

Foundation

GCSE

Combined Science B Twenty First Century Science

J260/04: Combined science (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2022

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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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MARKING INSTRUCTIONS**PREPARATION FOR MARKING****RM ASSESSOR**

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training*; *OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor.
3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 50% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.

5. Crossed Out Responses

Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

Rubric Error Responses – Optional Questions

Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple Choice Question Responses

When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).

When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses

When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**)

Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth **two or more marks**)

If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response)

Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.
7. Award No Response (NR) if:
 - there is nothing written in the answer space.

Award Zero '0' if:

- anything is written in the answer space and is not worthy of credit (this includes text and symbols).

Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

If you have any questions or comments for your Team Leader, use the phone, the RM Assessor messaging system, or email.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:

Read through the whole answer from start to finish, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance. Using a 'best-fit' approach based on the skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.

Once the level is located, award the higher or lower mark:

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in italics) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in italics) are missing.















In summary:

The skills and science content determines the level.

The communication statement determines the mark within a level.

Level of response questions on this paper is **4b**

11. Annotations available in RM Assessor

Annotation	Meaning
	Correct response
	Incorrect response
	Omission mark
	Benefit of doubt given
	Contradiction
	Rounding error
	Error in number of significant figures
	Error carried forward
	Level 1
	Level 2
	Level 3
	Benefit of doubt not given
	Noted but no credit given
	Ignore

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
()	Words which are not essential to gain credit
—	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

13. Subject-specific Marking Instructions

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

The breakdown of Assessment Objectives for GCSE (9-1) in Combined Science B:

	Assessment Objective
AO1	Demonstrate knowledge and understanding of scientific ideas and scientific techniques and procedures.
AO1.1	Demonstrate knowledge and understanding of scientific ideas.
AO1.2	Demonstrate knowledge and understanding of scientific techniques and procedures.
AO2	Apply knowledge and understanding of scientific ideas and scientific enquiry, techniques and procedures.
AO2.1	Apply knowledge and understanding of scientific ideas.
AO2.2	Apply knowledge and understanding of scientific enquiry, techniques and procedures.
AO3	Analyse information and ideas to interpret and evaluate, make judgements and draw conclusions and develop and improve experimental procedures.
AO3.1	Analyse information and ideas to interpret and evaluate.
AO3.1a	Analyse information and ideas to interpret.
AO3.1b	Analyse information and ideas to evaluate.
AO3.2	Analyse information and ideas to make judgements and draw conclusions.
AO3.2a	Analyse information and ideas to make judgements.
AO3.2b	Analyse information and ideas to draw conclusions.
AO3.3	Analyse information and ideas to develop and improve experimental procedures.
AO3.3a	Analyse information and ideas to develop experimental procedures.
AO3.3b	Analyse information and ideas to improve experimental procedures.

Question		Answer		Marks	AO element	Guidance																
1	(a)	Biofuel	<input checked="" type="checkbox"/>	2	2.1																	
		Fossil fuels	<input checked="" type="checkbox"/>																			
		Hydroelectricity	<input type="checkbox"/>																			
		Nuclear fuel	<input type="checkbox"/>																			
		The Sun	<input type="checkbox"/>																			
		Wind	<input type="checkbox"/>																			
			✓✓																			
	(b)	gas ✓ water ✓ turbine ✓		3	1.1																	
	(c)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Boiler to make steam</th> <th>Turbine turns to operate generator</th> <th>Does not release CO₂ gas</th> </tr> </thead> <tbody> <tr> <td>Nuclear power</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>The Sun</td> <td></td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Wind</td> <td></td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> </tbody> </table>		Boiler to make steam	Turbine turns to operate generator	Does not release CO ₂ gas	Nuclear power	✓	✓	✓	The Sun			✓	Wind		✓	✓		3	1.1	1 mark for each correct row.
	Boiler to make steam	Turbine turns to operate generator	Does not release CO ₂ gas																			
Nuclear power	✓	✓	✓																			
The Sun			✓																			
Wind		✓	✓																			
			✓✓✓																			

