

# Respiration

## Mark Scheme 1

<b>Level</b>	GCSE (9-1)
<b>Subject</b>	Combined Science: Trilogy - Biology
<b>Exam Board</b>	AQA
<b>Topic</b>	4.4 Bioenergetics
<b>Sub-Topic</b>	Respiration
<b>Difficulty Level</b>	Bronze Level
<b>Booklet</b>	Mark Scheme 1

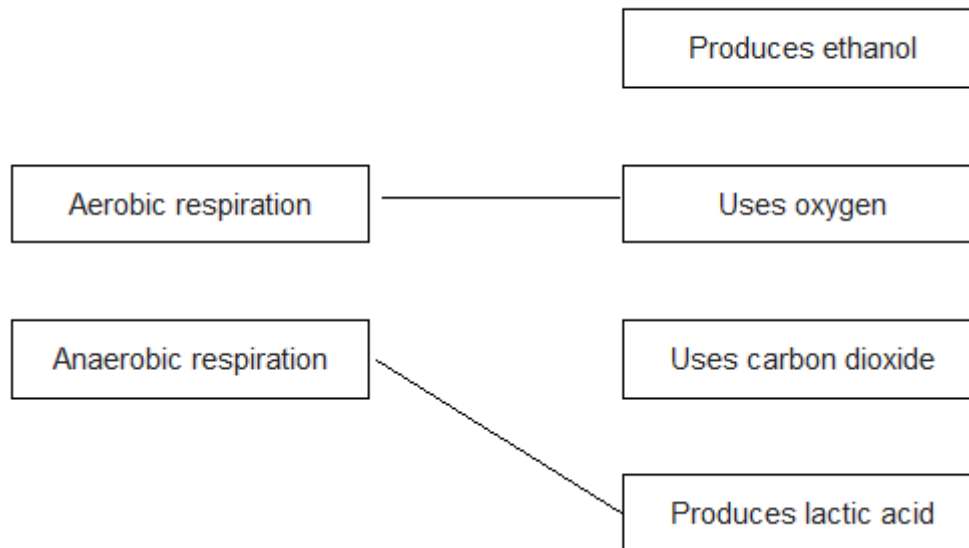
**Time Allowed:** 59 minutes

**Score:** /58

**Percentage:** /100

**Grade Boundaries:**

M1.(a)



*an extra line from a LH box negates that mark*

2

(b) any **one** from:

- not enough oxygen present (for aerobic respiration)
- more energy required for exercise (than can be transferred by aerobic respiration)

1

*allow named example for exercise*

(c) produces carbon dioxide

1

produces ethanol

1

plus any **two** from:

- (carbon dioxide) makes bread rise
- (carbon dioxide) makes beer / cider / (some) wines fizzy

- *allow for alcoholic drinks / named drink*  
(ethanol) is the alcohol in beer / cider / wine / spirits

2

[7]

**M2.(a)** 66 (beats per minute)

1

(b) heart rate increased

1

(c) 4

1

(d) any **two** from:

- resting heart rate was lower
- heart rate did not increase as much
- heart rate did not increase as fast
- heart rate returned to normal sooner

2

(e) **Level 2 (3–4 marks):**

A detailed and coherent explanation is given, which logically links changes in the body during exercise to reasons for these changes.

**Level 1 (1–2 marks):**

Discrete relevant points made. Links may not be made.

**0 marks:**

No relevant content

**Indicative content**

**Changes:**

- breathing rate increases
- deeper breathing
- (body) temperature increases
- sweating occurs
- muscle fatigue
- vasodilation

## Explanations linked to correct change:

- to provide more oxygen
- to remove carbon dioxide faster
- (as) more energy required
- (so) increased respiration
- (so) more energy transferred
- for movement or contraction of muscles
- some energy warms the body
- (sweating) cools the body down
- (by) evaporation of sweat

4

[9]

### M3.(a)

Structure	Organ	Organ system	Tissue
Stomach	✓		
Cells lining the stomach			✓
Mouth, oesophagus, stomach, liver, pancreas, small and large intestine		✓	

all 3 correct = 2 marks  
 2 correct = 1 mark  
 1 or 0 correct = 0 marks

2

- (b) (i) diffusion  
*allow phonetic spelling*

1

- (ii) glucose

1

- (iii) mitochondria

1

[5]

