**NZQA**

**Approved**

Achievement standard: 91059 Version 3

Standard title: Demonstrate understanding of basic concepts used to make products from resistant materials

Level: 1

Credits: 4

Resource title: Finding out about farm fences

Resource reference: Construction and Mechanical Technologies VP-1.22 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-02-2015-91059-02-7325 |
| 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: 91059

Standard title: Demonstrate understanding of basic concepts used to make products from resistant materials

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Learner instructions

# Introduction

This assessment activity requires you to create a report that demonstrates your understanding of basic concepts used to make farm fences from resistant materials.

You are going to be assessed on how comprehensively you demonstrate your understanding of basic concepts used to make farm fences from resistant materials.

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

Produce a report that demonstrates your understanding of basic concepts used to make farm fences from resistant materials.

Make sure you do the following:

* describe characteristics of the materials used to make fences. This might include hardness, malleability, tensile strength, elasticity, rigidity and grain
* explain safe techniques to be used with resistant materials to make fences. The techniques must cover one or more from each of the following four categories:
	+ measuring or marking out
	+ sizing, shaping, or forming
	+ joining or assembly
	+ finishing, detailing, or tuning
* explain how the characteristics of resistant materials used in fencing influence safe technique selection (for the selected categories of techniques listed above)
* discuss why resistant materials used for farm fences require particular techniques for their safe handling and use. Cover the selected categories of techniques
* explain which combinations of techniques and resistant materials would be suitable for use in a farming situation:
	+ for example, explain the techniques and resistant materials used to make a deer fence
* discuss why techniques and resistant materials are combined in different ways across two or more fencing situations.

The situations you could consider that would impact on materials characteristics and their techniques could include:

* ease or optimisation of production
* length of the fencing
* terrain
* weather conditions
* animals to be fenced
* budget constraints
* life expectancy
* maintenance plan.

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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 evidence of their comprehensive understanding of basic concepts used to make farm fences from resistant materials.

Learners will need to show that they can process and interpret information, and prepare a report that discusses why resistant materials require particular techniques for their safe handling and use, and why techniques and resistant materials are combined in different ways across two or more situations.

# Conditions

Learners could work independently or in groups to develop their understanding, but they need to create their report independently, and will be assessed individually.

# Resource requirements

Assessors/educators will provide learners with the opportunities to explore a range of resistant materials that are used to make farm fences in order to discuss the materials used, their characteristics and the techniques that would be appropriate to work with them safely.

# Additional information

None.

# Assessment schedule: Construction and Mechanical Technologies 91059 – Finding out about farm fences

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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 basic concepts used to make farm fences from resistant materials by:* describing the characteristics of resistant materials

For example:* + the learner describes the characteristics of wood and metal posts and battens, wire and pipe. The characteristics they describe include hardness, malleability, tensile strength, elasticity, rigidity and grain.
* explaining safe techniques to be used with resistant materials

For example, the learner explains safe techniques used with resistant materials for at least one of each of the following categories:* + measuring/marking out, e.g. how the wire is rolled out and measured against the line of posts and how it needs to be held tightly; how post and strainer hole depth is determined depending on different factors including terrain and position; how the distance between posts is measured
	+ sizing/shaping/forming, e.g. how the tension curves in the wire are carefully stretched out by about one third; how stays are trimmed
	+ joining/assembling, e.g. how wires are knotted and broken so there are no sharp edges sticking out; how staples that hold wires are driven in on a slant to the grain to prevent splitting of posts
	+ finishing/detailing/tuning, e.g. the safe techniques when applying wood preserving paint to a post and rail horse fence; how gaps under the fence can be plugged by stapling on old posts.
* describing which combinations of techniques and resistant materials would be suitable for use in a situation

For example, the learner describes * + the techniques used to make a wire and post fence for a high country sheep farm
	+ how the pine posts need to be uniform, durable, free of knots and ground treated; the mild steel wire needs to have a particular gauge and tensile strength; the footing wire needs to be heavily galvanised; the possibilities for battens (e.g. H3 treated pine, galvanised steel)
	+ the positioning and installing of posts and strainers, e.g. how a guide wire is run out, marking out distances between posts, determining wire spaces, tensioning/knotting/tying off/stapling wires, attaching battens, footing the strainer.

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of basic concepts used to make farm fences from resistant materials by:* explaining how the characteristics of man-made or natural resistant materials influence safe technique selection

For example:* + the learner explains the characteristics of wood and metal posts and battens, wire and pipe; including in the explanation terms such as hardness, malleability, tensile strength, elasticity, rigidity and grain.
* explaining safe techniques to be used with the resistant materials

For example, the learner explains safe techniques selection for at least one of each of the following categories:* + measuring/marking out, e.g. how the wire is rolled out and measured against the line of posts and how, because of its high tensile characteristic, it needs to be held tightly; how post and strainer hole depth is determined depending on different factors including terrain and position; how the distance between posts is measured
	+ sizing/shaping/forming, e.g. how tension curves in the wire are carefully stretched out by about one third; how stays are trimmed
	+ joining/assembling, e.g. how wires are knotted and broken so there are no sharp edges sticking out; how staples that hold wires are driven in on a slant to the grain to prevent splitting of posts
	+ finishing/detailing/tuning, e.g. the safe techniques when applying wood preserving paint to a post and rail horse fence; how gaps under the fence can be plugged by stapling old posts.
* explaining which combinations of techniques and resistant materials would be suitable for use in a situation

For example, the learner explains* + the techniques used to make a wire and post fence for a high country sheep farm
	+ why the pine posts need to be uniform, durable, free of knots and ground treated; why the mild steel wire needs to have a particular gauge and tensile strength; why the footing wire needs to be heavily galvanised; the possibilities for battens (e.g. H3 treated pine, galvanised steel)
	+ the importance of the positioning and installing of posts and strainers; why a guide wire is run out; how the distances between posts and wires are determined and marked out; how wires are tensioned/knotted/tied off/staples; when and how battens are attached; the techniques for footing the strainer.

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates comprehensive understanding of basic concepts used to make farm fences from resistant materials by:* discussing why resistant materials require particular techniques for their safe handling and use

For example:* + the learner discusses the characteristics of wood and metal posts and battens, wire and pipe; including in the discussion terms such as hardness, malleability, tensile strength, elasticity, rigidity and grain.
* explaining safe techniques to be used with the resistant materials

For example, the learner explains safe techniques used with the resistant materials for at least one of each of the following categories: * + measuring/marking out, e.g. why the quantity of wire needed is generally determined by rolling it out and measuring it against the line of posts; why it needs to be held tightly, techniques for enabling this, the possible dangers if it is not held tightly; why factors such as terrain, position and weather need to be considered when determining the post and strainer hole depth
	+ sizing/shaping/forming, e.g. how the tension curves in the wire need to be carefully stretched out by an optimal amount to enable the wire to dissipate and absorb the impact of animals
	+ joining/assembling, e.g. the effectiveness of different types of knots used to join wires and how and why the wire must be broken in such a way so there are no sharp edges sticking out; why the grain of posts means that staples that hold wires are driven in on a slant
	+ finishing/detailing/tuning, e.g. the different possibilities for finish on a post and rail horse fence and why particular finishes might be chosen; why there may be a need to plug gaps under a fence and how this can be done.
* discussing why techniques and resistant materials are combined in different ways across two or more situations

For example, the learner discusses:* + how such things as topography, weather conditions and stock to determine when different sorts of fences might be erected (e.g. an electric post and batten, a post and wire, a barbed wire, a woven wire, a post and rail or a multi wire post and batten)
	+ why particular materials and techniques are needed for a least two different situations.

*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.