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## Level 1 Biology, 2015

### 90927 Demonstrate understanding of biological ideas relating to micro-organisms

2.00 p.m. Friday 20 November 2015  
 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 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

ASSESSOR'S USE ONLY

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**The examination continues on the following page.**

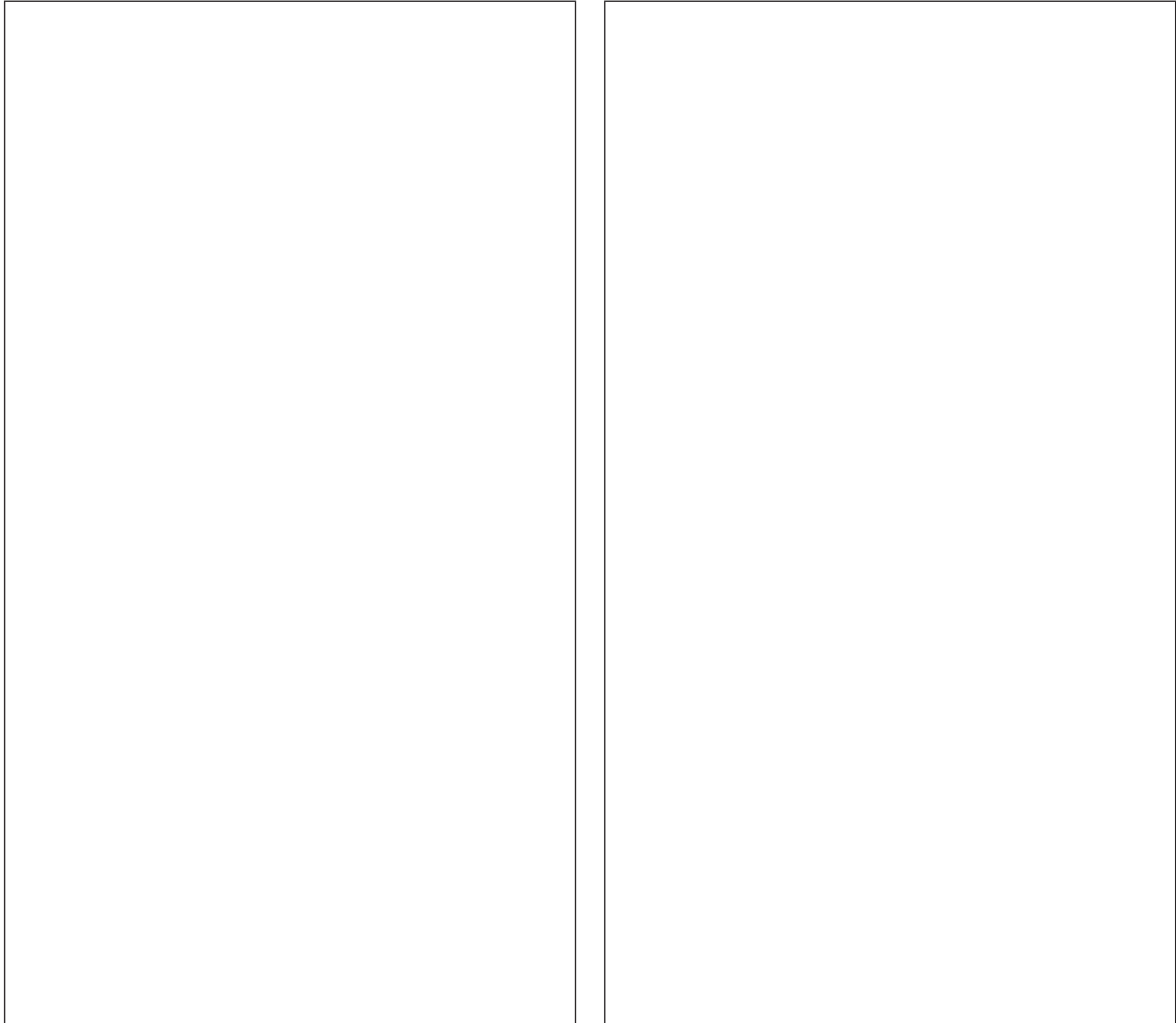
**QUESTION ONE: MICROBES AND ILLNESS**ASSESSOR'S  
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Two students, Manaaki and Angela, were sick and went to the doctor on the same day.

