National Moderator Report 2026
Materials and Processing Technology

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 2025. It also provides further insights from moderation material viewed throughout the year and outlines the Assessor Support available for Materials and Processing Technology. Please note this report does not introduce new criteria, change the requirements of the standard, or change what we expect from assessment.

Insights

92012: Develop a Materials and Processing Technology outcome in an authentic context

Performance overview:

This standard requires students to progress through stages of technological practice to develop an outcome that is fit for purpose, with measurable physical and functional specifications. The strongest evidence demonstrated engagement in multiple technological practices beyond simply producing the final outcome. The most common practices included:

- Unpacking the social and physical environment.
- Researching existing solutions and materials.
- Concept sketches and development sketches.
- Testing of materials/ingredients/components.
- Scale modelling.
- Sectional modelling.
- Producing mock-ups and toiles.
- Trialling practical techniques and processes.

Achievement was strengthened when students included manufacturing photographs or concise action plans.

Students who restricted their technological practice provided insufficient evidence of authentic outcome development.

At least one photograph of the authentic outcome is required, shown in its actual or modelled intended environment. Where evidence of a physical, completed outcome was not provided, the standard was not achieved.

Care must be taken to ensure assessment activities enable engagement with authentic, personalised contexts. Students were more successful when they developed an outcome that addressed a real-world need or served an end user other than themselves, within a familiar social or cultural setting.

Achievement at higher levels required students to think critically about the impact of their practice on the developing outcome. Students who analysed the results of their technological practice, incorporating relevant feedback from multiple sources, were better able to explain their decisions clearly.

Higher grades were achieved when students refined the developing outcome and provided clear explanations of how those refinements improved the likelihood that the authentic outcome would meet the end user's needs.

Excellence was achieved when students demonstrated analysis through comparative evaluation of feedback from multiple sources and explored clear connections between stakeholder feedback and development decisions. Explanations of how feedback influenced, or could have influenced, the outcome, identifying both positive impacts and potential issues, enabled students to demonstrate the critical thinking required for Excellence.

Examples of innovative assessment practice included video portfolio evidence.

Practices that need strengthening:

Using a wide range of technological practices enhanced opportunities for the level of analysis and decision-making required for higher grades. Broad-ranging practices that explored and developed a variety of attributes into measurable specifications increased the likelihood of higher achievement.

Confusion about attributes, constraints, and specifications persisted in some contexts. Emphasis must be placed on developing measurable physical and functional specifications from initial attributes. Several submissions failed to express specifications in measurable terms, indicating a lack of understanding of how specifications communicate the authentic outcome's unique ability to meet the identified need.

A common issue was distinguishing between merely describing stakeholder feedback and analysing how that feedback informed the development of the outcome. Simply duplicating or summarising feedback does not constitute analysis. To reach higher grades, students need to compare, evaluate, and apply the feedback. This was challenging when the feedback lacked relevance or purpose.

Interaction with only one stakeholder, or when the student acted as the sole stakeholder, limited opportunities to present relevant feedback and meet the requirements for Merit or higher. Higher grades require feedback from at least two stakeholders, gathered at a minimum of two different stages of development. Submissions that collected feedback more widely and purposefully were more likely to achieve Excellence.

Heavily templated documents prepared by assessors often restricted authentic student evidence. When using templates or writing frames, assessors must ensure they allow students to record personalised evidence for all aspects of the standard.

92013: Experiment with different materials to develop a Materials and Processing Technology outcome

Performance overview:

While outcome development is required and a physical outcome must be created, the scope of the evidence of development is not the same as what is needed for 92012.

Students were more likely to achieve the standard when experimentation involved the use of two or more materials. These materials may come from the same material group, but students who pre-selected a single material were unlikely to attain the standard.

The standard was met when students applied one or more of the methods in Explanatory Note (EN) 3 to more than one material to explicitly explore material properties. Where the evidence showed that the student observed material properties when combining,

manipulating, transforming, or forming materials, the standard was met (provided those materials were then used in the creation of the outcome).

Students who explored material properties through physical testing or trialling of materials were most likely to achieve. Research into different materials and their inherent properties, or simulation of material testing, was not sufficient on its own to meet the standard. Students who then experimented further using those same materials and strengthened their understanding of performance properties were more likely to attain a Merit grade.

Refined use of materials resulted from ongoing, deeper investigation using methods in EN3. These refinements could be significant or minor, and ideally increased the likelihood of the outcome being purposeful.

