**NZQA**

**Approved**

EXPIRED

Achievement standard: 91047 Version 3

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

Level: 1

Credits: 6

Resource title: Waste not, want not

Resource reference: Generic Technology VP-1.4 v2

Vocational pathway: Manufacturing and Technology

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| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-91047-02-7358 |
| 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 worm farm or composter prototype to address a brief.

You are going to be assessed on how you undertake development to make a justified worm farm or composter 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 worm farm or composter out of a durable non-plastic material. The worm farm or composter must be made in a way that enables it to be dismantled to be sold by a garden nursery, and be easily put back together by the customer. It must not cost more than $100 to fabricate.

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

* Carefully read the brief and working drawings for the worm farm or composter.
* Consider the requirements of the stakeholder/s (for example the owner/workers of the nursery and their potential customers) and the garden 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 worm farm or composter:
	+ consider such things as the physical attributes (for example smooth texture, colour blends in with garden setting) and the functional attributes (for example withstands moisture).
* Seek stakeholder/s (for example the owner/workers of the nursery and potential customers) opinion 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 garden.
* Select suitable tools and equipment to use with the selected materials and/or components for the worm farm or composter.
* Research, trial and select suitable techniques and processes for the selected materials and/or components to make the worm farm or composter.
* Check your brief to ensure the prototype will be fit for purpose.
* Using your trialling and stakeholder/s 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/s throughout the making of your prototype.
* Trial the prototype by placing and using the worm farm or composter in the garden centre for a month to establish its fitness for purpose.
* Gain stakeholder/s feedback on your worm farm/composter.
* Compare your worm farm/composter against the brief, for example:
	+ how well does your worm farm/composter meet the brief specifications?
	+ do the materials, components, techniques and processes contribute to the fitness for purpose of the worm farm/composter?
* Make a judgement based on the stakeholder/s feedback to justify the worm farm or composter prototype’s fitness for purpose in the social and physical environment:
	+ the social environment relates to who is going to be using the worm farm or composter (for example home gardeners)
	+ the physical environment relates to where the worm farm or composter will be used (for example outdoors, in bad weather).

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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 prototype of a worm farm or a composter 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 can be 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 trialling 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.

Useful websites include:

<http://www.tasman.govt.nz/environment/environmental-education/sustainable-living/composting-worm-farms-and-bokashi/>

<http://resources.ccc.govt.nz/files/AGuideToWormComposting-docs.pdf>

<http://www.createyourowneden.org.nz/comp_makeyourownbin.html>

# Assessment schedule: Generic Technology 91047 – Waste not, want not

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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 worm farm or composter prototype to address a brief by:* selecting and using materials and/or components

For example, the learner:* + chooses a timber product to make the worm farm or composter because it was durable enough to hold the compost.
* selecting and using tools and equipment

For example, the learner:* + uses a variety of hand and power tools to make clean and tidy cuts to form each of the components.
* applying practical techniques and processes to make a worm farm or composter prototype

For example, the learner:* + screws the timber to four posts marking the corners of the bin
	+ makes the worm farm or composter by applying 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 worm farm or composter is made, and the choice of untreated timber versus tanalised timber to ensure it will be suitable for a worm farm or composter
	+ shows the stakeholder/s how easy it is to assemble: *The composter is easy to put together, air can circulate, and the total cost is less than $100.*

*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 worm farm or composter prototype to address a brief by:* selecting and using tools and equipment

For example, the learner:* + uses a variety of hand and power tools 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:* + researches and trials untreated timber, tanalised timber, and chicken wire
	+ determines that tanalised timber, although more durable could leach chemicals into the compost, and that chicken wire is difficult to handle
	+ selects untreated timber which is sturdy and would hold the compost
	+ trials a range of components and selects those that would withstand the moist conditions of the rotting compost.
* trialling, to inform the selection and application of practical techniques and processes

For example, the learner:* + trials butt joints but they are not strong enough, so the learner speaks with a builder who suggests a range of joints to trial; as a result the learner decides to sink posts and screw the boards to the posts for strength
	+ makes the worm farm or composter by applying 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 worm farm or composter is made, and the choice of untreated timber versus tanalised timber to ensure it will be suitable for a worm farm or composter
	+ shows the stakeholder/s how easy it is to assemble: *The composter is easy to put together, air can circulate, and the total cost is less than $100.*

*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 worm farm or composter prototype to address a brief by:* selecting and using tools and equipment

For example, the learner:* + uses a variety of hand and power tools 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:* + researches and trials untreated timber, tanalised timber, and chicken wire
	+ determines that tanalised timber, although more durable could leach chemicals into the compost, and that chicken wire is difficult to handle
	+ selects untreated timber which is sturdy and would hold the compost
	+ trials a range of components and selects those that would withstand the moist conditions of the rotting compost.
* trialling, to inform the selection and application of practical techniques and processes

For example, the learner:* + trials butt joints but they are not strong enough, so the learner speaks with a builder who suggests a range of joints to trial; as a result the learner decides to sink posts and screw the boards to the posts for strength
	+ makes the worm farm or composter by applying 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:* + installs and sets up the worm farm or composter in the garden centre where it is trailed for a month.
* using evidence, including stakeholder feedback, to make a judgement of the worm farm or composter’s fitness for purpose

For example, the learner:* + modifies the joints, as a result of the use of the prototype for a month; on the front of the composter the learner cuts slots in the posts so the timber could be slotted in place and easily removed when the stakeholder/s wants to use the compost
	+ explains (to the stakeholder) the choice of untreated timber versus tanalised timber (which could leach chemicals such as arsenic) to ensure it will be suitable for a worm farm or composter, the stakeholder acknowledges that untreated timber would be strong enough for the task but over time would break down, and would have to be replaced. However it was agreed that untreated timber would not poison the soil and was therefore the best choice of material.

*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.