Zig Zag Education

Combined Science: Biology GCSE (9–1) | Edexcel | 1SCO

Learning Grids for GCSE Edexcel Biology Paper 2

(Combined Science Only)

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POD 9232

Contents

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 each section of **Topics 6–9** within the **Edexcel GCSE Combined Science Paper 2 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 Edexcel 2016 specification and to the approved textbooks. Relevant textbook page numbers are provided at the top of each worksheet, to allow easy cross-referencing.

This resource directly references:
Edexcel GCSE (9-1) Biology Student Book
Kearsey, Levesely and Johnson 2016,
Pearson Education Ltd

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 on average take 20–30 minutes each. However, this resource includes substantial opportunities to develop mathematics skills, and students who find maths challenging may find that these resources take longer to complete.

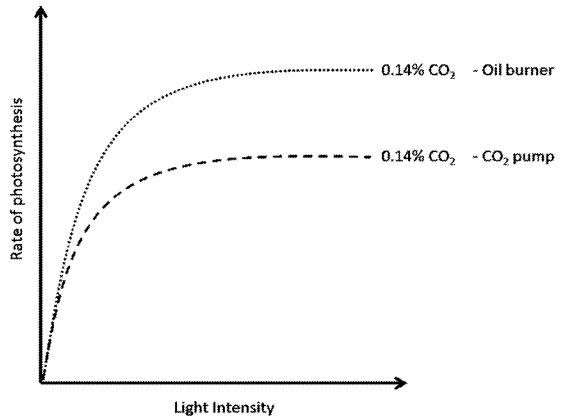
These resources can be used to engage students and allow those who have missed lessons to catch up quickly. They can be the basis for a homework exercise, and the answer scheme allows them to be easily used in cover lessons. Students could also use the sheets as an independent learning and revision resource.

All resources can be photocopied into black and white.

We hope you and your students enjoy this resource!

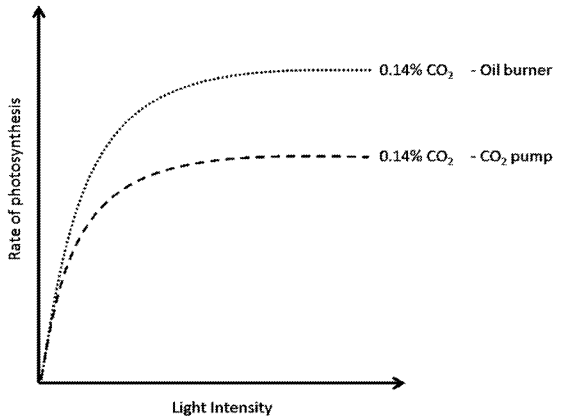
Selected Question and Answer Pages

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

	Questions	Answers
6.3–6.4: Limiting Factors (continued)	(HT only) The graph to the right shows the effect of increasing light intensity and adding CO_2 to a greenhouse. A CO_2 pump supplies carbon dioxide, while an oil burner burns fossil fuels to release CO_2. a) Why might the rate of photosynthesis be higher when using the oil burner than when using a CO_2 pump alone? b) What is the rate-limiting factor in this greenhouse?	 a) b)

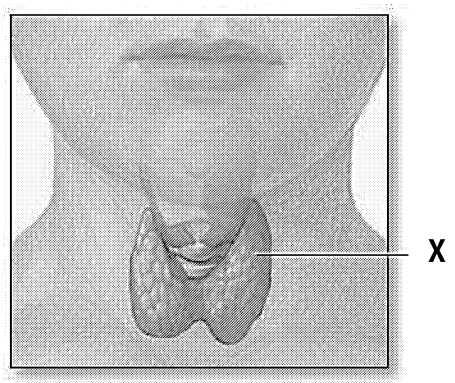
Pearson: pp. 128-129

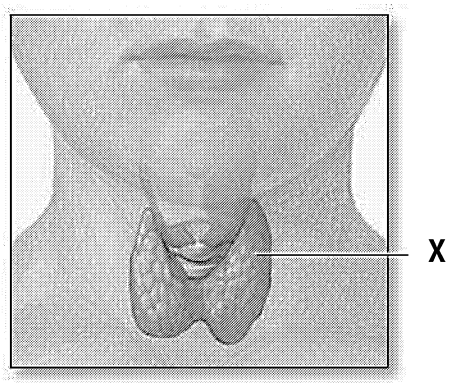
	Questions	Answers
6.6: Light Intensity	(HT only) Describe the relationship between light intensity and the rate of photosynthesis.	
	(HT only) What does the following equation tell us about the relationship between light intensity and the distance from the light source? $\text{Light intensity} \propto \frac{1}{\text{Distance}^2}$	
	(HT only) Using the equation above, how much is light intensity decreased, when the distance from the light is three times increased?	

