**NZQA**

**Approved**

Achievement standard: 91366 Version 3

Standard title: Undertake development and implementation of an effective manufacturing process

Level: 2

Credits: 6

Resource title: Dozens of drawers

Resource reference: Generic Technology VP-2.13 v2

Vocational pathway: Construction and Infrastructure

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| Quality assurance status | These materials have been quality assured by NZQA.  NZQA Approved number A-A-02-2015-91366-02-8267 |
| 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: 91366

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Learner instructions

# Introduction

This assessment activity requires you to undertake development and implementation of an effective manufacturing process to produce a predetermined number of kitchen drawers.

You are going to be assessed on how comprehensively you develop and implement an effective manufacturing process to produce a predetermined number of kitchen drawers.

The following instructions provide you with a way to structure your work to demonstrate what you have learnt to allow you to 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

## Part 1: Prepare for the task

You will submit a report or presentation that documents the planning, development and implementation of your manufacturing process and confirms that the majority of your drawers meet established specifications.

Confirm, with your assessor/educator, the format for your report or presentation. You could submit a portfolio, a slide presentation, an audio-visual presentation or a written report, for example.

Record the decisions that you make and include evidence of what you do and how you do it.

Your assessor/educator will advise you on what evidence you might gather. This might include flow diagrams, annotated photographs, results of quality control checks, and details of modifications made.

## Part 2: Undertake development

Choose an existing drawer, such as one you have made in another project, and determine its suitability for manufacturing.

Establish specifications for your drawer, including the accepted tolerances.

Decide, with your assessor/educator, how many drawers you will produce.

Make any design changes as necessary to allow you to manufacture this number of drawers in your learning environment to meet your specifications while still maintaining the quality and unique characteristics of your design. Select a suitable manufacturing process, such as batch or continuous manufacturing.

Select quality control procedures that allow for ongoing monitoring. These should help you review and refine your manufacturing process to better suit your intended outcome (that is, your drawers, made to specifications) and where you are working.

Confirm the relevant codes of practice and select and organise resources and techniques so that you can follow these relevant codes. You may want to consider:

* what equipment, facilities and materials you require and how these will be organised
* how your materials will be safely stored
* whether you need other people to help you manufacture your drawers (although you must develop the manufacturing process independently)
* when the facilities and staff will be available.

Create a detailed manufacturing plan that enables you to produce the required number of drawers to meet the established specifications and tolerances.

## Part 3: Implement and refine your process

Following your manufacturing plan, manufacture the drawers. Work independently and accurately, in keeping with relevant codes of practice. Use feedback to ensure the majority of drawers meet your specifications and tolerances.

As you develop your plan and manufacture your products, collect evidence to show how you have:

* modified the selected techniques and made decisions about use of resources to better suit your intended outcome (that is, your drawers) and where you are working
* modified the quality control procedures to improve the quality of the feedback and allow you to refine the manufacturing process to better suit your intended outcome and manufacturing location.

When you have produced the required number of drawers, collect evidence to confirm that the majority of these meet your specifications and tolerances.

## Part 4: Produce a report or presentation

Produce a report or presentation that documents how comprehensively you developed and implemented your manufacturing process and confirms that the majority of your drawers meet established specifications.

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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 comprehensive development and implementation of an effective manufacturing process for a specified number of drawers.

# Conditions

This is an individual assessment activity.

While learners must individually organise the manufacturing process, they could use other people to carry out parts of the actual manufacturing.

# Resource requirements

Learners will need access to:

* an area that is suitable for manufacturing drawers
* all necessary materials (such as timber, laminate, glue, screws, handles, paint)
* all necessary tools and equipment (such as planer, thicknesser, drop saw, screwdriver)
* a camera with which to take photographs to use as evidence.

# Additional information

To enable learners to achieve this standard, they will need to be familiar with woodworking procedures so that they can select an appropriate process and adapt it to successfully manufacture their required number of drawers.

Learners will also need to determine (in negotiation with the assessor/educator) how many units they will need to produce. The intention of the standard is for learners to develop and implement a manufacturing process that goes beyond one unit to a larger run that ensures consistency of the product. In this case, for example, the learner may want to show that if they made ten drawers using the specified process, all of these would be uniform enough to meet the specifications. In some instances it will be possible to make a smaller number of units to test the specified manufacturing process and then modify as necessary. For example, a system could be set up to produce five drawers and this could provide sufficient information to refine the manufacturing process to ensure future consistency in the product.

## Other possible contexts for this vocational pathway:

* specialised chairs
* bathroom accessories
* garden ornaments.

