

Learning Grids

For GCSE WJEC Biology Unit 1

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Teacher's Introduction

These learning grids are designed to help your students independently learn content and will help you to assess their knowledge during teaching of the **First Unit** of the **WJEC GCSE Biology** specification. The concept is that your students are assigned a set of pages to read from the relevant book and are then asked to complete the relevant learning grids, possibly for homework or as a refresher for a topic. These activities are particularly useful for students who need more support, but they also contain some thought-provoking reasoning questions which will stimulate highly engaged students.

Each learning grid is closely linked to the WJEC (first teaching 2016) specification and to the approved textbooks. Relevant textbook page numbers are provided at the top of each worksheet, to allow easy cross-referencing.

Each learning grid contains a range of question styles, including:

- **Quick-testing questions** – these may be a phrase, a definition or a numeric response.
- **Labelling questions** – designed to introduce structural and anatomical concepts to the student.
- **Missing-information/Match-terms-to-definitions questions** – test key knowledge quickly.
- **Explain-a-process questions** – encourage students to recognise cause and effect in biological processes.
- **Applied-knowledge questions** – challenge students to apply knowledge in unfamiliar situations.
- **Experiment time** – asks students to analyse a practical, interpret its results and recognise strengths and weaknesses.
- **Quick quiz** at the end of each topic assesses understanding and can be used to confirm students are ready to move on to the next topic.

Learning grids in this section will take on average 20–30 minutes each.

These resources can be used to engage students and allow those who have missed lessons to catch up quickly. They can be the basis for a homework exercise, and the answer scheme allows them to be easily used in cover lessons. Students could also use the sheets as an independent learning and revision resource.

All resources can be photocopied in black and white.

We hope you and your students enjoy this resource!

This resource directly
references:

WJEC/CBAC GCSE Biology,
Schmit and Pollar (Hodder)
ISBN: 9781471868719

Free Updates!

Register your email address to receive any future free updates* made to this resource or other Biology resources your school has purchased, and details of any promotions for your subject.

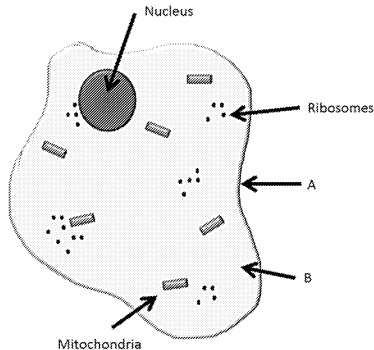
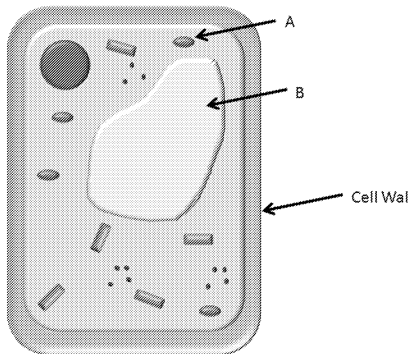
* resulting from minor specification changes, suggestions from teachers and peer reviews, or occasional errors reported by customers

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Selected Question and Answer Pages

For demonstration only, the sample answer pages immediately follow their corresponding question pages

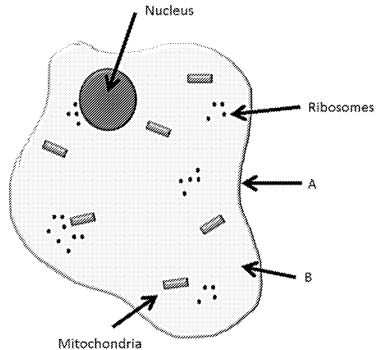
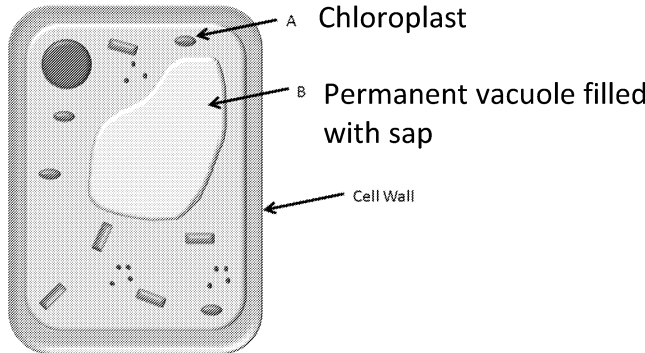
Cells and Movements Across Membranes

