

90928



Draw a cross through the box (X) if you have NOT written in this booklet

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Mana Tohu Mātauranga o Aotearoa

New Zealand Qualifications Authority

Level 1 Biology 2023

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

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 room for any answer, use the extra space provided at the back of this booklet.

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

Do not write in any cross-hatched area (DO NOT WRITE). This area will be cut off when the booklet is marked.

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

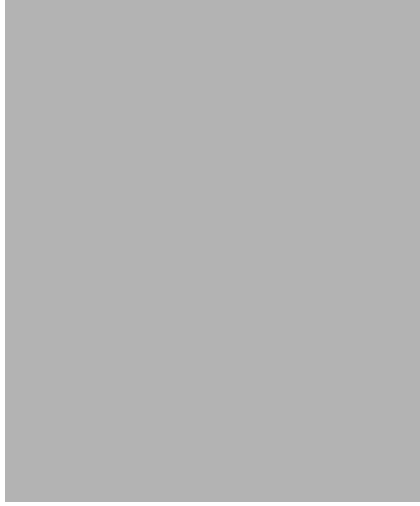
QUESTION ONE: SEED FORMATION AND DISPERSAL

Seed formation and dispersal are important processes in the life cycle of flowering plants.

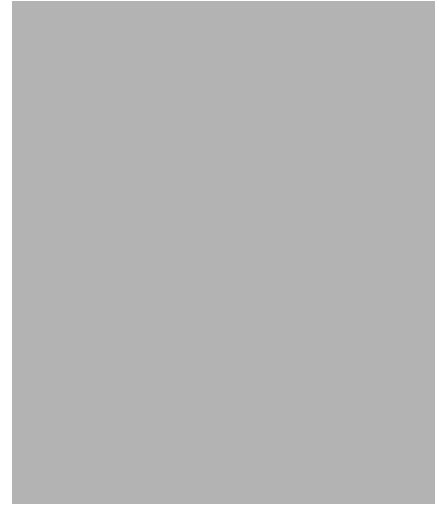
After fertilisation in pūriri trees, the ovary of the flower turns into a fruit that contains seeds. Pūriri fruit is either eaten by birds or turns black, rots, and falls off.



Pūriri flower



Pūriri fruit



Pūriri flowers and fruit



Parts of a typical seed

Discuss how **seed formation** and **dispersal** occurs in a flowering plant such as pūriri, and why it is important in the life cycle of a flowering plant.

In your answer, include discussion of:

- how a seed and fruit are formed from a flower
- why seeds need to be dispersed
- how the structures of the pūriri seed and fruit enable them to be dispersed successfully, and why this is beneficial to the flowering plant.

The ngutukākā has a long-lived seed which may still be able to germinate after 30 years, when specific environmental factors are right. The seeds wait for light gaps to appear in the forest, following a tree-fall or a slip, and then germinate in response.

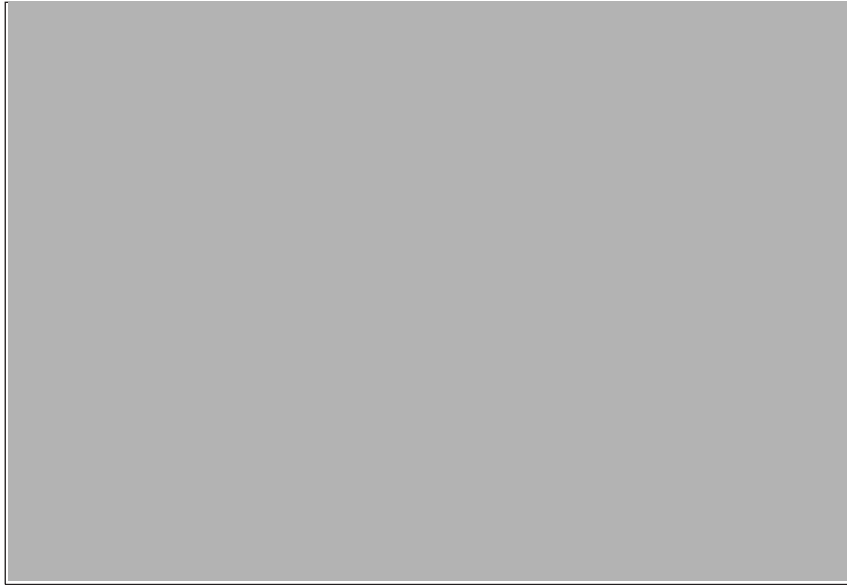


In your answer, include discussion of:

- the purpose of germination, including a description
- how the structure of the flower leads to the successful pollination of ngutukākā by birds
- how germination, when specific environmental factors are right, leads to the survival of the ngutukākā species
- the process of pollination and germination, comparing and contrasting these processes.

QUESTION THREE: PRIMARY AND SECONDARY GROWTH

After successful germination, flowering plants go through primary and secondary growth processes.



The areas of primary and secondary growth in a plant



Structure and cross section of a mature woody stem

Discuss how the processes of primary and secondary growth enable a flowering plant to successfully carry out its life cycle.

In your answer, include discussion of:

- the process of both primary and secondary growth, including a description and using information from the diagrams above
- the similarities and differences between both primary and secondary growth
- the significance and timing of both primary and secondary growth to the life cycle of a flowering plant.

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

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Write the question number(s) if applicable.

Acknowledgements

Material from the following sources has been adapted for use in this assessment:

Page 2

Images: https://twitter.com/StuartWilliams_/status/1022743696591056896/photo/1
<https://www.nzplants.auckland.ac.nz/en/about/seed-plants-flowering/lamiaceae/vitex-lucens.html>
<https://predatorfreenz.org/research/if-our-native-birds-were-gardeners-what-would-they-plant/> (Image 25 of 26)
<https://byjus.com/biology/identification-of-the-different-parts-of-an-embryo-of-a-dicot-seed/>

Page 4

Image: <https://www.doc.govt.nz/nature/native-plants/kakabeak/>

Page 6

Images: <https://organismalbio.biosci.gatech.edu/growth-and-reproduction/plant-development-ii-primary-and-secondary-growth/>
<https://www.sciencelearn.org.nz/images/3588-structure-of-a-woody-stem>