

MARK SCHEME for the May/June 2014 series

0610 BIOLOGY

0610/62

Paper 6 (Alternative to Practical), 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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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Page 2	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0610	62

Question	Mark scheme	Mark	Guidance
1 (a)	red ;	[1]	
(b) (i)	(surface area) $2(1 \times 1) + 4(2 \times 1)$; 10 ;	[2]	
(ii)	(volume) = 2 ; cm^3 ;	[2]	I working A both marks if correct answer
(c) (i)	Any two from: stopclock / suitable measuring device / knife or scalpel / ruler / tile / beaker / forceps / test-tube rack ;	[1]	
(c) (ii)	table with 2 columns ; column 1 heading <u>block/tube</u> ; column 2 heading <u>time</u> ; units column 2 – <u>seconds/s(ec)</u> ; 4 results recorded in seconds ;	[5]	

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0610	62

(f)	Any 2 × 2		<i>mark in pairs looking for a linked error and improvement</i>
	<i>source of error:</i>		
	<i>improvement:</i>		
	idea of cutting cubes accurately		
	use cutters / make up agar in premeasured moulds / template / use a more precise ruler / Vernier callipers / use a sharper knife ;		
	idea of contamination / damage to cubes from handling		
	wear gloves / use forceps or suitable instrument to move agar pieces ;		
	difficult to judge end point / AW		
	use white / black background / do each tube separately ;		
	small cubes stick together so not all surface area exposed	[4]	
	separate with a glass rod / spill / suitable apparatus ;		
	amount / volume / concentration of sulphuric acid poured into each tube		
	use a burette / graduated pipette / measuring cylinder ;		
	timing all at the same time (so end point missed)		
	time each separately ;		
	acid is added at different times ;		
	time each separately / stagger the start / method of adding acid at the same time ;		

Page 5	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0610	62

(g) (i)	bile required to emulsify / break down large fat droplets to smaller droplets ; (this) increase the surface area of the fat to react with <u>enzyme</u> (so tube F has the fastest reaction) ;	[2]	
(ii)	(as a) control / proves that the enzyme is needed for the reaction / for comparison ;	[1]	
		[Total: 23]	
2 (a) (i)	Any two correct labels : lamina / (leaf) blade ; (leaf) edge / margin ; <u>Petiole</u> ; midrib ; vein ;	max [2]	
(b) (i)	allow 50–60 cm ² ;	[1]	
(ii)	use a grid with smaller squares ;	[1]	
(c)	(H is lowest as) it has a larger surface area / is the largest ; to capture more light ;	[2]	

Page 6	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0610	62

(d) (i)	<p>A – axes labelled, with units and scaled evenly ;</p> <p>S – size to fill at least $\frac{1}{2}$ of grid ;</p> <p>P – plot ;</p> <p>L – line of best fit ;</p>	[4]	accurate plots to ± 0.5 of grid square
(ii)	<p>as surface area increases, water loss also increases ;</p> <p>reference to the linear pattern / proportional increase or description / positive correlation / some processing of data ;</p>	[2]	
(e)	<p>length of JK = 14 (mm) ; (measurement)</p> <p>$\frac{(\text{length of stomata})}{(\text{magnification})} = \frac{14}{400}$; (formula)</p> <p>= 0.035 (mm) ; (calculation)</p>	<p>[1]</p> <p>[2]</p>	<p>A ecf for calculations from an incorrect measurement</p> <p>Rounding of figures must be correct – ‘5’ rounds up</p>

Page 7	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0610	62

(f)	any 2 of: temperature ; wind (speed)/ air movement ; light wavelength ; time in the light / duration of light ; humidity ; age of leaf ; species of plant / type of plant ; carbon dioxide (concentration) ; surface area of leaf ; water supply to leaf / plant ;	max [2]	
		[Total: 17]	