



The following report gives feedback to assist assessors with general issues and trends that have been identified during external moderation of the internally assessed standards in 2024. It also provides further insights from moderation material viewed throughout the year and outlines the Assessor Support available for the Level 1 Sciences – Physics, Earth and Space Science, Science, and Chemistry and Biology.

Physics, Earth and Space Science

Insights

92044: Demonstrate understanding of human-induced change within the Earth system

Performance overview:

This standard requires students to describe change within the Earth system that has resulted from human activity.

Evidence of using relevant scientific ideas to show the effect of the change on at least two spheres (atmosphere, biosphere, geosphere, and hydrosphere) within the Earth system met the standard's requirements.

Practices that need strengthening:

Using scientific ideas to describe the effects of human-induced change is required to achieve the standard, rather than using scientific ideas to describe the change itself.

For higher grades, scientific ideas need to be used to explain how the change affects at least two spheres in the Earth system for Merit. For Excellence, the evidence needs to discuss the scientific implications of the change within at least two spheres within the Earth system. Students who did this well used the science ideas to show how the impact in one sphere resulted in an impact on another sphere.

92045: Demonstrate understanding of a physical phenomenon through investigation

Performance overview:

Evidence that met the standard was set in a phenomenon that allowed two distinct relationships to be investigated. Two relevant physics concepts were clearly described for the phenomena. The results of each investigation were recorded as numbers that could be plotted on a graph with numerically ordered axes. The conclusion of each investigation compared the way the dependent variable increased or decreased when the independent variable is changed, in magnitude.

Evidence that met the standard for Merit explained how the two concepts and each relationship were involved in the phenomenon.

Practices that need strengthening:

A variable that differs in quality, such as the surface material a ball rolls along, is difficult to put into the equation of a relationship.

Describing suitable physics concepts proved difficult for some students. Understanding the background concepts in a variety of physics phenomena enabled students to describe relevant concepts.

Physics concepts include, but are not limited to: gravitational potential energy, kinetic energy, the conservation of energy, air resistance, terminal velocity, friction (which has many forms), voltage, electrical current, and heat transfer by conduction, convection, or radiation.

Science

Insights

91920: Demonstrate understanding of a science-informed response to a local issue

Performance overview:

This standard requires the description of a science idea that informs a science perspective involved in the issue, outlines another perspective from a group relevant to the issue, and identifies a science-informed response to the issue.

Practices that need strengthening:

A perspective is a particular way of regarding an issue that is shared by a group. If the group is too general, perspectives may vary. For example, perspectives within groups such as Māori, Pacific Peoples, or teenagers may vary. Examples of groups include iwi or hapū, a local council, a company or business.

The science-informed response needs to be clearly identified. That the local issue is also a science-informed response is not sufficient evidence of identifying a science-informed response. For example, fluoridating the water supplied by the local council or using sodium fluoroacetate to control mammalian pests in Aotearoa is both the local issue and a science-informed response. Evidence that clearly identified a science-informed response was seen when a template or task prompted this, or explicit evidence stated ‘a science-informed response is...’

91921: Demonstrate understanding of the use of a range of scientific investigative approaches in a context

This standard has been reviewed and changed. The insights below are for Version 3 of this standard. Version 4 of the standard is published on the NZQA website, ready for use in 2025.

The Achieved Explanatory Note 1 has changed to “describing the purpose of using each investigative approach, supported by evidence.”

The Excellence criteria has been changed for 2025, so this report does not cover Excellence.

Performance overview:

This standard requires students to carry out a range of investigative approaches and describe the purpose of each of the approaches they used during their investigation.

The use of a template often helped students to stay focused on the purpose of the investigative approaches.

One context is required by this standard. The context can come from any area of science. Some possible examples are a local stream, rock types and formation in Aotearoa, or how

space suits protect astronauts. It is easier for students to stay in the context when they have an overarching question. A sub-question for each investigative approach contributes to answering the overarching question.

Student gathered evidence is required to support the description or explanation of the investigative approaches.

Practices that need strengthening:

The purposes of the investigative approaches need to be described with evidence, rather than the aims and outcomes of their investigations.

Chemistry and Biology

Insights

92020: Demonstrate understanding of the relationship between a microorganism and the environment

Performance overview:

Appreciating that all living things are related and live as part of interconnected systems is a useful way of approaching this standard.

Evidence that met the requirements of this standard described a life process of a microorganism and described an abiotic or biotic factor of the interconnected environment that affects the life process of the microorganism, using observations.

Practices that need strengthening:

The requirements for Merit and Excellence need to relate to a life process that has been described.

In a disease context, biotic factors such as an animal or plant host are also the interconnected environment.

Merit requires linking a change to an abiotic or biotic factor of the interconnected environment to the effect on the life process of the microorganism, rather than the microorganism as a whole, using observations. For example, evidence that links a change in the immune system of a human host to the effect on the microorganism does not meet the requirements of the standard.

Excellence requires examining how the life process of the microorganism, rather than the microorganism itself, affects an abiotic or biotic factor of the interconnected environment, using observations. For example, evidence that examines how the microorganism causes disease or symptoms in the human host does not meet the requirements of the standard.

92021: Demonstrate understanding of chemical reactions in context

This standard has been reviewed and changed. The insights below are for Version 3 of this standard. Version 4 of the standard is published on the NZQA website, ready for use in 2025.

Performance overview:

This standard requires students to show an understanding of at least three different chemical reaction types.

Students met the standard's requirements with evidence of using predictable patterns and observations to describe the reaction type, referencing conservation of mass to support the description of the reactants and products, and linking the reaction to a context modelled with the generic word equation.

Practices that need strengthening:

Students who achieved higher grades explained the conservation of mass modelled by using the supplied chemical word equation for Merit, and justified the conservation of mass modelled using the supplied balanced chemical equation for Excellence.

Supporting information, such as equations, should be provided to students as a separate resource.

Assessor Support

NZQA offers online support for teachers as assessors of NZC achievement standards. These include:

- Exemplars of student work for most standards*
- National Moderator Reports*
- Online learning modules (generic and subject-specific)**
- Clarifications for some standards*
- Assessor Practice Tool for many standards**
- Webcasts*

*hosted on the NZC Subject pages on the NZQA website.

**hosted on Pūtake, NZQA's learning management system. Accessed via Education Sector Login.

We also may provide a speaker to present at national conferences on requests from national subject associations. At the regional or local level, we may be able to provide online support.

Please contact workshops@nzqa.govt.nz for more information or to lodge a request for support.

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