NZQA
New Zealand Qualifications Authority
Mana Tohu Matauranga O Aotearoa

LIVE

Assessment Report

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Level 2 Earth and Space Science 2019

Standards 91191 91192 91193

Part A: Commentary

Those candidates who thought through the questions carefully, planned their answers and drew annotated diagrams to support their answers showed a deeper understanding of the questions than those who did not.

Part B: Report on standards

91191: Demonstrate understanding of the

causes of extreme Earth events in New Zealand

Candidates who were awarded **Achievement** commonly:

- identified different plate tectonic boundary processes
- described properties of basaltic magma
- defined earthquake, tsunami and hotspot formation
- described water movement or energy transfer in tsunami formation

Candidates whose work was assessed as **Not Achieved** commonly:

- provided generic answers that were not linked to the questions
- misinterpreted diagrams and questions
- did not provide definitions e.g. tsunami or basaltic magma properties
- did not understand volcanic or earthquake processes in the different areas of New Zealand.

Candidates who were awarded **Achievement with Merit** commonly:

- labelled diagrams to support their answers
- demonstrated clear understanding of magma type and the volcanic formations
- showed understanding of fault, earthquake and tsunami processes.

Candidates who were awarded **Achievement with Excellence** commonly:

- drew annotated diagrams and used these to elaborate on their written answers
- used the resource materials to inform their answers
- provided in-depth explanations regarding volcanoes, faults, earthquakes and tsunami.

Standard specific comments

Many candidates did not understand the processes involved in hotspot formation; therefore, this question was poorly answered. Successful candidates were familiar with extreme earth events across New Zealand.

91192: Demonstrate understanding of stars and planetary systems

Candidates who were awarded **Achievement** commonly:

- recognised that gravity results from the mass of a star or planet
- understood the concept of nuclear fusion
- described how a protoplanetary disc and planetesimals are formed
- understood that higher mass main sequence stars are to the left of the HR diagram and lower mass stars are to the right.
- described the lifecycles of different main sequence stars.

Candidates whose work was assessed as **Not Achieved** commonly:

- used the word burns instead of fuses as a verb for nuclear fusion
- confused volume and mass
- misinterpreted the HR diagram
- omitted the role of gravity in star formation.

Candidates who were awarded **Achievement with Merit** commonly:

- explained the importance of gravity to planet and star formation
- gave reasons for the higher temperature of a newly formed planet

- explained the composition of the outer planets
- interpreted fully, the aspects of the HR diagram
- compared the life cycles and characteristics of different stars referring to their original mass.

Candidates who were awarded **Achievement with Excellence** commonly:

- gave a comprehensive account of the formation of an outer planet from protoplanetary disc to accumulation of materials emphasising the importance of gravity and temperature
- showed evidence of thinking critically about the reasons for an outer planet being hotter than expected
- justified current thinking on the reasons why massive main sequence stars have shorter life spans
- comprehensively explained the link between mass and gravity in the formation and lifecycles of stars.

Standard specific comments

Candidates frequently demonstrated familiarity with the concepts being examined, but many found it difficult to apply their knowledge to the context of the question.

91193: Demonstrate understanding of physical principles related to the Earth System

Candidates who were awarded **Achievement** commonly:

- recognised that different colour light has different wavelengths
- recognised that white light is a mix of the colours

- described some effects of clouds on the reflection, transmission and scattering of light waves
- understood that cold water sinks due to its higher density
- linked increased temperature at the equator to the concentration of solar radiation at this latitude
- described how the ocean can absorb heat at the equator and distribute this heat to the poles or atmosphere.

Candidates whose work was assessed as **Not Achieved** commonly:

- stated that the appearance of clouds is due to reflection of light
- restated the resources or question provided
- identified the earth's core as the source of heat for the ocean and atmosphere
- explained the difference between the temperature at the poles and equator as being due to the relative distances from the sun.
- outlined examples from previous exam papers that were not relevant to the question being asked.

Candidates who were awarded **Achievement with Merit** commonly:

- explained the behaviour of light in terms of waves
- summarised scattering of light in clouds due to water droplets
- explained the effect of high / low clouds on the temperature at the surface of the earth during the day / night
- outlined how energy is distributed from the equator to the poles due to cold, dense water sinking at the poles
- explained energy transfer to the atmosphere from the ocean surface by conduction.

Candidates who were awarded **Achievement with Excellence** commonly:

- gave a comprehensive account of the appearance of clouds due to different wavelengths of light being scattered the same amount by water droplets
- explained in detail the effects of high and low-level clouds on surface temperatures in terms of the absorption and transmission of light waves
- outlined comprehensively the absorption and movement of heat energy from the equator to the poles and atmosphere by convection / surface currents and conduction.

Standard specific comments

Some candidates were able to demonstrate an understanding of some of the concepts examined by the standard but were not necessarily able to apply them to the question's context. There was also evidence of students pre-learning responses to previous years' questions and attempting to relate them to the current context, for example, outlining the Gulf Stream and Labrador Current.

Successful candidates made use of the vocabulary detailed in the standard's explanatory notes, such as transmission, absorption, reflection and scattering.

Science subject page

Previous years' reports

2018 (PDF, 105KB)

2017 (PDF, 43KB)

2016 (PDF, 217KB)

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