Assessment Report

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Level 2 Technology 2020

Standards 91358 91359 91360 91363

Part A: Commentary

Commentary is not provided for Technology standards.

Part B: Report on standards

91358: Demonstrate understanding of how technological modelling supports risk management

Candidates who were awarded **Achievement** commonly:

- explained functional modelling and prototyping and how to use this to manage risks in the development of an outcome.
- based their reports around a variety of models from their own practice
- identified risks that would need managing and improve the development of the outcome

- explained why a certain model was used to manage or eliminate an identified risk
- identified the stakeholders they had selected and explained why these were selected
- explained why a particular stakeholder or stakeholder group was shown a particular model
- explained why stakeholder feedback was given at selected points in the development of their outcome
- explained how stakeholder feedback assisted with their management of an identified risk
- used different forms of modelling techniques to help with ‘could’ and ‘should’ decisions to assist with the development of their outcome.
- demonstrated understanding of what ‘could’ (functional or technical reasoning) and ‘should’ (practical or social reasoning) decisions are, and why the modelling was undertaken at a particular stage of the development of their outcome
- used their own words and were not limited by writing frames that limited their responses.

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

- wrote about a company’s product development but had no stakeholder decisions, no ‘could’ or ‘should’ decisions, or minimal reference to the models used in the development of the product
- showed limited understanding that models are used to avoid mistakes, errors or malfunctions (risks) before embarking on the final outcome/prototype, e.g. wrote they had no risks in the development of their outcomes or wrote that they only discovered risks upon completion of their outcome
- did not demonstrate understanding of what constituted a model that managed risk in the development of an outcome
- wrote about the risk involved in making or using the model i.e. “drawing thumbnails is hard as they are so small” or “the cellotape wouldn’t stick to the cardboard”
- wrote about the ‘process’ of developing an outcome, not managing the risks which enabled the progression of their outcome

- mentioned the model and the risk in generic terms only – no descriptions or explanations of specific model or risks e.g. "I made a model, and I managed the risk, so I made the next model", or “this model showed my outcome was fit for purpose”
- demonstrated no or limited understanding of ‘could’ (functional or technical reasoning) and ‘should’ (practical or social reasoning) decisions to assist with development of their outcome.
- developed an outcome with no stakeholder group apart from themselves
- included transcripts of stakeholder feedback with no link to the model or the identified risk
- presented reports that were limited by writing frames that did not enable them to meet the criteria of the standard.

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

- used a variety of models to develop their outcome
- used models that were purposefully made to assist with the management of an identified risk
- presented risks that were specific to the completed outcome
- identified some risks before starting the development of their outcome – often linked to ‘should’ (practical and social reasoning)
- linked risks to ‘could’ (functional and technical reasoning) decisions where identified throughout the development of their outcome.
- used a Risk Register table that identified the risk, the impact of the risk – high, medium, low, and the ‘could’ (functional or technical reasoning) and ‘should’ (practical or social reasoning) decisions that were relevant to the outcome’s development
- explained the ranking, severity and the probability/possibility of the identified risk occurring
- identified risks that were specific to the stage of the technology process, e.g. the sketches at the beginning to help with idea development, then cardboard models to see the item in 3D and judge scale, then practising technical skills to minimise waste etc.

- referred to ‘could’ as Technically Feasible or Functional Reasoning and ‘should’ as Social or Practical Reasoning – this helped candidates to avoid getting caught up in the semantics of could and should i.e. “I could do this but decided I shouldn’t”
- followed the technology process or stages to develop their outcome
- demonstrated understanding of the sequence in which an outcome is developed and why a particular model is made at a certain stage of the development.

