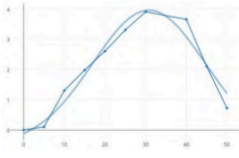


Q1. (2018)

A)

21	(a)	energy/heat is taken from surroundings/into the reaction✓	1	1.1	ALLOW energy absorbed is more than the energy released
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B)

	(b)	suitable smooth line of best fit is drawn✓	1	2.2	 dot to dot line = 0
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C)

	(c)	<p>at point A light is limiting as increasing light intensity increases the rate / as it has sufficient temperature and carbon dioxide ✓</p> <p>at point B temperature is limiting as increasing temperature increases rate / as it has sufficient light and carbon dioxide ✓</p> <p>at point C carbon dioxide is limiting as increasing carbon dioxide increases rate / it has sufficient temperature and light ✓</p>	3	3 x 2.1	<p>if no other mark scored allow one mark for correct identification of the three limiting factors with no explanations</p>
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D)

	(d)	(i)	<p>photosynthesis makes sugars in guard cells✓</p> <p>epidermal cells (don't photosynthesise so) lower in sugar than guard cell✓</p> <p>and any two from: epidermal cells higher osmotic / water potential than guard cells✓ ORA</p> <p>water enters guard cells (by osmosis) ✓ ORA</p> <p>increasing turgidity of guard cell opens stomata✓ ORA</p> <p>due to thicker inner cell wall✓</p> <p>opening / size of stoma affects transpiration rate✓</p>	4	<p>2 x 1.1</p> <p>2 x 2.1</p>	<p>ALLOW correct description of transpiration linked to the size of stoma</p>
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E)

		(ii)	<p>they have differentiated✓</p> <p>have a specific job to do (in the leaf/plant)✓</p>	2	2 x 1.1	<p>ALLOW they have adapted (to their function)</p> <p>ALLOW no other cells do the same job</p> <p>ALLOW they can open / close stomata</p> <p>they have adapted to a specific job / they are adapted to open and close stomata = 2 marks</p>
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F)

	(e)	<p>phloem is removed✓</p> <p>swelling caused by a build-up of food/sugar ✓</p> <p>food/sugar produced in the leaves / moving downwards cannot get past (the ringed area) ✓</p>	3	3 x 3.2b	<p>ALLOW phloem is on the outside</p> <p>IGNORE nutrients / minerals / ions</p> <p>ALLOW glucose / sucrose</p> <p>ALLOW translocation to roots is prevented</p>
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Q2. (2019)

2		B	1	2.1	
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Q3. (2021)

9		B✓	1	1.1	
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Q4. (2021)

14		C✓	1	2.2	
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Q5. (2021)

A)

17	(a)	(i)	Photosynthesis ✓	1	2.1	
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B)

		(ii)	Oxygen stops being produced ✓	1	3.1a	ALLOW because photosynthesis produces oxygen
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C)

	(b)	(i)	Light enables the moss ball plant to float/rise ✓ Idea of slight time lag between exposure to light and floating or sinking ✓	2	2 x 3.2a	ALLOW converse arguments in the dark
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D)

		(ii)	Any two from: Idea that exposure to light produces oxygen/allows photosynthesis, so ball floats ✓ Idea that (in experiment 1) dark conditions stop photosynthesis/oxygen production causing sinking ✓ Idea that the light is shone for a longer time in experiment 2, so the ball floats for longer ✓	2	2 x 2.1	DO NOT ALLOW in the dark respiration starts Answer needs to compare the length of time the light is shone and the length of time the ball floats to score this marking point
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E)

	(c)		Any three from: (Increased temperature) will increase photosynthesis/respiration/transpiration/water uptake OR ✓ Molecules move faster / increased kinetic energy ✓ Increased rate of collisions between enzymes and substrates/ increased rate of formation of ES complexes ✓ High temperature levels/above 37°C will stop/reduce the rate of photosynthesis/respiration ✓	3	3 x 1.1	ALLOW increase evaporation ALLOW higher level responses to high temperature effects on enzymes e.g. enzymes/structural proteins in plants may start to denature
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Q6. (2022)

1		C ✓	1	1.1	
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Q7. (2022)

15	B ✓	1	1.1	
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Q8. (2023)

2	B	1	1.1	
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Q9. (2023)

A)

22	(a)	<p>Any three from:</p> <p>Concentration of solution/sodium hydrogen carbonate ✓</p> <p>Volume of solution/sodium hydrogen carbonate ✓</p> <p>Size/number/area of leaf discs / part of the leaf the discs were taken from ✓</p> <p>Temperature ✓</p> <p>Light intensity ✓</p> <p>Same size/height of syringe ✓</p>	3	3 x 2.2	<p>IGNORE amount</p> <p>IGNORE size of leaf</p> <p>IGNORE same syringe</p>
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B)

	(b)	Oxygen is produced ✓	1	2.2	
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C)

	(c)	<p>Use of a lamp/light at different distances from the syringe ✓</p> <p>Time how long it takes for the discs to rise ✓</p> <p>Use of inverse square law to calculate the light intensity ✓</p>	3	3 x 3.3a	ALLOW use bulbs of different brightness/wattage
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Q10. (2024)

13	B	1	1.1	
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Q11. (2024)

14	A	1	2.1	
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