



## **Mark Scheme**

**Sample Assessment Material 2018**

**Pearson Edexcel International GCSE  
in Science (Single Award) (4SS0)  
Paper 1B**

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## **General Marking Guidance**

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

## **Subject specific marking guidance**

### *Symbols, terms used in the mark scheme*

- Round brackets ( ): words inside round brackets are to aid understanding of the marking point but are not required to award the point
- Curly brackets { }: indicate the beginning and end of a list of alternatives (separated by obliques), where necessary, to avoid confusion
- Oblique /: words or phrases separated by an oblique are alternatives to each other and either answer should receive full credit.
- ecf: indicates error carried forward which means that a wrong answer given in an early part of a question is used correctly to a later part of a question.

You will not see 'owtte' (or words to that effect). Alternative correct wording should be credited in every answer unless the mark scheme has specified specific.

The Additional Guidance column is used for extra guidance to clarify any points in the mark scheme. It may be used to indicate:

- what will not be accepted for that marking point in which case the phrase 'do not accept' will be alongside the relevant marking point
- it might have examples of possible acceptable answers which will be adjacent to that marking point

Question Number	Answer	Mark										
<b>1</b>	<table border="1"> <thead> <tr> <th><b>Cell structure</b></th> <th><b>Function</b></th> </tr> </thead> <tbody> <tr> <td>cell membrane</td> <td>control entry in or out of cell (1)</td> </tr> <tr> <td>mitochondria</td> <td>respiration / energy / ATP (1)</td> </tr> <tr> <td>nucleus</td> <td>contains DNA / contains genetic material (1)</td> </tr> <tr> <td>vacuole</td> <td>store water / minerals / support / turgor (1)</td> </tr> </tbody> </table>	<b>Cell structure</b>	<b>Function</b>	cell membrane	control entry in or out of cell (1)	mitochondria	respiration / energy / ATP (1)	nucleus	contains DNA / contains genetic material (1)	vacuole	store water / minerals / support / turgor (1)	<b>4</b>
<b>Cell structure</b>	<b>Function</b>											
cell membrane	control entry in or out of cell (1)											
mitochondria	respiration / energy / ATP (1)											
nucleus	contains DNA / contains genetic material (1)											
vacuole	store water / minerals / support / turgor (1)											

**Total for Question 1 = 4 marks**

Question Number	Answer	Mark
<b>2(a)</b>	<b>D</b> lizards	<b>1</b>

Question Number	Answer	Mark
<b>2(b)(i)</b>	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• photosynthesis (1)</li> <li>• light absorbed by chloroplasts / chlorophyll (1)</li> <li>• carbon dioxide + water (1)</li> <li>• glucose / starch (1)</li> </ul>	<b>3</b>

Question Number	Answer	Mark
<b>2(b)(ii)</b>	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• energy loss (1)</li> <li>• respiration of grass cells (1)</li> <li>• indigestible / faeces (1)</li> <li>• uneaten (1)</li> </ul>	<b>3</b>

**Total for Question 2 = 7 marks**

Question Number	Answer	Additional guidance	Mark
<b>3(a)</b>	<ul style="list-style-type: none"> <li>• 5 million x 50 = 250 million (1)</li> <li>• 15% of 250 million = 37 500 000 (1)</li> <li>• 250 000 000 – 37 500 000 = 212 500 000 (1)</li> </ul>	award full marks for correct numerical answer without working	<b>3</b>

Question Number	Answer	Mark
<b>3(b)(i)</b>	<ul style="list-style-type: none"> <li>• protease / pepsin / trypsin</li> </ul>	<b>1</b>

Question Number	Answer	Mark
<b>3(b)(ii)</b>	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• cell membrane (1)</li> <li>• cytoplasm (1)</li> <li>• lobed nucleus (1)</li> <li>• irregular shape (1)</li> </ul>	<b>3</b>

Question Number	Answer	Mark
<b>3(c)</b>	<p>An explanation that makes reference two of the following points:</p> <ul style="list-style-type: none"> <li>• thin so diffusion is faster / shorter diffusion pathway (1)</li> <li>• moist so gases in solution (1)</li> <li>• blood supply so concentration gradient maintained (1)</li> </ul>	<b>2</b>

**Total for Question 3 = 9 marks**

Question Number	Answer	Mark
<b>4 (a)</b>	<b>C</b> cell walls made of chitin	<b>1</b>

Question Number	Answer	Additional guidance	Mark
<b>4(b)</b>	Division <ul style="list-style-type: none"> <li>• <math>816 \div 24 = 34</math></li> </ul> Multiplication <ul style="list-style-type: none"> <li>• <math>34 \times 100 = 3400</math></li> </ul>	award full marks for correct numerical answer without working	<b>2</b>

