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Level 1 Biology 2022

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

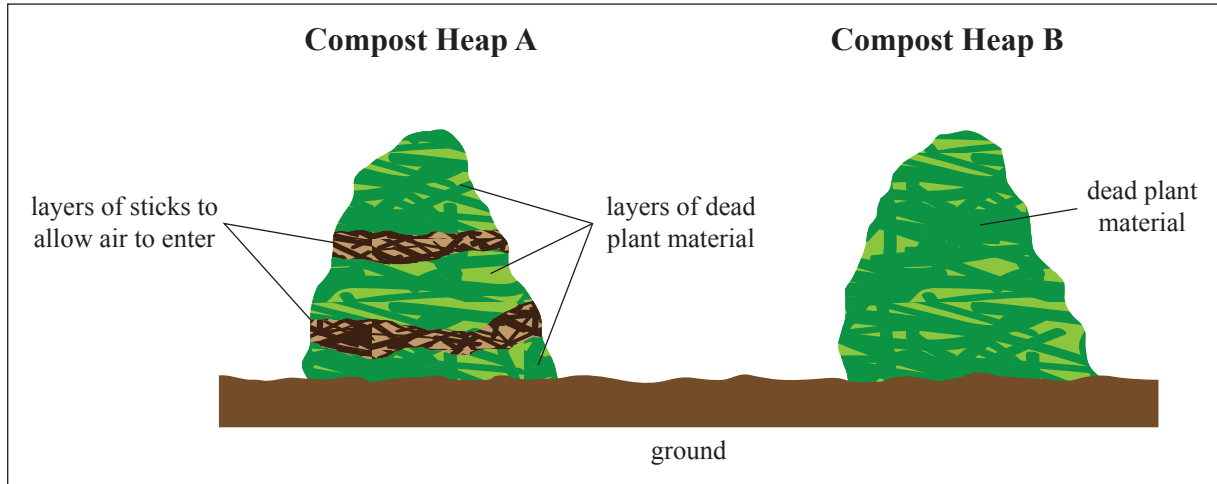
Do not write in any cross-hatched area (///). This area may be cut off when the booklet is marked.

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

QUESTION ONE: COMPOST

Bacteria are a type of micro-organism that act as a decomposer by breaking down dead plant material so that nutrients, like carbon, can be recycled. The process of making compost involves breaking down dead plant material by bacteria and other micro-organisms.

Two different compost heaps are shown below:



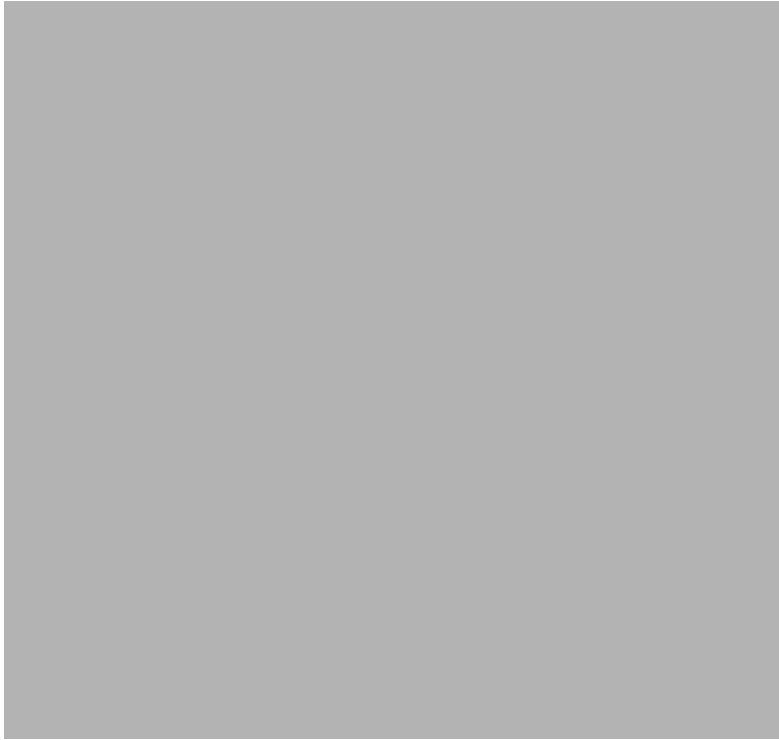
Compare and contrast the breakdown of dead plant material by bacteria in Compost Heaps A and B shown above.

In your answer:

- describe how bacteria gain nutrition (feed), and carry out respiration
- explain how the process of bacteria gaining nutrition (feeding) is linked to the process of breaking down dead plant material
- discuss how changes in TWO environmental factors (such as temperature, oxygen availability, pH level) impact on the life processes of feeding and respiration in bacteria, and impact on the rate of the breakdown of the dead plant material in a compost heap.

QUESTION TWO: MOULDY BREAD

In the summer holidays Rawiri made sandwiches for lunch for his whānau. One day Rawiri left the bread on the bench in the warm kitchen with the bag open. When he came to make the sandwiches the next day, he noticed that the bread had grey, furry spots on it. His mum said that fungi was growing on the bread.



Bread left on the bench in a warm kitchen.

Source: <https://jgklausner.com/work/white-bread-slice-mold-i>

Discuss the impact of changing environmental factors on the growth and reproduction of fungi.

In your answer:

- describe how fungi grow and reproduce
- explain how the fungi got onto the bread
- discuss how food can be stored to prevent fungi from growing and reproducing on it, by controlling the effect of environmental factors such as temperature, oxygen, and water.

QUESTION THREE: TOMATO VIRUS

In July 2021, New Zealand stopped sending tomatoes to other countries because New Zealand tomatoes were found to be infected with a virus, called the Pepino mosaic virus (Pep MV). The virus slows the growth of the tomato plant, and reduces the number of healthy tomatoes produced.

Tomato growers were told to help control the spread of the virus by using measures such as:

.... good hygiene around equipment, and properties, for example, keeping equipment sterilised, keeping records of people's movements around the farm and onto other properties.

Source: <https://www.rnz.co.nz/news/country/447787/mpi-continues-effort-to-control-tomato-disease>



Healthy tomatoes

Source: <https://gardenerspath.com/plants/vegetables/growing-cherry-tomatoes/>

Tomatoes infected with the Pepino mosaic virus

Source: <https://gd.eppo.int/taxon/PEPMV0/photos>

Unlike plant diseases caused by bacteria, plant diseases caused by viruses such as the Pepino mosaic virus cannot be controlled by antibiotic sprays.

Compare and contrast the methods used to control plant diseases caused by viruses with those caused by bacteria.

In your answer:

- describe how viruses reproduce
- explain how viruses can be spread
- discuss why antibiotic sprays can control plant diseases caused by bacteria, but other methods are required to control plant diseases caused by viruses.

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

QUESTION
NUMBER

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