

# 1

90948



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## Level 1 Science 2020

### 90948 Demonstrate understanding of biological ideas relating to genetic variation

9.30 a.m. Friday 27 November 2020  
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.**

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

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



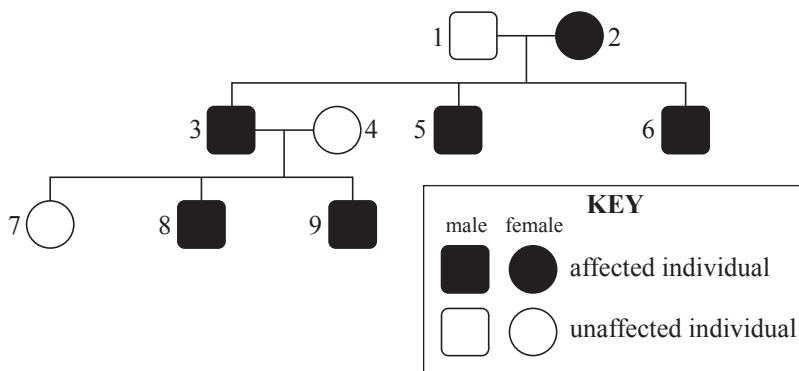




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The examination continues on the following page.**

## QUESTION TWO

Below is a pedigree chart for a family with the genetic disorder, polycystic kidney disease.

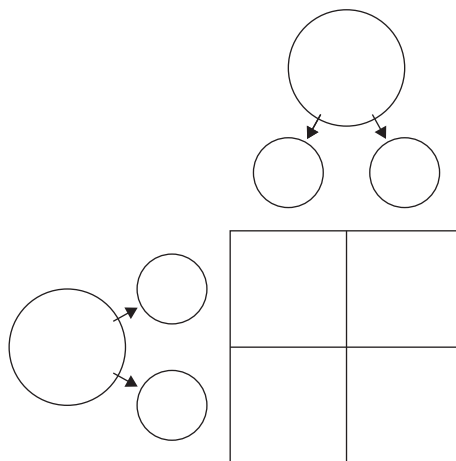


Adapted from: <https://pdfs.semanticscholar.org/a910/3db712e5773776ec97789225704991f6fd15.pdf>

[https://en.wikipedia.org/wiki/Polycystic\\_kidney\\_disease#/media/File:Polycystic\\_kidneys,\\_gross\\_pathology\\_CDC\\_PHIL.png](https://en.wikipedia.org/wiki/Polycystic_kidney_disease#/media/File:Polycystic_kidneys,_gross_pathology_CDC_PHIL.png)

Polycystic kidney disease is caused by a dominant allele (D) and the unaffected allele is recessive (d).

- (a) Complete the Punnett square for the cross between individual 1 homozygous recessive and individual 2 heterozygous for polycystic kidney disease.



- (b) List the genotypes of the following two individuals:

individual 3 \_\_\_\_\_ individual 4 \_\_\_\_\_

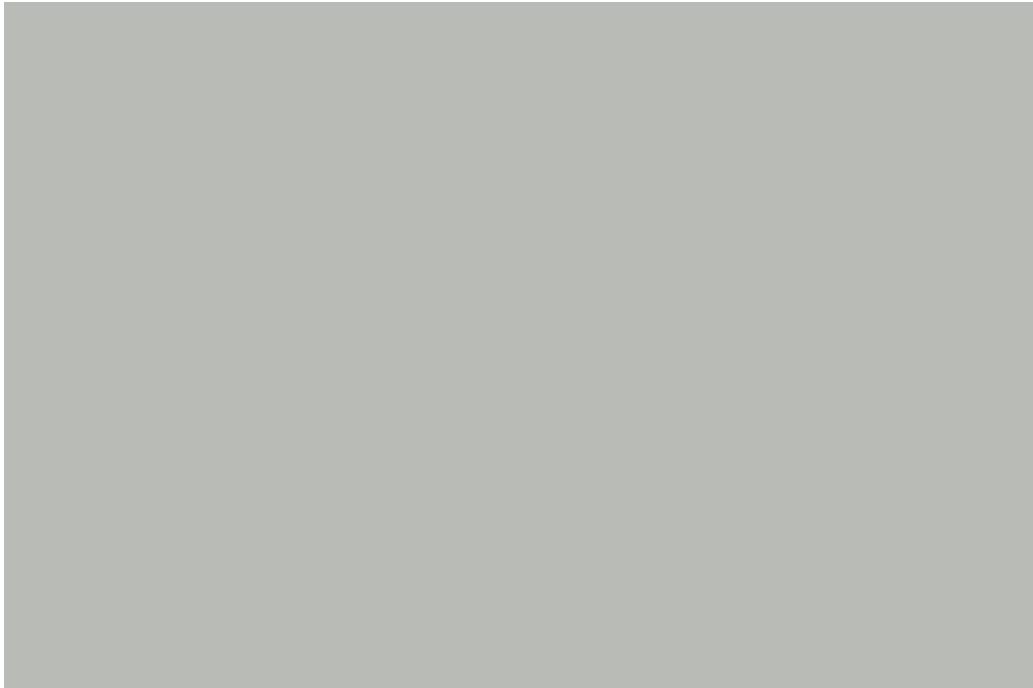






**QUESTION THREE**

Avian malaria is a parasitic disease affecting hoiho (yellow-eyed penguins), which can lead to death.



Source: <http://nzbirdsonline.org.nz/species/yellow-eyed-penguin>

(a) Describe genetic variation in hoiho.

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on the following page.**





