopes or through: <a href="#">Amoeba movement.</a></li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 17–21</p> <p>ActiveBook Page 19</p> <p>Edexcel International GCSE Biology Revision Guide Pages 5–7</p> <p>Society for General Microbiology</p> <p><a href="#">BBC GCSE Bitesize</a></p> <p><b>Video clips:</b></p> <ul style="list-style-type: none"> <li>Assignment Discovery (<a href="#">Virus</a>)</li> </ul>



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		<p>Examples include <i>Lactobacillus bulgaricus</i>, a rod-shaped bacterium used in the production of yoghurt from milk, and <i>Pneumococcus</i>, a spherical bacterium that acts as the pathogen causing pneumonia</p> <p>Protoctists: these are microscopic single-celled organisms. Some, like <i>Amoeba</i>, that live in pond water, have features like an animal cell, while others, like <i>Chlorella</i>, have chloroplasts and are more like plants.</p> <p>A pathogenic example is <i>Plasmodium</i>, responsible for causing malaria</p> <p>Viruses: these are small particles, smaller than bacteria; they are parasitic and can reproduce only inside living cells; they infect every type of living organism. They have a wide variety of shapes and sizes; they have no cellular structure but have a protein coat and contain one type of nucleic acid, either DNA or RNA</p> <p>Examples include the tobacco mosaic virus that causes discolouring of the leaves of tobacco plants by preventing the formation of chloroplasts, the influenza virus that causes 'flu' and the HIV virus that causes AIDS</p>		
2(b)	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>a) Levels of organisation</p> <p>b) Cell structure</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.1</b> describe the levels of organisation within organisms: organelles, cells, tissues, organs and systems.</p> <p><b>2.2</b> describe cell structures, including the nucleus, cytoplasm, cell membrane, cell wall, chloroplast and vacuole</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>● View images of plant and animal cells then construct a table to show similarities and differences.</li> <li>● Construct a table of various cells, tissues, organs and organ systems</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 1–3 and 12–13</p> <p>ActiveBook Page 1 – cell labelling resource</p> <p>Edexcel International GCSE Biology Revision Guide Pages 1–4</p>



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		<p><b>2.3</b> describe the functions of the nucleus, cytoplasm, cell membrane, cell wall, chloroplast and vacuole</p> <p><b>2.4</b> compare the structures of plant and animal cells.</p>	<p><b>Class practicals:</b></p> <ul style="list-style-type: none"> <li>Staining and observing onion epidermis</li> <li>Compare two different stains</li> <li>Viewing pondweed leaves with a microscope.</li> </ul>	<p><b>Video clips:</b></p> <ul style="list-style-type: none"> <li>BBC clip 10602 (<a href="#">plant and animal cells</a>) (2min 12sec)</li> <li>Assignment Discovery Short (eukaryote/prokaryotes) (2min 30 sec)</li> <li>Assignment Discovery Short (<a href="#">cells</a>) (1min 36 sec)</li> <li><a href="#">Dnatube – Elodea canadensis</a></li> <li><a href="#">Mitochondria</a></li> <li><a href="#">Cells Alive website</a></li> </ul>
2(c)	<p><b>Section 1: The nature and variety of living organisms</b></p> <p><b>Section 2: Structures and functions in living organisms</b></p>	Consolidation and assessment	<ul style="list-style-type: none"> <li>Introduce examination-style questions on topics covered, with a focus on one or two command words such as 'Name' and 'Label'.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Questions – Pages 14–15 and 22</p> <p>Self assessment on Page 22 of ActiveBook</p> <p>Edexcel International GCSE Biology Revision Guide Pages 4, 5 and 8</p>
3	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>d) Movement of substances into and out of cells</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>2.12</b> understand definitions of diffusion, osmosis and active transport</p> <p><b>2.13</b> understand that movement of substances into and out of cells can be by diffusion, osmosis and active transport</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Small group activity with a series of cards that need to be sorted to produce diffusion, osmosis and active transport definitions.</li> <li>Wordsearch game: <a href="#">Diffusion and Osmosis</a>.</li> </ul> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>Animation on ActiveBook.</li> </ul> <p><b>Demonstrations:</b></p> <ul style="list-style-type: none"> <li>Diffusion in air and water.</li> <li>Use Visking tubing, distilled water and a concentrated solute solution to show that osmosis can occur in both directions.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 9–11 and 122</p> <p>ActiveBook Page 10</p> <p>Edexcel International GCSE Biology Revision Guide Page 3</p>



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4	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>d) Movement of substances into and out of cells</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.15</b> understand the factors that affect the rate of movement of substances into and out of cells, to include the effects of surface area to volume ratio, temperature and concentration gradient</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>List some substances that cells take in and those that cells remove and suggest mechanism of movement for each.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Experiment 4: Demonstration of diffusion in a jelly.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Diffusion in cold and warm water.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 9–11</p> <p>Edexcel International GCSE Biology Revision Guide Page 3</p> <p>Experiment 4 – Page 10 of Student Book Protocol also via <a href="#">SoB/Practicalbiology</a></p>
5(a)	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>d) Movement of substances into and out of cells</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.14 understand the importance in plants of turgid cells as a means of support</b></p> <p><b>2.16</b> describe experiments to investigate diffusion and osmosis using living and non-living systems.</p>	<p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>Red blood cells bursting/crenulations as an example of osmotic effect on animal cells.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Experiments 11 and 12: Investigating the effects of osmosis in onion epidermis cells and on potato tuber tissue.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 9–11 and 122–126</p> <p>Edexcel International GCSE Biology Revision Guide Pages 44–45</p> <p>Experiment 11 – Page 125 and Experiment 12 – Page 126 of Student Book</p> <p>Various osmosis practicals on <a href="#">SoB/Practicalbiology</a></p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>Using red onion to show turgor</li> </ul>
5(b)	<p><b>Section 2: Structures and functions in living organisms</b></p>	<p>Consolidation and assessment</p>	<p>Students can produce a table to compare osmosis, diffusion and active transport.</p>	<p>Edexcel International GCSE Biology Student Self assessment on Page 15 of ActiveBook</p> <p>Edexcel International GCSE Biology Revision Guide Page</p>



