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Level 1 Biology, 2017

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

9.30 a.m. Thursday 16 November 2017
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 2–8 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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QUESTION ONE: POLLINATION

Pollination is an important part of a plant's life cycle. Pollination can occur in a number of different ways. Use the following pictures and diagrams to help you answer the question below.



Tūi in a kōwhai tree.

www.tonywhitehead.com/wildlight/2012/10/tuis-in-the-kowhai/

Diagram of kōwhai flower.

<http://sciencelearn.org.nz/Contexts/Pollination/Sci-Media/Images/Cutaway-kowhai>



Maize flowers releasing pollen.

<http://sciencelearn.org.nz/Contexts/Pollination/Sci-Media/Images/Maize-flowers-releasing-pollen>

Diagram of a wind-pollinated flower.

<http://slideplayer.com/slide/4027685/>

Compare and contrast pollination carried out by the wind and pollination carried out by an animal such as an insect or bird, and discuss why pollination is important in the life cycle of a flowering plant.

In your answer:

- describe the process of pollination
- explain the similarities and differences between wind pollination and pollination carried out by an animal such as a bird or an insect
- discuss the importance of pollination to the life cycle of all flowering plants.

QUESTION TWO: SEXUAL AND ASEXUAL REPRODUCTION

Some flowering plants are able to reproduce both sexually with flowers, and asexually through tubers, rhizomes, runners or bulbs. Below are pictures of some ways flowering plants reproduce.



Strawberry plant showing runners and flowers.

<https://bonnieplants.com/wp-content/uploads/strawberry-plant-Illustration-web.jpg>

Bulbs of onion and garlic.

www.dreamstime.com/stock-images-bulbs-garlic-onion-image4947184



Potato plant showing tubers and flowers.

www.shutterstock.com/image-photo/potato-plant-tubers-soil-dirt-isolated-101102626

Ginger plant rhizome.

www.tutorvista.com/content/biology/biology-iii/angiosperm-morphology/underground-stem-modifications.php

Compare and contrast the advantages and disadvantages to a plant of being able to reproduce both sexually and asexually.

Your answer should:

- describe the purpose of reproduction in plants
- explain how at least TWO of the following: tubers, bulbs, rhizomes, and runners, allow a plant to reproduce asexually.
- discuss the overall advantages and disadvantages to a plant of reproducing sexually, asexually, or both.

QUESTION THREE: GERMINATION AND GROWTH

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Successful germination of seeds is an important part of the life cycle of a flowering plant.

A student dissected a seed and set up some experiments to find out about the environmental factors that are important for seed germination and seedling growth.

After some of the seeds germinated, the student wanted to find out more about how different volumes of water affected the growth of the seedlings, and graphed the results.



<http://www.mysmartgarden.org.au/en/Resources/Food/Seed-Saving-Workshop>

The effects of different amounts of water on seedling growth



adapted from: <http://aaryamsience.blogspot.co.nz/2015/10/mung-bean-plant-research.html>

Discuss how environmental factors can affect successful seed germination and growth of a seedling.

In your answer:

- describe the environmental factors required for seed germination to occur
- explain the purpose of different parts of a seed in germination
- describe how different volumes of water can affect the growth of a seedling
- discuss how environmental factors and the parts of a seed and seedling, work together to allow the seed to germinate and grow.

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

QUESTION
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