1.1 Structure of cells	Questions	Answers										
	<p>Name the animal cell parts labelled A and B.</p> <div></div> <p>A= B=</p>	<p>a) What type of cell is labelled here?</p> <div></div> <p>b) What are the parts labelled A and B, that are specific to this cell type?</p>										
	What is the function of mitochondria?											
	Complete this table.	<table><tr><th>Part</th><th>Role</th></tr><tr><td>Nucleus</td><td></td></tr><tr><td></td><td>Performs photosynthesis</td></tr><tr><td></td><td>Can make bacteria resistant to antibiotics</td></tr><tr><td>Cell membrane</td><td></td></tr></table>	Part	Role	Nucleus			Performs photosynthesis		Can make bacteria resistant to antibiotics	Cell membrane	
	Part	Role										
	Nucleus											
	Performs photosynthesis											
	Can make bacteria resistant to antibiotics											
Cell membrane												
What does cellulose do to plant cell walls?												
Mitochondria are 100 times smaller than an animal cell. Why is it difficult to measure the exact length of mitochondria?												

Cells and Movements Across Membranes



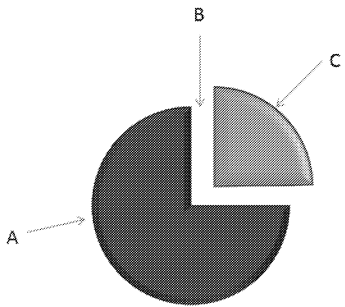
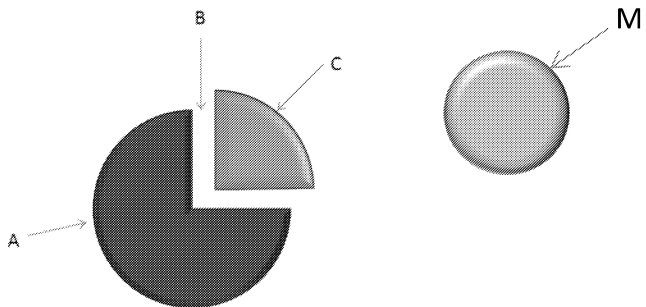
Hodder: pp. 1–6

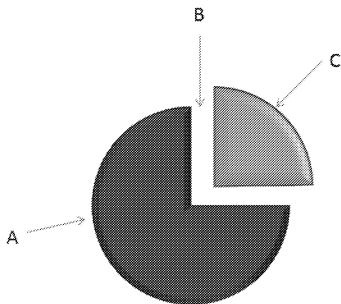
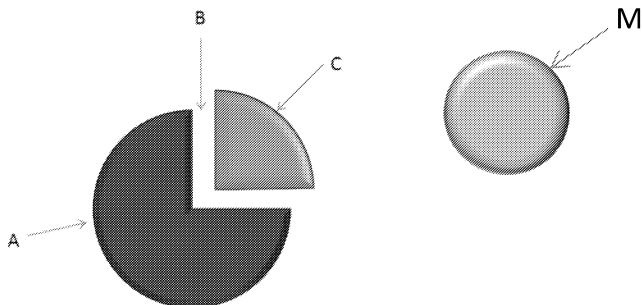
	Questions	Answers										
1.1 Structure of cells	<p>Name the animal cell parts labelled A and B.</p>  <p>A= Cell membrane B= Cytoplasm</p>	<p>a) What type of cell is labelled here? Plant cell</p>  <p>b) What are the parts labelled A and B, that are specific to this cell type?</p>										
	What is the function of mitochondria?	Mitochondria provide energy for cells.										
	Complete this table.	<table border="1"> <thead> <tr> <th>Part</th><th>Role</th></tr> </thead> <tbody> <tr> <td>Nucleus</td><td>Carries genetic information</td></tr> <tr> <td>Chloroplast</td><td>Performs photosynthesis</td></tr> <tr> <td>Plasmid</td><td>Can make bacteria resist</td></tr> <tr> <td>Cell membrane</td><td>Controls what comes in</td></tr> </tbody> </table>	Part	Role	Nucleus	Carries genetic information	Chloroplast	Performs photosynthesis	Plasmid	Can make bacteria resist	Cell membrane	Controls what comes in
	Part	Role										
	Nucleus	Carries genetic information										
Chloroplast	Performs photosynthesis											
Plasmid	Can make bacteria resist											
Cell membrane	Controls what comes in											
What does cellulose do to plant cell walls?	Strengthens the cell walls.											
Mitochondria are 100 times smaller than an animal cell. Why is it difficult to measure the exact length of mitochondria?	They are far too small to be seen. We can estimate.											