Manaaki was told that he had the common cold, which is caused by a viral infection, and was advised to stay home and rest.

Angela had a sore throat, which is caused by a bacterial infection, and was prescribed a 10-day course of antibiotics.

- (a) Draw labelled diagrams of a virus and a bacterium.

The image contains two large, empty rectangular boxes side-by-side, intended for students to draw and label a virus and a bacterium respectively.

- explain how the reproduction of viruses and bacteria affected how quickly Manaaki and Angela developed the symptoms
- compare and contrast the way viruses and bacteria reproduce, including their requirements of energy.

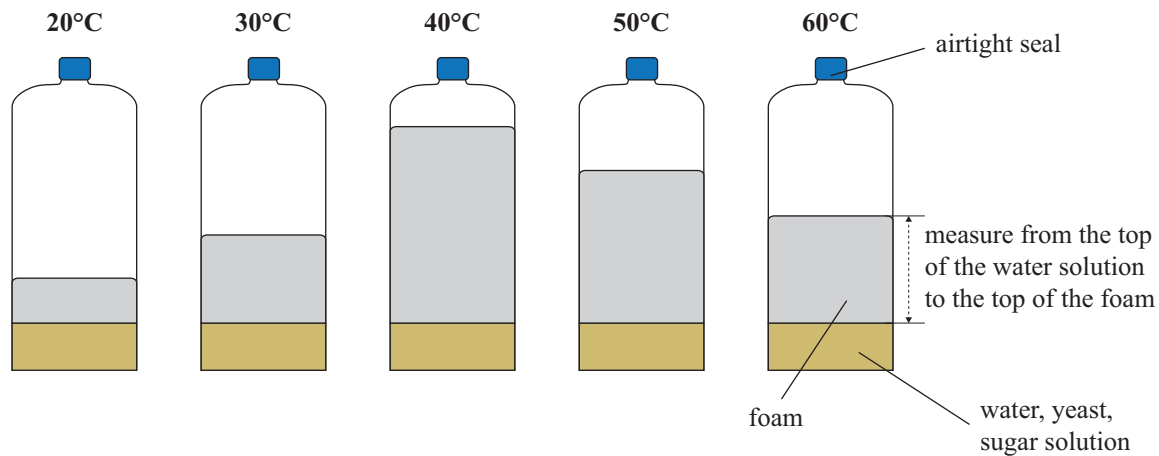


- explain how life processes of bacteria can be affected by antibiotics
- explain how bacteria can develop antibiotic resistance if Angela did not complete her 10-day course of antibiotics
- explain how this process might affect Angela's symptoms.

## QUESTION TWO: THE SCIENCE OF MAKING BREAD

The following experiment was set up by a group of Year 11 students who wanted to investigate respiration in fungi (yeast) cells. When fungi (yeast) are mixed with sugar and water, foam forms, and may be measured to indicate the amount of carbon dioxide produced.

### Year 11 Fungi Respiration Experiment



The type of yeast the students used was dried active yeast.

The instructions say to refrigerate the container after opening. There is an **airtight** seal on the top of the container under the lid that must be removed before use.

Discuss what the students can determine about respiration from their experiment.

In your answer you should:

- describe three conditions required for the growth of fungi (yeast)
- describe anaerobic respiration
- explain how fungi (yeast) gain their nutrients
- identify the optimal temperature for growing fungi (yeast) as shown in the experiment above, and explain how this can be applied to the production of bread and the storage of fungi (yeast)
- discuss the importance of keeping the fungi (yeast) sealed and refrigerated once opened.