As with 92012, stakeholder feedback gathered from more than one stakeholder at different stages of development was needed, although stakeholder engagement was not the primary focus of the evidence.

At Excellence, an analysis of the connection between material properties and the creation of a purposeful outcome was required. Successful students generally showed ongoing analysis as experiments were completed, and often supported this with data from research or stakeholder feedback. Evidence at Excellence used the analysis of material properties to justify the capacity or ability of the outcome to be purposeful.

While the standard does not explicitly require the outcome to be tested in the actual or modelled intended environment, this evidence was often present when students were working at Excellence.

Practices that need strengthening:

The requirement to “experiment with different materials” was often misunderstood. Experimentation, as defined by the standard, necessitates the use of the methods explained in EN3. A common mistake was assuming that evidence from research into materials was sufficient to demonstrate experimentation. Alternatively, some students undertook typical testing to ascertain characteristics, such as stretching, dropping, denting, burning, abrading, wetting, tasting for flavour, or observing colours. While these tests are legitimate for building understanding, they do not involve methods of transforming, combining, manipulating, or forming. Therefore, on their own, they did not contribute to attainment of the standard.

Another issue was that students often used methods for transforming, combining, manipulating, or forming materials with the goal of selecting appropriate processes, techniques, tools, and equipment, rather than exploring material properties.

When the evidence focused too heavily on the technological practices used to develop the outcome and associated specifications, it often did not meet the standard. The primary focus of this standard is the exploration of material properties to inform development.

Convenience-based selection was an issue in some evidence. Choosing materials for convenience, such as “*it was available at school*” or “*my stakeholder told me to use it*” is unlikely to meet the standard, unless clearly linked to material properties observed during experimentation.

When Merit grades were adjusted during moderation, assessors needed to ensure that the evidence of refinement was related to the selection of materials based on their properties, rather than just refining the appearance or function of the outcome, or the choice of tools, equipment, processes, and techniques.

The criterion requiring students to analyse the properties of different materials for the creation of a purposeful outcome is often misunderstood. Some students interpret this as simply describing inherent characteristics or conducting basic material tests, rather than engaging in systematic experimentation using methods of transforming, combining, manipulating, or forming. Analysis involves applying these methods to explore how material properties influence performance and suitability, and using this understanding to inform decisions that justify the outcome's purposefulness.

Many students assume that simply stating which materials were used, or describing their inherent characteristics, is sufficient to justify material choices. Justification requires a clear, reasoned explanation of why specific materials were selected based on their performance properties and suitability for the intended purpose.

The requirement to "evaluate different materials" was also often misinterpreted as a final evaluation of the outcome's fitness for purpose, or an evaluation of how well the student met the requirements of the assessment activity.

In some cases, students considered design elements or material characteristics as properties. The focus should be on the performance properties of materials that determine how they behave when transformed, combined, manipulated, or formed, and their suitability for particular applications.

In many Processing Technology samples, evidence of what was observed about the properties of the ingredients or electronic components when combined or manipulated was not explicit enough to attain the standard.

91610: Develop a conceptual design considering fitness for purpose in the broadest sense

Performance overview:

This standard requires students to develop an original conceptual design that is not a replication of existing designs or a simple modification of one idea.

Successful evidence incorporated targeted research, a wide range of functional modelling techniques, and feedback from relevant sources to inform the development of a conceptual design that could ultimately be evaluated as fit for purpose in the broadest sense. A focus on gathering feedback from a range of stakeholders using open-ended questions enabled students to obtain relevant and in-depth information to confirm or refine developing ideas. Evidence gathered through these sources validated assumptions about the design and guided refinement.

Limiting an evaluation of fitness for purpose to a judgement on how the conceptual design would look and function in the intended environment demonstrated insufficient understanding of the standard. Evidence of fitness for purpose in the broadest sense is required throughout the documentation. Evidence that triangulated ongoing research, stakeholder feedback, and consideration of fitness for purpose provided a stronger opportunity to demonstrate Excellence.

At NZC level 8, students should document iterative refinement of ideas and record changes and improvements based on functional modelling and feedback. The conceptual design should be of sufficient complexity to justify development at this level.

91620: Implement complex procedures to integrate parts using resistant materials to make a specified product

Performance overview:

This standard requires students to implement complex procedures to integrate two or more assembled parts using resistant materials to produce a specified product.

