

GCSE

Environmental and Land Based Science

Unit **B682/01**: Plant Cultivation and Small Animal Care (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2015

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

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These are the annotations, (including abbreviations), including those used in scoris, which are used when marking

Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response

	no benefit of doubt
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Subject-specific Marking Instructions

- a. If a candidate alters his/her response, examiners should accept the alteration.
- b. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

- c. The list principle:
 If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

- d. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Answer	Mark	Guidance
1	a		A and B	2	
1	b	(i)	A change in DNA/base sequence/genetic material/ gene/change in chromosome structure/number/ random/(copying) errors in DNA;	1	A mistake for change or error
		(i)	Radiation (named type)/ chemicals (named chemical);	1	I pollution
2	a	i	33	1	
2	a	ii	66	1	
2	b		D B A C	2	2 marks all correct 1 mark for one correct response
2	c		<p>[Level 3] A detailed description of all the stages in growing plants from seed using correct scientific terms. Quality of written communication does not impede communication of the science at this level. (5–6 marks)</p> <p>[Level 2] A detailed description of most of the stages in growing plants from seed using some scientific terms. Quality of written communication partly impedes communication of the science at this level. (3–4 marks)</p> <p>[Level 1] A description of some of the stages in growing plants from seed. Quality of written communication impedes</p>	6	<p>This question is targeted at grades up to E</p> <p>Indicative scientific points may include:</p> <p>Sowing seeds:</p> <ul style="list-style-type: none"> • Use seed compost • Sterile to prevent diseases and growth of weeds • Place in a seed tray or pot • Firm down the compost to remove air spaces • Small seeds -Sprinkle seeds over the surface and cover with compost • Large seeds – Make a hole and plant the seed in/plant spaced out • Water with watering can/rose or by placing the pot in a tray of water • Place in a glasshouse for warmth <p>Pricking out:</p> <ul style="list-style-type: none"> • When seedlings are large enough • Transfer them individually into a larger tray or individual pot • This prevents competition • Hold seedling by leaves • Care not to snap stem

Question		Answer	Mark	Guidance
		<p>communication of the science at this level. (1–2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>		<ul style="list-style-type: none"> Remove all the root ball with the compost Water and place in the glasshouse <p>Potting on:</p> <ul style="list-style-type: none"> Place the seedling in a bigger pot Some large plants may need staking <p>Planting out:</p> <ul style="list-style-type: none"> After the risk of frost/in summer In the area it will remain in for the summer /named abiotic factor In (well cultivated) soil/prepared bed <ul style="list-style-type: none"> In a basket or planter <p>NB Credit watering only once</p> <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
3	a	<p>(Most of the) plants show a decrease in magnesium content Except for peas which show an increase Suitable figures, e.g. peas increase by arbitrary units/ bananas decrease by arbitrary units</p>	3	Must be a trend
3	b	<p>Any two from: Carried out by a different scientist Used different equipment Plants may be different types/varieties Plants may have been grown in different conditions/places No intermediate results More accurate techniques/ technology improved No current data for comparison</p>	2	<p>A Carried out by a different people;</p> <p>A 50yrs apart OWTTE</p>
3	c	<p>Any one from: Yellow leaves; reduced growth; smaller/no fruit;</p>	1	

Question	Answer	Mark	Guidance
4	<p>[Level 3] A detailed description of the differences between self-pollination and cross-pollination and a comprehensive explanation of the adaptations plants have evolved to prevent self-pollination and encourage cross-pollination Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] A description of the difference between self-pollination and cross-pollination and a description of the adaptations plants have evolved to prevent self-pollination and encourage cross-pollination. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] An understanding of the differences between self-pollination and cross-pollination and a relevant adaption that plants have evolved. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points may include:</p> <p>Cross Pollination - description:</p> <ul style="list-style-type: none"> • The transfer of pollen from the anther of one flower to the stigma of another plant of the same species. <p>Cross Pollination - adaptations</p> <ul style="list-style-type: none"> • Insect pollinated flowers have the following adaptations: <ul style="list-style-type: none"> - Bright (petals) - Scented petals - Nectar • Wind pollinated flowers have the following adaptations: <ul style="list-style-type: none"> - Anthers hanging outside the flower so pollen can be blown away by the wind - Feathery stigmas hanging outside the flower to catch the pollen - Large quantities of light pollen - Small flowers - Green/uncoloured flowers <p>Self-pollination - description:</p> <ul style="list-style-type: none"> • The transfer of pollen from the anther of one flower to the stigma of the same plant <p>Self-pollination – adaptations to prevent:</p> <ul style="list-style-type: none"> • (Dioecious) plants have separate male and female flowers • Stamens ripen/pollen is produced at a time when the stigmas of the same flower are not receptive • Different lengths of stamen and stigma <p>Self incompatibility so the pollen does not grow an effective pollen tubeAVP:</p> <ul style="list-style-type: none"> • Some plants are adapted to allow self-pollination at the end of the flowers life span if cross-pollination has not occurred. <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>

Question			Answer	Mark	Guidance
5	a		8	1	
5	b	i	Any two from: Carbohydrate/protein/vitamin C/vitamin D/iron/mineral/vitamins/fat	1	Allow: water and fibre A Named mineral/vitamin not stated in question
5	b	ii	One from: More palatable OWTTE/ provides fibre/for additional minerals/vitamins/carbohydrates/protein	1	I to make healthier
5	c		It does not tell you the percentages/mass of each nutrient It does not tell you all the ingredients present It doesn't tell you how much to feed your dog	1	A Reference to the source of food A No information on allergies A No information about age
6	a		Pregnant for less time/shorter gestation More offspring	2	ORA
6	b		Limping – Leg injury Diarrhoea – Stomach upset Scratching – Parasite	2	2 marks for all three matched correctly 1 mark for one matched correctly
6	c		Any two from: Housing Feeding Grooming Temperament Gender Handling Check that the buyers have got somewhere suitable to put them; Ensure they are healthy; How to keep them healthy Exercise Exercise	2	A What they live in A What they eat A How old they are A Are they vaccinated A Are they neutered I How to look after them I Breed

Question		Answer	Mark	Guidance
6	d	<p>[Level 3] A description of all the events from mating to birth using scientific terms. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] A description of some of the events from mating to birth using some scientific terms. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] A description of one of the events from mating to birth. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points may include:</p> <ul style="list-style-type: none"> • The male mounts the female/sexual intercourse • When she is on heat/releases egg • Sperm is produced by the male • It is released from the penis • Into the vagina of the female • Sperm swim up the fallopian tube/oviduct • Sperm fertilises the egg • Fertilised egg passes down the fallopian tube to the uterus • Egg embeds in the uterine wall • Placenta forms to provide nutrients for the developing embryo • Embryo/foetus grows and develops • Mammary glands develop • Uterine muscles contract to expel the foetus during birth • Hormones that control the reproductive cycle <p>! any information after birth Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
7	a	5	1	
7	b	Living plants to provide oxygen Pump to circulate the water	2	

Question		Answer	Mark	Guidance
8	a	<p>Three from: Choose the characteristics you want Breed (male and female) with these characteristics Example of a suitable characteristic, e.g. temperament Select offspring with the best characteristics Continue breeding over many generations</p>	3	
8	b	<p>One characteristic linked with an explanation Small easy to handle OWTTE/ Friendly so he doesn't get bitten/ Intelligent so it is easily trained</p>	2	<p>One mark for a characteristic and one mark if this is linked with an explanation Do not credit two characteristics without an explanation Accept: short hair</p>

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553

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