

Assessment Report

New Zealand Scholarship Earth & Space Science 2016

Standard 93104

Part A: Commentary

The cohort sitting Earth and Space Science scholarship was noticeably larger in 2016 than in previous years, but contained a lower proportion of well-prepared candidates who were at or near the standard required.

Successful candidates were able to use skills and information from both Earth and Space Science and Nature of Science Achievement Objectives in their answers and exhibit higher level critical thinking and analysis. They used relevant resource material and clearly understood the context of the question. Many drew accurate and correctly labelled diagrams.

Question 1 (Seafloor methane hydrates) and question 3 (The warming ocean and the effect on NZ) proved to be harder to answer compared with question 2 (Liquid water on Mars), but candidates who had taken the time to read and consider the resource booklet in depth wrote well thought-out answers.

Most candidates attempted all questions, and most used legible handwriting.

Part B: Report on performance standard

Candidates who were awarded **Scholarship with Outstanding Performance** commonly:

- made few or no errors
- linked all aspects of their answer into a comprehensive, literate essay
- made insightful use of the resources provided
- used prior knowledge of earth and space science (ESS) to expand and explain their answers
- thoroughly understood what the general size and extent of the continental shelf around New Zealand is, and that slow-moving, underwater landslides cannot cause tsunamis
- understood the implications of the eccentricity of Mars' orbit
- made excellent use of any data provided
- understood that liquid water on Mars may be only transient

- knew enough about the biosphere to be able to evaluate the consequences of global warming on marine ecosystems.

Candidates who were awarded **Scholarship** commonly:

- answered most aspects of the questions
- did not make major errors
- linked the resource material with their own knowledge
- understood the consequences of extra methane in the atmosphere on warming oceans, and the resulting feedback loop
- had a well-developed understanding of the areas on Mars where liquid water may be found
- had a good understanding of what affected surface currents around New Zealand.

Other candidates commonly:

- did not answer or only partially answered questions
- made errors which showed a lack of understanding
- repeated or paraphrased the resources provided
- confused global warming with the depletion of ozone
- did not interpret data provided intelligently eg took notice of the maximum temperature recorded on Mars, 35°C, rather than the average temperature, -55°C and the diurnal range which is up to 90°C.
- did not understand ocean circulation to scholarship standard.

Further comments

There was evidence of a lack of understanding of Earth and Space Science concepts at Level 8 of the New Zealand Curriculum, such as the fact that surface currents are more complex than just the gyres because of factors such as the influence of landmasses and continental shelves.

There also appeared to be confusion in many candidates' minds about the difference between Global Warming and the Ozone Hole, and whether excess methane directly causes ocean acidification (it does not).

Also, many candidates wrote about the El Niño Southern Oscillation when it was not necessary and not indicated in any of the questions.

A surprising number of candidates did not read the questions carefully and did not attempt all parts of the questions. For example, they were not able to justify the need for extra research – a key Nature of Science skill at this level of the curriculum. Nor did they consider in depth the consequences of global warming on New Zealand and its surrounding ocean and ecosystems. Level 8 Planet Earth and Beyond, Achievement Objective AO1 requires an in-depth understanding of the interrelationship between human activities and the geosphere, hydrosphere, atmosphere, and biosphere over time.

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