

Title	Demonstrate knowledge of and apply good work practices when performing simple fabrication operations in MaPS environment		
Level	2	Credits	7

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 fabrication equipment components; demonstrate knowledge of common fabrication materials and processes; apply good work practices when preparing for fabrication of simple components; apply good work practices when fabricating simple components to meet job specifications.</p>
----------------	---

Classification	Mechanical Engineering > Manufacturing Pathways Skills
-----------------------	--

Available grade	Achieved
------------------------	----------

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>).

Timings R. (2011) *Fabrication and welding engineering*. Routledge, Abingdon, England, ISBN 978-0-7506-6691-6.
- Definitions

Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.

Good work practices – safe, efficient, and effective routine work practices that are generally accepted by an industry sector. These may include standard operating procedures such as: a series of specific steps to complete a job, health and safety practices, care and use of tools and equipment, use of personal protective equipment, communications, and reporting. They may also include compliance with quality standards, manufacturer’s instructions, and workshop policies and procedures covering housekeeping, personnel hygiene, drug and alcohol use, computer and internet use, and privacy.

Job specifications refers to instructions relevant to the safe completion of the specific task, such as technical specifications, assembly instructions, drawings, parts lists, standards, codes of practice, test and commissioning procedures, and verbal instructions.

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.

Materials list (also referred to as bill of materials) – list of the raw materials, sub-assemblies, intermediate assemblies, sub-components, parts, and the quantities of each needed to manufacture an end product.

Under supervision refers to working under the direction of a suitably qualified person or teacher who oversees the learner and is responsible for ensuring that the quality of work meets the required standard.

Workshop procedures refers to procedures used by the school carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

Workshop recycling procedures – procedures used by the school workshop to recycle materials. Examples are – ferrous-nonferrous metal scrap bins, sorting of recyclable materials.

3 Range

Assembly methods – fasteners, welding.

Fabrication equipment – band saw, horizontal band saw, cut off saw (disc), manually controlled brake press, pipe bender, manually controlled guillotine, bench shears, drill press, sheet rollers, welding equipment, jigs & fixtures.

Simple fabrication components – includes components based on rectangular, and/or cylindrical shapes, and simple structural frames. Evidence of three is required.

4 Assessment information

All evidence must be within the context of mechanical engineering or fabrication and meet applicable workshop procedures.

Job specifications for tasks to be assessed should consider the introductory nature of this unit standard, and the materials and machinery used.

It is recommended that the skills in this unit standard be assessed using a project integrating all the skills contained in this unit.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of fabrication equipment components.

Performance criteria

1.1 Fabrication equipment is identified, and the principles of operation are stated.

Range	principles of operation include but are not limited to – purpose, method of operation, controls, alignment and holding of workpiece, limitations to use.
-------	--

1.2 Fabrication equipment components are identified, and their functions are explained.

Outcome 2

Demonstrate knowledge of common fabrication materials and processes.

Performance criteria

2.1 Common fabrication sections are identified and a typical application for each is stated.

Range may include but not limited to – equal and unequal angles, rectangular hollow section (RHS), square hollow section (SHS), circular hollow section (pipe or tube), flat, solid square, solid round, plate, sheet.

2.2 Properties of common fabrication materials are compared.

Range includes but not limited to – mild steel, aluminium, stainless steel, non-metals;
properties include but are not limited to – strength, corrosion resistance, formability, weldability.

2.3 Fabrication processes are outlined in accordance with workshop procedures and/or accepted industry practice.

Range material selection, layout, marking, cutting, forming, assembling, joining.

2.4 Basic quality control checks used in fabrication are described.

Range assembly, orientation, dimensions, specifications.

Outcome 3

Apply good work practices when preparing for fabrication of simple components.

Performance criteria

3.1 Job instructions are interpreted, and the required fabrication processes and sequence of operations are described.

3.2 Tools and equipment are identified, and their operating procedures are described.

3.3 Materials list created and explained in accordance with job specifications.

3.4 Methods to control distortion during fabrication are described.

3.5 Safety hazards associated with the task to be carried out are identified and managed.

Outcome 4

Apply good work practices when fabricating simple components to meet job specifications.

Performance criteria

- 4.1 Equipment and tools are selected and used.
- 4.2 Cutting and bending allowances are applied.
- 4.3 It is ensured distortion is controlled during fabrication.
- 4.4 Application of good work practices are ensured during the fabrication processes.
- Range fabrication processes – marking out, cutting, forming, assembling, joining.
- 4.5 Fabricated components are inspected and measured for compliance with job specifications. Any identified deviations are reported.
- 4.6 Equipment is cleaned, lubricated where required, and ready for next use.
- 4.7 Any unserviceable equipment is reported.
- 4.8 Waste material is disposed of in accordance with workshop recycling procedures.

Planned review date	31 December 2024
----------------------------	------------------

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
--	------

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.