



Additional Assessment Materials  
Summer 2021

Pearson Edexcel GCSE in Biology (1BI0)  
Higher

Resource Set Topic 6: Plant structures

Questions

(Public release version)

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## General guidance to Additional Assessment Materials for use in 2021

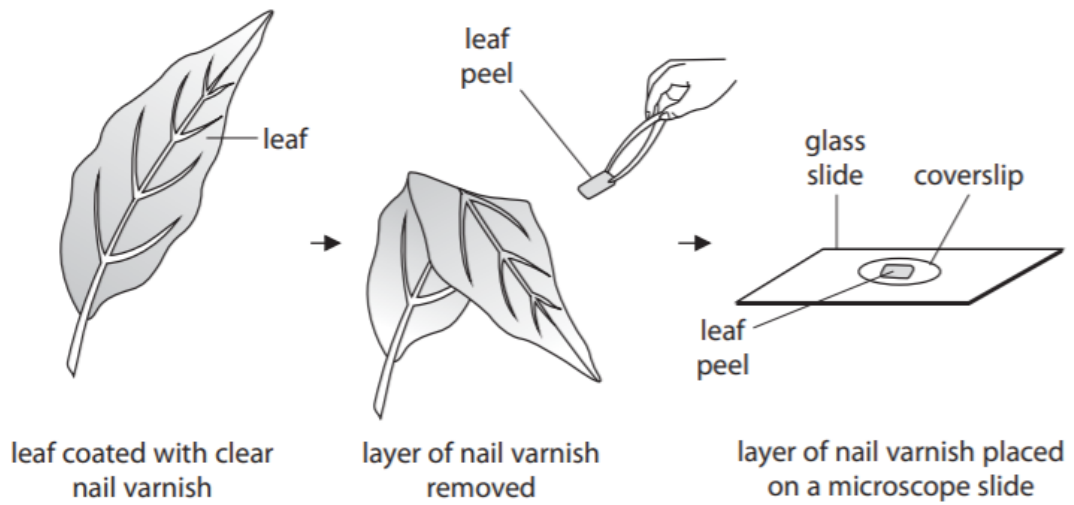
### Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an **optional** part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

### Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

- 3 A student compared the number of stomata on the upper and lower surfaces of a leaf. She completed a leaf peel as shown in Figure 5.



**Figure 5**

The layer of nail varnish shows an impression of the cells on the surface of the leaf.

- (a) (i) State why a coverslip is placed on top of the leaf peel.

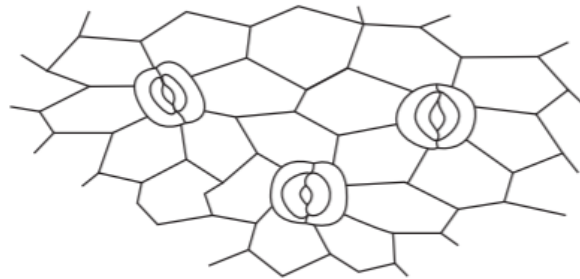
(1)

- (ii) Explain why the leaf peel rather than the whole leaf was viewed with a microscope.

(2)

(b) The student drew a biological diagram of the leaf peel taken from the underside of the leaf.

Figure 6 shows this diagram.



**Figure 6**

(i) State the number of stomata visible on Figure 6.

(1)

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(ii) The student observed that the stomata were open.

Describe how stomata open.

(3)

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(iii) The leaf peel from the upper surface of this leaf showed no stomata.

Explain why it is an advantage to the plant to have this distribution of stomata in the upper and lower surfaces of the leaf.

(2)

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7bi-ii

(b) Figure 15 shows the results of this investigation.

seedling in test tube	length at the start in mm	length after 7 days in mm
1	4	11
2	6	17
3	5	26

**Figure 15**

(i) Explain why there are differences in the change in the lengths of the seedlings.

(2)

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(ii) Explain how nitrate ions were absorbed by the seedling in test tube 3.

(3)

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- 8 (a) Figure 16 shows the effect of light intensity and temperature on the rate of photosynthesis.

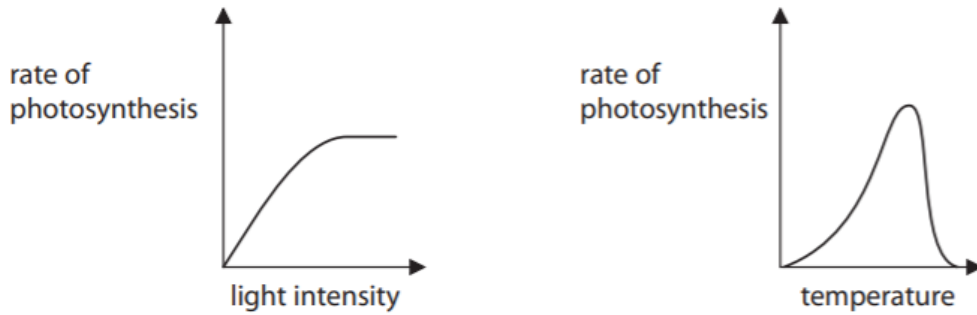


Figure 16

- (i) Describe the effect of light intensity on the rate of photosynthesis.

