



For Supervisor's use only

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90188



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA



National Certificate of Educational Achievement  
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

## Level 1 Science, 2003

### 90188 Describe uses and effects of micro-organisms and the transfer of genetic information

Credits: Five

2.00 pm Thursday 13 November 2003

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 answer ALL the questions in this booklet.

If you need more space for any answer, use the pages provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–11 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.**

Achievement Criteria			For Assessor's use only		
Achievement		Achievement with Merit		Achievement with Excellence	
Describe biological ideas relating to how humans use and are affected by micro-organisms.	<input type="checkbox"/>	Explain biological ideas relating to helpful and harmful micro-organisms.	<input type="checkbox"/>	Apply biological ideas relating to helpful and harmful micro-organisms.	<input type="checkbox"/>
Describe biological ideas relating to transfer of genetic information.	<input type="checkbox"/>	Explain biological ideas relating to transfer of genetic information.	<input type="checkbox"/>	Apply biological ideas relating to transfer of genetic information.	<input type="checkbox"/>
Overall Level of Performance (all criteria within a column are met)					<input type="checkbox"/>

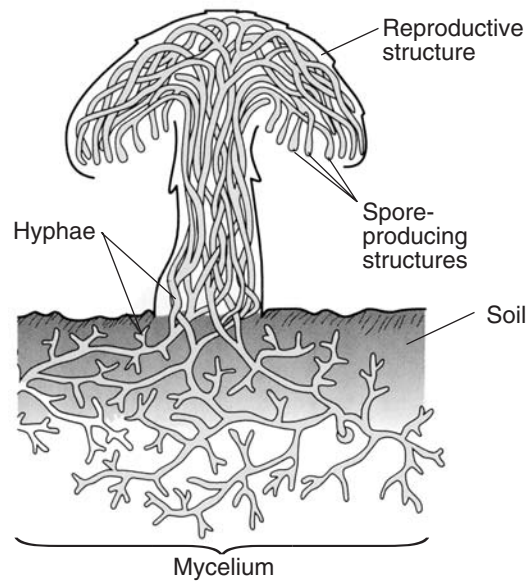
You are advised to spend 40 minutes answering the questions in this booklet.

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## QUESTION ONE: TOADSTOOLS

When researching fungi, Kanya found the diagram on the right showing the structure inside a fungus that lives in soil.

Source: Campbell N A, Reece J B, Mitchell L G, (1999)  
*Biology Fifth Edition*. Addison Wesley Longman. USA.



- (a) Describe how this fungus feeds.

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- (b) Explain why this fungus reproduces using reproductive structures above the ground.

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- (c) Fungi can be saprophytes or pathogens. Is the fungus shown in the diagram above a saprophyte or pathogen? Explain your answer.

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*Yeast is a type of fungus that is used to make bread rise. Bread recipes contain a small amount of sugar, as well as flour and milk or water. The mixture is left to stand in a warm place before being made into loaves or rolls.*

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.

**QUESTION TWO: WINTER COLDS AND FLU***Assessor's  
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Faguele went to the doctor with a sore throat. A sample from his throat was cultured on nutrient agar to see if bacteria caused the problem.

- (a) Draw and label a diagram of a bacterial cell.



- (b) Explain why agar plates are usually placed in an incubator when culturing bacteria.

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**QUESTION THREE: SPLIT UP***Assessor's  
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Mitosis and meiosis are types of cell division.

(a) Describe the purpose of mitosis.

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(b) Explain why cells produced by meiosis have fewer chromosomes than the cell they came from.

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Diana was interested in breeding Labrador dogs. From her research she found out that they have **78 chromosomes**. **Genes** control the coat colour of these dogs. Genes can have different **alleles**.

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One of the genes for coat colour in Labrador dogs causes black or yellow coat colour. Yellow coloured Labradors are homozygous recessive for this coat colour gene.