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

- presented a well-structured report with risks identified, a status given, severity and probability clearly explained and clear links between decisions both practical and functional reasonings
- clearly described models, the purpose of the model, the risk identified that the specific model was to help with
- clearly discussed who stakeholders were, why they had been chosen and the assistance they would be giving throughout the development of their outcome
- gained stakeholder feedback from expert sources and made decisions that were both technically (could) and socially (should) appropriate
- gave clear reasoning why a particular model was used and discussed how the evidence gained was valid and reliable
- explained stakeholder expertise and how this led to the valid and reliable feedback, which in turn enabled good decisions to be made
- discussed valid and reliable evidence gained from modelling which utilised a variety of modelling forms e.g. excellent research resources, commercially validated (e.g. award winning) information, recommended codes and conventions etc.
- wrote to discussion level.

Standard specific comments

Candidates were successful when they focused on how the model(s) they made helped them manage risks which could have impeded the development of their final outcome.

The overarching contexts of risk are:

- **Social environment** (should)
  Is this sustainable? Is this the right thing to do? What are the long term effects of doing this?
- **Socially acceptable** (should)
  Is this culturally, socially appropriate? Is it ethical? Is it legal?
- **Practical Reasoning** (should)
  The should context has a broader context outside of the outcome itself ie does it meet the brief, specifications, the client's need, is it suitable for the proposed environment?
- **Technically feasible** (could)
  Do I have the skills? Can it be made that way? How do I make it? What materials and or resources are needed etc
- **Functional Reasoning** (could)
  Will this do what it is meant to do? Is this the best way to do this? Is this the best tool or technique to use?

Successful candidates used a specific model that would enable them to make decisions connected to these contexts (could and should), for example:

- The square edges on my cardboard model showed me that I should change to rounded corners making it safer for kids in the lounge (social environment).
- My research modelling showed me that my skirt had to be the right length for attending church (socially acceptable).
- Doing the dovetail modelling showed me I had the skills (technically feasible) and which joint was the strongest.
- By testing the fabric for waterproof qualities, I could see it would be fit for purpose in the rain.

Candidates are reminded that ethical and legal risks need to be relevant to the model/outcome i.e., plastic in the ocean linked to food packaging or the legality of using an image i.e. copyright.

Candidates were disadvantaged when they wrote about every step of their brief, specification, or how the model was made. Candidates are encouraged to address the achievement criteria concisely not fill the report with unnecessary information.

It is not necessary for candidates to discuss the advantage or disadvantage of one form of modelling over another; the standard is about choosing a specific model that will help manage a risk, enabling the candidate to complete their outcome to the desired brief/specifications. For example, using CAD drawing to visualise their sketches in 3D.

Use of case studies disadvantaged some candidates because these students had not sufficiently covered the achievement criteria.

While important in the development of an outcome, candidates do not need to explain what recycling, sustainability, Health and Safety or Hazard Analysis and Critical Control Point (HACCP) are, just how these might be linked to a modelling method, which will enable a decision to be made, for example:

- My modelling research showed that I should use recycled items.
- My brief stated that it had to be sustainably made so to meet the brief I decided to use FCS paper for my book.
- I now know what joints I had to make, and I have decided to use the band saw and this will require me to wear masks, and eye protection.
- Because of my client's allergies I will adhere to the HACCP plan

Candidates are reminded that the modelling is not the person wearing the outfit e.g. "My model was too tall for the toile to be socially acceptable". The model is the toile so this could be written as: "The toile helped me manage the risk of the dress being too short for my tall client and not socially acceptable."

Candidates should avoid making repetitive statements throughout their report which do not demonstrate their understanding, for example 'This stage of modelling helped me decide what should and could be done at different stages of my technological practice'.

Candidates need to demonstrate that each model had a purpose, they cannot repeat the same generic sentence throughout the report i.e. " this model helped me meet my brief".

Candidates who used risk registers were often able to meet the Merit criteria. However, candidates are reminded to link the type, severity and probability of the risk to a model, rather than just listing risks and stating whether the risk was high or low.