**M4.(a)** any **two** from:

*or allow converse for outdoors*

- constant speed
  - *variable speed*
- constant effort
  - *variable terrain*
- constant temperature
  - *traffic conditions*
  - *variable temperature*
  - *wind (resistance)*
  - *rain / snow*

} allow  
weather

*allow pollution only if qualified by effect on body function but  
ignore pollution unqualified*

*if no other marks obtained allow variable conditions outdoors*

2

(b) Brain

1

(c) (i) 20 800

*correct answer with or without working gains 2 marks*

*if answer incorrect, allow 1 mark for use of 1200 and 22 000  
only*

2

(ii) oxygen

*apply list principle*

1

*do **not** accept other named substances eg CO<sub>2</sub> water*

glucose / sugar

*allow glycogen*

*ignore food / carbohydrate*

1

(iii) respire aerobically

1

(iv) carbon dioxide

1

lactic acid

1

(d) increased heart rate

*ignore adrenaline / drugs*

*accept heart beats more but not heart pumps more*

1

[11]

M5.(a) (i) C and D

*no mark if more than one box is ticked*

1

(ii) any **one** from:

*do **not** allow if other cell parts are given in a list*

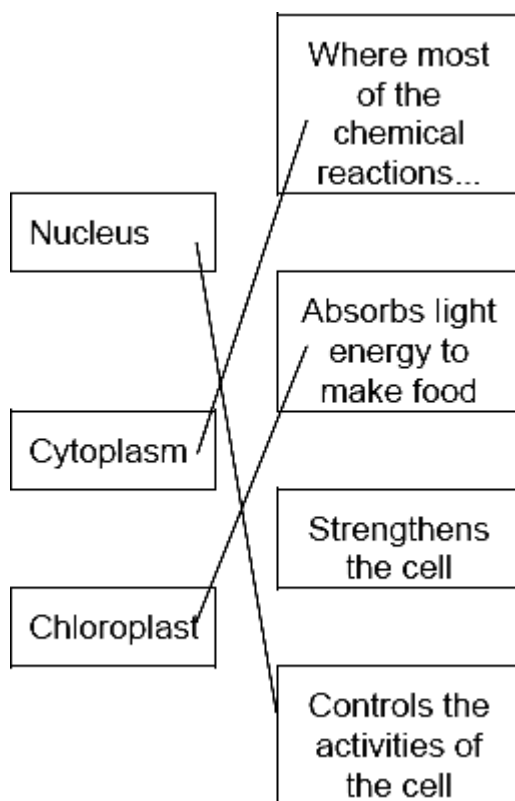
• (have) cell wall(s)

• (have) vacuole(s)

1

(b)	(i)	A	<i>apply list principle</i>	1	
	(ii)	D	<i>apply list principle</i>	1	
(c)	respiration	<i>apply list principle</i>	1	[5]	
M6.(a)	40 – 60 hours		1		
(b)	(i)	decrease	1		
		1 <sup>st</sup> slowly then faster / appropriate detail from the graph – e.g. from 7.8 to 0 / faster after 4 – 10h	1		
	(ii)	oxygen after glucose <i>extra box ticked cancels 1 mark</i>	1		
		oxygen less than glucose	1		
	(iii)	respiration	1		

[6]



M7. (a)

1 mark for each correct line  
mark each line from left hand box  
two lines from left hand box cancels mark for that box

3

(b) energy

1

[4]

M8. (a) (i) glycogen

1



	(ii)	respiration	1	
(b)	(i)	483 kJ	1	
	(ii)	oxygen	1	
	(iii)	dilate	1	
(c)		supplies more / a lot of oxygen <b>or</b> removes more carbon dioxide <b>or</b> release more energy / faster respiration	1	[6]
<b>M9.</b>	(a)	(i)	C and D	1
		(ii)	cell wall	1
(b)	(i)	A	1	
	(ii)	D	1	

(c) respiration

1

[5]