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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, 2006

90731 Describe geological processes affecting New Zealand

Credits: Two
9.30 am Tuesday 28 November 2006

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 2–7 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 ☐		

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

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QUESTION ONE: PLATE TECTONICS

Map showing the New Zealand continent

NIWA map, *Awesome Forces*, Geoff Hicks, Hamish Campbell, Te Papa Press, Wellington, p 4.

(a) (i) When one tectonic plate subducts under another, a trench or a trough is formed.

State the name of the very deep **trench** that is found north-east of the North Island of New Zealand.

(ii) Discuss how the subducting Pacific plate forms the very deep trench named in (a) (i).

Subduction of the Pacific plate under the east coast of the North Island results in molten magma rising under the Taupo Volcanic Zone, forming volcanoes.

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(b) Explain how molten magma is formed as a result of subduction.

QUESTION TWO: VOLCANOES AND EARTHQUAKES

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Not all volcanoes are found on tectonic plate boundaries. The Auckland volcanic field is the result of the presence of a region of hot rock known as a hot spot, located about 100 km beneath the city. Temperatures are high enough to melt the rock to form basalt magma.

Rangitoto Island, a shield volcano

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http://dommy.com/az2nzau/fotos/images/rangitoto/P9120020.jpg

(a) Discuss why basalt magma caused Rangitoto Island to have a shield shape.

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(b) In the Auckland volcanic field, some eruptions can be very explosive.

Describe which factor could make eruptions explosive.

(c) Pending eruptions in the Auckland region would be preceeded by earthquakes, even though this area does not have any major fault lines.

(i) Explain what would cause earthquakes in this region.

(ii) What other sign would indicate that an eruption may be about to happen?

(d) (i) Name the scale that measures the energy of an earthquake.

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The diagram below shows seismograph readings from five sites in the Hutt Valley after a magnitude 5.7 earthquake near Westport in January 1991. It also shows the effect of underlying geology on ground movement in an earthquake.

Adapted from *Caught in the Crunch*, Rebecca Ansell and John Taber, Harper Collins 1999, p 19

(ii) Explain the relationship between the intensity of the earthquake and the type of rock underneath each seismometer.

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

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Question number	