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6	<b>Section 2: Structures and functions in living organisms</b> c) Biological molecules	Students will be assessed on their ability to:  <b>2.5</b> identify the chemical elements present in carbohydrates, proteins and lipids (fats and oils)  <b>2.6</b> describe the structure of carbohydrates, proteins and lipids as large molecules made up from smaller basic units: starch and glycogen from simple sugar; protein from amino acids; lipid from fatty acids and glycerol  <b>2.7</b> describe the tests for glucose and starch	<b>Activities:</b> <ul style="list-style-type: none"><li>View models of the biological molecules to ascertain common elements.</li><li>Make an informational poster for each large molecule and share with the class.</li><li><a href="#">Build a Carbohydrate</a> interactive game</li></ul> <b>Animation:</b> <ul style="list-style-type: none"><li>Virtual laboratory – starch test.</li></ul> <b>Class practical:</b> <ul style="list-style-type: none"><li>Experiment 6: Test for starch and glucose.</li></ul>	Edexcel International GCSE Biology Student Book Pages 37–43  Experiment 6 – Student Book Page 43 and pdf on ActiveBook Page 42  Edexcel International GCSE Biology Revision Guide Page 15
7	<b>Section 2: Structures and functions in living organisms</b> c) Biological molecules	Students will be assessed on their ability to:  <b>2.8</b> understand the role of enzymes as biological catalysts in metabolic reactions  <b>2.9</b> understand how the functioning of enzymes can be affected by changes in temperature, including changes due to change in active site  <b>2.10</b> understand how the functioning of enzymes can be affected by changes in active site caused by changes in pH	<b>Activities:</b> <ul style="list-style-type: none"><li>Use supplied data to plot a graph of effect of temperature on enzyme activity.</li><li>Compare diagrams of an enzyme before and after denaturing. Relate this to shape of substrate and altered shape of active site.</li><li><a href="#">How do enzymes work?</a></li></ul> <b>Animation:</b> <ul style="list-style-type: none"><li><a href="#">How enzymes work.</a></li></ul> <b>Demonstration:</b> <ul style="list-style-type: none"><li>Catalase on hydrogen peroxide.</li></ul>	Edexcel International GCSE Biology Student Book Pages 3–6 and 48  Edexcel International GCSE Biology Revision Guide Page 2  <b>Video clip:</b> <ul style="list-style-type: none"><li><a href="#">Dnatube: Enzyme action</a></li></ul>
8(a)	<b>Section 2: Structures and functions in living organisms</b> c) Biological molecules	Students will be assessed on their ability to:  <b>2.11</b> describe experiments to investigate how enzyme activity can be affected by changes in	<b>Activity:</b> <ul style="list-style-type: none"><li>Compare class data with data on Page 6 of Student Book/ActiveBook.</li></ul>	Edexcel International GCSE Biology Student Book Pages 5–6/ActiveBook  Edexcel International GCSE Biology Revision



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		temperature.	<p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Experiment 1: Effect of temperature on lipase activity.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Starch-amylase prior to class practical.</li> </ul>	<p>Guide Page 2</p> <p>Experiment 1, Page 5 of Student Book</p> <p>Lipase practical can be accessed from a link on the Society of Biology's website or go direct to <a href="#">SoB/Practicalbiology</a></p>
8(b)	<b>Section 2: Structures and functions in living organisms</b>	Consolidation and assessment	<ul style="list-style-type: none"> <li>It would be useful to introduce examination-style questions on topics covered, with a focus on production of a graph</li> </ul>	<p>3Book questions – Pages 14–15 and 51–52</p> <p>Edexcel International GCSE Biology Revision Guide Pages 4–5 and 17</p>
9	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>e) Nutrition</p>	<p>Students will be assessed on their ability to</p> <p><b>Humans</b></p> <p><b>2.23 understand that a balanced diet should include appropriate proportions of carbohydrate, protein, lipid, vitamins, minerals, water and dietary fibre</b></p> <p><b>2.24</b> identify sources and describe functions of carbohydrate, protein, lipid (fats and oils), vitamins A, C and D, the mineral ions calcium and iron, water and dietary fibre as components of the diet</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Students to categorise their meal items over one day into carbohydrates, proteins, lipids.</li> <li>Do a literature/Internet search to find the functions of fibre.</li> <li>Three-way cut-and-paste matching activity, linking listed components of diet with sources and functions.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Use food tests (from week 5) on various foods such as bread, potatoes, butter, soya, chicken, etc.</li> <li>Test for Vitamin C concentration in various foods</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Show images of various sources of dietary components.</li> </ul>	<p><b>Video clip:</b></p> <p>Supersize me</p> <p>Edexcel International GCSE Biology Student Book Pages 37–42</p> <p>Edexcel International GCSE Biology Revision Guide Pages 14–15</p>
10	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>e) Nutrition</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.25 understand that energy requirements vary with activity levels, age and pregnancy</b></p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Use/build a model of the alimentary canal.</li> <li>Label a diagram of the alimentary canal.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 43–45 and 46–50, and ActiveBook</p> <p>Edexcel International GCSE Biology Revision</p>



