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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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Level 1 Biology, 2014

90928 Demonstrate understanding of biological ideas relating to the life cycle of flowering plants

2.00 pm Monday 17 November 2014

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to the life cycle of flowering plants.	Demonstrate in-depth understanding of biological ideas relating to the life cycle of flowering plants.	Demonstrate comprehensive understanding of biological ideas relating to the life cycle of flowering plants.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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(a) Plants use different methods of seed dispersal.

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<http://www.flickr.com/photos/mullyv410/5031292705/>

www.bcliving.ca/garden/
fruit-edible-inedible-incredible-
by-wolfgang-stuppy-and-rob-
kessler#Cenchrus-spinifex

[http://www.bic.searca.org/
photo_exchange/pages/coconut_
jpg.htm](http://www.bic.searca.org/photo_exchange/pages/coconut_jpg.htm)

http://guacamoleinthetrees.blogspot.co.nz/2013_01_01_archive.html

1. _____ 2. _____ 3. _____ 4. _____

(b) Using the four examples above, compare the different dispersal methods used by each seed, and explain how the method of dispersal is linked to the structure of the seed.

- (c) Discuss the advantages AND possible disadvantages of the **different methods of seed dispersal** used by each of the four plants.

Once the seeds have been dispersed they may germinate. The pictures below show miro seedlings that have germinated.

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<http://www.conifers.org/po/pr/ferruginea2.jpg>

- Diagram of transverse section of tree trunk, showing growth rings**

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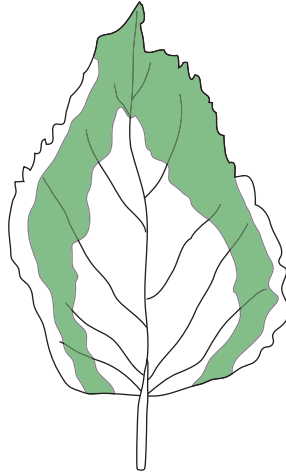
www.nzbordercollies.co.nz/index%20files/Photos.htm

Explain how primary and secondary growth occur, and discuss the importance of these two types of growth for the plant.

- an explanation of the differences between primary and secondary growth
- an explanation of how and where primary and secondary growth occur
- a discussion of the importance of both primary and secondary growth.

(a) The diagram below shows how an iodine test can be used to investigate photosynthesis.

Before iodine test

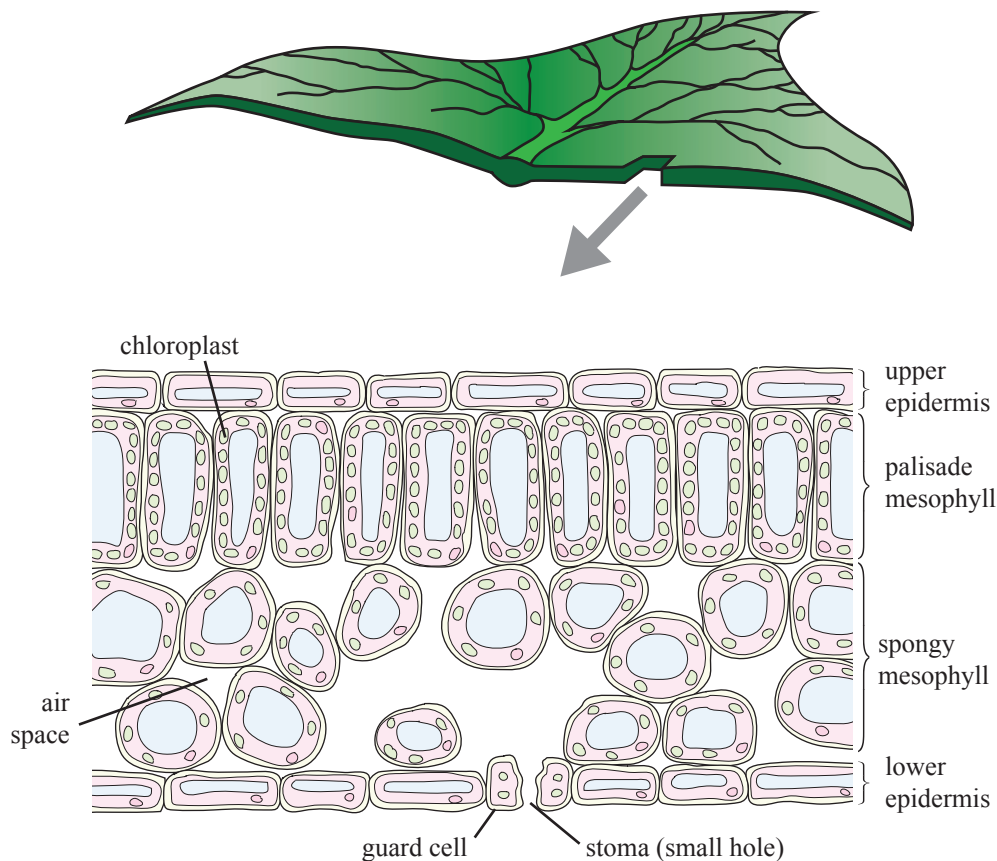


A stylized black and white illustration of a leaf. The leaf has a prominent central vein and several lateral veins branching off. The outer edge of the leaf is irregular and jagged, with a thick, dark border that appears to be a shadow or a thick outline. The interior of the leaf is white, and the overall shape is somewhat heart-shaped or ovate.

Refer to the diagram above and explain what the results of the iodine test indicate in the experiment.

- describe what the iodine test shows in this experiment
- explain what the results mean in terms of photosynthesis occurring in the leaf.

- (b) The diagram below is of a cross section of a leaf and it shows the cells and structures you find in any typical leaf.



Source (adapted): http://scienceuniquiez.blogspot.co.nz/2011_10_01_archive.html
and K. Gadd, *AQA Science: For AQA GCSE Additional Studies* (London: Harper Collins, 2006), p. 29.

Using the diagram above, discuss how the structures of a leaf assist the process of photosynthesis.

In your discussion you should:

- name the organelle involved in photosynthesis
- identify adaptations that can make photosynthesis more efficient
- include explanations of how these adaptations improve photosynthesis
- link the specialised features and structures of the leaf to the overall efficiency of photosynthesis.

There is more space for your answer to this question on the following pages.

Extra paper if required.
Write the question number(s) if applicable.

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QUESTION
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