91359: Demonstrate understanding of the role of material evaluation in product development

Candidates who were awarded **Achievement** commonly:

- had clear performance specifications of their products to allow for evaluation against criteria
- used relevant and safe testing and trialling techniques to evaluate the performance of a material within in a particular context or product to judge its fitness for purpose and suitability
- included the use of knowledge relating to composition, change in composition and structure
- used fair tests and trials, tested hypotheses regarding the suitability of a material
- evaluated particular components/ ingredients/materials for inclusion and had made decisions about a particular material relative to the performance specifications required in the product
- understood the purpose of the types of testing and trialling they were undertaking and could identify how this related to their decision making.

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

- described generic knowledge relating to a group of products or generic descriptions without relating this knowledge to the specifics of evaluation techniques and processes for the material and product
- demonstrated little knowledge of the actual product, material or evaluation processes
- used an initial brief as performance specifications that did not allow for the demonstration of knowledge
- focussed on the development of a product without referring to the evaluation procedures used to select the materials
- described the process of technological practice without demonstrating understanding of material evaluation

- focussed on testing a whole product rather than aspects of an incorporated material to be selected for use in the product.

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

- explained the selection of material(s) after a process of evaluation – testing and trialling in various forms
- explained the knowledge and techniques used in the evaluation processes and made the decisions and rationale for selection clear.

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

- used a reasoned argument to make a decision regarding selection of a material(s) after evaluative techniques were applied. This may have included testing more than one feasible component, ingredient or material and making a reasoned choice given the performance properties required of the end product
- developed a conclusion relating to suitability of a material in relation to the product's design
- included the maintenance and disposal implications of using a specific material within the product.

Standard specific comments

The focus of this standard is on the evaluation methods and procedures used to determine the suitability of a material/materials for use in development of a product. This means testing to select and /or justify the selection of specific materials/components/ingredients. Many candidates focussed on testing techniques and did not focus on the properties of the material(s).

Candidates are expected to explain the link between the performance properties of a material and how this relates to the required performance specifications of a specific product. This also requires the candidate to demonstrate knowledge of the testing and trialling procedures used to make the selection of a material to use, i.e. test, trial and come to a conclusion about the suitability of the material(s) within the context of the product. It is essential that candidates use relevant and safe testing approaches related to the material and product.

The standard directs candidates to describe the knowledge and techniques/procedures used to make decisions about the material selection in the development of a product. This includes the use of codified knowledge in

conjunction with other testing and evaluation techniques. However, using codified knowledge alone is insufficient to meet the requirements of the standard. Candidates need access to relevant information if the material/ product is not one they are using. Testing and trialling must be relevant to the product and the performance specifications in order to demonstrate reasoned decisions. The report must focus on material evaluation and selection and not solely on the development of a product.

Candidates who focussed on testing techniques and processes often missed the crucial component of material(s) selection. The focus of this standard is not on the process of generic development of a product but the selection of specific materials after testing, trialling or application of knowledge. Explanatory notes 3 and 4 outline that the evaluation processes may be subjective, objective or both. However, candidates who included both categories of evaluation were more likely to achieve as this demonstrates greater understanding in the selection process. Some candidates showed lack of clarity around the social, cultural and environmental factors of where the product was to be situated. Focussing on wider social factors was often at the expense of focus on the selection of the materials in relation to the performance specifications of the product.

91360: Demonstrate understanding of redundancy and reliability in technological systems

Candidates who were awarded **Achievement** commonly:

- explained the importance of Reliability and Redundancy
- described how redundancy was applied and reliability was addressed in a technological system.

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

- did not demonstrate a clear understanding of reliability and redundancy in technological systems
- did not provide specific examples of reliability and redundancy
- describe systems that could not be considered technological.

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

- showed in depth understanding of both reliability and redundancy in a technological system
- explained why decisions regarding reliability and redundancy were made in the development of a technological system.

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

- discussed how reliability and redundancy implications, influenced design and maintenance decision-making in the development of a system
- discussed the social, cultural and environmental factors that impacts on a system's reliability.

Standard specific comments

Candidates must ensure the initial system chosen, is advanced enough to be considered a Technological System.