Question			Answer	Marks	AO element	Guidance								
2	(a)	(i)	<p>Any one from:</p> <p>(to ensure his results are) repeatable ✓</p> <p>Identify odd/anomalous results / outliers ✓</p>	1	2.2	<p>IGNORE mean / average / accurate / valid / fair / reliable / reproducible / more evidence alone / precision</p> <p>ALLOW to check the results / see if they are similar / different</p> <p>IGNORE compare without qualification</p>								
		(ii)	<p>FIRST CHECK THE ANSWER ON THE LINE</p> <p>If answer = 5 award 3 marks</p> <p>$5 + 6 + 7 + 5 + 4 = 27$ ✓</p> <p>27/5 or 5.4 ✓</p> <p>5 ✓</p>	3	2 x 2.2 1.2	<p>If no other marks awarded, an incorrect number correctly rounded = 1 mark</p> <p>ALLOW sight of 27</p>								
	(b)	(i)	<table border="0"> <tr> <td>Combustion</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Endothermic</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Exothermic</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Neutralisation</td> <td><input type="checkbox"/></td> </tr> </table> <p>✓</p>	Combustion	<input type="checkbox"/>	Endothermic	<input type="checkbox"/>	Exothermic	<input checked="" type="checkbox"/>	Neutralisation	<input type="checkbox"/>	1	3.2b	
Combustion	<input type="checkbox"/>													
Endothermic	<input type="checkbox"/>													
Exothermic	<input checked="" type="checkbox"/>													
Neutralisation	<input type="checkbox"/>													
		(ii)	C ✓	1	2.1									

