

**MARK SCHEME for the May/June 2010 question paper**  
**for the guidance of teachers**

**0610 BIOLOGY**

**0610/52**

Paper 52 (Practical Test), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the May/June 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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### General notes

Symbols used in mark scheme and guidance notes.

- / separates alternatives for a marking point
- ; separates points for the award of a mark
- A accept – as a correct response
- R reject – this is marked with a cross and any following correct statements do not gain any marks
- I ignore/irrelevant/inadequate – this response gains no mark, but any following correct answers can gain marks.
- ( ) the word/phrase in brackets is not required to gain marks but sets context of response for credit. e.g. (waxy) cuticle. Waxy not needed but if it was described as a cellulose cuticle then no mark.
- Small underlined words – this word only/must be spelled correctly
- ref./refs. answer makes appropriate reference to
- AVP additional valid point (e.g. in additional guidance)

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Question	Mark scheme		Guidance															
1 (a) (i)	(both) have different kinds of teeth AW; (both) have teeth on upper and lower jaws; (both have premolars / molars;	[1]																
(ii)	<table border="1"> <tr> <td></td> <td>sheep</td> <td>dog</td> </tr> <tr> <td>Tooth surface</td> <td>ridged / not smooth / interlocking</td> <td>not ridged / smooth AW not interlocking / overlapping</td> </tr> <tr> <td>Upper front teeth</td> <td>no <u>upper</u> incisors / no teeth / horny pad</td> <td><u>upper</u> incisors present / no horny pad</td> </tr> <tr> <td>Arrangement of front and back teeth</td> <td>space / gap between front and back teeth</td> <td>no space between front and back teeth / canines present</td> </tr> <tr> <td>Canines</td> <td>No canines</td> <td>canines present</td> </tr> </table>		sheep	dog	Tooth surface	ridged / not smooth / interlocking	not ridged / smooth AW not interlocking / overlapping	Upper front teeth	no <u>upper</u> incisors / no teeth / horny pad	<u>upper</u> incisors present / no horny pad	Arrangement of front and back teeth	space / gap between front and back teeth	no space between front and back teeth / canines present	Canines	No canines	canines present	[max 2]	<p>1 mark per row</p> <p><b>A</b> equivalent wording</p> <p><b>A</b> front teeth in upper jaw <b>R</b> if upper jaw not specified</p> <p><b>A</b> ref. to diastema / little spaces in dog</p> <p><b>I</b> size / shape / number</p>
	sheep	dog																
Tooth surface	ridged / not smooth / interlocking	not ridged / smooth AW not interlocking / overlapping																
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Arrangement of front and back teeth	space / gap between front and back teeth	no space between front and back teeth / canines present																
Canines	No canines	canines present																
(b) (i)	upper jaw and lower jaw completed; one canine on each side on each jaw in proper place; PPMMM / PPMMX;	[max 2]	<b>A</b> more Xs															

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Question	Mark scheme		Guidance
(ii)	<p>It / they = human (my) teeth / canines / incisors are smaller (in relation to the skull); (my) teeth / canines are less pointed / flatter;</p> <p>(my teeth) are all of similar / same + length;</p> <p>(my teeth) do not have gaps between them;</p>	[max 2]	<p><b>A</b> converse</p> <p><b>A</b> fangs / fang like for canines <b>I</b> sharp /blunt <b>A</b> ref. to dog having carnassial teeth <b>I</b> more canines in dog <b>I</b> I have more incisors than dog <b>I</b> size of molars</p>
(c) (i)	<p>1. <i>Safety</i> – one from: clothes covered / overall / apron / hair tied back / goggles or glasses worn / water bath for heating test-tubes / use of test tube holders; <i>Procedure</i> 2. S1 and S2 into each of two test- tubes; 3. add water; 4. add Benedict's solution; 5. heat; 6. Expected outcome – colour change from initial to final colour; <i>Equivalentents for comparison</i> – one out of: 7. same volume for 2., 3., 4., / heat for the same time / comparison of colour intensity / time taken to change;</p>	[max 5]	<p>Max 3 for procedure + one mark for safety + one mark for comparison.</p> <p><b>R</b> ref. to <i>warm</i> water</p> <p><b>A</b> repeat with S2</p>
(ii)	<p><i>Procedure</i> 1. leaves on tile; 2. iodine solution added to each; 3. expected colour change from initial to final colour; <i>Equivalentents for comparison</i> 4. same volume / mass for 1. 2. / colour intensity;</p>	[max 2]	<p><b>A</b> 'drops of iodine' for iodine solution</p> <p><b>R</b> 'amount'</p>

