

Title	Construct a simple printed circuit		
Level	2	Credits	3

Purpose	<p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – make a single sided laminate PCB for a simple electronic circuit; – demonstrate safe hand soldering practices; – hand solder electronic components and wires; and – inspect soldered electronic components and confirm PCB operation.
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Classification	Electronic Engineering > Electronics Technology
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Available grade	Achieved
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Guidance Information

- 1 For the purpose of this unit standard, printed circuit board (PCB) construction and soldering should be assessed at amateur or hobby level. Professional or industrial standards are not expected, nor is the use of computer aided drafting software for PCB design.
- 2 Health and safety precautions relevant to the chemicals used and to the type of operation performed must be strictly observed at all times during assessment of this unit standard. This applies to activities such as soldering, use of chemicals, cutting and drilling of PCB to minimise exposure to fibreglass dust and particles.

Refer to *Safety in Technology Education – A Guidance Manual for New Zealand Schools*, from <https://technology.tki.org.nz/Technology-in-the-NZC/Safety-in-Technology-Education>.

Outcomes and performance criteria

Outcome 1

Make a single sided laminate PCB for a simple electronic circuit.

Range two to three transistors or equivalent.

Performance criteria

1.1 Draw a PCB layout diagram from circuit schematic.

Range diagram follows logical layout practice for components and allows for mounting of input and output connections as appropriate.

1.2 Transfer the diagram to the PCB.

Range using any of these methods – direct etch, photoresist method, use of an engraving machine, other acceptable methods.

1.3 Drill the PCB to match the components and ready for soldering.

Outcome 2

Demonstrate safe hand soldering practices.

Performance criteria

2.1 Select and use appropriate safety gear and equipment.

Range may include but is not limited to – goggles, wrist strap, electrostatic discharge mat.

2.2 Carry out safety procedures prior to soldering.

Range includes but is not limited to – check for adequate ventilation, use of personal protective equipment, clean and tin soldering iron tips, clean components, check power leads will not be damaged during use of the soldering iron, check the soldering iron tip has reached operating temperature prior to use.

Outcome 3

Hand solder electronic components and wires.

Performance criteria

3.1 Hand solder electrical components and wires safely and without damage.

Range Safety and workshop procedures are followed, soldering does not cause short circuits to adjacent tracks or components, soldering does not cause heat damage of components, wire insulation, and PCB tracks.
components – evidence for one PCB as in outcome 1, and including terminals and connecting wires.
wires – single and multi-strand.

3.2 Repair a broken PCB track without causing further damage.

3.3 De-solder without damage to components and PCB.

Range evidence of de-soldering one of – resistor, diode, transistor.

Outcome 4

Inspect soldered electronic components and confirm PCB operation.

Performance criteria

- 4.1 Inspect and confirm soldered joints support components and wires mechanically.
- 4.2 Inspect and confirm solder has flowed onto the parts to be joined without the formation of 'dry' joints.
- 4.3 Inspect and confirm PCB operates as intended.

Planned review date	31 December 2025
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	30 April 2001	31 December 2012
Revision	2	12 March 2002	31 December 2012
Revision	3	17 March 2004	31 December 2012
Review	4	25 May 2007	31 December 2024
Rollover and Revision	5	15 March 2012	31 December 2024
Revision	6	15 January 2014	31 December 2024
Rollover and Revision	7	27 January 2015	31 December 2024
Review	8	24 June 2021	N/A

Consent and Moderation Requirements (CMR) reference	0003
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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 The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.