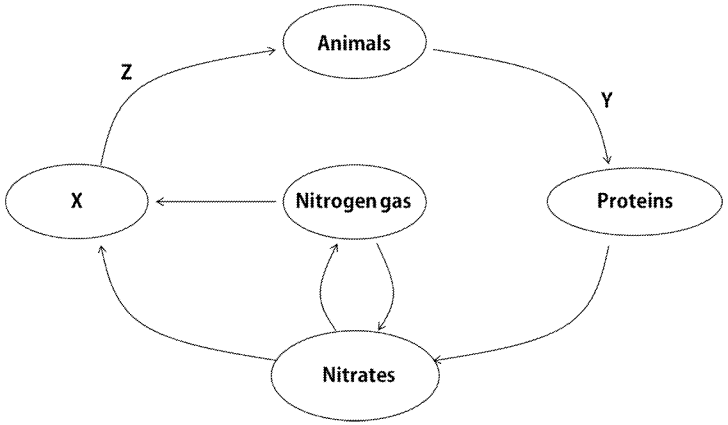
	Questions	Answers
6.3–6.4: Limiting Factors (continued)	**(HT only) The graph to the right shows the effect of increasing light intensity and adding CO_2 to a greenhouse. A CO_2 pump supplies carbon dioxide, while an oil burner burns fossil fuels to release CO_2.** **a) Why might the rate of photosynthesis be higher when using the oil burner than when using a CO_2 pump alone?** **b) What is the rate-limiting factor in this greenhouse?**	 **a)** Oil burner produces heat **b)** Rate limiting factor is heat

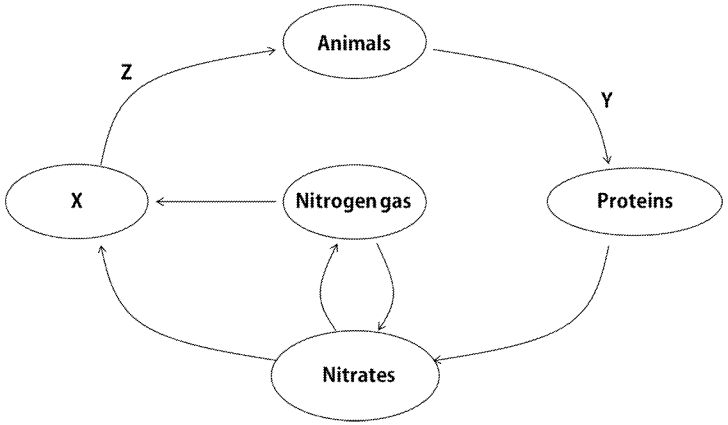
Pearson: pp. 128-129

	Questions	Answers
6.6: Light Intensity	**(HT only) Describe the relationship between light intensity and the rate of photosynthesis.**	It is a linear relationship.
	(HT only) What does the following equation tell us about the relationship between light intensity and the distance from the light source? $\text{Light intensity} \propto \frac{1}{\text{Distance}^2}$	There is an inverse proportion, fitting the inv
	(HT only) Using the equation above, how much is light intensity decreased, when the distance from the light is three times increased?	$\text{Light intensity} \propto \frac{1}{3^2}$ $\text{Light intensity} \propto \frac{1}{9}$ Light intensity is 1/9 as much when light is 3x

	Questions		Answers
7.2 – 7.3 : Adrenaline & Thyroxine	(HT only) How does thyroxine regulation differ from the regulation of adrenaline?		
	(HT only) a) Which hormone is secreted during the fight or flight response? b) Where is it produced?		a) b)
	(HT only) State the effect of adrenaline on the following factors.	Heart rate	
		Muscle blood supply	
		Blood pressure	
		Blood sugar level	
	(HT only) Which hormone is produced by this gland?  		

	Questions		Answers
7.2 – 7.3 : Adrenaline & Thyroxine	**(HT only) How does thyroxine regulation differ from the regulation of adrenaline?**		Adrenaline does not have a clear-cut negative feedback loop. It is released during stress, anger, excitement or fear, and is turned off only when the stimulus is removed.
	(HT only) **a) Which hormone is secreted during the fight or flight response?** **b) Where is it produced?**		**a)** Adrenaline **b)** In the adrenal glands
	(HT only) State the effect of adrenaline on the following factors.	**Heart rate**	Increase
		Muscle blood supply	Increase
		Blood pressure	Increase
		Blood sugar level	Increase
	(HT only) Which hormone is produced by this gland?  		Thyroxine

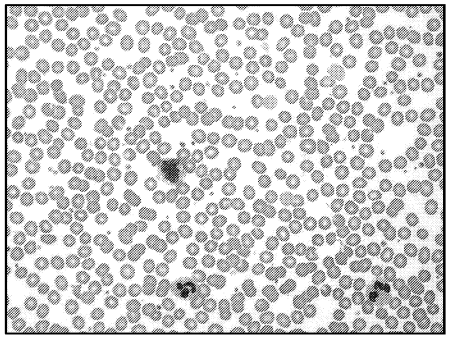
	Questions	Answers
9.12–9.15: Material Cycling (continued)	**The diagram below shows a simple nitrogen cycle.** **Identify the organisms or processes represented by X, Y and Z.**  	
	A chemical spill leads to the death of bacteria in the soil in an area. **How might this affect the amount of plant growth in the region?**	
	Select two activities from the list that play a role in the nitrogen cycle: • **Use of fertiliser** • **Use of crop rotation** • **Use of heavy machinery** • **Use of a sprinkler system**	

