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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

SUPERVISOR'S USE ONLY

Level 1 Science, 2011

90948 Demonstrate understanding of biological ideas relating to genetic variation

9.30 am Monday 21 November 2011

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to genetic variation.	Demonstrate in-depth understanding of biological ideas relating to genetic variation.	Demonstrate comprehensive understanding of biological ideas relating to genetic variation.

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.

Show ALL working.

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.

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

TOTAL

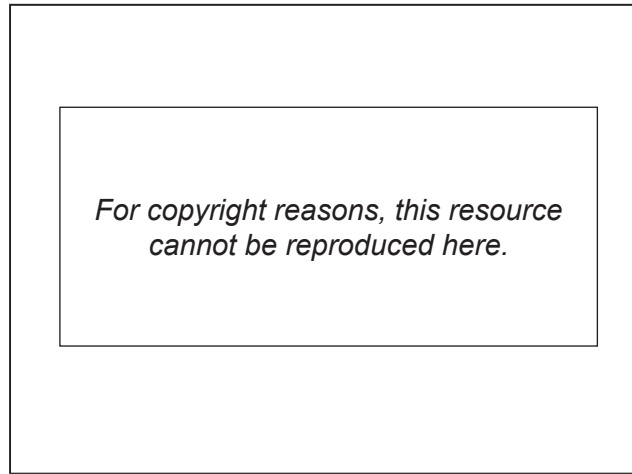
ASSESSOR'S USE ONLY

You are advised to spend 60 minutes answering the questions in this booklet.

QUESTION ONE: SQUASH PLANTS



<http://myfolia.com/plants/87-patty-pan-squash-cucurbita-pepo-var-clypeata/varieties/6851-early-white-bush-scallop>



http://enjoyindianfood.blogspot.com/2008_10_01_archive.html

One trait in squash plants is the colour of the fruit.

White fruit are due to a **dominant** allele (**F**) and yellow fruit are due to a **recessive** allele (**f**).

- (a) Explain the **difference** between a gene and an allele.

- (b) The alleles for the colour of squash fruit combine to produce **THREE** different genotypes, but only **TWO** phenotypes.

Explain how the alleles **combine** to produce **only** two different squash colours – white and yellow.

In your answer you should:

- define genotype **and** phenotype
- state the three different genotypes produced **and** the phenotype of each.

QUESTION TWO: APEING AROUND



Normal gorilla

<http://thundafunda.com/33/animals-pictures-nature/candid-western-lowland-gorilla-pictures.php>



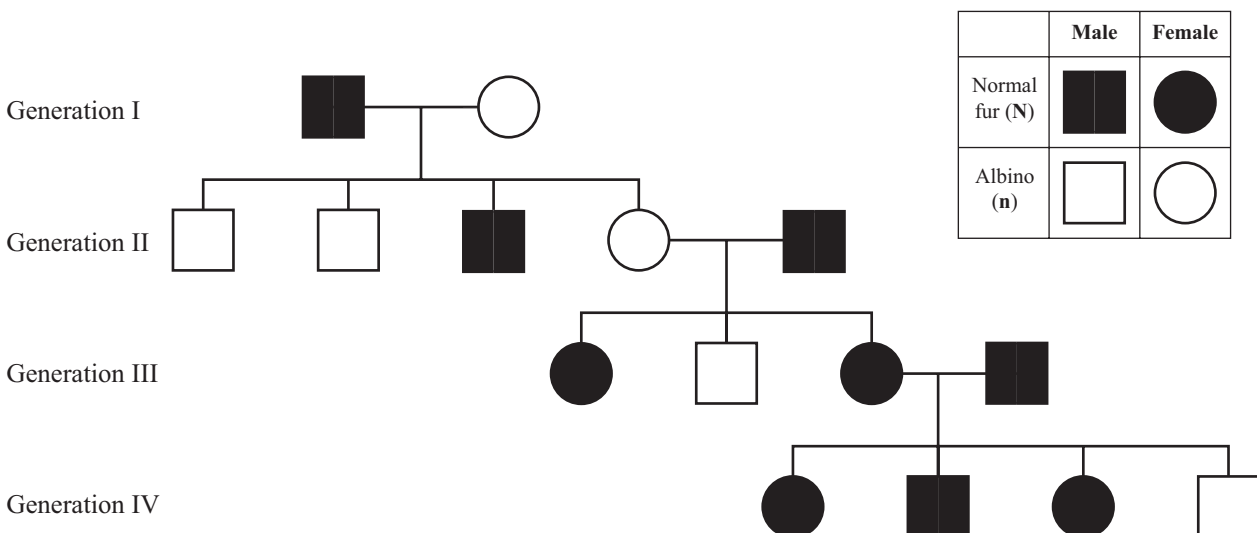
Albino gorilla

<http://s288.photobucket.com/albums/l1184/audrey083053/animals/Albino%20Animals/?action=view¤t=albinogorilla.jpg&mediafilter=images>

Gorillas show an inherited **recessive** condition called albinism. This results in white fur.

The pedigree chart below shows the inheritance of albinism in a family of gorillas. Normal fur is the **dominant** allele (N), while albino fur is **recessive** (n).

Pedigree Chart



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QUESTION THREE: A GIRL OR A BOY?

A couple are expecting their third child. They already have one boy and one girl.

(a) Discuss the likelihood of their third child being a girl.

In your answer you should:

- explain how sex is determined in humans
- complete a Punnett square showing sex inheritance
- explain the relevance of the couple already having children.