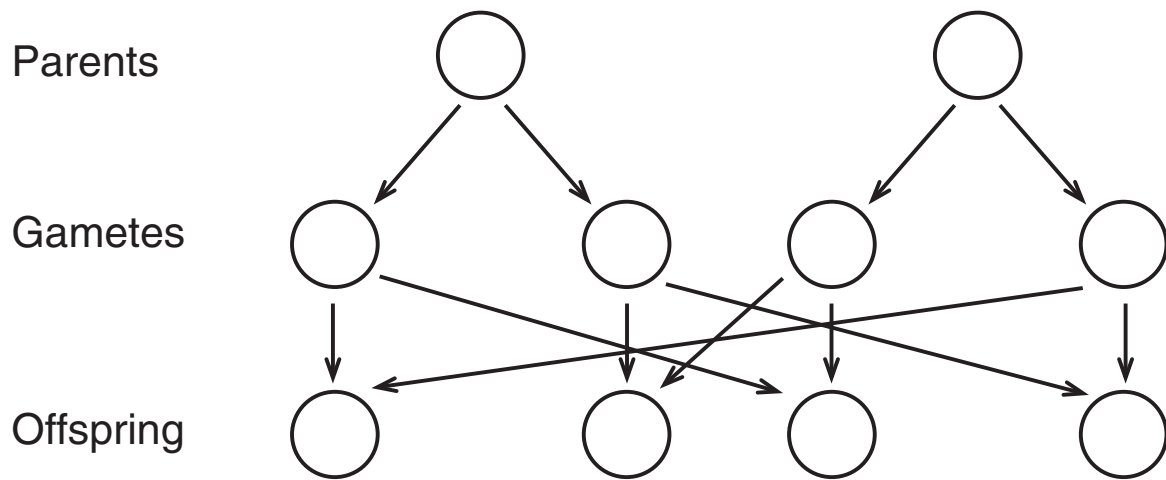
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- (b) (i) Show the symbols you will use for:

black coat colour

yellow coat colour

- (ii) Two Labradors with yellow coat colour are mated. Complete the following diagram to show the possible genotypes of the offspring.



A female offspring from the mating described in part (b)(ii) is crossed with a black male. Some of their offspring (puppies) have black coats and some have yellow coats.

- (c) Explain why 50% of the offspring produced from this cross would be expected to be black. A Punnett square could be included in your answer.

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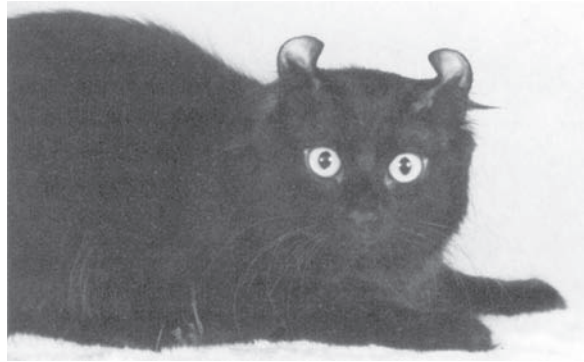
## QUESTION FIVE: THE CAT'S EARS

The photograph on the right shows a male cat with curled ears.

This male cat can be used to produce a new **pure-breeding** variety of curled-ear cats.

The new breed could be produced using selective breeding or cloning.

Discuss how both selective breeding and cloning can be used to produce a new pure-breeding variety of curled-ear cats.



Source: Campbell N A, Reece J B, Mitchell L G, (1999)  
*Biology Fifth Edition*. Addison Wesley Longman. USA.

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**Extra paper for continuation of answers if required.  
Clearly number the question.**

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Question Number	Question	Answer
1	What is the primary purpose of a business plan?	To provide a clear and concise overview of the business and its goals.
2	What are the key components of a business plan?	Executive Summary, Company Description, Market Analysis, Financial Projections, and Management Team.
3	What is the importance of a market analysis?	It helps identify the target market, understand customer needs, and assess the competitive landscape.
4	What is the role of financial projections in a business plan?	They provide a forecast of the company's financial performance, including revenue, expenses, and profitability.
5	What is the management team's role in a business plan?	They are responsible for implementing the business plan and managing the company's operations.

[illegible]

**Extra paper for continuation of answers if required.  
Clearly number the question.**

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Question  
Number

[illegible]