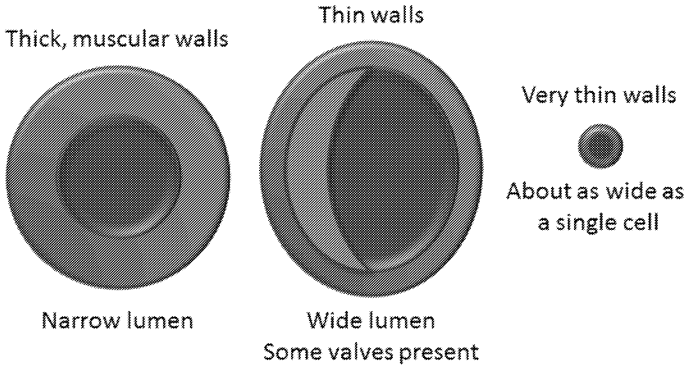
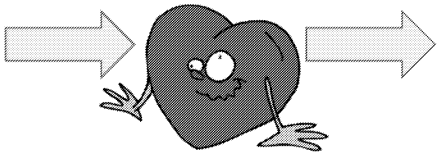
	Questions	Answers
9.12–9.15: Material Cycling (continued)	**The diagram below shows a simple nitrogen cycle.** **Identify the organisms or processes represented by X, Y and Z.**  	X = Plants Y = Excretion/Death/Decomposition Z = Feeding
	A chemical spill leads to the death of bacteria in the soil in an area. **How might this affect the amount of plant growth in the region?**	Plants will grow more slowly, or maybe not at all, as the amount of available nitrates will be reduced.
	Select two activities from the list that play a role in the nitrogen cycle: • **Use of fertiliser** • **Use of crop rotation** • **Use of heavy machinery** • **Use of a sprinkler system**	Use of fertiliser Use of crop rotation

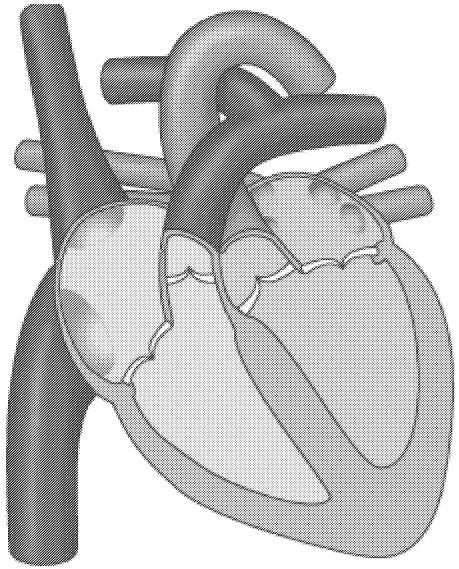
Additional Selected Question Pages

Pearson: pp. 167

8.6: Blood Cells

Questions	Answers
What part of blood makes it red?	
Blood cells live in what yellow/brown coloured liquid?	
Complete the table.	<table><tr><th>Cell type</th><th>Function</th></tr><tr><td></td><td>Carries oxygen through the body</td></tr><tr><td>White Blood Cells</td><td></td></tr><tr><td></td><td>Forms a clot during injury</td></tr></table>
How are red blood cells adapted to their role?	
This is an image of blood. What type of blood cell is there most of in a person's blood? 	

8.7: Blood Vessels	Questions	Answers
	Identify the blood vessels, based on their adaptations  **a)** **b)** **c)**	**a)** **b)** **c)**
	a) Why are artery walls adapted in the way shown above? **b) Why does the left side of the heart have such thick, muscular walls?**	**a)** **b)**
	What function do the valves in veins play?	
	Explain how the capillary is adapted for its function.	
	Which types of blood vessels complete this cartoon?	

	Questions	Answers
8.7: Blood Vessels (Continued)	**Which side of the heart contains oxygenated blood?**	
	Place these vessels in the order they pass blood through the heart and lungs, starting with the vena cava: **Vena Cava, Aorta, Pulmonary Vein, Pulmonary Artery**	**1** Vena Cava **2** **3** **4**
	Label this diagram of the heart to show: • **Right atrium** • **Left ventricle** • **Aorta** • **Vena cava**	

Pearson: pp. 170–173

	Questions	Answers
8.8–8.10: Respiration	Define the term 'cellular respiration'.	
	What two molecules are needed for aerobic respiration?	
	When does respiration take place in cells? • Only during exercise • Only during rest • During growth • At all times	
	Why is respiration described as exothermic?	
	Fill in the gaps in this description of the need for respiration.	Respiration is used for maintaining body temperature, building larger molecules and _____.
	Fill in the gaps in this reaction:	Glucose + Oxygen → _____ + _____
	Complete this description of anaerobic respiration.	Anaerobic respiration does not require _____.