Question Number	Answer	Mark
<b>4(c)</b>	An answer that makes reference to four of the following points: <ul style="list-style-type: none"> <li>• more plant growth (1)</li> <li>• less infection / less disease (1)</li> <li>• therefore more carbon dioxide absorbed (1)</li>   <li>• less decomposition / digestion (1)</li> <li>• of dead organic material / organisms (1)</li> <li>• therefore less release of carbon dioxide (1)</li>   <li>• less (fungal) respiration (1)</li> <li>• bacteria are decomposers and would not be affected (1)</li> </ul>	<b>4</b>

**Total for Question 4 = 7 marks**

Question Number	Answer	Mark
<b>5(a)</b>	<p>An answer that makes reference to four of the following points:</p> <ul style="list-style-type: none"> <li>• more light moths in sample (1)</li> <li>• birds cannot see light moths / light moths camouflaged (1)</li> <li>• trees are less black (1)</li> <li>• light moths survive and reproduce (1)</li> <li>• pass on allele for light phenotype / colour (1)</li> </ul>	<b>4</b>

Question Number	Answer	Mark
<b>5(b)(i)</b>	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> <li>• parents      Bb and bb (1)</li> <li>• gametes      B and b and b and b (1)</li> <li>• offspring      Bb and bb (1)</li> </ul>	<b>3</b>

Question Number	Answer	Mark
<b>5(b)(ii)</b>	<ul style="list-style-type: none"> <li>• 50% / <math>\frac{1}{2}</math> / 0.5</li> </ul>	<b>1</b>

**Total for Question 5 = 8 marks**



Question Number	Answer	Mark
<b>6(a)</b>	<ul style="list-style-type: none"> <li>• 30 °C</li> </ul>	<b>1</b>

Question Number	Answer	Mark
<b>6(b)</b>	<p>A description that makes reference to the following points:</p> <ul style="list-style-type: none"> <li>• collect gas in measuring cylinder / count bubbles per minute (1)</li> <li>• use water bath / thermometer (1)</li> </ul>	<b>2</b>

Question Number	Answer	Mark
<b>6(c)</b>	<p>An explanation that makes reference to the following points:</p> <ul style="list-style-type: none"> <li>• increase in rate due to increase in kinetic energy of enzymes / substrate / eq (1)</li> <li>• more collisions / enzyme substrate complexes (1)</li> <li>• decrease in rate due to denaturation of enzymes / change in active site (1)</li> </ul>	<b>3</b>

**Total for Question 6 = 6 marks**

Question Number	Answer	Mark
<b>7(a)</b>	<b>C</b> 16 mm	<b>1</b>

Question Number	Answer	Mark
<b>7(b)</b>	<b>D</b> transport of deoxygenated blood to the lungs	<b>1</b>

Question Number	Answer	Mark
<b>7(c)(i)</b>	<p>An explanation that makes reference to five of the following points:</p> <ul style="list-style-type: none"> <li>• exercise increases heart rate (1)</li> <li>• more oxygen / glucose (1)</li> <li>• muscles (1)</li> <li>• respiration / energy / ATP (1)</li> <li>• training lowers resting heart rate (1)</li> <li>• training lowers heart rate during and after exercise (1)</li> </ul>	<b>5</b>

Question Number	Answer	Mark
<b>7(c)(ii)</b>	<ul style="list-style-type: none"> <li>• heart rate</li> </ul>	<b>1</b>

Question Number	Answer	Mark
<b>7(c)(iii)</b>	<p>An answer that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• gender (1)</li> <li>• age (1)</li> <li>• intensity of exercise (1)</li> <li>• duration of exercise (1)</li> </ul>	<b>3</b>

Question Number	Answer	Mark
<b>7(c)(iv)</b>	An answer that makes reference to the following points: <ul style="list-style-type: none"><li>• fingers/monitor on wrist / neck / chest (1)</li><li>• count pulse for one minute (1)</li></ul>	<b>2</b>

**Total for Question 7 = 13 marks**

Question Number	Answer	Mark
<b>8</b>	<p>An answer that makes reference to six of the following points:</p> <ul style="list-style-type: none"> <li>• C with and without oxygen (1)</li> <li>• O same species / mass of yeast (1)</li> <li>• R repeat (1)</li> <li>• M1 mass / number of yeast cells (1)</li> <li>• M2 after same stated time (1)</li> <li>• S1 same temperature (1)</li> <li>• S2 same mass / volume / type of carbohydrate (1)</li> </ul>	<b>6</b>

**Total for Question 8 = 6 marks**

