

Mark scheme higher test – plants and photosynthesis

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	2	carbon dioxide; oxygen;	CO ₂ O ₂		CO ² / CO2 O2/ O ²
(b)	2	{contains/ has} chlorophyll/ chlorophyll is found in chloroplast; Absorbs light ;	{traps/ takes in} light		Chlorophyll alone attracts light
(c)	2	(rate) increases then {plateaus/ stays the same}; at 3 a.u. light intensity;			
	2	80 - 50; 30;	Correct answer = 2 marks		
Total Mark		8			

Indicative content

plants use chlorophyll to absorb light energy.
 convert carbon dioxide and water
 into glucose and oxygen
 glucose can be changed to starch and stored
 used to make cellulose/ proteins
 light, temperature and carbon dioxide are limiting factors

5 – 6 marks

The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.

3 – 4 marks

The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.

1 – 2 marks

The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.

- 8/3 (a) carbon dioxide/CO₂ (not CO² or Co₂ etc) required for 1
photosynthesis/starch manufacture;
- (b) (i) {Boil/ heat} in {alcohol/methanol/ethanol}; 1
Boiling water = neutral
- (ii) Iodine (solution); 1
- (iii) no CO₂/ CO₂ absorbed by sodium hydroxide; 3
no photosynthesis;
no starch produced;
- (c) Control/ to make a comparison; 1
- (d) because you wouldn't know whether it was the lack of light or 1
lack of carbon dioxide which prevented photosynthesis/starch
production;
Answer must refer to both carbon dioxide and light limiting
photosynthesis

Question 8/3 Total

[8]

Drop leaf in boiling water to {kill the leaf/ burst the chloroplasts/
{burst/destroy} cell membranes/ to get rid of waxy cuticle}

Boil the leaf in ethanol/alcohol/methanol to remove the
chlorophyll

Place the leaf in water to soften it

Spread the leaf on a white tile (or any suitable surface)

Add iodine solution to the leaf surface to test for starch

If leaf turns {blue-black/ black} starch is present

5 – 6 marks

The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.

3 – 4 marks

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