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90731

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 3 Science, 2005

90731 Describe geological processes affecting New Zealand

Credits: Two
9.30 am Friday 18 November 2005

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 geological processes affecting New Zealand.		Explain geological processes affecting New Zealand.		Discuss geological processes affecting New Zealand.	
Overall Level of Performance					

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You are advised to spend 25 minutes answering the questions in this booklet.

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QUESTION ONE: EARTHQUAKES AND TECTONIC PLATES

On the 14th of March 2005 an earthquake occurred that was centred off the coast of Taranaki. The earthquake registered 6.4 on the Richter scale and occurred at a depth of 150 km. Shaking was felt over the central part of New Zealand.

(a) Earthquakes occur because of movement along a fault line.

Describe a fault line.

(b) Explain what happens during an earthquake to make the ground shake.

(c) There are two main earthquake waves. Name the wave that:

(i) reaches the surface of the Earth **second**.

(ii) shakes the ground backwards and forwards in the direction that the wave is travelling.

Below is a map that shows the distribution of deep earthquakes in New Zealand as recorded from 1990 to 1999.

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Source: *The rise and fall of the Southern Alps*, Glen Coates, Canterbury Press, 2002, p 43.

(d) Describe **how** the earthquake depths change in moving from east to west across the North Island.

(e) Discuss fully the distribution of earthquake depth across the North Island in terms of the subduction of the Pacific Plate.

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(f) Explain why the distribution of earthquake depth in the Fiordland region of the South Island differs from the distribution in the North Island.

QUESTION TWO: VOLCANOES

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The summit of Mount Tarawera is formed from three rhyolitic lava domes. These domes were extruded about 800 years ago and overlie older lava and pyroclastic deposits.

Mount Tarawera

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http://www.gns.cri.nz/what/earthact/volcanoes/nzvolcanoes/okatbookprint.htm

(a) Describe the **silica content** of the rhyolitic magma that makes lava domes.

Mt Tarawera is part of the Okataina Volcanic Field. Rhyolitic eruptions from this field can be extremely violent.

(b) Describe the **main** volcanic formation that is formed by these extremely violent explosions.

(c) The growth of rhyolite domes such as those found on the Mount Tarawera summit doesn't pose much of a threat to human life. Discuss why the growth of rhyolitic lava domes is a gentle process compared with other rhyolitic eruptions that can be very violent.

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

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Question number	