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Level 1 Biology 2021

90927 Demonstrate understanding of biological ideas relating to micro-organisms

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to micro-organisms.	Demonstrate in-depth understanding of biological ideas relating to micro-organisms.	Demonstrate comprehensive understanding of biological ideas relating to micro-organisms.

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.

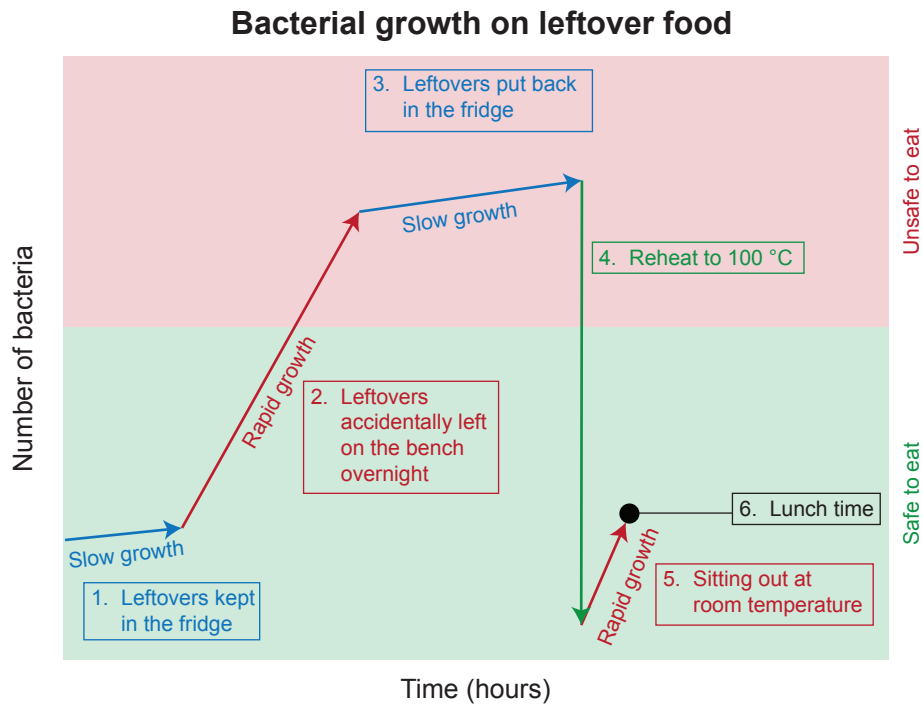
Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (///). This area may be cut off when the booklet is marked.

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

QUESTION ONE: BACTERIA AND ENVIRONMENTAL FACTORS

Bacterial growth on leftover food causes food to decay if it is not stored and treated correctly. This can make the food unsafe to eat.



Adapted from: <https://www.fdareader.com/blog/2017/07/25/on-the-kill-step-and-leftovers>

Discuss how changing the way we store and treat food can affect food decay caused by bacteria.

In your answer:

- describe how bacteria reproduce
- explain how changes in temperature can affect the growth rate of bacteria living on leftover food
- discuss how TWO environmental factors other than temperature (such as pH, water, or oxygen) can be controlled to affect the growth rate of bacteria, and link this to the way we can store and preserve food so that it is safe to eat.

QUESTION TWO: THE FLU

The New Zealand Ministry of Health has the following information about the flu on its website:

Influenza – or the flu – is a virus that spreads quickly from person to person. Symptoms include fever, chills, aches, runny nose, a cough, and stomach upset. Antibiotics are not an effective defence against the flu. Immunisation is your best defence against the flu. Large numbers of people usually catch the flu each year, with case numbers highest over winter months. Vaccines can provide protection against the flu virus.

www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/influenza

Discuss how viruses can reproduce and spread, and why people can catch the flu, even if they've had the flu before.

In your answer:

- describe how viruses can be spread quickly from person to person
- explain how viruses reproduce
- discuss why antibiotics are not an effective defence against the flu, and why people can catch the flu more than once.



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QUESTION THREE: FUNGUS IN TREES

Tōtara is a tree of great importance and can be used for building waka and for carving. Kaikākā refers to tōtara heartwood in the centre of old trees that has been decayed by a fungus called *Inonotus lloydii*. This fungus rots parts of the wood to form narrow honeycomb-like pockets, resulting in an attractive effect in carvings. The decay weakens the affected wood and reduces its value for building waka, but affected kaikākā wood can still be used for carvings and for fence posts. When reproducing, the fungus can form a bracket-shaped sporangium on tōtara trunks.



A bowl made from tōtara heartwood/kaikākā showing the attractive pattern caused by fungal infection.
Source: <https://www.sciencelearn.org.nz/resources/2668-maori-knowledge-and-use-of-fungi>

Discuss how environmental factors (water, oxygen, food, temperature) and the life processes of a fungus (growth, reproduction, feeding) allow fungi to decay parts of a tree such as a tōtara.

In your answer:

- describe how fungi grow and reproduce
- explain how fungi gain nutrition (feed)
- discuss how life processes of fungi are affected by environmental factors, resulting in the decay of trees such as tōtara.