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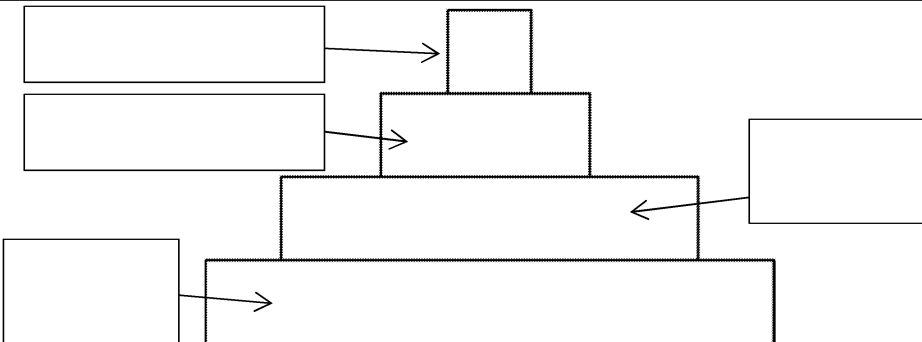
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		Questions	Answers
1.8 Enzymes		<p>The picture shows how enzymes work. What do the labels refer to?</p> 	
		<p>Explain the reason for the enzyme working on substrate C, but not substrate M:</p> 	
		What is meant by the term 'specificity'?	
		How can the rate of an enzyme reaction be increased?	

	Questions	Answers
1.8 Enzymes	<p>The picture shows how enzymes work. What do the labels refer to?</p> 	<p>A = Enzyme B = Active Site C = Substrate</p>
	<p>Explain the reason for the enzyme working on substrate C, but not substrate M:</p> 	<p>Enzymes work by complementarity of the shape of the substrate to the active site. Substrate M is not complementary, while substrate C is.</p>
	What is meant by the term 'specificity'?	An enzyme is specific and fits only a single, unique
	How can the rate of an enzyme reaction be increased?	<p>Any of the following:</p> <ul style="list-style-type: none"> • increase temperature to optimal (but not bey • increase the concentration of substrate • increase the concentration of enzyme • alter pH of the enzyme environment to the op



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		Questions	Answers
6.3 Representing biomass with pyramids		Which trophic level contains the producers?	
		<p>Label, using the pyramid, the trophic level that contains:</p> <ul style="list-style-type: none"> • The first level of carnivores • The most biomass • The least biomass • Plant eaters 	
		Define the phrase 'first stage consumer'	
		<p>Construct a pyramid of biomass to represent a food chain containing:</p> <p>Owl, Beetle, Oak tree, Mouse</p>	
		<p>(HT Only) Algae in a rock pool weighs 2000 g. Winkles consume the algae – their combined mass is 400 g.</p> <p>Calculate the percentage biomass lost between these trophic levels.</p>	

		Questions	Answers
6.3 Representing biomass with pyramids	Which trophic level contains the producers?	Level 1	
	Label, using the pyramid, the trophic level that contains: <ul style="list-style-type: none"> The first level of carnivores The most biomass The least biomass Plant eaters 		
	Define the phrase 'first stage consumer'	A consumer that only eats producers	
	Construct a pyramid of biomass to represent a food chain containing: Owl, Beetle, Oak tree, Mouse		
		(HT Only) Algae in a rock pool weighs 2000 g. Winkles consume the algae – their combined mass is 400 g. Calculate the percentage biomass lost between these trophic levels.	$2000 - 400 = 1600$ $\frac{1600}{2000} \times 100 = 80\%$



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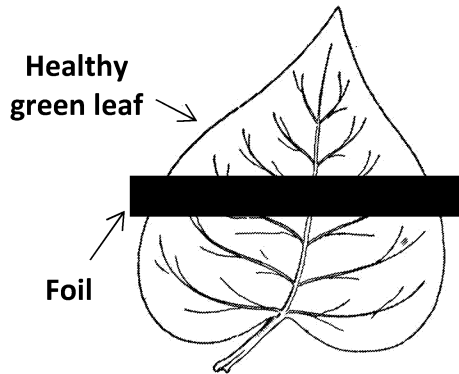
Additional Selected Question Pages

