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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, 2004

90188 Describe aspects of biology

Credits: Five
2.00 pm Wednesday 17 November 2004

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 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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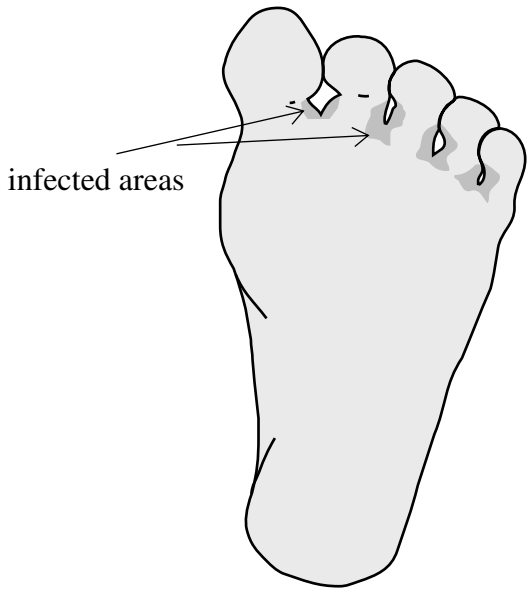
QUESTION ONE: ATHLETE'S FOOT



What is athlete's foot?

Athlete's foot is a skin disease causing an itchy rash on the bottom and sides of the feet and between the toes. Athlete's foot is caused by a fungus.

Feet provide a warm, dark, and humid environment, which encourages fungal growth using aerobic respiration.

(a) What does '**aerobic**' mean in aerobic respiration?

(b) Describe how the athlete's foot fungus feeds (obtains nutrients). A **labelled** diagram may assist your answer.

(c) Discuss how the biology of fungi allows the athlete's foot fungus to be transmitted from one person to another.

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QUESTION TWO: GLANDULAR FEVER

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Glandular fever is caused by a viral infection.

(a) Describe the process of virus reproduction. A **labelled** diagram may assist your answer.

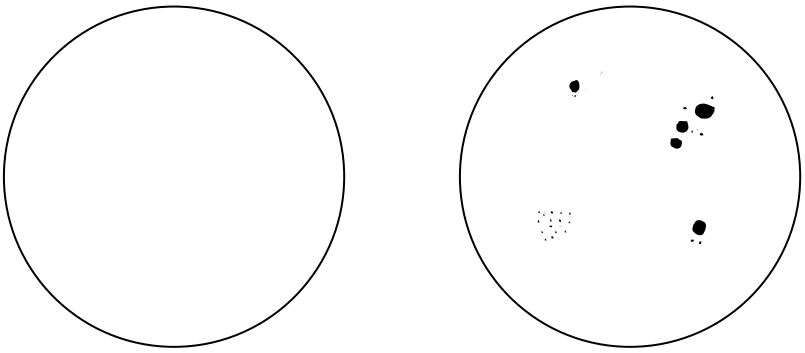
(b) Explain why it is not possible to culture a virus on a nutrient agar plate in a school laboratory.

QUESTION THREE: CULTURING BACTERIA

Assessor's use only

Two sterile nutrient agar plates have been inoculated with a sample of bacteria from a kitchen bench and then incubated at two different temperatures for six days.

Results:



A B

(a) The plates were incubated at 25°C and 55°C. Complete the table below, using the correct letter, to show which one of the plates was incubated at each temperature.

Temperature (°C)	Plate
25°	
55°	

(b) Discuss why the bacterial growth on the two nutrient agar plates is different at the different temperatures.

