

93104



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SUPERVISOR'S USE ONLY



NEW ZEALAND QUALIFICATIONS AUTHORITY  
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD  
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Tick this box if you  
have NOT written  
in this booklet

# Scholarship 2021 Earth and Space Science

Time allowed: Three hours  
Total score: 24

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.

Pull out Resource Booklet 93104R from the centre of 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 2–16 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.**

Question	Score
ONE	
TWO	
THREE	
TOTAL	

ASSESSOR'S USE ONLY

**QUESTION ONE: EL NIÑO – SOUTHERN OSCILLATION (ENSO) AND NEW ZEALAND**

Discuss and evaluate how the effect of the Southern Oscillation on the West Coast of the South Island can be used to further understanding of past climate.

Consider in your answer:

- how the sediment core can be dated
- the origin of the eroded rock and sediment, and how the deposition of the material varies between years
- what evidence is present in the sediment cores to show how often El Niño and La Niña have occurred in the past
- what other information is available from a core and how this could be useful.

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**QUESTION THREE: GLOBAL SEA LEVEL RISE**

Cyclic sea-level changes have affected our planet over hundreds of thousands of years.

Discuss the causes of global warming and its effect on sea level.

In your answer, you should also consider potential changes in:

- thermohaline circulation
- albedo effect
- solubility of carbon dioxide.

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