Plants and Photosynthesis

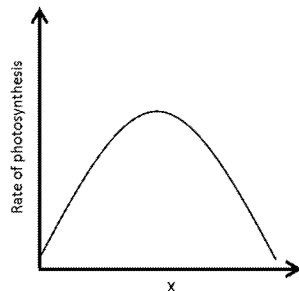


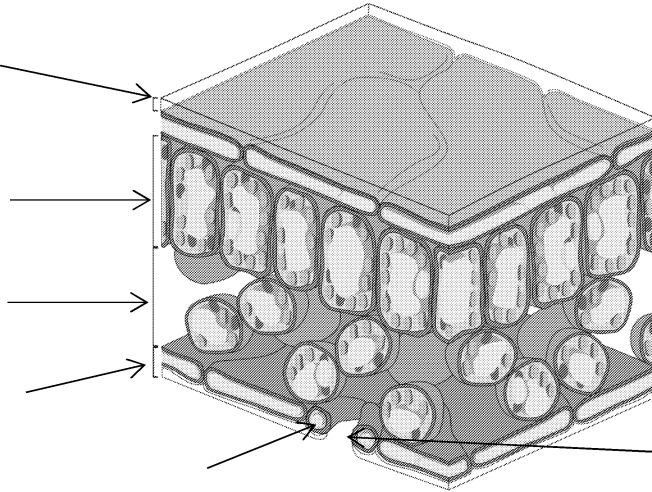
Hodder: pp. 52–61

	Questions	Answers
5.1 Photosynthesis	Complete the photosynthesis equation:	Carbon dioxide + _____ → Glucose + Oxygen
	What should go above the arrow in the equation?	<input type="checkbox"/> Light <input type="checkbox"/> Heat <input type="checkbox"/> Nitrogen-rich soil <input type="checkbox"/> Magnesium
	What is the source of energy in photosynthesis?	
	Why is it correct to state that photosynthesis is an energy-requiring reaction?	
	Why are leaves adapted to have large surface areas full of chlorophyll?	
	<p>A variegated leaf is green at the centre, with a white border around its edge.</p> <p>The leaf is covered in an iodine solution, which stains starch blue-black.</p> <p>Predict the likely observations of this experiment.</p>	

	Questions	Answers	
5.1 Photosynthesis	Order the stages in this experiment in order to test the effect of light on photosynthesis. A Stain the leaf with an iodine solution. B Cover the leaf with ethanol and place in a beaker of boiling water until the ethanol boils and turns green, with the leaf turning white. C Boil the leaf for a few seconds to kill the leaf and make it permeable. D Remove the leaf and place it on a white tile. E The parts of the leaf that perform photosynthesis stain blue-black as a result of the conversion of glucose to starch, while the parts that did not perform photosynthesis do not change colour as there is no glucose/starch present.		
5.2 Affecting Photosynthesis	(HT Only) Why are certain factors associated with photosynthesis known as ‘limiting factors’?		
	Which of these is not a function of water in plants?	<input type="checkbox"/> Used in photosynthesis <input type="checkbox"/> Used in respiration <input type="checkbox"/> Used to transport minerals <input type="checkbox"/> Used to support the plant	

5.2 Affecting Photosynthesis

Questions	Answers										
<p>What factor, light, temperature or CO₂ concentration, is depicted (X) in the following graph? Why?</p> 											
<p>(HT Only) What does the following equation tell us about the relationship between light intensity and the distance from the light source?</p> $\text{Light intensity} \propto \frac{1}{\text{Distance}^2}$											
<p>(HT Only) Using the equation above, how much is light intensity decreased, when the distance from the light is three times increased?</p>											
<p>Complete the table with the following terms: <i>Storage, Produce amino acids, Provides energy, Produce cellulose</i></p>	<table><tr><th>Use of Glucose</th><th>Function</th></tr><tr><td>Respiration</td><td></td></tr><tr><td>Produce starch, fat or oil</td><td></td></tr><tr><td></td><td>Strengthens the cell wall</td></tr><tr><td></td><td>Vital for protein synthesis</td></tr></table>	Use of Glucose	Function	Respiration		Produce starch, fat or oil			Strengthens the cell wall		Vital for protein synthesis
Use of Glucose	Function										
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		Questions	Answers
5.3 Plant Tissues		Plant cells, tissues and organs are classified differently to animal cells, tissues and organs. True or false?	
		Identify the cells/tissues highlighted with arrows in this figure of a leaf:	
		How are xylem adapted for their job?	
		Why is it important that a plant is able to control the opening and closing of stomata?	
		Identify the missing part of the plant organ system: <ul style="list-style-type: none"> • Root • _____ • Leaf 	