

Achievement Standard

Subject Reference	Construction and Mechanical Technologies 1.25		
Title	Demonstrate understanding of basic concepts related to machines		
Level	1	Credits	3
		Assessment	Internal
Subfield	Technology		
Domain	Construction and Mechanical Technologies		
Status	Registered	Status date	20 January 2011
Planned review date	31 December 2014	Date version published	20 January 2011

This achievement standard involves demonstrating understanding of basic concepts related to machines.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of basic concepts related to machines. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of basic concepts related to machines. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of basic concepts related to machines.

Explanatory Notes

- This achievement standard is derived from the Level 6 achievement objectives from the Technology learning area in *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, and is related to the material in the *Teaching and Learning Guide for Technology*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>.

Appropriate reference information is available in *Safety and Technology Education: A Guidance Manual for New Zealand Schools*, Learning Media, Ministry of Education, 1998; and The Health and Safety in Employment Act 1992.

Further information can be found at <http://www.techlink.org.nz>.

- 2 *Demonstrate understanding of basic concepts related to machines* involves:
- explaining the purpose of levers, inclined planes and screws
 - explaining the purpose of mechanical components
 - explaining the advantages and disadvantages of pneumatic and hydraulic systems
 - describing the mechanical advantage and motion provided by a machine.

Demonstrate in-depth understanding of basic concepts related to machines involves:

- explaining how a machine provides the mechanical advantage and motion.

Demonstrate comprehensive understanding of basic concepts related to machines involves:

- discussing why particular levers, inclined planes and screws, and mechanical components were selected to ensure the mechanical advantage and motion of a machine.
- 3 Mechanical components include:
- bearings may include but are not limited to – plain, ball, roller, needle, thrust
 - cams and followers may include but are not limited to – cams such as plate and eccentric; followers such as needle, roller, flat, offset
 - pivots and linkages may include but are not limited to – pivots such as fixed and moving; linkages such as parallel, reverse and sliding crank motion
 - gears may include but are not limited to – spur, bevel, helical, rack and pinion, worm, idler
 - belt or chain and sprocket may include but are not limited to – flat belt, v-belt, duplex chain or double belt, tooth belt
 - shafts and bearings may include but are not limited to – solid shafts, hollow shafts, ball bearing, roller bearing, conical bearing.
- 4 For this achievement standard a machine will include one or more levers, inclined planes and/or screws, and one or more mechanical components.
- 5 Conditions of Assessment related to this achievement standard can be found at <http://www.tki.org.nz/e/community/ncea/conditions-assessment.php>.
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Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against achievement standards.
- 2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference

0233