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NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 2 Science, 2009

90772 Describe the factors and processes involved in the evolution of New Zealand's plants and animals

Credits: Four
2.00 pm Wednesday 2 December 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 the factors and processes involved in the evolution of New Zealand's plants and animals.	Explain the factors and processes involved in the evolution of New Zealand's plants and animals.	Discuss the factors and processes involved in the evolution of New Zealand's plants and animals.
Overall Level of Performance		

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

Assessor's use only

QUESTION ONE: TAKAHĒ

The South Island takahē (*Porphyrio hochstetteri*) is the largest living member of the rail family of birds. It is flightless. It is thought that the takahē has been in New Zealand for around two million years.

Discuss how biological factors have contributed to the evolution of the South Island takahē so that it is now large and flightless.

QUESTION TWO: THE EVOLUTION OF NEW ZEALAND'S MOKO SKINK.

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http://www.nhc.net.nz/index/lizards-new-zealand/moko-skink/moko-skink.htm

New Zealand skinks, including the moko skink (*Oligosoma moco*), do not lay eggs like other reptiles but give birth to live young that are independent miniature adult skinks. It is thought that this is an adaptation to living in a climate that is colder than is usual for reptiles. Some scientists believe that skinks have been present in New Zealand since it broke away from Gondwana.

(a) Describe how "live birth" is an adaptation to survival in a cold climate.

(b) Explain what information either fossil or DNA sequencing evidence could tell you about the overall evolution of the moko skink.

(c) Discuss the influence of environmental changes during the break-up of Gondwana on the evolution of the moko skink.

Consider the following in your answer:

- effect of isolation
- effect of climate.

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QUESTION THREE: EVOLUTION OF THE SOUTHERN BEECH

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Southern beech

The beech family (*Nothofagus)* has been in New Zealand for 85 million years, but research, such as the fossil pollen record, suggests that today's southern beech species are much younger and evolved from an ancestor that arrived around 30–40 million years ago.

(a) Explain the relationship between the timing of the arrival of the southern beech and New Zealand's geological events around this time. You may need to refer to a specific event in New Zealand's geological history.

(b) Discuss how natural selection can change the gene pool and therefore the appearance of today's southern beech species.

In your answer consider:

- genetic isolation
- mutation
- founder effect.

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

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Question number

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