**NZQA**

**Approved**

Achievement standard: 91047 Version 3

Standard title: Undertake development to make a prototype to address a brief

Level: 1

Credits: 6

Resource title: Tools to go

Resource reference: Generic Technology VP-1.4 v2

Vocational pathway: Construction and Infrastructure

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| Date version published | February 2015 Version 2To support internal assessment from 2015 |
| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-91047-02-7360 |
| 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: 91047

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Learner instructions

# Introduction

This assessment activity requires you to undertake development to make a toolbox prototype to address a brief.

You are going to be assessed on how you undertake development to make a justified toolbox prototype to address a brief.

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

Develop and make a prototype for a toolbox for a tradesperson in the construction and infrastructure sector (for example for the plumbing trade). It must be able to hold all the essential tools of the trade, and must be able to be carried to the workplace. It must also meet these specifications:

* have a hinged lid
* be able to be locked
* contain multiple compartments to house specialist tools.

Respond to the brief you’ve been given (or the one that you have developed and agreed on with your assessor/educator) by doing the following:

* Carefully read the brief and working drawings for the toolbox.
* Consider the requirements of the user (for example a plumber), the toolbox itself, and the work environment in order to research and source a range of potentially suitable materials and components.
* Trial, and select materials and/or components to choose those that best fit the purpose of the toolbox:
	+ for example consider such things as the physical attributes (appearance, identification) and the functional attributes (strength, durability).
* Seek stakeholder opinion (the users, for example plumbers and/or apprentices) to gain feedback, and to help inform your selection of the materials and components that will contribute to the fitness for purpose of the final outcome when used in the workplace.
* Select suitable tools and equipment to use with the selected materials and/or components for your toolbox.
* Research, trial and select suitable techniques and processes for the selected materials and/or components to make the toolbox.
* Check your brief to ensure the prototype will be fit for purpose.
* Using your trialling and stakeholder feedback, make notes about any changes you have made, and adjust your brief and refine your specifications if necessary.
* Use the selected materials and/or components, and apply the selected techniques and processes to make your prototype.
* Consult with your stakeholder throughout the making of your prototype.
* Trial the prototype by placing tools in the toolbox, and taking the toolbox to the workplace to establish its fitness for purpose.
* Gain stakeholder (for example the plumber) feedback on the prototype.
* Compare the prototype against your brief, for example:
	+ how well does the toolbox meet the brief specifications?
	+ do the materials, components, techniques and processes contribute to the fitness for purpose of the toolbox?
* Make a judgement based on the stakeholder feedback to justify the toolbox prototype’s fitness for purpose in the social and physical environment:
	+ the social environment relates to who is going to be using the tool box (for example plumbers and apprentices)
	+ the physical environment relates to the work environment itself (for example plumbers’ workshop, client homes or workplaces).

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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 undertake development to make a justified toolbox prototype to address a brief, and then evaluate this in terms of its fitness for purpose within the physical and social environment it was designed for.

The brief can be provided by the assessor/educator, or developed by the learners and agreed to by the assessor/educator.

# Conditions

This is an individual activity.

# Resource requirements

Assessors/educators will instruct learners on safety practices relevant to the materials, components, tools and equipment they are using, before they begin to work.

Learners require access to:

* the internet and library for research
* information about material and construction techniques, and relevant resources including materials, components, tools and equipment.

# Additional information

Prototyping is the modelling of a realised but yet-to-be-implemented technological outcome. The purpose of prototyping is to evaluate the fitness for purpose of a technological outcome against the brief, and is undertaken to establish (or not) a defendable case for its implementation, refinement or further development.

## Other possible contexts for this vocational pathway

A prototype for a temporary shelter needed by a roading company for its crew to work under in bad weather. The prototype must be constructed out of durable material and the panels must be able to be joined to other modules and be flat when packed down. Minimal and quick assembly is required.