Candidates must have sufficient knowledge of what Reliability and Redundancy are in a Technological System

The reasoning about why Reliability and Redundancy was addressed in the Technological System, must be clearly described and/or explained.

91363: Demonstrate understanding of sustainability in design

Candidates who were awarded **Achievement** commonly:

- described a Life Cycle Analysis (LCA) model and the Sustainability Venn Diagram and then used these to inform their own technological practice and/or critique a product and the practice of others
- described how design decisions or interventions could increase the sustainability of a product
- described how life cycle analysis of an outcome enabled them to identify innovative practice which addressed social, economic or environmental concerns and was able to contribute to, and enhance, product sustainability.

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

- included models of LCA, Cradle to Cradle and/or the Sustainability Venn Diagram but had no descriptors and showed limited understanding
- described LCA, but with limited evidence that informed the considerations to determine the focus for design interventions
- focused on Fairtrade and ethics rather than sustainability in design
- produced a report that was limited to how and why materials may be produced, recycled or reused; or limited their report to explanations about how to prolong the life of an outcome
- described the life cycle of a material such as cotton, plastic or aluminium without incorporating design
- produced a report where large sections were cut and pasted, with no student voice or discussion of the candidate's own technology practice

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

- explained how LCA influenced innovations made by designers in case studies
- submitted evidence derived from their own technological practice, conducted an LCA of an existing product and explained the focus for design innovation. This knowledge was often applied within their own development of a sustainable technological outcome
- explained how the competing priorities and compromises were managed within the development and lifecycle of a sustainable technological outcome
- showed an in-depth understanding of sustainability in design, particularly in design decisions that impacted on the sustainability of the outcome (both positive and negative).

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

- emphasised the competing priorities and compromises made as a result of LCA in the development of a sustainable technological outcome. This was often evident within naturally occurring evidence where a student was required to address dilemmas and balance in different aspects of the LCA, conflicting social, environmental and economic factors and demands within their own practice

- discussed how LCA can influence a technologist's design decisions to improve the social, economic or environmental sustainability of an outcome
- discussed their own technological practice, and that of another technologist (s), in relation to sustainability in design
- included a high level of independent voice and reflective comments of their practice that justified the compromises made and illustrated and demonstrated an understanding of sustainability in design.

Standard specific comments

Successful candidates explained a sustainable diagram and were able to apply to their practice/ the practice of others' products. They were also able to comment on the impact their/designer products had on social, economic and sustainable factors.

The majority of successful candidates explored Life Cycle Analysis (LCA) and used the Sustainability Venn Diagram to identify areas where economic, environment and societal related factors could be influenced and resolved by innovative design decisions to increase the sustainability of a product. Often candidates were able to identify alternatives that would increase the sustainability of a product, both within their own technological practice and/or in the practice of others.

Successful candidates also used the Venn Diagram to identify viable, bearable, equitable and sustainable considerations that impact on a designer's decision-making process, and how these impact on the life cycle of the product.

Many candidates reported on LCA without showing evidence of understanding life cycle assessment as a method for assessing the environmental aspect of a product through its life cycle.

A common issue was candidates stating, inaccurately, that the product meets the LCA, where LCA is an assessment of all the outputs and inputs into a product's life from raw materials to its disposal.

It is essential that the candidate's chosen context aligns with the Achievement Standard and enables the candidate to demonstrate an in-depth understanding of sustainability in design.

Reports that followed a template often enabled candidates to gain achieved grades, but could limit higher achievement. Candidates would benefit from a

report structure that included, innovation, competing priorities, compromises and relevance to either their practice or the practice of others.

Candidates are also encouraged to proofread their reports for consistency and to ensure that all report writing guidelines are followed, as there were instances of reports that did not meet the requirements of the assessment specifications.

Technology subject page

Previous years' reports

2019 (PDF, 412KB) 2018 (PDF, 174KB) 2017 (PDF, 75KB) 2016 (PDF, 246KB)