

**MARK SCHEME for the May/June 2009 question paper
for the guidance of teachers**

5090 BIOLOGY

5090/03

Paper 3 (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.

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- 1 (a) (i) number of teeth ;
- (ii) X's in Fig. 1.1 ;
- (iii) not yet through because of age / removed ; [1]
- (iv) biting/cutting/grinding/crushing ; **R** ref molecules.
to increase surface area of food (for enzyme action) ; [2]
/mechanical digestion

(b) (i)

	Immediate observation	Observation after 30 minutes
plain cotton bud (without sugar)	green/yellow	darker/deeper yellow ;
treated cotton bud (with sugar)	paler green/orange/yellow	orange/red ;

(1 mark per line) [2]

- (ii) orange/red – more acidic ;
because sugar converted to acids ;
by bacteria ; [3]

(c) (i) & (ii)

add iodine (to starch/substrate) ;
brown (etc)/colour of iodine – negative ;
(blue) black if starch present ;
add Benedict's, heat ;
blue to green/orange/red if reducing sugar etc ; [max 4]

(d) (i) Table 1.3

		test for starch	test for product
first test	amylase	negative	negative (for reducing sugar) ;
	starch	starch present / +ve	negative (for reducing sugar) ;
second test	with salt added	no starch present ;	yellow/orange ;
	without salt added	(starch still) present ;	blue/green (less than with salt) ;

[max 5]

- (ii) salt speeds activity of amylase ;
more breakdown of starch ;
more sugars formed ;
- without salt: breakdown of starch starts ;
but some still present ;
some sugars formed ; [max 3]

[Total: 22]

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- 2 (a) Consider as a whole.
Drawing:
all 3 attempted ;
good quality, double lines, minimal shading etc ;
Measurements:
units (once), cm to 0.1 in all 3 ;
realistic accuracy (even if no units) ;
Labels/Description:
testa ;
no germination/growth ;
ref normal **S3** ;
green, c.f. white/pale **S2** ;
etiolation ;
tall v short(er) stature ;
root hairs drawn & labelled ; [max 8]
- (b) (i) in **S1** enzymes/metabolism slower at low temp ;
so less energy/material from store ; [2]
- (ii) in **S2** no light so no photosynthesis ;
not green/no chlorophyll present ;
growth longer & thinner/etiolated ; [max 2]
- (c) (i) good shape of root tip, with root hairs ;
label: root hairs ; [2]
- (ii) increased surface area for absorption AW ; [1]
- (d) (i) mitosis ; [1]
- (ii) unspecialised cells ;
dividing repeatedly ; **A** reproducing
± same shape/size ; [max 2]

[Total: 18]