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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, 2005

90188 Describe aspects of biology

Credits: Five
9.30 am Friday 18 November 2005

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 page(s) 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.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe aspects of biology.	Explain aspects of biology.	Discuss aspects of biology.
Overall Level of Performance		

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

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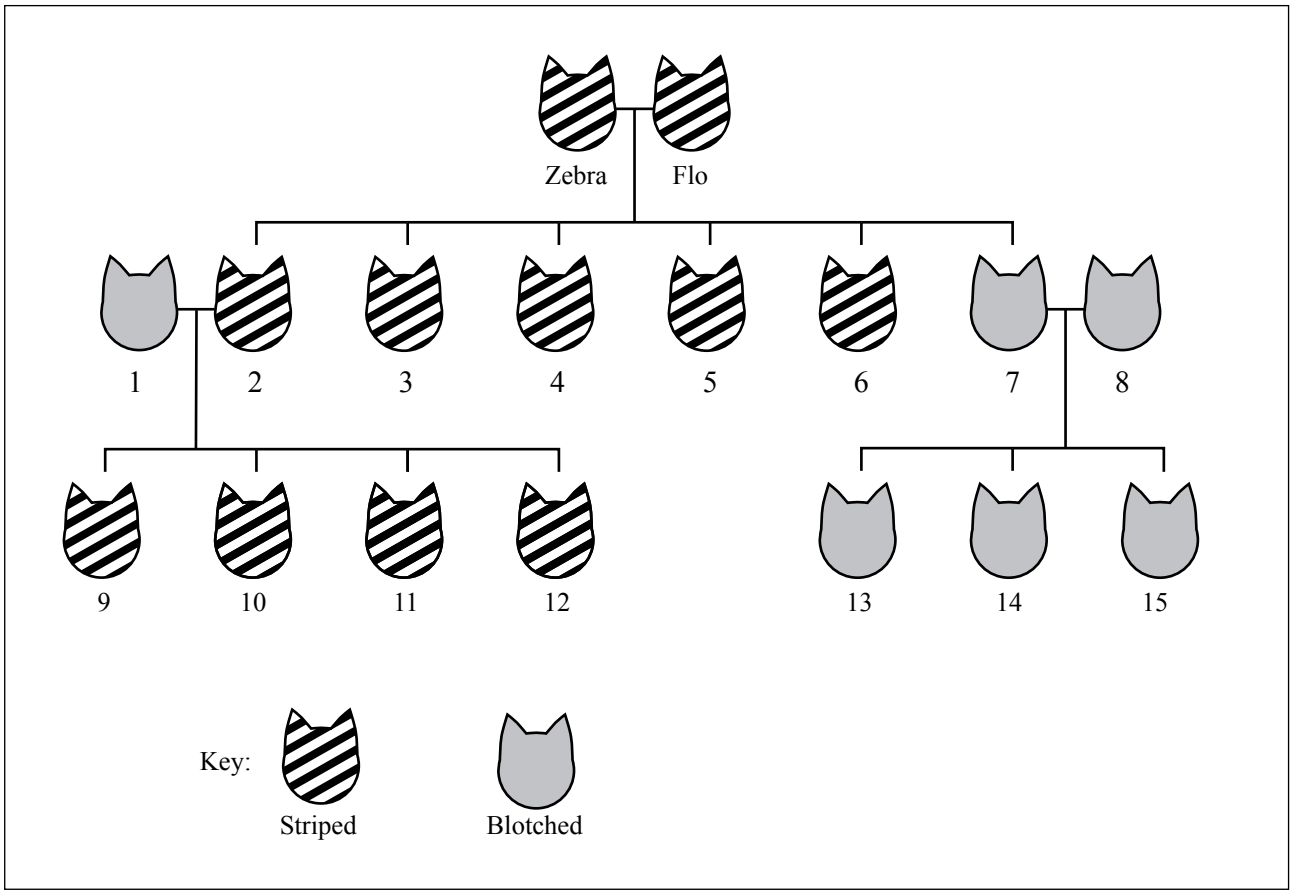
QUESTION ONE: TABBY CATS

Zebra and Flo are Tabby cats. Tabby cats can have two types of coats, striped or blotched. The following is a pedigree chart showing the inheritance of coat type in their offspring.