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(iii)	<table border="1"> <tr> <td></td> <td>S1</td> <td>S2</td> </tr> <tr> <td>for reducing sugar</td> <td>green / yellow;</td> <td>blue / green;</td> </tr> <tr> <td>for starch</td> <td>blue / black;</td> <td>blue / black;</td> </tr> </table>		S1	S2	for reducing sugar	green / yellow;	blue / green;	for starch	blue / black;	blue / black;	[4]	<p><b>Check supervisor's report first</b> One mark per box Observations. No marks for conclusions here</p>
	S1	S2										
for reducing sugar	green / yellow;	blue / green;										
for starch	blue / black;	blue / black;										
(iv)	<p>more reducing sugar in S1; starch present in both / may be more in S1; <b>A</b> correct conclusion about how cooking has altered the <i>relative quantities</i> from 'wrong' colours when compared to supervisor's report.</p>	[2]	<p>Conclusions Reducing sugar and starch must be described separately, not together as carbohydrates</p>									
(v)	<p><b>A plausible explanation for the conclusion in (iv);</b> <b>A</b> less reducing sugar because it dissolves in cooking water AW <b>A</b> ref. to hydrolysis / breakdown of starch / condensation AW <b>A</b> leaves do not store starch (if negative)</p>	[1]										
	<b>Total:</b>	<b>[21]</b>										
2 (a) (i)	<p>in pairs / alternate / opposite / spiral / irregular AW; in one plane AW / flat / ref. to mosaic / non overlapping AW;</p>	[2]	<p>Check with supervisor's report <b>A</b> AW for all <b>A</b> random if appropriate <b>A</b> making a layer</p>									
(ii)	<p>Drawing clear 'unfuzzy' outline; midrib and side veins shown;</p> <p>Labels 2 from leaf blade / lamina'; midrib / veins; petiole / stalk / stem;</p>	<p>[2] [2] [max 4]</p>	<p><b>R</b> broken, sketchy lines / shading <b>I</b> ref. to phloem / xylem / chlorophyll <b>A</b> hairs / serrated margin where appropriate.</p>									

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(iii)	whole squares covered by leaf plus part squares added together / whole squares uncovered by leaf plus part squares uncovered and total taken from 100 in grid; leaf area + units;	[max 2]	Credit workable <i>method</i> <b>R</b> area without units
(b) (i)	Measured length from <b>2 (a) (iii)</b> is in the table; lengths of 10 leaves entered; measurements in mm;	[3]	Measure the length of leaf in <b>2 (a) (iii)</b>
(ii)	bar chart; <b>A</b> axes and orientation  <b>S</b> scale; if bar chart <b>P</b> accurate columns;;	[5]	Line graph – accept <b>A</b> and <b>S</b> marks only x axis – position of leaf / leaf number from base; y axis – length of leaf blade in mm; <i>credit if more than half the grid used.</i>  All correct – 2 marks One incorrect – 1 mark
(iii)	Comment on position of largest / smallest leaf; Trend / pattern / relationship described e.g. leaves near the base are larger / no pattern / irregular; AVP ref. to age / stage of development / shading / for max. light / photosynthesis ;	[3]	<b>Look at the graph first as some may be irregular.</b>  Biological 'reason'