(2)

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- (ii) Explain the effect of temperature on the rate of photosynthesis.

(2)

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- (b) A student measured the rate of photosynthesis using algal balls in a laboratory. The tube of algal balls was kept at a temperature of 25°C and was moved to different distances from a light source.

The results of this investigation showed that the rate of photosynthesis is

(1)

- A directly proportional to the distance from a light source
- B inversely proportional to light intensity
- C directly proportional to temperature
- D inversely proportional to the distance from a light source

\***(c)** Explain how substances are moved through a plant by transpiration and translocation. (6)

A series of horizontal lines for writing, consisting of 20 lines spaced evenly down the page.

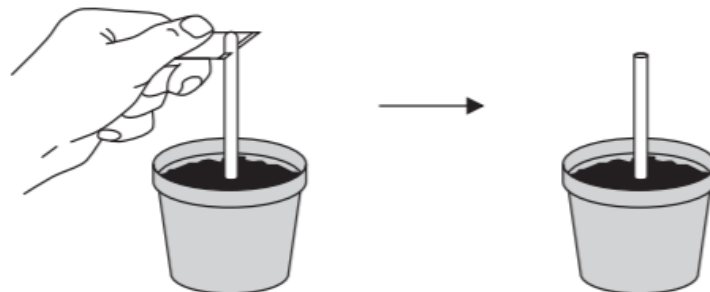


10 (a) Figure 18 shows an investigation into the growth of plant shoots.

Experiment 1:

The tip of a shoot was removed from the plant.

There was no growth in the shoot after 3 days.



Experiment 2:

The tip of a shoot was cut off and then placed back onto the shoot.

The shoot had grown 6 mm after 3 days.

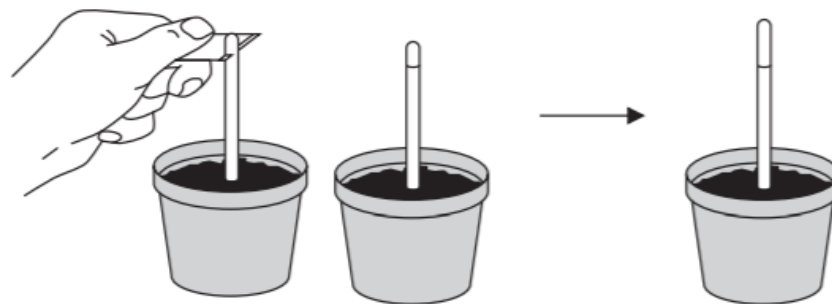


Figure 18

- (i) Give **one** variable that must have been controlled for the plant shoot to grow vertically, as shown in experiment 2.

(1)

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- (ii) State **one** conclusion that could be made based on these two experiments.

(1)

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(iii) Which plant hormone causes growth in the plant shoot?

(1)

- A auxin
- B ethene
- C gibberellin
- D chlorophyll

(iv) Explain **one** way that this investigation could be improved.

(2)

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1 (a) Figure 1 shows a cross section of a leaf.

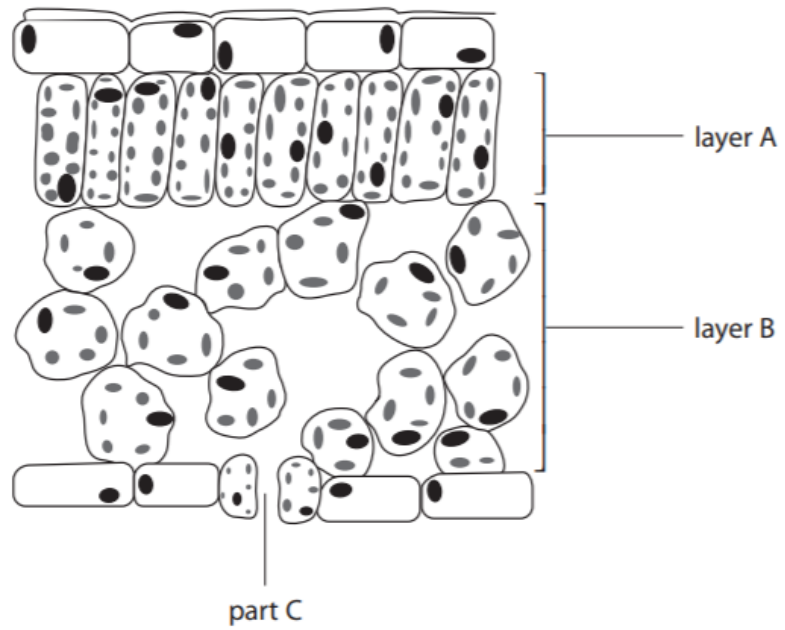


Figure 1

(i) What is the name of layer A?