QUESTION FOUR: PRETTY PLANTS

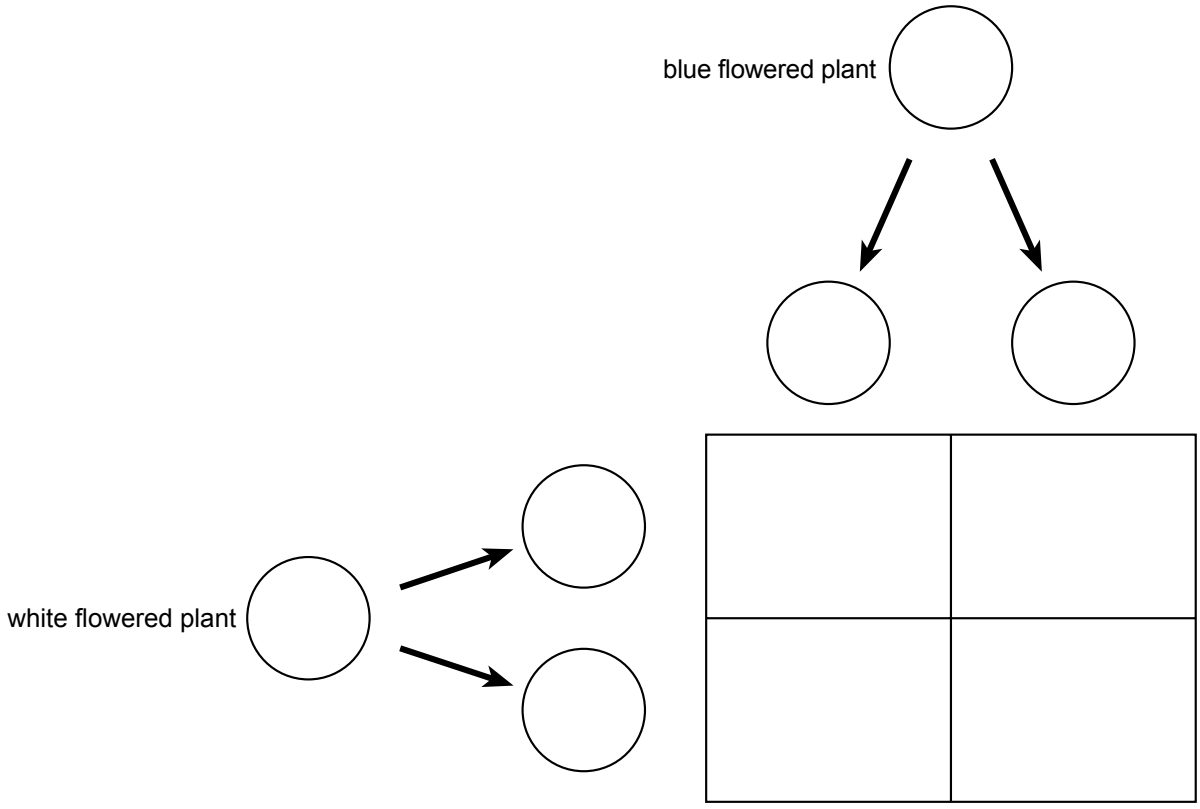
Assessor's use only

A variety of flowering plant produces blue or white flowers. A plant breeder wants more blue flowering plants. The allele for blue flowers is dominant over the allele for white flowers.

(a) Define the word **dominant** as it is used in genetics.

(b) Give the **genotype** for a **white** flowered plant if the blue allele is given the letter B.

(c) Draw a Punnett square showing a cross between a pure-breeding, blue flowered plant and a pure-breeding, white flowered plant.



(d) Discuss how a plant with white flowers could appear as a seedling from plants that had only produced seedlings with blue flowers for several generations. You may use Punnett squares in your answer.

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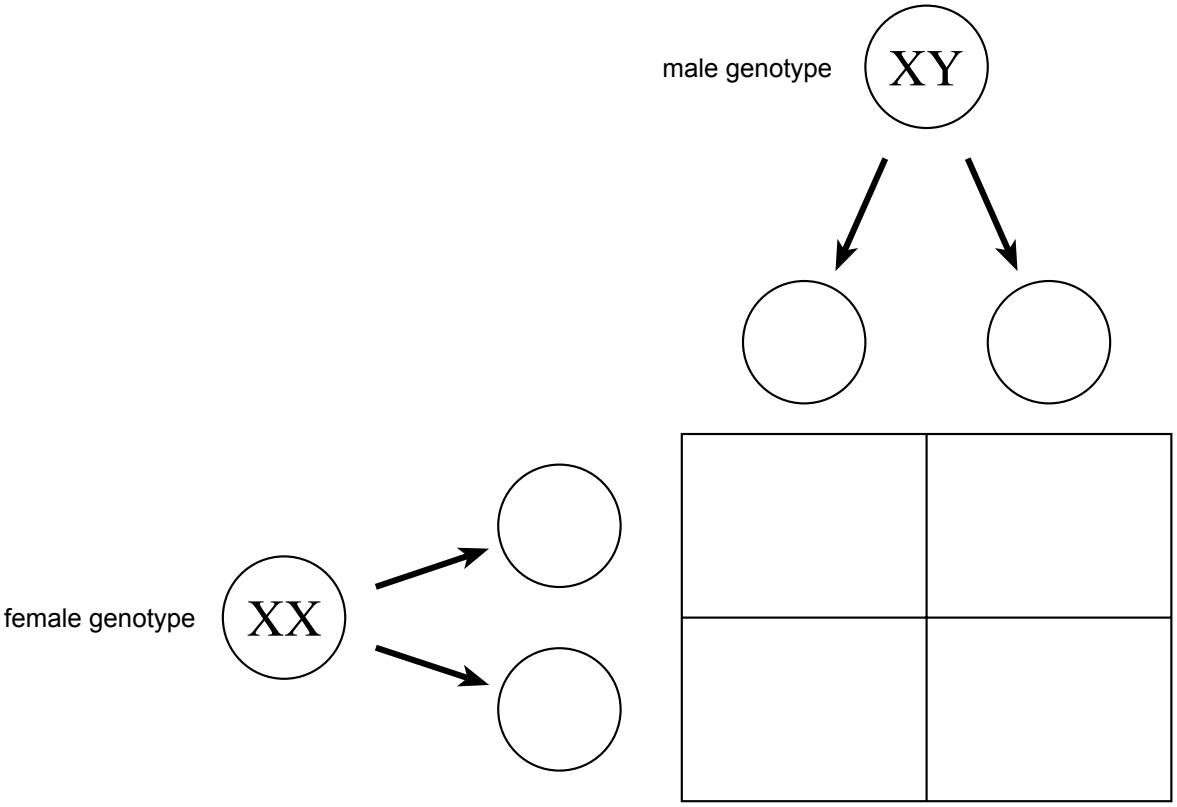
QUESTION FIVE: SEX INHERITANCE

Assessor's use only

A Labrador dog had a litter of six puppies. The puppies produced were all males.

(a) Complete this Punnett square to show the **expected** inheritance of sex in the puppies.



(b) If the Labrador dog had another litter, what percentage of the puppies would you expect to be **female**? Explain your answer.

QUESTION SIX: CLONING

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Cloning is a process whereby plants or animals can be copied exactly. Cloning can make genetically identical plants or animals. Usually only identical twins in animals, or cuttings in plants, are genetically identical.

[For copyright reasons, this resource cannot be reproduced here. See below.]

Holly and friends – Australia's first cloned calves.
Photo: http://genetech.csiro.au/biotechLivestock/index.htm

(a) Explain why cloning involves **only** mitosis while sexual reproduction involves meiosis **and** mitosis.

(b) New plants or animals may be produced by cloning or sexual reproduction. Compare the biological advantages and disadvantages of these TWO methods of reproduction.

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

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