**NZQA**

**Approved**

Achievement standard: 91046 Version 3

Standard title: Use design ideas to produce a conceptual design for an outcome to address a brief

Level: 1

Credits: 6

Resource title: Agrichemical storage

Resource reference: Generic Technology VP-1.3 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-02-2015-91046-02-7357 |
| 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: 91046

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Learner instructions

# Introduction

This assessment activity requires you to use design ideas to produce a conceptual design for an agrichemical storage shed that addresses a brief.

You are going to be assessed on how you use refined design ideas to produce a conceptual design for an outcome to address a brief. You need to show that you can test, refine and evaluate design ideas through functional modelling and ongoing research, and then justify that your conceptual design for the agrichemical storage shed has the potential to be fit for purpose.

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 outcome of this brief is a conceptual design for a storage shed to store agrichemicals on a farm. You are not required to make the agrichemical storage shed as part of this activity.

The brief for this agrichemical storage shed includes the following specifications:

* Must follow the guidelines for the storage of agrichemicals in line with the Industry Standard NZS8409 Management of Agrichemicals (for more information visit the Growsafe website: <http://www.growsafe.co.nz/>).
* The storage shed must take into account that agrichemicals are bought in 20 litre containers.
* The shelves must be able to hold at least three 20 litre containers of agrichemicals.
* This shed must be able to be locked and be ventilated in some way.
* The shed must be made out of non-absorbent materials, have a bounded lip around the edge to prevent spills spreading and include a fire extinguisher that is easily accessible.
* The shed must be 12 square metres.

Ensure you do the following:

* Carefully read the brief.
* Research and analyse existing storage solutions and outdoor utility buildings in order to generate design ideas. The ideas generated may be for the whole shed or particular parts of the shed.
* Consult with your stakeholders to reflect on your initial research and notes. This will ensure you have sufficient information to start designing and that you have interpreted the brief correctly.
* Generate your initial design ideas, and draw designs for the storage of the agrichemicals and for the shed.
* Test whole or parts of your design by:
	+ using functional modelling, for example discussions with others, 3D drawings, scaled models
	+ doing ongoing research, for example into safety standards, materials testing, ventilation systems etc.
* Use feedback from stakeholders to help develop your designs, and refine your ideas in order to address the brief.
* Evaluate your feedback from stakeholders and the functional modelling to justify the selection of the design ideas you will develop.
* Produce a conceptual design for the storage shed that addresses your brief.
* Justify the potential fitness for purpose of the shed as a storage space for agrichemicals.

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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 use refined design ideas to produce a conceptual design that addresses a brief for an agrichemical storage shed.

# Conditions

This is an individual activity.

# Resource requirements

The assessor/educator will provide learners with:

* information about material and construction techniques
* resources to undertake functional modelling and evolve conceptual designs
* access to actual agrichemical storage sheds, if possible
* access to the internet for research.

# Additional information

Functional modelling is used in the ongoing exploration and evaluation of developing design ideas. It is undertaken to gather evidence on all aspects of the outcome, including its likely technical feasibility and social acceptability.

During this activity, ensure that learners have opportunities to undertake a variety of functional modelling techniques and strategies to test design ideas and gather data. They need to understand how to use these tools to review and refine their design ideas, and inform their development of a conceptual design.

For more information, download an explanatory paper about functional modelling available from Technology Online at <http://technology.tki.org.nz/>.

## Other possible contexts for this vocational pathway

Substitute the brief for an irrigation system, a set of cattle or sheep yards, or a feed system for calves or cattle.

# Assessment schedule: Generic Technology 91046 – Agrichemical storage

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| --- | --- | --- |
| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner uses design ideas to produce a conceptual design for an agrichemical storage shed to address a brief by:* generating design ideas

For example:The learner sketches ideas for the shed as well as parts of the shed (e.g. locking system).* testing design ideas through functional modelling

For example, the learner:* + gets feedback from a locksmith about the technical feasibility of the locking system
	+ generates, using CAD (computer aided design), a plan of where the agrichemicals will be stored to test whether the shelving system is adequate.
* using stakeholder feedback to inform decision making

For example:The learner shows the farmer (who the shed is for) the locking system, and gets feedback about the suitability of the lock and other aspects stated in the brief.* using findings from functional modelling to select design ideas

For example:Having generated the idea to scale and gained feedback from the farmer and a community expert, the learner chooses the shelving arrangement that best houses the agrichemicals.* producing a conceptual design for a chemical storage shed

For example:The learner makes a model of the shed, and also presents scale drawings to show the inside detail.* determining the outcome’s potential fitness for purpose

For example:The learner documents how the conceptual design for the shed has the potential to meet the requirements of the brief.*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner uses informed design ideas to produce a conceptual design for an agrichemical storage shed to address a brief by:* creating design ideas informed by research and analysis of existing outcomes

For example:The learner uses pamphlets and the internet, and looks at their neighbour’s shed. They use these findings to sketch ideas for the shed as well as parts of the shed (e.g. locking system).* evaluating findings from functional modelling and stakeholder feedback to justify the selected design ideas

For example:The learner validates that a particular system would work to secure the shed as required by the brief, by using locksmith and farmer’s feedback, and a mock-up of the locking system.* producing a conceptual design for an agrichemical storage shed

For example:The learner makes a model of the shed, and also presents scale drawings to show the inside detail.* determining the outcome’s potential fitness for purpose

For example:The learner documents how the conceptual design for the shed has the potential to meet the requirements of the brief.*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner uses refined design ideas to produce a conceptual design for an agrichemical storage shed to address a brief by:* creating design ideas informed by research and analysis of existing outcomes

For example:The learner uses pamphlets and the internet, and looks at their neighbours’ sheds. They use these findings to sketch ideas for the shed as well as parts of the shed (e.g. locking system).* testing, refining and evaluating design ideas through functional modelling and ongoing research

For example, the learner:* + validates that a particular system would work to secure the shed as required by the brief, by using locksmith and farmer’s feedback, and a mock-up of the locking system
	+ having gained feedback from the farmer, conducts further research as to how a combination lock, instead of a key lock, could be incorporated into the system, and develops the model to demonstrate the change to the farmer.
* using stakeholder feedback to inform decision making

For example, the learner:* + gains feedback from the farmer on the shelving system; the farmer feels the lip on the shelving would make the lifting of the chemicals too difficult
	+ develops a system of a moveable bar that would allow the farmer to slide the containers on to the shelves, and then the bar would lock into place to prevent the containers moving off the shelves if there was an earthquake.
* producing a conceptual design for an agrichemical storage shed justifying the potential fitness for purpose of the outcomes

For example:The learner demonstrates that the conceptual design for the shed has the potential to address the brief by evaluating and justifying how each specification has been met.*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.