(a) Which characteristic, striped or blotched, is the **recessive** characteristic? Give a reason for your answer.

(b) Give the probable genotype of Zebra. _____

(c) Give the probable genotype of cat 2. _____

(d) Describe the **difference** between the terms allele and gene.

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The ancestral domestic cat (*Felis domesticus*) looked different from the many modern breeds we see today.

(e) Discuss how, with the help of humans, these **modern breeds** have arisen from a single ancestral type cat.

QUESTION TWO: CORN

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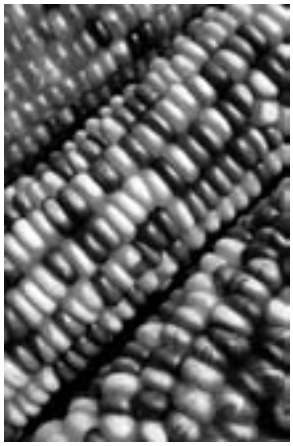
Sweetcorn (*Zea mays*) consists of many individual seeds attached to a central core. Each seed can be used to grow a new corn plant. The corn plant has 20 chromosomes in each mature cell.

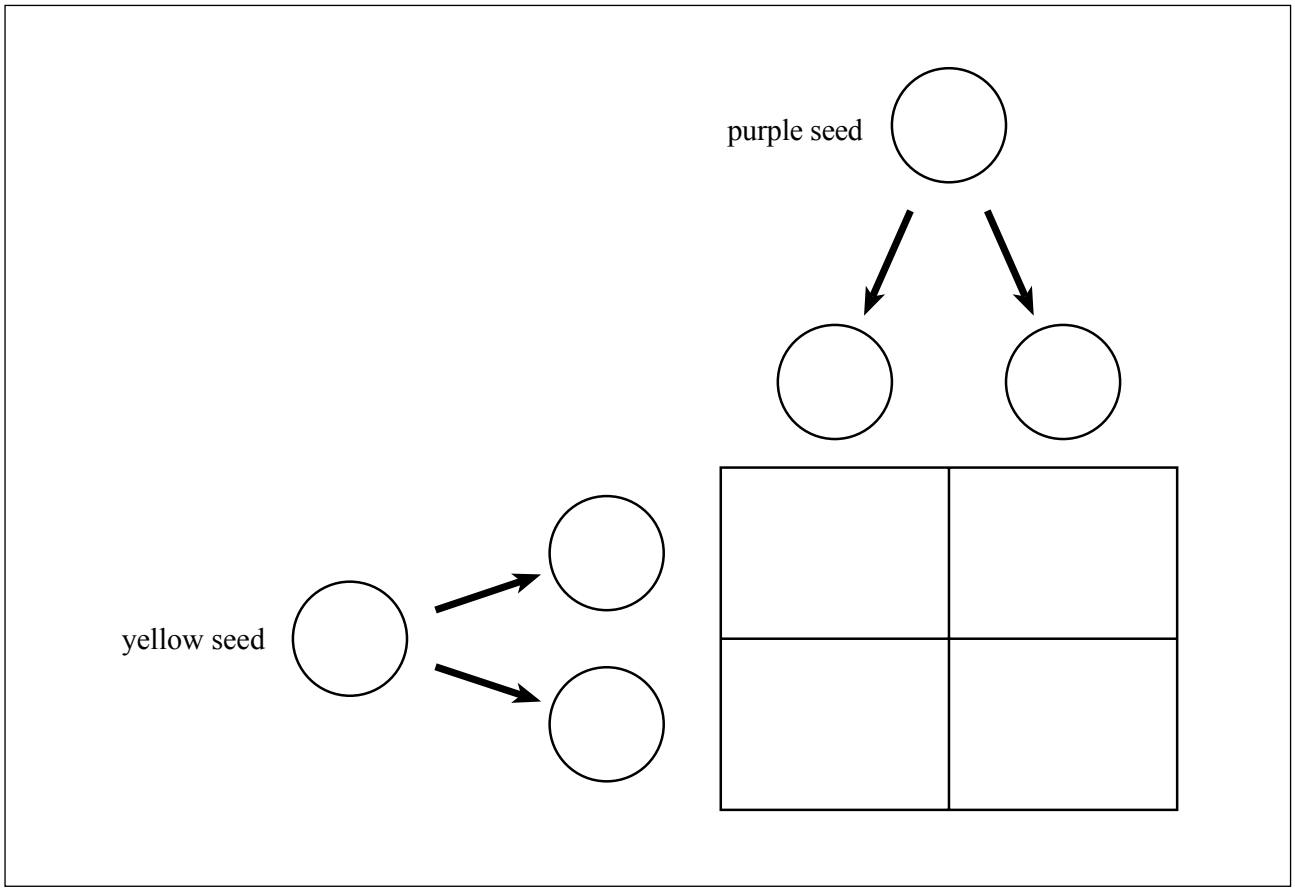
(a) How many chromosomes are found in the **embryo** of the seed? _____