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		<p><b>2.26</b> describe the structures of the human alimentary canal and describe the functions of the mouth, oesophagus, stomach, small intestine, large intestine and pancreas</p> <p><b>2.27</b> understand the processes of ingestion, digestion, absorption, assimilation and egestion</p>	<p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Dnatube – enzymes, food digestion.</a></li> </ul>	<p>Guide Pages 14 and 16</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>• Living Body</li> </ul>
11	<p><b>Section 2: Structures and functions in living organisms</b> e) Nutrition</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.28</b> explain how and why food is moved through the gut by peristalsis</p> <p><b>2.29</b> understand the role of digestive enzymes, to include the digestion of starch to glucose by amylase and maltase, the digestion of proteins to amino acids by proteases and the digestion of lipids to fatty acids and glycerol by lipases</p>	<p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>• Animation on ActiveBook.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>• Model gut using Visking tubing.</li> <li>• Lipase on lipids to change pH.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>• Peristalsis by trying to get a small ball or dried pea out of a length of (clear) plastic tubing. Then repeat with some vegetable oil as a lubricant.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 46–49</p> <p>ActiveBook Page 46</p> <p>Edexcel International GCSE Biology Revision Guide Page 17</p> <p>Model gut practical on <a href="#">SoB/Practicalbiology</a></p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>• Living Body/New Living Body</li> <li>• Assignment Discovery (Digestion) (2 min 29 sec)</li> </ul>
12(a)	<p><b>Section 2: Structures and functions in living organisms</b> e) Nutrition</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.30</b> understand that bile is produced by the liver and stored in the gall bladder, and understand the role of bile in neutralising stomach acid and emulsifying lipids</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>• Draw and label a villus. Annotate various structural adaptations with an explanation of how they help absorption.</li> <li>• Make a crossword puzzle or wordsearch.</li> <li>• Compare experiment 7 with use of a food</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 48–50</p> <p>Edexcel International GCSE Biology Revision Guide Page 17</p>





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		<p><b>2.31</b> describe the structure of a villus and explain how this helps absorption of the products of digestion in the small intestine</p> <p><b>2.32</b> describe an experiment to investigate the energy content in a food sample.</p>	<p>industry calorimeter</p> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>Emulsification animation.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Experiment 7: Measuring the energy content of a food.</li> <li>Dissection of rat</li> </ul>	<p>Experiment 7 – Page 45 of Student Book</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>BBC clip 10649 (<a href="#">digestive enzymes</a>) (2 min 55 sec)</li> </ul>
12(b)	<b>Section 2: Structures and functions in living organisms</b>	Consolidation and assessment	It would be useful to introduce examination-style questions on topics covered, with a focus on production of a graph	<p>Edexcel International GCSE Biology Student Book questions – Pages 51–52</p> <p>Self assessment on Page 52 of ActiveBook</p> <p>Edexcel International GCSE Biology Revision Guide Page 17–19</p>
13	<b>Section 2: Structures and functions in living organisms</b> f) Respiration	<p>Students will be assessed on their ability to:</p> <p><b>2.33</b> understand that the process of respiration releases energy in living organisms</p> <p><b>2.34</b> describe the differences between aerobic and anaerobic respiration</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Produce a table to compare differences between aerobic and anaerobic respiration.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Comparing inhaled and exhaled air using limewater.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Yeast releasing carbon dioxide/dough rising in a measuring cylinder.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 6–9</p> <p>Edexcel International GCSE Biology Revision Guide Pages 2–3</p>
14	<b>Section 2: Structures and functions in living organisms</b> f) Respiration	<p>Students will be assessed on their ability to:</p> <p><b>2.35</b> write the word equation and the balanced chemical symbol equation for aerobic respiration in living organisms</p>	<p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Experiment 2: Demonstration of the production of carbon dioxide by small living organisms and Experiment 3: Demonstration that heat is produced by respiration.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Page 7</p> <p>Edexcel International GCSE Biology Revision Guide Pages 2–3</p>



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		<p><b>2.36</b> write the word equation for anaerobic respiration in plants and in animals</p> <p><b>2.37</b> describe experiments to investigate the evolution of carbon dioxide and heat from respiring seeds or other suitable living organisms.</p>	<p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Experiment 2.</li> </ul>	<p>Experiments 2 and 3 – Page 8 of Student Book</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>BBC clip 10885 (<a href="#">aerobic and anaerobic respiration</a>) (4 min 36 sec)</li> </ul>
15	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>g) Gas exchange</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>Humans</b></p> <p><b>2.38</b> understand the role of diffusion in gas exchange</p> <p><b>2.44</b> describe the structure of the thorax, including the ribs, intercostal muscles, diaphragm, trachea, bronchi, bronchioles, alveoli and pleural membranes</p> <p><b>2.46</b> explain how alveoli are adapted for gas exchange by diffusion between air in the lungs and blood in capillaries</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Build a paper model of the thorax. Relate to Figure 3.1 Page 26.</li> <li>Undertake interactive task: <a href="#">Lungs</a>.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>View model, a pair of lungs or show video clip below.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 26–27 and 29–30</p> <p>Edexcel International GCSE Biology Revision Guide Pages 10–11</p> <p>Check recall of activity using resource on Page 26 of ActiveBook</p> <p>Lung dissection protocol on <a href="#">SoB/Practicalbiology</a></p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>BBC clip 5373 (<a href="#">anatomy and physiology of the lungs</a>) (3 min 16 sec)</li> </ul>
16	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>g) Gas exchange</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>2.45</b> understand the role of the intercostal muscles and the diaphragm in ventilation</p> <p><b>2.48</b> describe experiments to investigate the effect of exercise on breathing in humans</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Analyse data from Page 30 and make conclusions. Link to Experiment 5: An investigation into the effect of exercise on breathing rate.</li> <li>Use hand-held spirometer to measure maximum expiratory volume of class, plot</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 27–28</p> <p>Edexcel International GCSE Biology Revision Guide Pages 11–12</p>



