

Title	Demonstrate knowledge of and produce development drawings and patterns for three-dimensional objects in MaPS environment		
Level	3	Credits	4

Purpose	<p>This unit standard has been designed for secondary school learners in a manufacturing pathway skills (MaPS) programme.</p> <p>People credited with this unit standard are able to: demonstrate knowledge of development drawings; manually produce development drawings for three-dimensional objects; manually produce development patterns for three-dimensional objects; and label and store patterns.</p>
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Classification	Mechanical Engineering > Manufacturing Pathways Skills
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Available grade	Achieved
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Guidance Information

- Legislation and references relevant to this unit standard:

Health and Safety at Work Act 2015.

Safety in Technology Education: A Guidance Manual for New Zealand Schools 2017 and any subsequent versions of this document, available from Ministry of Education website (<https://education.govt.nz>).

SAA/SNZ HB1:1994, *Technical drawing for students*, available from Standards New Zealand.

Boundy, A. W. 2011, *Engineering Drawing*, 8th ed., McGraw-Hill Inc, Australia, ISBN 0071016767.
- Definitions

Manually – produced by-hand using non-electronic drawing instruments.

MaPS environment refers to any workplace or context where work or activities related to the Manufacturing and Engineering sector take place.

MaPS project refers to a project undertaken in a MaPS environment under general supervision, using a range of tools, equipment and materials, and involving standard processes.

MaPS refers to Manufacturing pathways skills

Specifications – detail that defines an object being made; commonly communicated by annotated and dimensioned drawings; by written description, or by other communication media.

Three-dimensional objects – objects based on right angles including no more than one transition. Examples include – right angle elbow joints in tube, simple polygon prism, cylinders and bends, square to square and round to round transitions to join sections or ducts of different size, a pipe penetrating a larger pipe. branches of equal diameter cylinders, cones (eccentric and concentric), pyramids; truncated right-angle

cones and pyramids; transitions: square to square, square to round, rectangular to rectangular.

3 Assessment information

All explanations and skills demonstrated must be in accordance with the references and legislation listed above.

All work must be produced manually. This unit is not suitable for Computer Aided Drawing (CAD) applications.

4 Range

Material thickness – up to 3mm.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of development drawings.

Performance criteria

1.1 Types of development drawings and their features are described.

Range parallel lines, radial lines, true length.

1.2 The purpose and use of development drawings is described.

Outcome 2

Manually produce development drawings for three-dimensional objects.

Range three development drawings using parallel lines, radial lines and true shape elevations.

Performance criteria

2.1 Material thickness calculations are made to establish orthographic view dimensions.

2.2 Orthographic views are drawn to enable pattern development.

Outcome 3

Manually produce development patterns for three-dimensional objects.

Range must include orthographic views drawn in performance criterion 2.2; pattern material – paper or cardboard.

Performance criteria

3.1 Patterns are developed from orthographic views.

- 3.2 Material thickness allowances are calculated and included in pattern dimensions.
- 3.3 Patterns are checked for accuracy against specifications and any inaccuracies are corrected.

Range may include but is not limited to – measurements, modelling of patterns into three-dimensional shapes.

Outcome 4

Label and store patterns.

Performance criteria

- 4.1 Patterns are labelled.
- 4.2 Completed patterns are stored.

Planned review date	31 December 2024
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 April 2020	N/A

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.