

# Respiration

## Mark Scheme 2

<b>Level</b>	IGCSE
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Respiration
<b>Sub-Topic</b>	
<b>Paper Type</b>	Alternative to Practical
<b>Booklet</b>	Mark Scheme 2

**Time Allowed:** 47 minutes

**Score:** /39

**Percentage:** /100

Question	Answer	Mark allocation	Guidance
1 (a) (i)	respiration / fermentation;	[1]	
(ii)	carbon dioxide;	[1]	<b>A</b> chemical formula if correct.
(iii)	limewater; cloudy / milky / AW;	[2]	<b>A</b> ecf If test matches gas named in (ii)
(b)	temperature control / avoid temperature fluctuation / to keep them at same temperature / AW; (warm water) increase in rate of reaction / activates yeast / increases respiration / AW; correct reference to enzyme activity;	<b>Max [2]</b>	
(c)	<i>Description</i> <b>W1</b> lower number bubbles than <b>W2</b> / AW; No: bubbles decrease from trial 1 to trial 2 and /or trial 3 (for <b>W1</b> and /or <b>W2</b> / AW;  <i>Explanation</i> less yeast in <b>W1</b> / <b>W2</b> has been (reacting) in warm water longer / AW; sugar / substrate decreasing;	<b>Max [3]</b>	Explanation must link to correct description

<p><b>(d)</b></p>	<p><i>Any 2 sources of error and 2 linked suggestions of improvement.</i></p> <p><b>e.</b>  <i>Error:</i> change in temperature / different starting temperatures / different length of time in warm water;  <i>Improvement:</i> (monitor with thermometer and) add hot / cold water (to keep constant) / use water bath / start testing at same time / AW;</p> <p><i>Error:</i> varying amounts of yeast  <i>Improvement:</i> use same mass yeast / AW;</p> <p><i>Error:</i> (inaccurate) timing;  <i>Improvement:</i> use stop watch / AW;</p> <p><i>Error:</i> (variable) shaking of tube;  <i>Improvement:</i> shake for same amount of time / at same rate / AW;</p> <p><i>Error:</i> inaccurate counting of bubbles / different sized bubbles;  <i>Improvement:</i> use gas syringe / measuring cylinder / repeat (experiment);</p>	<p><b>Max [4]</b></p>	<p><b>NB</b> Improvement should be <b>specific</b> to an error and refer to an experimental method.</p>
		<p><b>[Total: 13]</b></p>	

2 (a) (i) use numbers by ticks to indicate point awarded.

1 respiratio; [of maggots]

2 use oxygen;

3 release/produce carbon dioxide/CO<sub>2</sub>;

4 volume drops/decreases/shrinks/becomes less/AW;

**[accept references to space left if connect to use of NaOH] [ignore references to vacuum]**

5 pressure decreases/drops/becomes less;  
**[ignore references to breathing]**

**[Max: 3]**

(ii) no maggots/dead maggots/glass beads/linked;

same apparatus/same set/same experiment;

**[use same set up without maggots = 2] [ignore 'absence of NaOH] ['an experiment' alone = 0]**

**[2]**

(b) ( O orientation;

**A** labelling of axes; **[distance moved/mm is minimum]**

**S** scale; **[needs to be even and to fill more than half of the printed grid]**

**P** plot; **[+/- half a small printed square]**

**L** line; **[an accurate curve connecting all points or joined point to point by a ruled line and no extrapolation]**

**[for histograms – can award O, A, S and P not L for the labelling of temperature the number must be central for each column]**

**[5]**

**(ii) Use numbers by ticks**

1. increase with rise in temperature; **[ignore comments re: direct proportion]**
2. correct change at **35°C**;
3. higher temperature rate decreases; (for parts 1 and 3 look for a process taking place)
4. steepness or gradient of line;
5. any correct reference to 2 or more actual figures; **[Max: 3]**

**(ii) 1. enzymes;**

2. optimum/fastest; **[linked to either enzyme or respiration]**
3. maggots more active/more or higher metabolism;
4. maggots respire faster/AW;
5. AVP; e.g. anomaly **[35°C refers to incorrect/freaky reading]**

**[Max: 2]**

**[Total: 15]**

- 3 (a)** use of microscope;  
cell counter;  
sample taken on a slide;  
stain cells;  
high power magnification;  
count on slide AW;  
multiply for flask volume;  
repeat;  
dilute sample;  
equal sample taken at timed intervals; **[Max 4]**
- (b)** lag [to LHS];  
log [to RHS];  
accurate location of **Q** at 6 hours [A. 5-7]; **[3]**
- (c)** warmth/suitable temperature;  
sterile medium/stop contaminants;  
suitable nutrients;  
aeration; **[Max 2]**
- (ii)** numbers stop increasing/increase in number will drop; R. decrease. **[1]**
- (iii)** curve flattens/plateaus/falls; **[1]**
- TOTAL [11]**