# Assessment schedule: Generic Technology 91366 – Dozens of drawers

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner undertakes development and implementation of an effective manufacturing process by:   * analysing a technological outcome to determine suitability for manufacture and making design changes as required   For example:  The learner made a few changes to their original design so it would be cheaper and easier to produce in numbers.   * establishing specifications, including tolerances, required of the outcome that is to be manufactured   For example:  The learner determined the type of joints, finish, handles and the dimensions (with tolerances).   * selecting a manufacturing process and quality control procedures that enable units to meet the established specifications and tolerances   For example:  The learner considered their outcome and the available resources and chose batch processing as a suitable manufacturing process. They developed a flow diagram of processes that included when particular quality control procedures, such as checking the quality of the timber and the paint finish, would be carried out.   * organising and using selected resources and carrying out techniques independently and accurately in keeping with relevant codes of practice   For example:  With minimal assessor/educator guidance, the learner selected and organised equipment, facilities, staff and materials, including safe storage of these materials. They followed their manufacturing plan and adhered to relevant codes of practice.   * implementing the manufacturing process using feedback from quality control to ensure the majority of the units meet the established specifications and tolerances   For example:  Quality control checks showed that the lacquer finish was not within acceptable tolerances on some surfaces. These surfaces were rebuffed to ensure consistency in the end result.  The learner produced the predetermined number of drawers and the majority of these were within the accepted tolerances.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner undertakes in-depth development and implementation of an effective manufacturing process by:   * analysing a technological outcome to determine suitability for manufacture and making design changes as required   For example:  The learner made a few changes to their original design so it would be cheaper and easier to produce in numbers.   * establishing specifications, including tolerances, required of the outcome that is to be manufactured   For example:  The learner determined the type of joints, finish, handles and the dimensions (with tolerances).   * selecting a manufacturing process and quality control procedures that enable units to meet the established specifications and tolerances   For example:  The learner considered their outcome and the available resources and chose batch processing as a suitable manufacturing process. The learner developed a flow diagram of processes that included when particular quality control procedures, such as checking the quality of the timber and the paint finish, would be carried out.   * organising and using selected resources and carrying out techniques independently and accurately in keeping with relevant codes of practice   For example:  With minimal assessor/educator guidance, the learner selected and organised equipment, facilities, staff and materials, including safe storage of these materials. They followed their manufacturing plan and adhered to relevant codes of practice.   * modifying the techniques and the use of resources to tailor the manufacturing process to the nature of the outcome and the constraints and/or opportunities of the manufacturing location   For example:  The learner realised, after the lacquer was delivered, that it was high in chemicals and so reorganised the working space to ensure adequate ventilation to manage these conditions. Learners from another programme were used as labour, enabling more efficient techniques to be adopted.   * modifying the quality control procedures to improve the quality of the feedback within the manufacturing process   For example:  The learner checked the lacquer finish on a more regular basis than originally planned to ensure they were within the acceptable range.   * implementing the manufacturing process using feedback from quality control to ensure the majority of the units meet the established specifications and tolerances   For example:  Quality control checks showed that the lacquer was not always being applied evenly. The learner changed the method of application and the buffing process to ensure consistency in the end result.  The learner produced the predetermined number of drawers and the majority of these were within the accepted tolerances.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner undertakes comprehensive development and implementation of an effective manufacturing process by:   * analysing a technological outcome to determine suitability for manufacture and making design changes as required   For example:  The learner made a few changes to their original design so it would be cheaper and easier to produce in numbers.   * establishing specifications, including tolerances, required of the outcome that is to be manufactured   For example:  The learner determined the type of joints, finish, handles and the dimensions (with tolerances).   * selecting a manufacturing process and quality control procedures that enable units to meet the established specifications and tolerances   For example:  The learner considered their outcome and the available resources and chose batch processing as a suitable manufacturing process. They developed a flow diagram of processes that included when particular quality control procedures, such as checking the quality of the timber and the paint finish, would be carried out.   * organising and using selected resources and carrying out techniques independently and accurately in keeping with relevant codes of practice   For example:  With minimal assessor/educator guidance, the learner selected and organised equipment, facilities, staff and materials, including safe storage of these materials. They followed their manufacturing plan and adhered to relevant codes of practice.   * modifying the techniques and the use of resources to tailor the manufacturing process to the nature of the outcome and the constraints and/or opportunities of the manufacturing location   For example:  The learner realised, after the lacquer was delivered, that it was high in chemicals and so reorganised the working space to ensure adequate ventilation to manage these conditions. Learners from another programme were used as labour, enabling more efficient techniques to be adopted.   * establishing quality control procedures that allow for ongoing monitoring to enhance the review and refinement of the manufacturing process to better suit the nature of the outcome and the constraints and/or opportunities of the manufacturing location   For example:  The learner checked the lacquer finish on a more regular basis than originally planned to ensure they were within the acceptable range.  They decided that a different finish should be used for the next batch but, for the current batch, this was not viable.   * implementing the manufacturing process using feedback from quality control to ensure the majority of the units meet the established specifications and tolerances   For example:  Quality control checks showed that the lacquer was not always being applied evenly. The learner changed the method of application and the buffing process to ensure consistency in the end result.  The learner produced the predetermined number drawers and the majority of these were within the accepted tolerances.  *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.