<p>(c)</p>		<table border="1"> <thead> <tr> <th data-bbox="421 172 707 199">Improvement</th> <th data-bbox="831 172 1061 199">Explanation</th> </tr> </thead> <tbody> <tr> <td data-bbox="421 209 707 252">Change the concentration of the acid</td> <td data-bbox="831 209 1061 252">To get a broader range of data</td> </tr> <tr> <td data-bbox="421 268 707 311">Insulate the beaker ✓</td> <td data-bbox="831 268 1061 311">To change the rate of reaction</td> </tr> <tr> <td data-bbox="421 327 707 370">Use a different type of metal</td> <td data-bbox="831 327 1061 370">To reduce heat loss ✓</td> </tr> </tbody> </table> <p data-bbox="405 395 450 422">✓✓</p>	Improvement	Explanation	Change the concentration of the acid	To get a broader range of data	Insulate the beaker ✓	To change the rate of reaction	Use a different type of metal	To reduce heat loss ✓	<p>2</p>	<p>3.3b</p>	<p data-bbox="1413 172 2040 272">If one line is drawn 1 mark for identifying the correct improvement 1 mark for identifying the correct explanation</p> <table border="1"> <thead> <tr> <th data-bbox="1435 276 1621 287">Improvement</th> <th data-bbox="1704 276 1854 287">Explanation</th> </tr> </thead> <tbody> <tr> <td data-bbox="1435 300 1621 327">Change the concentration of the acid ✗</td> <td data-bbox="1704 300 1854 327">To get a broader range of data</td> </tr> <tr> <td data-bbox="1435 343 1621 370">Insulate the beaker</td> <td data-bbox="1704 343 1854 370">To change the rate of reaction</td> </tr> <tr> <td data-bbox="1435 386 1621 413">Use a different type of metal</td> <td data-bbox="1704 386 1854 413">To reduce heat loss ✓</td> </tr> </tbody> </table> <p data-bbox="1839 411 2040 438">E.g. 1 mark</p> <p data-bbox="1413 507 2040 576">If more than one line drawn then ALLOW one mark for the correct line. Ignore other two lines.</p> <table border="1"> <thead> <tr> <th data-bbox="1435 616 1621 627">Improvement</th> <th data-bbox="1704 616 1854 627">Explanation</th> </tr> </thead> <tbody> <tr> <td data-bbox="1435 639 1621 667">Change the concentration of the acid</td> <td data-bbox="1704 639 1854 667">To get a broader range of data</td> </tr> <tr> <td data-bbox="1435 683 1621 710">Insulate the beaker</td> <td data-bbox="1704 683 1854 710">To change the rate of reaction</td> </tr> <tr> <td data-bbox="1435 726 1621 753">Use a different type of metal</td> <td data-bbox="1704 726 1854 753">To reduce heat loss</td> </tr> </tbody> </table> <p data-bbox="1839 735 2040 762">E.g. 1 mark</p> <p data-bbox="1413 836 2040 904">If three lines drawn and insulate the beaker is not joined to reduce heat loss, then zero marks.</p> <table border="1"> <thead> <tr> <th data-bbox="1435 908 1621 919">Improvement</th> <th data-bbox="1704 908 1854 919">Explanation</th> </tr> </thead> <tbody> <tr> <td data-bbox="1435 932 1621 959">Change the concentration of the acid</td> <td data-bbox="1704 932 1854 959">To get a broader range of data</td> </tr> <tr> <td data-bbox="1435 975 1621 1002">Insulate the beaker</td> <td data-bbox="1704 975 1854 1002">To change the rate of reaction</td> </tr> <tr> <td data-bbox="1435 1018 1621 1045">Use a different type of metal</td> <td data-bbox="1704 1018 1854 1045">To reduce heat loss</td> </tr> </tbody> </table> <p data-bbox="1839 1023 2040 1050">E.g. 0 marks</p>	Improvement	Explanation	Change the concentration of the acid ✗	To get a broader range of data	Insulate the beaker	To change the rate of reaction	Use a different type of metal	To reduce heat loss ✓	Improvement	Explanation	Change the concentration of the acid	To get a broader range of data	Insulate the beaker	To change the rate of reaction	Use a different type of metal	To reduce heat loss	Improvement	Explanation	Change the concentration of the acid	To get a broader range of data	Insulate the beaker	To change the rate of reaction	Use a different type of metal	To reduce heat loss
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Question		Answer	Marks	AO element	Guidance
3	(a)	<p>Circuit diagram A ✓</p> <p>Because the number of cells has been increased / more cells ✓</p>	2	3.2b	<p>If A not chosen then 0 marks</p> <p>ALLOW explanation of why B and C are incorrect only if A is correct</p> <p>ALLOW batteries instead of cells</p> <p>ALLOW 2 cells</p> <p>IGNORE current / energy / power / volts / potential difference</p>
	(b)	<p>The current is the same in all parts of the circuit ✓</p> <p>it's a series circuit / there is only one route or pathway / single closed loop / all the electrons have to flow through all the components ✓</p>	2	<p>3.1b</p> <p>2.1</p>	<p>ALLOW ammeters show the same reading</p> <p>IGNORE energy / electricity / power / voltage / volts</p> <p>IGNORE there is only one circuit</p>
	(c) (i)		2	1.1	<p>3 correct = 2 marks</p> <p>2 or 1 correct = 1 mark</p>
	(ii)	<p>FIRST CHECK THE ANSWER ON THE ANSWER LINE</p> <p>If answer = 0.125 award 2 marks</p> <p>3 / 24 ✓</p> <p>= 0.125 ✓</p>	2	2.1	

Question		Answer	Marks	AO element	Guidance
4	(a)	<div style="display: flex; flex-direction: column; gap: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 100px; text-align: center;">Alleles</div> <div style="border: 1px solid black; padding: 5px; width: 100px; text-align: center;">Dominant</div> <div style="border: 1px solid black; padding: 5px; width: 100px; text-align: center;">Gamete</div> <div style="border: 1px solid black; padding: 5px; width: 100px; text-align: center;">Genome</div> </div>	3	1.1	4 correct = 3 marks 3 or 2 correct = 2 marks 1 correct = 1 mark
		<div style="border: 1px solid black; padding: 5px; width: 100%; text-align: center;">Only one copy of this genetic variant is needed to have the feature it produces.</div>			
		<div style="border: 1px solid black; padding: 5px; width: 100%; text-align: center;">The entire genetic material of an organism.</div>			
		<div style="border: 1px solid black; padding: 5px; width: 100%; text-align: center;">The two versions of a gene in a pair of chromosomes.</div>			
		<div style="border: 1px solid black; padding: 5px; width: 100%; text-align: center;">A sex cell used in sexual reproduction.</div>			
		✓✓✓			

