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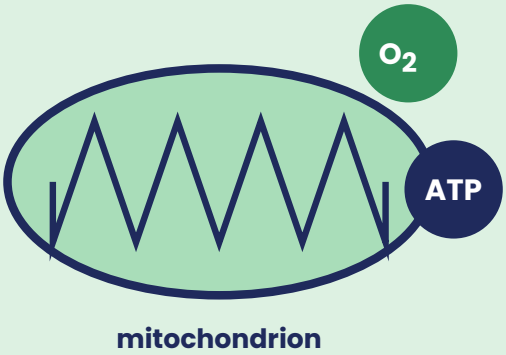
Year 10–11 • GCSE & IGCSE Biology

Respiration



mitochondrion

Mark Scheme – Teacher Copy

Answers, marking points and guidance for the Respiration worksheet.

Aerobic | Equation | Anaerobic | Oxygen debt | Exercise | Practicals

KEY IDEAS IN THIS WORKSHEET

YEAR 10–11

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Section A	Aerobic respiration	**12 marks**
Section B	Anaerobic respiration	**14 marks**
Section C	Exercise and investigation	**14 marks**
Section D	Respiration in other organisms	**5 marks**

Marking notes

- (1) = one mark for each marking point.
- / separates alternative answers.
- Allow error carried forward in calculations.
- Accept any correct, clearly expressed alternative.

Total marks

45

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Respiration Worksheet – Mark Scheme

Total: 45 marks. (1) = one mark. Accept any scientifically correct alternative wording.

Section A – Aerobic respiration

Q	Answer	Mark	Guidance
1(a)	energy	1	
1(b)	mitochondria (1); oxygen (1)	2	
1(c)	glucose (1); carbon dioxide (1)	2	
2	$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$	2	1 mark for correct formulae, 1 mark for balancing
3	breathing is moving air in and out of the lungs (1); respiration is the chemical reaction in cells that releases energy (1)	2	
4	any three: muscle contraction; building larger molecules (e.g. proteins); keeping warm; active transport; cell division	3	
	Section A total	**12**	

Section B – Anaerobic respiration

Q	Answer	Mark	Guidance
5	muscles: glucose → lactic acid; lactic acid; muscle fatigue / cramp. Yeast: glucose → ethanol + carbon dioxide; ethanol and carbon dioxide; brewing and bread-making	6	1 mark for each correct box
6	aerobic respiration releases much more energy (1); because glucose is fully broken down (1)	2	
7	muscles need energy faster than the blood can supply oxygen (1); cells respire anaerobically to release energy without oxygen (1); lactic acid builds up (1)	3	
8	the extra oxygen needed after exercise to break down lactic acid (1); heart rate and breathing rate stay high (1); so more oxygen is delivered to the muscles / blood carries lactic acid to the liver (1)	3	Higher tier / Extended
	Section B total	**14**	

Section C – Exercise and investigation

Q	Answer	Mark	Guidance
9	both increase (2); muscles need more oxygen and need carbon dioxide removed faster (1); so blood is pumped faster to supply oxygen and remove CO_2 (1)	4	
10	rest for a few minutes and count the pulse for 1 minute (1); exercise for a set time, e.g. 2 minutes (1); measure the pulse immediately and every minute until it returns to normal (1); control: same exercise / same time / same person (1)	4	
11	mix yeast with glucose solution in a flask (1); connect a delivery tube to limewater (1); keep in a warm place (1); limewater turns cloudy / milky (1)	4	
12	to keep oxygen out (1); so the yeast respires anaerobically (1)	2	
	Section C total	**14**	

Section D – Respiration in other organisms

Q	Answer	Mark	Guidance
13	seeds respire to release energy (1); some of this energy is released as heat (1)	2	
14	oxygen diffuses from the alveoli into the blood (1); the blood carries oxygen to respiring cells (1); carbon dioxide diffuses from the blood into the alveoli to be breathed out (1)	3	
	Section D total	**5**	

Worksheet total: 45