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			<p>histogram of results, and relate to body size and fitness.</p> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Experiment 5.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Demo balloons in a plastic bottle (this could then be used to consider whether it is a good or poor model for ventilation).</li> </ul>	<p>Experiment 5 – Page 30 of Student Book Demo-resource on Page 28 of ActiveBook</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>Living Body/New Living Body</li> </ul>
17(a)	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>g) Gas exchange</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.47</b> understand the biological consequences of smoking in relation to the lungs and the circulatory system, including coronary heart disease.</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Students to produce posters on various effects of smoking including coronary heart disease.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>'Smoking machine' (in a fume cupboard).</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 30–34</p> <p>Edexcel International GCSE Biology Revision Guide Pages 12–13</p> <p>Smoking machine protocol on <a href="#">SoB/Practicalbiology</a></p> <p>ASH (<a href="#">Action on Smoking and Health</a>) website</p>
17(b)	<p><b>Section 2: Structures and functions in living organisms</b></p>	<p>Consolidation and assessment</p>	<ul style="list-style-type: none"> <li>It would be useful to introduce examination-style questions on topics covered, with a focus on production of a graph</li> </ul>	<p>Edexcel International GCSE Biology Student Book questions – Pages 14–15, 35–36 and 120–121</p> <p>Self assessment on Pages 36 and 121 of ActiveBook</p> <p>Edexcel International GCSE Biology Revision Guide Pages 4–5, 13–14 and 42–44</p>
17	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>h) Transport</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.49</b> understand why simple, unicellular organisms can rely on diffusion for movement of substances in and out of the cell</p> <p><b>2.50</b> understand the need for a transport</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Work out surface area, volume, and surface area to volume ratio for three different sized cubes. Then compare back to Experiment 4: Demonstration of diffusion in a jelly.</li> </ul> <p><b>Class practical:</b></p>	<p>Edexcel International GCSE Biology Student Book Pages 53–54</p> <p>Edexcel International GCSE Biology Revision Guide Page 2</p> <p>Experiment 4 – Page 10 of Student Book</p>



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		system in multicellular organisms	<ul style="list-style-type: none"> <li>Observe <i>Amoeba</i>.</li> </ul>	
18	<b>Section 2: Structures and functions in living organisms</b> h) Transport	Students will be assessed on their ability to:  <b>2.63</b> describe the structure of the heart and how it functions  <b>2.64</b> explain how the heart rate changes during exercise and under the influence of adrenaline	<b>Activities:</b> <ul style="list-style-type: none"> <li>Undertake interactive task: <a href="#">Heart</a>.</li> <li>Cloze loop of question and answer cards.</li> </ul> <b>Animation:</b> <ul style="list-style-type: none"> <li>Various on Internet such as <a href="#">howstuffworks</a>.</li> </ul> <b>Class practical:</b> <ul style="list-style-type: none"> <li>Heart dissection</li> <li>Heart rate at different exercise levels; could also do before and after adrenaline flowing.</li> </ul> <b>Demonstration:</b> <ul style="list-style-type: none"> <li>Datalogger recording heart rate at varying exercise levels.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 56–58  Edexcel International GCSE Biology Revision Guide Page 21  Heart dissection practical on <a href="#">SoB/Practicalbiology</a>  Also <a href="#">SoB/Practicalbiology</a> for practical on exercise effects on heart rate  <b>Video clip:</b> <ul style="list-style-type: none"> <li><a href="#">Pumping myocytes</a> from Cells Alive website</li> </ul>
19	<b>Section 2: Structures and functions in living organisms</b> h) Transport	Students will be assessed on their ability to:  <b>2.65</b> describe the structure of arteries, veins and capillaries and understand their roles  <b>2.66</b> understand the general structure of the circulation system to include the blood vessels to and from the heart, the lungs, the liver and the kidneys	<b>Activities:</b> <ul style="list-style-type: none"> <li>Students to make own route plans for a red blood cell travelling from one organ to another using circulation system plan; then test fellow students in small groups.</li> <li>Look at prepared slides of vessels to compare them.</li> </ul> <b>Animation:</b> <ul style="list-style-type: none"> <li>BBC GCSE Bitesize (<a href="#">introduction to blood</a>).</li> </ul> <b>Class practical:</b> <ul style="list-style-type: none"> <li>Harvey's vein demonstration to show valves in veins.</li> </ul> <b>Demonstration:</b>	Edexcel International GCSE Biology Student Book Pages 54–57 and 58–59  Edexcel International GCSE Biology Revision Guide Pages 19–20  Observing blood circulation practical on <a href="#">SoB/Practicalbiology</a>  <b>Video clip:</b> <ul style="list-style-type: none"> <li>BBC clip 1466 (<a href="#">heart activity, ECG</a>) (2 min 24 sec).</li> </ul>