<p>(b) *</p>	<p>Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question.</p> <p>Level 3 (5–6 marks) A correct Punnet square AND A detailed explanation of why Sara is right using information from the Punnet square to support the conclusion. <i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Level 2 (3–4 marks) A correct Punnet square AND A basic explanation of why Sara is right OR A detailed explanation of why Sara is right alone <i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p>Level 1 (1–2 marks) An attempt at a Punnet square but there are inaccuracies OR A basic explanation of why Sara is right <i>There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.</i></p> <p>0 marks <i>No response or no response worthy of credit.</i></p>	<p>6</p>	<p>3 x 3.2a 3 x 2.1</p>	<p>AO 3.2a Analyse genetic diagrams to make judgements</p> <ul style="list-style-type: none"> • The albino allele b is recessive • The brown allele B is dominant • Genotype Bb or bB or BB will be brown • Genotype bb / homozygous recessive alleles will cause albino offspring • Each parent rat has a recessive allele • Gametes / egg / sperm produced could have the recessive allele b • 50% of the offspring's genes come from each / a / one parent • If each parent passes on the recessive allele / If a sperm has b and an egg has b then the offspring will have the genotype bb / be albino • There is a 25% chance of an albino offspring • There is a 75% chance of a brown offspring • Punnet square clearly annotated to show albino phenotype <p>ALLOW white for albino throughout</p> <p>AO 2.1 Application of ideas about genetic diagrams</p> <ul style="list-style-type: none"> • Punnet square contains appropriate alleles (B & b) • Gametes correctly filled in (one allele in each box)
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						<ul style="list-style-type: none"> Punnet square completed correctly to show possible genotypes Understanding that this shows the probability of offspring genotype
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Question		Answer	Marks	AO element	Guidance
5	(a)	(RFM of glucose + fructose =) $180 + 180 = 360$ ✓ (sucrose + water =) $342 + 18 = 360$ ✓ idea of the mass of reactants is equal to the mass of products ✓	3	3.1b	ALLOW sight of 360 ALLOW $360 - 342 = 18$ ALLOW no mass lost / reactants and products are both 360 / mass not lost or gained / mass stays the same / mass cannot be created nor destroyed
	(b)	chloroplast <input type="checkbox"/> mitochondria <input checked="" type="checkbox"/> nucleus <input type="checkbox"/> ribosome <input type="checkbox"/>	1	1.1	
	(c)	FIRST CHECK THE ANSWER ON THE ANSWER LINE If answer = 40 (%) award 4 marks Sight of 16×3 or 48 ✓ Working to get 100 or $12 + 40 + 48$ / (RFM) $\text{CaCO}_3 = 100$ ✓	4	2.2	IGNORE 40 alone (without %) in the working out space rather than the answer line ALLOW maximum 3 marks the use of 68 as RFM (RFM) $\text{CaCO}_3 = 68$ / sight of 68 ✓

			40/100 or 0.4 ✓ 40 (%) ✓			40/68 or 0.59 or 0.588 ✓ 59 / 58.8 (%) ✓
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Question			Answer	Marks	AO element	Guidance
6	(a)	(i)	<p>Any three from:</p> <p>Oestrogen is higher (than progesterone) / ORA ✓</p> <p>oestrogen rises ✓</p> <p>oestrogen peaks at ovulation / day 14 ✓</p> <p>progesterone is low / zero / constant ✓</p> <p>progesterone starts to rise the day before ovulation / at day 13 ✓</p>	3	3.1a	<p>IGNORE comments relating to after ovulation / day 14</p> <p>IGNORE values for hormone levels unless zero</p> <p>IGNORE hormone unqualified</p> <p>Answer must be comparative for first marking point</p> <p>ALLOW optimum / reaches a maximum / is highest for peak</p> <p>DO NOT ALLOW progesterone rises at ovulation</p>
		(ii)	14 ✓	1	3.2b	
		(iii)	17 ✓	1	3.2b	ALLOW 16
	(b)	(i)	Beth AND Sara ✓	1	2.1	Both names needed for the mark
		(ii)	Nina ✓	1	2.1	
		(iii)	Beth ✓	1	2.1	

