1

90163

901630

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Biology, 2009

90163 Describe the transfer of genetic information

Credits: Three
9.30 am Wednesday 25 November 2009

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 2–8 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.

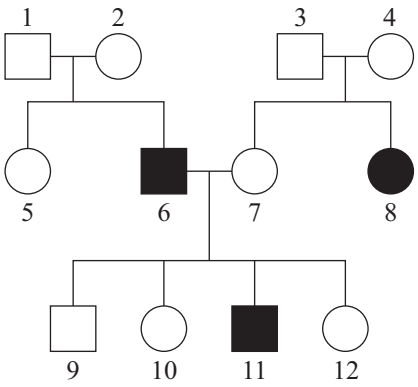
For Assessor's use only	**Achievement Criteria**		
Achievement	**Achievement with Merit**	**Achievement with Excellence**	
Describe biological ideas relating to the transfer of genetic information.	Explain biological ideas relating to the transfer of genetic information.	Discuss biological ideas relating to the transfer of genetic information.	
Overall Level of Performance			

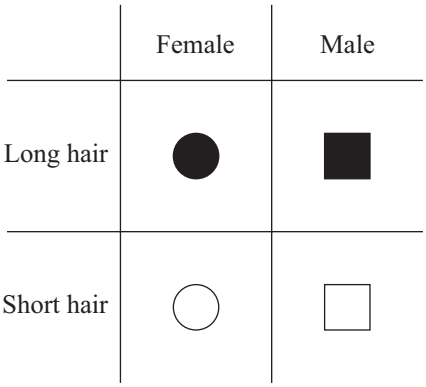
You are advised to spend 40 minutes answering the questions in this booklet.

Assessor's use only

QUESTION ONE: HAIR LENGTH IN CATS

Hair length in cats is controlled by a single gene, which is expressed as either short-haired or long-haired. The following pedigree diagram shows three generations of cats.





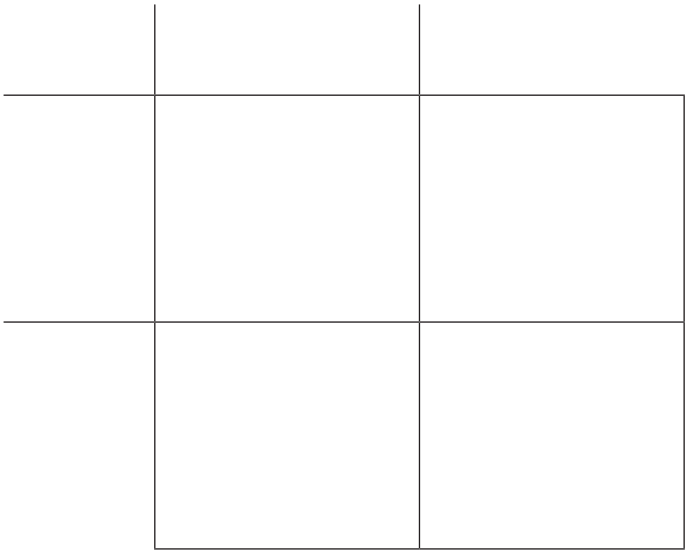
Using the information above, determine the **genotype** of cat 7 from the pedigree diagram and **discuss** the reasons for your answer. Use **H** for the dominant allele and **h** for the recessive allele.

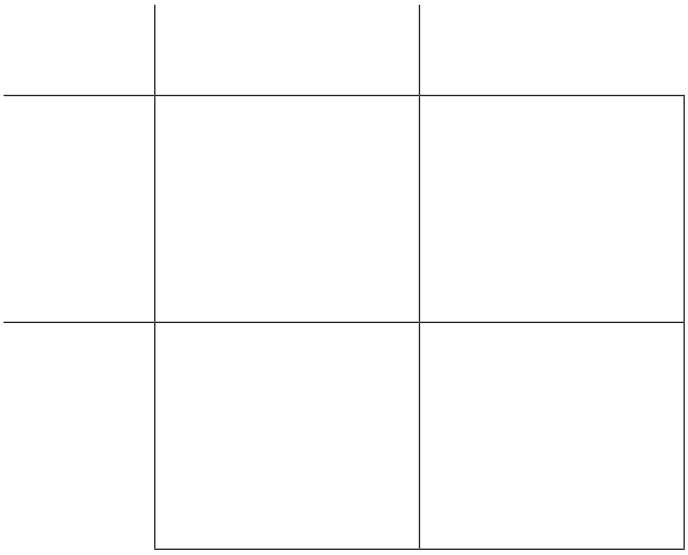
Your answer should include:

- an explanation for whether the **short-hair** phenotype is dominant or recessive
- an explanation for whether the **genotype** of cat 7 is homozygous or heterozygous.

Support your answer with Punnett squares.

Assessor's use only





QUESTION TWO: BREEDING ROSES

Assessor's use only

A plant breeder has bred a new variety of rose using sexual reproduction techniques.

To produce more of this rose the breeder then used asexual reproduction techniques.

Discuss the reasons why the breeder used sexual reproduction techniques to produce the new variety of rose AND asexual reproduction techniques to produce more plants.

In your answer you should:

- link mitosis AND meiosis to sexual and asexual reproduction
- **explain** how the genetic characteristics of the parent are inherited in both sexual AND asexual reproduction
- **explain** why the breeder used both sexual AND asexual reproduction to produce a new variety of rose.

Assessor's use only

QUESTION THREE: DNA REPLICATION

Assessor's use only

Before mitosis occurs, the DNA must replicate. The diagram below shows a section of DNA being replicated.

For copyright reasons, this resource cannot be reproduced here.

Adapted from: M.Hanson and M. Sinclair, *NCEA Level 1: Biology and Human Biology* (Auckland, ESA Publications, 2008), p 26.

Explain how DNA is replicated AND **discuss** why the genetic information has to be accurately copied.

In your answer you should:

- **describe** how DNA is replicated
- **explain** how the accuracy of the replication process is maintained
- relate **reasons** for the accuracy in DNA replication to the role of mitosis in an individual.

Assessor's use only

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

Assessor's use only

Question number