Corn seed colour is determined by a single gene. Purple seed (**D**) is dominant over yellow seed (**d**).

A yellow seed corn plant is crossed with a purple seed corn plant. There is a mix of both yellow and purple seed offspring.

(b) Complete the Punnett square below illustrating the cross.



(c) Give the phenotype ratio of the offspring.

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(d) Zac buys some purple corn seeds from the local seed merchant. Explain what he could do to determine whether the corn seed was homozygous or heterozygous. You may use Punnett squares as part of your answer.

The diagrams below show two ways that corn plants can be made.

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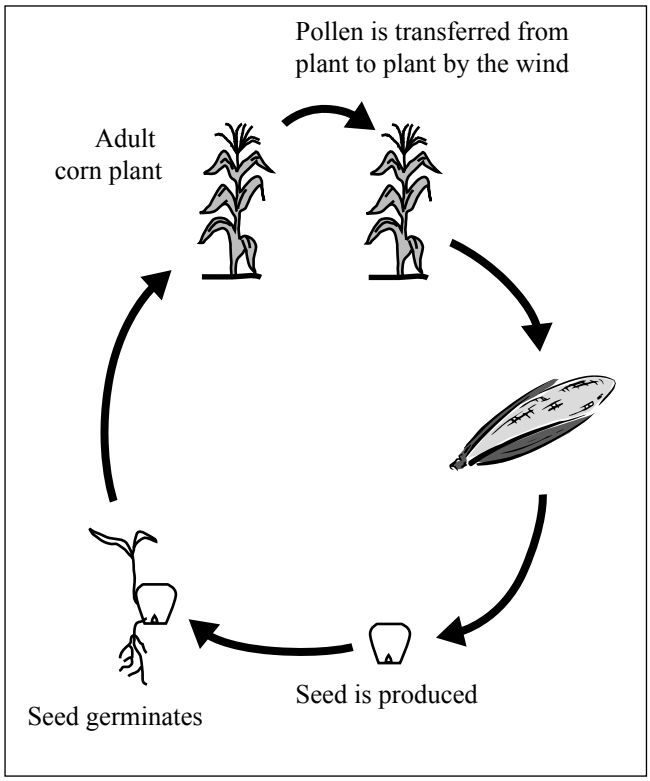
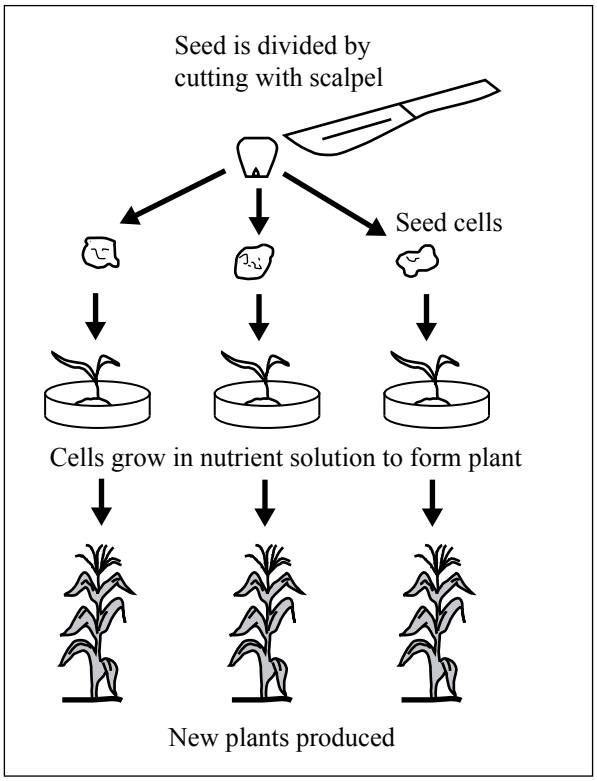
Process A