(1)

- A spongy mesophyll
- B palisade mesophyll
- C upper epidermis
- D waxy cuticle

(ii) Explain the function of the spaces between the cells in layer B.

(2)

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(iii) Explain the function of part C in Figure 1.

(2)

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(b) Xerophytes are plants adapted to live in very dry conditions.

State **two** differences between the leaf structure of a xerophyte and the leaf structure shown in Figure 1.

(2)

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2.....

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5 (a) (i) Water enters a plant through root hair cells.

Root hair cells have

(1)

- A** a small surface area and thin cell walls
- B** a small surface area and thick cell walls
- C** a large surface area and thin cell walls
- D** a large surface area and thick cell walls

(ii) Explain how water in the root is transported to the leaves of the plant.

(2)

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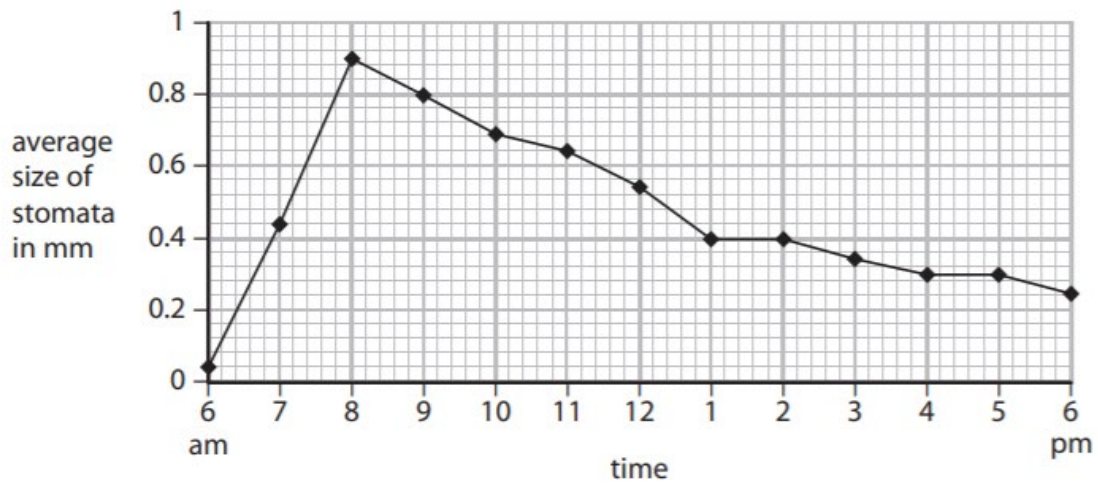
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(b) How is sucrose transported from the leaves to other parts of the plant?

(1)

- A by osmosis through the phloem
- B by osmosis through the xylem
- C by translocation through the phloem
- D by translocation through the xylem

(c) Figure 7 shows the average size of stomata in a leaf during one day.



**Figure 7**

(i) Name the cells that change the size of stomata.

(1)

(ii) Describe the trend shown in Figure 7.

(2)

(iii) The temperature increased from 8 am to 1 pm.

Explain why this affected the size of the stomata.

(2)

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2 Figure 2 shows the leaves and flowers of water lily plants (*Nymphaea odorata*) on a lake.



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**Figure 2**

(a) Water lilies have stomata on the upper surface of the leaves.

Explain why water lilies have no stomata on the lower surface of the leaves.

(2)

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(ii) Glucose is made by photosynthesis.

Glucose is converted to another sugar to be transported in the plant.

What is the name of this sugar?

(1)

- A** glycerol
- B** ribose
- C** sucrose
- D** starch

(iii) Describe how this sugar is transported from the leaves to the flowers of the water lily.

(2)

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7 (a) A gardener decided to kill the dandelion plants growing in his lawn.

The gardener set up a trial to see which concentration of weed killer would kill the most dandelions and be most economical.

He counted the number of dandelion plants in six 1 m<sup>2</sup> areas of the lawn.

He made six different concentrations of weed killer solution.

He applied the solutions to each of the six different areas.

After two weeks, he counted the number of dandelion plants in each area.

The results are shown in Figure 12.

concentration of weed killer solution (%)	number of dandelion plants in 1 m <sup>2</sup>	
	before applying weed killer	two weeks after applying weed killer
0	9	9
20	9	9
40	7	5
60	8	2
80	8	0

Figure 12

(i) Give **one** variable the gardener should control when completing this trial.

(1)

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(ii) State and explain the conclusions the gardener can make based on his trial.

(3)

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(b) Some weed killers contain plant hormones.

Explain how plant hormones work as weed killers.

(3)

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(c) Explain how phototropism is controlled in plant shoots.

(3)

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**TOTAL = 67 MARKS**