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
			<ul style="list-style-type: none"> <li>Observing blood circulation in <i>Asellus</i>.</li> </ul>	
20	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>h) Transport</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>Humans</b></p> <p><b>2.57</b> describe the composition of the blood: red blood cells, white blood cells, platelets and plasma</p> <p><b>2.58</b> understand the role of plasma in the transport of carbon dioxide, digested food, urea, hormones and heat energy</p> <p><b>2.59</b> explain how adaptations of red blood cells, including shape, structure and the presence of haemoglobin, make them suitable for the transport of oxygen</p> <p><b>2.60</b> describe how the immune system responds to disease using white blood cells, illustrated by phagocytes ingesting pathogens and lymphocytes releasing antibodies specific to the pathogen</p> <p><b>2.61</b> understand that vaccination results in the manufacture of memory cells, which enable future antibody production to the pathogen to occur sooner, faster and in greater quantity</p> <p><b>2.62</b> understand that platelets are involved in blood clotting, which prevents blood loss and the entry of micro-organisms</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li><a href="#">Red blood cell jigsaw</a> from Cells Alive website</li> <li>Virtual centrifugation of blood to discover solid and liquid fractions.</li> <li>Students to produce presentations on red blood cell structural adaptations, shape adaptations or presence of haemoglobin for oxygen carriage.</li> <li>Produce a mind map/spider diagram of how the immune system responds to disease.</li> <li>Find out about Edward Jenner.</li> <li>Produce a blood clotting flow diagram.</li> </ul> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>Resource on ActiveBook</li> <li>Immunity <a href="#">Ouch!</a> from Cells Alive website</li> <li>Antibody–antigen interaction.</li> </ul> <p><b>Class practical:</b></p> <p><a href="#">Infectious disease - simulation</a> (simulations showing how an infectious disease can spread through a human population).</p>	<p>Edexcel International GCSE Biology Student Book Pages 60–62</p> <p>Edexcel International GCSE Biology Revision Guide Page 22-23</p> <p><b>Video clips:</b></p> <ul style="list-style-type: none"> <li>BBC clip 1838 (<a href="#">phagocytosis</a>) (1min 9 sec)</li> </ul> <p>BBC clip 2456 (<a href="#">on Jenner</a>) (3 min 18 sec)</p>
21(a)	<p><b>Section 2: Structures and functions in living organisms</b></p>	Consolidation and assessment	It would be useful to introduce examination-style questions on topics covered, with a focus on production of a graph	<p>Edexcel International GCSE Biology Student Book questions – Pages 63–64 and 133–134</p> <p>Self assessment test – Page 64 on</p>



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
				ActiveBook Edexcel International GCSE Biology Revision Guide Pages 23–24 and 46–48
21 (b)	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>i) Excretion</p>	<p>Students will be assessed on their ability to:</p> <p><b>Humans</b></p> <p><b>2.68</b> recall that the lungs, kidneys and skin are organs of excretion</p> <p><b>2.69</b> understand how the kidney carries out its roles of excretion and osmoregulation</p> <p><b>2.70</b> describe the structure of the urinary system, including the kidneys, ureters, bladder and urethra</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Make a table to state organs of excretion and what is excreted and why.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Kidney dissection.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 85–86</p> <p>Edexcel International GCSE Biology Revision Guide Pages 32–33</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>BBC clip 5370 (<a href="#">kidney structure and function</a>) (3 min 18 sec)</li> </ul> <p>NB: Video could be used as an alternative to dissection.</p>
22	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>i) Excretion</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.71</b> describe the structure of a nephron, to include Bowman's capsule and glomerulus, convoluted tubules, loop of Henlé and collecting duct</p> <p><b>2.72</b> describe ultrafiltration in the Bowman's capsule and the composition of the glomerular filtrate</p> <p><b>2.74</b> understand that selective reabsorption of glucose occurs at the proximal convoluted tubule</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Make notes from resource on ActiveBook.</li> <li>'Snap' match structure to function for parts of a nephron.</li> </ul> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>See resource above.</li> </ul> <p>AFL: opportunity for students to produce a table of differences between selective reabsorption and ultrafiltration.</p>	<p>Edexcel International GCSE Biology Student Book Pages 86–89</p> <p>ActiveBook Page 87</p> <p>Edexcel International GCSE Biology Revision Guide Pages 32–33</p>
23	<p><b>Section 2: Structures and functions in living organisms</b></p> <p>i) Excretion</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.73</b> understand that water is reabsorbed into the blood from the collecting duct</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Students could explore <a href="#">howstuffworks</a> website for ADH function.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 89–90</p> <p>Edexcel International GCSE Biology Revision</p>