Process B



(e) **Compare** and **contrast** the processes used to produce the different corn plants in the diagrams.

QUESTION THREE: GINGER BEER

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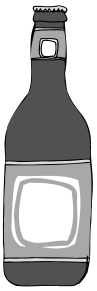

Ginger beer is a non-alcoholic soft drink made by adding ginger, sugar, water, and the fungus yeast together in a sterile container. The container is then kept in a warm place for a few days. At the end of this time, the container is heated at high temperature before the ginger beer is bottled.

(a) Name the conditions required to obtain maximum growth of the yeast fungus.

(b) Explain why the container of ginger beer is heated to a high temperature before its contents are bottled.

The yeast undergoes **anaerobic** respiration in the container.

(c) What does anaerobic mean?

(d) Name TWO products of this reaction.

QUESTION FOUR: CAMPYLOBACTER

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(a) Draw a **labelled** diagram of a bacterium.

Campylobacter is a bacterium that causes food poisoning. It is often caught from eating chicken.

(b) Discuss how the **storage temperature** and **cooking temperature** of chicken affect the life processes of the *campylobacter* bacterium.

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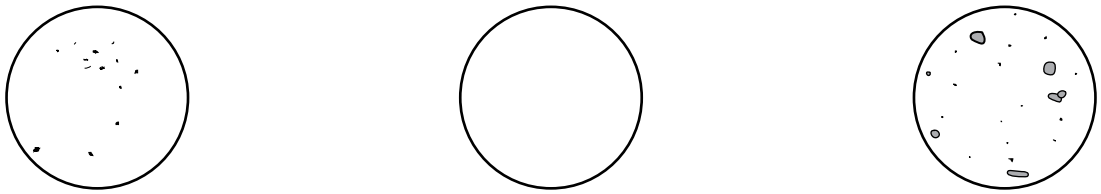
The following agar plates were inoculated from 3 areas in a kitchen. The plates were then covered and stored for 3 days in the same place from where the sample was collected.

Plate A **Plate B** **Plate C**



Area 1 – kitchen bench recently washed with disinfectant

Area 2 – pantry shelf

Area 3 – fridge shelf

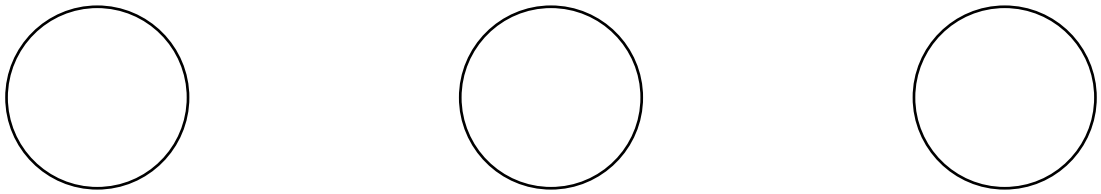
(c) Match up the agar plates to the areas they were collected from.
Give a reason for each of your answers.

Area	Plate	Reason
1		
2		
3		

The plates were then incubated at a temperature of 28°C for a further 3 days.

(d) In the circles below, draw what the plates would look like **after** the period of incubation.

Plate A **Plate B** **Plate C**



QUESTION FIVE: VIRUSES

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Viruses come in many different shapes, but they all have the same main parts in common.

(a) Draw a **labelled** diagram of a virus.

All living things have several common characteristics.

(b) Discuss whether a **virus** is **alive or not**. You should compare the virus's characteristics to those common to all living things.

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

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Question number	