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90316



NEW ZEALAND QUALIFICATIONS AUTHORITY MANA TOHU MĀTAURANGA O AOTEAROA



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

Level 2 Science, 2003

90316 Describe New Zealand's geological history and processes, and the nature and life cycle of stars

Credits: Four 9.30 am Thursday 13 November 2003

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 pages provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–10 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.

Achievement Criteria For Assessor's use only						
Achievement	Achievement with Merit	Achievement with Excellence				
Describe geological processes related to New Zealand's geological history.	Explain geological processes related to New Zealand's geological history.	Apply knowledge of geological processes to explain in detail New Zealand's geological history.				
Describe how stars are classified and describe their life cycles.	Link star types and their characteristics to their life cycles.	Explain links between the nature and life cycles of stars.				
Overall Level of Performance (all criteria within a column are met)						

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2

You are advised to spend 45 minutes answering the questions in this booklet.

Part A: New Zealand's Geological History and Processes

QUESTION ONE – The Rangitata Orogeny

(a) What is meant by the term **orogeny**?

(b) Explain, by relating to plate tectonics, how an orogeny occurs.

(c) Discuss the evidence a geologist would look for to determine whether an orogeny has occurred at some time in the past.



The Rangitata Orogeny occurred between 250–105 million years ago. Describe how geologists could date the timing of the Rangitata Orogeny events.	Asses
At the end of the Rangitata Orogeny, the Tasman Sea started to form. Explain how the Tasman Sea formed.	
Orogenies are often followed by a period of peneplaination. Describe a peneplain .	

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Photograph:

The Rise and Fall of the Southern Alps, p 37, Glenn Coates, Canterbury University Press.

Pollburn-Rough Ridge area, east of Cromwell – an example of the Cretaceous peneplain

Use features from this photograph to explain why geologists consider this area to be a peneplain.

New Zealand's geology.	

	Part B: Star Types	S As	ssessor's use only	
QUESTION TWO				
 The photographs below show three stars (photographs are not to scale): our average-sized star, the Sun a white dwarf (NGC 2440) and its corona the red giant Betelgeuse. 				
[For copyr	ight reasons the resources cannot be repor	duced here. See below.]		
Photographs:				
http//hubblesite.org/gallery	http//antwrp.gsfc.nasa.gov/apod/ap000730.html	http://historyoftheuniverse.com/starold.html		
The Sun	NGC 2440	Betelgeuse		
(1)	aracteristics of stars that provide useful info			
Compare the cl	dwarfs and red giants are types of stars. haracteristics of these three star types. the H–R graph on page 7 will be useful.)			

QUESTION THREE

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The Hertzsprung and Russell graph (H-R graph) describes important characteristics of star types.

Hertzsprung and Russell graph

[For copyright reasons the resources cannot be reporduced here. See below.]

http://freespace.virgin.net/gareth.james/3__objects/HR_Diagram/hr_diagram.html

(a) Explain how the H–R graph is used to group star types.

(b) Discuss the processes responsible for the possible formation of a red giant star. Illustrate your answer with diagrams where appropriate.

Use the box below for your diagrams.

8

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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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