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		<p><b>2.75</b> describe the role of ADH in regulating the water content of the blood</p> <p><b>2.76</b> understand that urine contains water, urea and salts.</p>	AFL: opportunity for students to produce a table of differences between excretion and egestion.	Guide Page 33
<b>24</b>	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>j) Coordination and response</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>2.77</b> understand that organisms are able to respond to changes in their environment</p> <p><b>2.78</b> understand that homeostasis is the maintenance of a constant internal environment and that body water content and body temperature are both examples of homeostasis</p> <p><b>2.79</b> understand that a coordinated response requires a stimulus, a receptor and an effector</p>	<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>Students could list the receptor and effector for each image of a stimulus presented.</li> <li><a href="#">Thermoregulation worksheet.</a></li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Assessing skin sensitivity to temperature.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Skin colour, water (sweat) level and temperature before and after exercise.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 65–66, 83–84 and 90–93</p> <p>Edexcel International GCSE Biology Revision Guide Pages 24–25 and 33–34</p> <p>Skin sensitivity practical on <a href="#">SoB/Practicalbiology</a></p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>Stimulus–response</li> </ul>
<b>25</b>	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>j) Coordination and response</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>Humans</b></p> <p><b>2.83</b> describe how responses can be controlled by nervous or by hormonal communication and understand the differences between the two systems</p> <p><b>2.84</b> understand that the central nervous system consists of the brain and spinal cord and is linked to sense organs by nerves</p> <p><b>2.85</b> understand that stimulation of receptors in the sense organs sends electrical impulses along nerves into and out of the central nervous system, resulting in rapid responses</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>View model of the vertebral column to recognise position of spinal cord, etc.</li> </ul> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>See Living Body video.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Measuring reaction rate.</li> <li>Knee jerk.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 65–68 and 72–75</p> <p>Edexcel International GCSE Biology Revision Guide Pages 24–26 and 31</p> <p>Measuring reaction practical on <a href="#">SoB/Practicalbiology</a></p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>Living Body</li> </ul>



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		<p><b>2.86</b> describe the structure and functioning of a simple reflex arc illustrated by the withdrawal of a finger from a hot object</p>		
26	<p><b>Section 2: Structures and functions in living organisms</b> j) Coordination and response</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.87</b> describe the structure and function of the eye as a receptor</p> <p><b>2.88</b> understand the function of the eye in focusing near and distant objects, and in responding to changes in light intensity</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>View a model of the eye.</li> </ul> <p><b>Animation:</b></p> <ul style="list-style-type: none"> <li><a href="#">Sight animation.</a></li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Eye dissection.</li> <li>Iris reflex.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Eye test experiments.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 68–71</p> <p>Edexcel International GCSE Biology Revision Guide Pages 26–27</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>BBC clip 6016 (<a href="#">eye structure and function</a> plus focusing and varying light intensity response) (4 min 2 sec)</li> </ul>
27(a)	<p><b>Section 2: Structures and functions in living organisms</b> j) Coordination and response</p>	<p>Students will be assessed on their ability to:</p> <p><b>2.89</b> describe the role of the skin in temperature regulation, with reference to sweating, vasoconstriction and vasodilation</p> <p><b>2.90</b> understand the sources, roles and effects of the following hormones: ADH, adrenaline, insulin, testosterone, progesterone and oestrogen.</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Match the sources, roles and effects, possibly as a series of cards so that students form correct triplets.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Whether adrenaline alters ability on <a href="#">Shooting Sheep Game.</a></li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 78–81</p> <p>Edexcel International GCSE Biology Revision Guide Pages 33–34</p> <p><b>Video clip:</b></p> <ul style="list-style-type: none"> <li>Living Body (Hormones)</li> </ul>
27(b)	<p><b>Section 2: Structures and functions in living organisms</b></p>	<p>Consolidation and assessment</p>	<p>It would be useful to introduce examination-style questions on topics covered, with a focus on production of a graph</p>	<p>Edexcel International GCSE Biology Student Book questions – Pages 76–77, 82, 94–95 and 142</p> <p>Self assessment on Pages 77, 82, 95 and 142 of ActiveBook</p> <p>Edexcel International GCSE Biology Revision Guide Pages 27–29, 34–35 and 50</p>
28	<p><b>Section 2: Structures and functions in living</b></p>	<p>Students will be assessed on their ability to:</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Use animation resource on ActiveBook to</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 109–114</p>





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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
	<b>organisms</b> <b>e) Nutrition</b>	<b>Plants</b>  <b>2.17</b> describe the process of photosynthesis and understand its importance in the conversion of light energy to chemical energy  <b>2.18</b> write the word equation and the balanced chemical symbol equation for photosynthesis  <b>2.20</b> describe the structure of the leaf and explain how it is adapted for photosynthesis	produce word and symbol equations. <ul style="list-style-type: none"> <li>Label a diagram of TS of a leaf.</li> <li>Make a 3D model of a section through a leaf.</li> <li>Produce a table with two columns. First is for structural adaptation of leaf, and second column shows how the adaptation enables/increases photosynthesis</li> </ul> <b>Demonstration:</b> <ul style="list-style-type: none"> <li>Experiment 8: Testing leaves for starch.</li> </ul>	ActiveBook Page 112  Edexcel International GCSE Biology Revision Guide Pages 40–42  Experiment 8 – Pages 109–110 of Student Book  <b>Video clip:</b> <ul style="list-style-type: none"> <li><a href="#">Photosynthesis song</a></li> <li>BBC clip 10655 (<a href="#">adaptations of the leaf for photosynthesis</a>) (3 min 13 sec)</li> <li>Assignment Discovery (<a href="#">Leaf Adaptation</a>)</li> </ul>
29	<b>Section 2: Structures and functions in living organisms</b> <b>e) Nutrition</b>	Students will be assessed on their ability to:  <b>2.22</b> describe experiments to investigate photosynthesis, showing the evolution of oxygen from a water plant, the production of starch and the requirements of light, carbon dioxide and chlorophyll  <b>2.19</b> understand how varying carbon dioxide concentration, light intensity and temperature affects the rate of photosynthesis	<b>Activity:</b> <ul style="list-style-type: none"> <li>Use Figure 10.4 to link to equation and discuss whether photosynthesis will occur.</li> <li>In groups of three, each consider a different factor and explain to the other group members.</li> <li>Undertake <a href="#">interactive task on requirements for factors limiting photosynthesis</a></li> <li>BBC Bitesize <a href="#">Factors limiting photosynthesis</a></li> </ul> <b>Animation:</b> <ul style="list-style-type: none"> <li>Consider animation on effect of light.</li> </ul> <b>Class practical:</b> <ul style="list-style-type: none"> <li>Use Experiment 8 on variegated leaves, leaves from de-starched plants with areas covered to exclude light.</li> <li>Experiment 10: Measuring the rate of photosynthesis using pondweed.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 109–117  Edexcel International GCSE Biology Revision Guide Pages 40–41  Experiment 8 – Pages 109–110 of Student Book  Experiment 10 – Pages 116–117 of Student Book  Practical also on <a href="#">SoB/Practicalbiology</a>