# Assessment schedule: Generic Technology 91047 – Tools to go

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| --- | --- | --- |
| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner undertakes development to make a toolbox prototype to address a brief by:* selecting and using materials and/or components

For example, the learner:* + chooses aluminium to make the toolbox as it was light and strong enough to hold the tools. *The plumber thought this was a good choice.*
* selecting and using tools and equipment

For example, the learner:* + selects hand and power tools in order to make clean and tidy cuts to form each of the components.
* applying practical techniques and processes to make a toolbox prototype

For example, the learner:* + bends as many corners as possible for the inner compartments, and then uses rivets to join the main toolbox
	+ makes a toolbox using aluminium, and applies the selected techniques and processes.
* evaluating the prototype in terms of the fitness for purpose in its intended physical and social environment

For example, the learner:* + explains how the toolbox was fit for purpose: *I used aluminium for the toolbox. It holds the plumbing tools the plumber uses for work and there are compartments for small components such as washers. The handle allows the plumber to carry it easily and the box holds the weight of the tools.*

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner undertakes development to make a refined toolbox prototype to address a brief by:* selecting and using tools and equipment

For example, the learner:* + selects hand and power tools in order to make clean and tidy cuts to form each of the components.
* trialling, to inform selection and use of materials and/or components

For example, the learner:* + trials different types of metal products, mechanical fixings and hardware for the toolbox
	+ considers the functional properties of weight, strength and durability
	+ selects aluminium as it meets the specifications including the fact that aluminium does not need painting and will not rust. *The plumber thought this was a good choice.*
* trialling, to inform the selection and application of practical techniques and processes

For example, the learner:* + trials different methods of forming and joining for the compartments, and trials the box itself (e.g. strength, ease of construction and appropriateness were considered)
	+ selects bending and riveting
	+ makes a toolbox using aluminium, and applies the selected techniques and processes.
* evaluating the prototype in terms of the fitness for purpose in its intended physical and social environment

For example, the learner:* + explains how the toolbox was fit for purpose: *I used aluminium for the toolbox. I placed all the plumbing tools and accessories in the box and custom built compartments. The hinged lid stayed open and was balanced by the weight of the tools which stopped the box from tipping over when open. Stamping the firm’s logo into the top means it can be easily identified.*

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner undertakes development to make a justified toolbox prototype to address a brief by:* selecting and using tools and equipment

For example, the learner:* + selects hand and power tools in order to make clean and tidy cuts to form each of the components.
* trialling, to inform selection and use of materials and/or components

For example, the learner:* + trials different types of metal products, mechanical fixings and hardware for the toolbox
	+ considers the functional properties of weight, strength and durability
	+ selects aluminium as it meets the specifications including the fact that aluminium does not need painting and will not rust. *The plumber thought this was a good choice.*
* trialling, to inform the selection and application of practical techniques and processes

For example, the learner:* + trials different methods of forming and joining for the compartments, and trials the box itself (e.g. strength, ease of construction and appropriateness were considered)
	+ selects bending and riveting
	+ makes a toolbox using aluminium, and applies the selected techniques and processes.
* trialling the prototype to gain evidence of the fitness for purpose in its intended physical and social environment

For example, the learner:* + explains how the toolbox was fit for purpose: *I used aluminium for the toolbox as the plumber agreed that this would be the most appropriate of the materials to use as it is strong enough to hold all the required tools but light enough that any extra weight added is minimal. The plumber placed all the plumbing tools and accessories in the box and custom built compartments. The hinged lid stayed open and was balanced by the weight of the tools which stopped the box from tipping over when open. The plumber carried the toolbox from the van into the workshop and the toolbox sits well on the bench top. Stamping the firm’s logo into the top means it can be easily identified.*
* using evidence, including stakeholder feedback, to make a judgement of the toolbox prototype’s fitness for purpose

For example, the learner evaluates the prototype in terms of its fitness for purpose in its intended physical and social environment:*When I trialled the toolbox by taking it to the plumber he thought it was well made, and had a professional finish but he pointed out two things. The plumber suggested that the lid needed some support when the box was open so I attached a chain to hold the lid at a 120 degree angle. He also suggested that I had some form of identification on the box in case it was left ‘on the job’. As a result I stamped the firm’s logo on the lid.**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.