**NZQA**

**Approved**

Achievement standard: 91051 Version 3

Standard title: Demonstrate understanding of how different disciplines influence a technological development

Level: 1

Credits: 4

Resource title: A team effort

Resource reference: Generic Technology VP-1.8 v2

Vocational pathway: Primary Industries

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| Quality assurance status | These materials have been quality assured by NZQA.  NZQA Approved number A-A-02-2015-91051-02-7362 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.  Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

Vocational Pathway Assessment Resource

Achievement standard: 91051

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Level: 1

Credits: 4

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Vocational pathway: Primary Industries

Learner instructions

# Introduction

This assessment activity requires you to demonstrate your understanding of how different disciplines influence the development of mining machinery.

You are going to be assessed on how comprehensively you demonstrate your understanding of how knowledge, practices and collaborations from a range of disciplines (i.e. mechanical, engineering, structural design, physics) influence the development of mining machinery.

The following instructions provide you with a way to structure your work so you can demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners

# Task

The mining industry always searches for bigger and more efficient machines. When developing heavy mining machines, experts are needed to work on designs, mechanics, engineering and functionality. They also need to focus on legal, health and safety standards. You are to prepare a report about the development of a mining machine, and how experts contributed towards this.

You will be expected to discuss how different disciplines have impacted on the quality of the design and functionality of mining machinery.

Begin by looking at a specific mining machine and identify:

* The knowledge and practices drawn from two or more disciplines that have influenced the development. This could include:
  + mechanical engineering,technology,physics (e.g. gearing associated with heavy machinery)
  + management, law, science (e.g. geology, as the equipment chosen could be influenced by the ground to be worked)
  + social science and ethics.
* How individuals from these disciplines collaborated during the development of the mining machinery, for example how the design engineer, the materials engineer and the production team collaborated during the development.

## Report

Complete your report. This could be written or presented in the first person as the consultant, or as an account in the third person.

When developing your report:

* identify the knowledge and practices drawn from two or more disciplines that influenced the development of a mining machine
* consider the role of the individuals associated with these different disciplines
* identify how the collaboration of these people interact during the development of the mining machine, for example how these people bring together different knowledge bases and practices
* discuss the impact this knowledge, practices and collaboration has on the development of a mining machine.

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This activity requires learners to present a report that that demonstrates comprehensive understanding of how different disciplines influence the development of mining machinery.

# Conditions

Learners could work individually or in groups to gather and analyse their evidence. The final work will be individually assessed. Decide on the format of the final presentation, for example a written report, computer slide show, brochure or video etc. You may wish to take learner preferences into account in deciding on the format.

# Resource requirements

Learners require access to the internet for research.

Visits to industry or from practicing specialists involved with operating, designing and maintaining mining machinery may be helpful.

# Additional information

Web based resources related to mining machinery:

<http://www.alsims.ca/index.php>

<http://batconstruction.com/>

http://[www.safe-mining.com](http://www.safe-mining.com)

Presenting the report as a Prezi presentation: <http://prezi.com>

A Technology Online report may be helpful:

<http://technology.tki.org.nz/>

<http://technology.tki.org.nz/Case-Studies/Technologists-Practice-case-studies-Introduction/Hard-Materials/A-new-Carter>

# Assessment schedule: Generic Technology 91051 – A team effort

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner demonstrates understanding of how different disciplines influence mining machinery by:   * identifying the knowledge and practices drawn from the disciplines   For example:  The learner identifies technologists and physicists added knowledge of mechanisms and movement.   * identifying how individuals from the disciplines collaborated during the development of a mining machine   For example:  The learner identifies mechanical engineers and physicists as key people who worked together to develop the gearing system found in a heavy mining machine.   * describing the impact of knowledge, practices and collaboration on the development of a mining machine   For example:  The learner describes how all the people involved in the development of the mining machine had different expertise or knowledge bases:  *The geologists knew how the local ground structure behaved and how it might react to being mined.*  *The technologists and physicists added knowledge of mechanisms and movement/properties of materials that was required in the mining machine.*  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of how different disciplines influence mining machinery by:   * identifying the knowledge and practices drawn from the disciplines   For example:  The learner identifies technologists and physicists added knowledge of mechanisms and movement.   * identifying how individuals from the disciplines collaborated during the development of a mining machine   For example:  The learner identifies mechanical engineers and physicists as key people who worked together to develop the gearing system found in a heavy mining machine.   * explaining how knowledge, practices and collaboration impacted the development of a mining machine   For example:  The learner explains how all the people involved in the development of the mining machine had different expertise or knowledge bases:  *The geologists knew how the local ground structure behaved and how it might react to being mined.*  *The technologists and physicists added knowledge of mechanisms and movement/properties of materials that were required to develop an efficient mining machine.*  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates comprehensive understanding of how different disciplines influence mining machinery by:   * identifying the knowledge and practices drawn from the disciplines   For example:  The learner identifies technologists and physicists added knowledge of mechanisms and movement.   * identifying how individuals from the disciplines collaborated during the development of a mining machine   For example:  The learner identifies mechanical engineers and physicists as key people who worked together to develop the gearing system found in a heavy mining machine.   * discussing how knowledge, practices and collaboration interacted to impact on the development of a mining machine   For example:  The learner discusses all the people involved in the development of a mining machine and how their different expertise or knowledge bases interacted:  *The mechanical engineer’s knowledge of mechanisms and movement, and properties of materials were required to develop an efficient heavy machine suitable for mining. These designs were further enhanced by discussions with geologists who knew how the local ground structure behaved and how it might react to being mined with heavy machinery.*  *A physicist contributed to the design by looking at the ratio between the input force being applied and the force being exerted. This knowledge was then applied to the mechanical engineer’s design of the hydraulic drive, which was being used as the primary source of motion in the mining machinery.*  *The above expected learner responses are indicative only and relate to just part of what is required.* |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.