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
30	<b>Section 2: Structures and functions in living organisms</b> <b>g) Gas exchange</b>	Students will be assessed on their ability to:  <b>Flowering plants</b> <b>2.38</b> understand the role of diffusion in gas exchange  <b>2.39</b> understand gas exchange (of carbon dioxide and oxygen) in relation to respiration and photosynthesis  <b>2.40</b> understand that respiration continues during the day and night, but that the net exchange of carbon dioxide and oxygen depends on the intensity of light	<b>Animation:</b> <ul style="list-style-type: none"> <li>Resource on ActiveBook (teacher driven).</li> </ul> <b>Demonstration:</b> <ul style="list-style-type: none"> <li>Datalogger with oxygen, carbon dioxide and light probes plus light on/light off over a 24-h period with pondweed.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 114–115  ActiveBook Page 115  Edexcel International GCSE Biology Revision Guide Pages 10 and 41
31(a)	<b>Section 2: Structures and functions in living organisms</b> <b>g) Gas exchange</b>	Students will be assessed on their ability to:  <b>2.41</b> explain how the structure of the leaf is adapted for gas exchange  <b>2.42</b> describe the role of stomata in gas exchange  <b>2.43</b> describe experiments to investigate the effect of light on net gas exchange from a leaf, using hydrogen-carbonate indicator	<b>Activities:</b> <ul style="list-style-type: none"> <li>Study a 3D model of the leaf and relate to Figure 10.6 Page 113.</li> <li>Predict mass change of leaves with Vaseline on upper/lower or both surfaces compared to a control leaf (with no Vaseline).</li> </ul> <b>Animation:</b> <ul style="list-style-type: none"> <li>Resource on ActiveBook to show role of stomata.</li> </ul> <b>Class practicals:</b> <ul style="list-style-type: none"> <li>Clear sticky tape/clear nail varnish on leaves to shown stomata/guard cells.</li> <li>Experiment 9: Investigating the effect of light on gas exchange by a leaf.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 112–115  Experiment 9 – Page 115 of Student Book  Edexcel International GCSE Biology Revision Guide Page 41
31(b)	<b>Section 2: Structures and functions in living organisms</b> <b>i) Excretion</b>	Students will be assessed on their ability to:  <b>Flowering plants</b>	<b>Activity:</b> <ul style="list-style-type: none"> <li>Make a table to state organs of excretion and what is excreted and why.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 130-131  Edexcel International GCSE Biology Revision



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		<b>2.67</b> understand the origin of carbon dioxide and oxygen as waste products of metabolism and their loss from the stomata of a leaf	<b>Class practical:</b> •	Guide Pages  <b>Video clip:</b>
32(a)	<b>Section 2: Structures and functions in living organisms</b> e) Nutrition	Students will be assessed on their ability to:  <b>2.21</b> understand that plants require mineral ions for growth and that magnesium ions are needed for chlorophyll and nitrate ions are needed for amino acids	<b>Activities:</b> • Produce a presentation (for example ppt/TV ad/interview sketch/music) to highlight the importance of magnesium and nitrate ions. • Undertake the interactive task on <a href="#">Plant mineral nutrition</a> .  <b>Demonstration:</b> • Show images of plants lacking named mineral ions.	Edexcel International GCSE Biology Student Book Pages 118–119  Edexcel International GCSE Biology Revision Guide Page 42  <b>Video clip:</b> • BBC clip 213 ( <a href="#">plant growth – soil and nutrients</a> ) (58 sec)
32(b)	<b>Section 2: Structures and functions in living organisms</b>	Consolidation and assessment	• Questions should focus on allowing students to describe and explain how the leaf is adapted for photosynthesis.	Edexcel International GCSE Biology Student Book questions – Pages 120–121 Self assessment on Page 121 of ActiveBook Edexcel International GCSE Biology Revision Guide Pages 42–44
33 (a)	<b>Section 2: Structures and functions in living organisms</b> h) Transport	Students will be assessed on their ability to:  <b>Flowering plants</b>  <b>2.51 describe the role of phloem in transporting sucrose and amino acids between the leaves and other parts of the plant</b>	<b>Activities:</b> • Identify roles of the root. • Draw and label root hair cell with (i) typical cell structures, and then (ii) label and annotate structures with a specific uptake function. • Recall role of magnesium and nitrate ions.	Edexcel International GCSE Biology Student Book Pages 127–130 and 131–132 ActiveBook Page 132  Edexcel International GCSE Biology Revision Guide Pages 44 and 45