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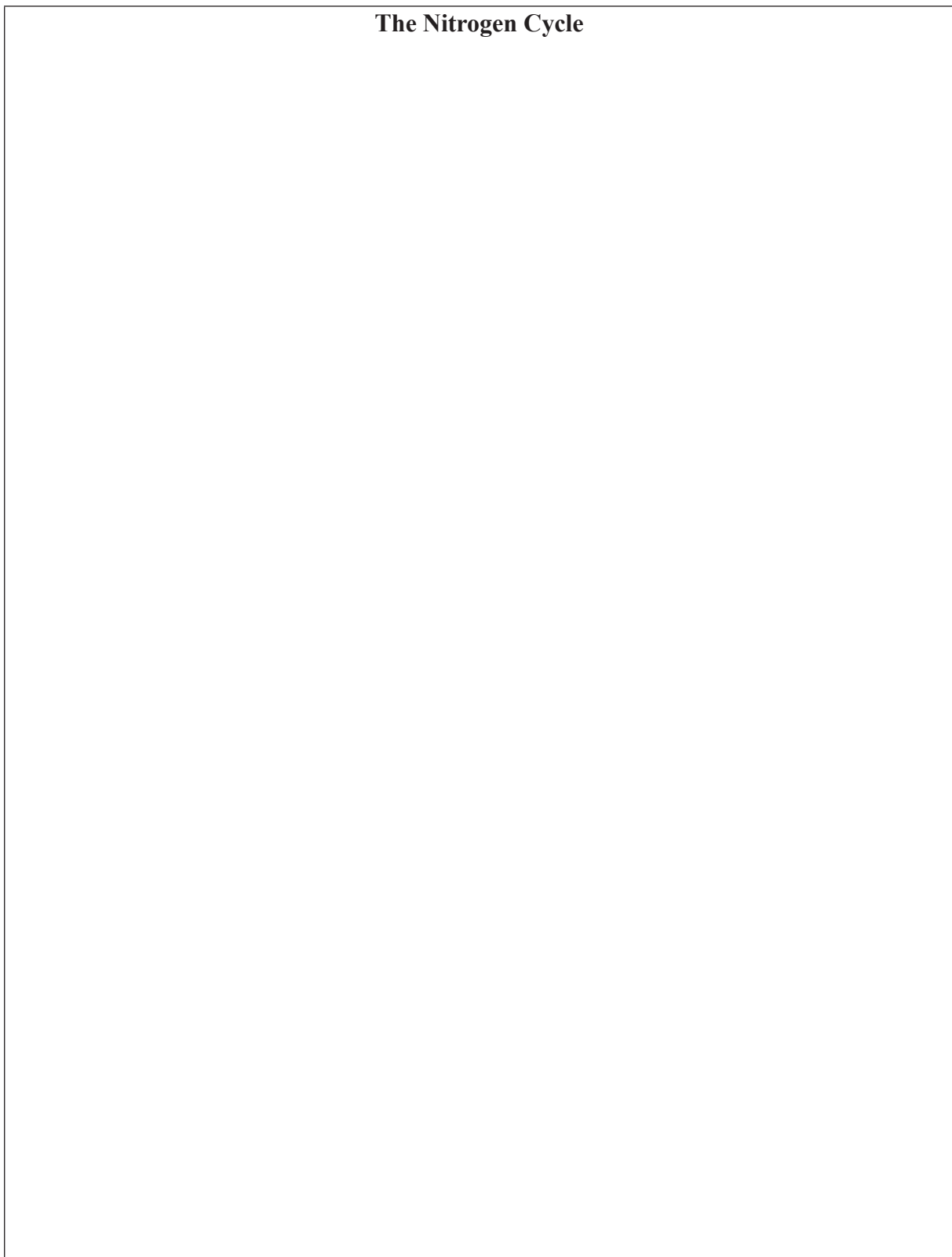


**QUESTION THREE: A PILE OF COMPOST**ASSESSOR'S  
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Compost is decayed organic matter. Composting is the process carried out by bacteria, turning organic matter such as vegetable matter and manure into compost. A successful compost heap requires good air flow.

Bacteria play a big part in the nitrogen cycle and the carbon cycle.

- (a) Draw a labelled diagram of the nitrogen cycle that shows the role of **bacteria** in this cycle.





- (c) Analyse the importance of the bacteria in cycling carbon and nitrogen in the compost heap.

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

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QUESTION  
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