Question		Answer	Marks	AO element	Guidance												
7	(a)	Watt OR Joules per second ✓	1	1.1	ALLOW W or J/s ALLOW kilowatts / megawatts etc												
	(b)	FIRST CHECK THE ANSWER ON THE ANSWER LINE If answer = 0.625 (A) award 3 marks 1.5 x 2.5 OR 3.75 ✓ 3.75 / 6 or (1.5 x 2.5) / 6 seen ✓ 0.625 ✓	3	2.2													
	(c) (i)	4 correct points ✓✓ LOBF drawn with ruler for their points ✓	3	2.2 2.1	Points must be clearly and accurately plotted ALLOW 1 mark for 3 correct points DO NOT ALLOW for MP3 more than one LOBF <table border="1"> <thead> <tr> <th>Primary</th> <th>Secondary</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>1.0</td> </tr> <tr> <td>2.0</td> <td>4.0</td> </tr> <tr> <td>6.0</td> <td>12.5</td> </tr> <tr> <td>10.0</td> <td>20.0</td> </tr> <tr> <td>12.0</td> <td>23.0</td> </tr> </tbody> </table>	Primary	Secondary	0.5	1.0	2.0	4.0	6.0	12.5	10.0	20.0	12.0	23.0
Primary	Secondary																
0.5	1.0																
2.0	4.0																
6.0	12.5																
10.0	20.0																
12.0	23.0																
	(ii)	as primary (pd) increases, secondary (pd) increases ✓ linear ✓	2	3.2b	ALLOW positive correlation ALLOW directly proportional ALLOW for 2 marks the secondary (pd) is almost double the primary (pd) ORA												
	(d)	decreases ✓ reduces ✓	2	3.2a													

Question		Answer	Marks	AO element	Guidance	
8	(a)	<p>Any one from: (wear) goggles / safety glasses ✓ Screen ✓ Lab coat/apron ✓ Gloves ✓</p>	1	1.2	<p>Glasses must be qualified</p> <p>ALLOW tweezers or tongs</p>	
	(b)	(i)	(B) C E A D ✓✓✓	3	3.1a	<p>C before E = 1 mark E before A = 1 mark A before D = 1 mark</p>
		(ii)	<p>(No) (to test for hydrogen, they need to) use a lighted/lit splint/do not blow out the splint ✓</p> <p>idea that the positive test for hydrogen will give a (squeaky) pop ✓</p>	2	3.3b	<p>ALLOW a glowing splint is the test for oxygen</p> <p>ALLOW positive test for oxygen given (relights the glowing splints)</p>
	(c)	<p>2[Na] ✓ 2[HCl] ✓ 2[NaCl] ✓</p>	3	2.1		

Question			Answer	Marks	AO element	Guidance												
9	(a)	(i)	<table border="1"> <tr><td>Greenfly</td><td></td></tr> <tr><td>Hedgehog</td><td>✓</td></tr> <tr><td>Lettuce</td><td></td></tr> <tr><td>Owl</td><td></td></tr> <tr><td>Rabbit</td><td></td></tr> <tr><td>Spider</td><td>✓</td></tr> </table>	Greenfly		Hedgehog	✓	Lettuce		Owl		Rabbit		Spider	✓	1	3.2b	Both required for the mark
Greenfly																		
Hedgehog	✓																	
Lettuce																		
Owl																		
Rabbit																		
Spider	✓																	
		(ii)	Five ✓	1	3.1a													
		(iii)	<p>Either: Snails would increase ✓ Because less competition for food ✓</p> <p>Or: Snails would decrease ✓ Because hedgehogs would eat more snails ✓</p>	2	3.2b	<p>ALLOW more lettuce / food (for them to eat)</p> <p>IGNORE blackbirds ALLOW stays the same with a suitable explanation of both ideas of increase and decrease</p>												
	(b)		<p>FIRST CHECK THE ANSWER ON ANSWER LINE If answer = 0.375 (kg) award 2 marks</p> <p>37.5 / 10 = 3.75 ✓ 3.75 / 10 = 0.375 ✓</p>	2	2.2	ALLOW 3.75 by other methods for 1 mark												

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