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		<p><b>2.52</b> describe the role of the xylem in transporting water and mineral salts from the roots to other parts of the plant</p> <p><b>2.53</b> explain how water is absorbed by root hair cells</p>	<p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>Use resource on ActiveBook.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Place celery in coloured food dye and then dissect out xylem tissue. Observe how it enters the leaves.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>View TS of stem showing xylem.</li> </ul>	
33 (b)	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>h) Transport</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>2.54</b> understand that transpiration is the evaporation of water from the surface of a plant</p> <p><b>2.55</b> explain how the rate of transpiration is affected by changes in humidity, wind speed, temperature and light intensity</p> <p><b>2.56</b> describe experiments to investigate the role of environmental factors in determining the rate of transpiration from a leafy shoot</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Computer simulation of transpiration; use data to plot a graph.</li> </ul> <p><b>Class practical:</b></p> <ul style="list-style-type: none"> <li>Use a photometer to investigate effect of wind speed on transpiration rate.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Show a 'weight' potometer (Figure 11.19, Page 130) and a volume potometer (Figure 11.20, Page 131).</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 127–131</p> <p>Edexcel International GCSE Biology Revision Guide Page 46</p>
34	<p><b>Section 2: Structures and functions in living organisms</b></p> <p><b>j) Coordination and response</b></p>	<p>Students will be assessed on their ability to:</p> <p><b>Flowering plants</b></p> <p><b>2.80</b> understand that plants respond to stimuli</p> <p><b>2.81</b> describe the geotropic responses of roots and stems</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Plant responses to stimuli.</li> </ul> <p><b>Demonstration:</b></p> <ul style="list-style-type: none"> <li>Experiments 13–15: Which part of shoot is sensitive to light, Effects of auxin in lanolin on growth of coleoptiles, and Use of clinostat to show geotropism in roots.</li> </ul>	<p>Edexcel International GCSE Biology Student Book Pages 135–141</p> <p>Edexcel International GCSE Biology Revision Guide Pages 48–49</p> <p>Experiment 13 – Page 139, Experiment 14 – Page 140 and Experiment 15 – Page 141 of Student Book</p>



# DHAHRAN BRITISH GRAMMAR SCHOOL

## IGCSE Biology (4BIO) Medium Term Plan



Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		<b>2.82</b> describe positive phototropism of stems		Activity on plant response to stimuli from <a href="#">SoB/Practicalbiology</a>  <b>Video clip:</b> <ul style="list-style-type: none"> <li>• <a href="#">Phototropism time-lapse video from YouTube</a></li> </ul>
35	<b>Section 3: Reproduction and inheritance</b> a) Reproduction	Students will be assessed on their ability to:  <b>3.1</b> understand the differences between sexual and asexual reproduction  <b>3.2</b> understand that fertilisation involves the fusion of a male and female gamete to produce a zygote that undergoes cell division and develops into an embryo  <b>Flowering plants</b> <b>3.3</b> describe the structures of an insect-pollinated and a wind-pollinated flower and explain how each is adapted for pollination	<b>Activities:</b> <ul style="list-style-type: none"> <li>• Build a model of an insect-pollinated flower.</li> <li>• Table to compare insect and wind pollinated flower structure</li> <li>• Research effect of reduced bee numbers on pollination by using two different sources, for example <a href="#">Telegraph Science</a> and <a href="#">BBC News</a>.</li> </ul> <b>Animation:</b> <ul style="list-style-type: none"> <li>• Resource on ActiveBook.</li> </ul> <b>Class practical:</b> <ul style="list-style-type: none"> <li>• Flower dissection.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 96–97, and 143 and 144  ActiveBook Page 79  Edexcel International GCSE Biology Revision Guide Pages 50–51  <b>Video clip:</b> Assignment Discovery ( <a href="#">Plant Reproduction</a> )
36	<b>Section 3: Reproduction and inheritance</b> a) Reproduction	Students will be assessed on their ability to:  <b>3.4</b> understand that the growth of the pollen tube followed by fertilisation leads to seed and fruit formation  <b>3.5 understand the conditions needed for seed germination</b>  <b>3.6 understand how germinating seeds utilise food reserves until the seedling can carry out photosynthesis</b>	<b>Animation:</b> <ul style="list-style-type: none"> <li>• Resource on ActiveBook.</li> </ul> <b>Class practical:</b> <ul style="list-style-type: none"> <li>• Observe pollen tube growth in flowers such as the lily.</li> <li>• Conditions required for seed germination.</li> </ul> <b>Demonstration:</b> <ul style="list-style-type: none"> <li>• Take cuttings.</li> </ul>	Edexcel International GCSE Biology Student Book Pages 145–147  ActiveBook Page 144  Edexcel International GCSE Biology Revision Guide Pages 50–52  <b>Video clip:</b> Assignment Discovery ( <a href="#">Seed dispersal</a> ) Assignment Discovery ( <a href="#">Germination</a> )



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Week	Content coverage	Learning outcomes	Exemplar activities	Exemplar resources
		3.7 understand that plants can reproduce asexually by natural methods (illustrated by runners) and by artificial methods (illustrated by cuttings)		
37	<b>Section 2: Structures and functions in living organisms</b>	Consolidation and assessment	<ul style="list-style-type: none"><li>• Questions should focus on allowing students to describe and explain how the leaf is adapted for photosynthesis.</li></ul>	Edexcel International GCSE Biology Student Book questions – Pages 120–121 Self assessment on Page 121 of ActiveBook Edexcel International GCSE Biology Revision Guide Pages 42–44
<b>END OF 1<sup>ST</sup> YEAR</b>				