The standard is met when evidence includes measurable specifications agreed upon before construction. Trialling and feedback to select the most suitable complex techniques for integration are essential. A schedule of ongoing tests, reviewed at key reference points during development, is required to reduce errors and ensure precise integration. Implementation must comply with health and safety regulations during preparation, integration, and testing. Evidence of the final outcome demonstrating the function of integrated parts is also required.

For grades above Achieved, students must provide evidence of skilful and efficient implementation of complex procedures. Successful students showed how techniques were applied, whether the product met specifications, and the quality of the finished outcome.

Where assessors provided observation-based evidence and attested grades at Merit or Excellence, assessment decisions were generally reliable.

Practices that need strengthening:

When grades were changed in moderation, assessors needed to ensure procedures align with the complexity described in the standard. Accuracy and precision define complexity. A lengthy work log is unnecessary, but evidence must show planning of the construction sequence and identification of testing points for precise preparation and integration. These schedules should be established before construction begins.

Students using teacher-led briefs and specifications may be disadvantaged in making informed technique selections.

Evidence of the integration environment is often insufficient, preventing achievement. Photographic or written evidence of part preparation, tool and equipment setup, and assembly aids is required, along with proof of health and safety practices. Lists of workshop rules or assessor ticks do not confirm compliance. Photographs of the student applying correct practices increase the likelihood of achievement.

91643: Implement complex procedures to process a specified product

Performance overview:

This standard requires students to implement complex procedures involving multiple processing operations in a specific sequence, informed by knowledge and testing feedback. Evidence must include agreed measurable specifications, including material specifications, before production begins. Students must use a flow diagram to show execution, feedback loops, and modifications to operations. Testing must go beyond a single sample, with random selection and repeated identical runs to demonstrate quality control for future production.

Yield and financial costs must be calculated, including energy and labour. For Merit, students predict these factors and compare them to actual per-unit costs. All procedures must comply with health and safety regulations, and photographs of the final outcome are required.

Assessment decisions were generally reliable when supported by observation-based evidence and assessor attestations for Merit or Excellence.

Practices that need strengthening:

When grades were adjusted in moderation, assessors needed to confirm that processing procedures matched the complexity described in the standard. At Level 3, evidence should show techniques requiring a diverse range of operations performed in a specific order, informed by knowledge and testing feedback.

Replicant testing is essential. This means repeating exactly the same procedures and measurements across two batches to check consistency, not trialling different recipes or changing quantities.

A lengthy work log is unnecessary, but evidence must include a flow diagram showing multitasking, quality control, and modifications based on feedback and test results. Students who annotated their diagrams to show corrective action were more likely to achieve.

Achievement also requires evidence of compliance with health and safety practices. Photo or video evidence of students applying correct practices are required evidence for this criterion.

For Merit, students must execute complex procedures independently and accurately. For Excellence, they must do so efficiently, economising time, effort, and materials. A tick box alone does not attest to higher grades.

Merit and Excellence at Level 3

At the Merit/Excellence boundary, overall quality of evidence is critical. For Level 3 Generic Technology standards, students must consider fitness for purpose in the broadest sense throughout design development, not just at the end. Concise, connected evidence improves the chances of Excellence.

In skills-based standards, higher grades require students to implement complex procedures independently and accurately (Merit), and efficiently, economising time, effort, and materials (Excellence). Assessor attestations must detail how this was achieved – a tick box is insufficient.

Attesting to Merit and Excellence in the ‘Implement’ Standards

To achieve grades above Achieved, students must implement procedures skilfully and economically. If this is not directly visible, teachers may attest, but the attestation must explicitly describe how the criteria were met. A tick box or general statement is insufficient. To be verifiable, attestations should detail what was observed, ideally with dates. These observations must be retained for verification and moderation at all levels.

Volume of Evidence

Some students submitted excessive evidence, including irrelevant research and trials. Students should only provide evidence required by the standard. Those who critically selected and documented significant alternatives achieved at higher levels.

Templates and writing frames helped to manage evidence volume, especially for skills-based standards. Effective templates are often 1-2 A3 pages with relevant text, photos, or audio/video. Assessors must ensure templates allow students to record evidence for all aspects of the standard.

To give feedback on this report click on this link.

Assessor Support

NZQA offers free 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.

Exemplars, National Moderator Reports, clarifications, and webcasts are hosted on the NZC Subject pages on the NZQA website.

Subject Pages

Online learning modules and the Assessor Practice Tool are hosted on Pūtake, NZQA's learning management system. You can access these through the Education Sector Logon.

Log in to Pūtake

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 assessorsupport@nzqa.govt.nz for more information or to lodge a request for support.