

90948



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SUPERVISOR'S USE ONLY

Tick this box if you  
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## Level 1 Science 2021

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

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.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (✂). This area may be cut off when the booklet is marked.

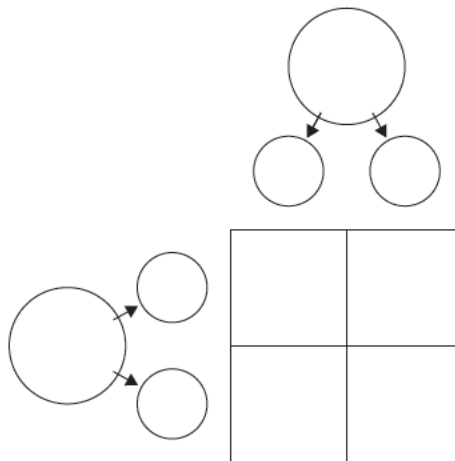
**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

**QUESTION ONE**

Source: <https://line.17qq.com/articles/ghgfogbz.html>

John and Noelene have three children, two girls and one boy.

(a) Complete a Punnett square showing sex inheritance.



(b) Explain how sex of children is determined in humans.

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(c) Explain the likelihood of John and Noelene’s next child being a girl.

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(d) John is a stone bench kitchen worker. He has silicosis, a lung disease caused by breathing in stone dust.

Will John and Noelene’s new baby inherit silicosis?  
Explain why or why not.

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- (b) Discuss whether this gene mutation, which protects against the HIV virus, is helpful to the human population.

In your answer, you should explain how it might be passed on to the next generation.

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**QUESTION THREE**

Himalayan wolves reproduce sexually.



Source: <https://twitter.com/geosrilanka/status/1172696055256928256>

- (a) Explain how sexual reproduction causes genetic variation.  
In your answer you should include the processes of gamete formation (meiosis) and fertilisation.

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Extra space if required.  
Write the question number(s) if applicable.

QUESTION  
NUMBER

90948