

Title	Use mathematics to solve problems in an extractive industries workplace		
Level	4	Credits	15

Purpose	People credited with this unit standard are able to: solve arithmetical problems; solve mensuration problems; solve trigonometrical problems; solve geometrical problems; and use algebra to solve workplace problems, in an extractive industries workplace.
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Classification	Extractive Industries > Extractive Industries Management
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Available grade	Achieved
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Guidance Information

None.

Outcomes and performance criteria

Outcome 1

Solve arithmetical problems in an extractive industries workplace.

Performance criteria

- 1.1 Fractions, decimals, and percentages are manipulated and interchanged in appropriate calculations.
- Range halves, thirds, quarters, fifths, tenths, twentieths.
- 1.2 Ratios, rates, and proportions are used to calculate solutions to workplace problems.
- Range speed, time, distance, water flow into and out of the site, production levels, pulleys.
- 1.3 Estimations and approximations are used in the solution of workplace problems.
- 1.4 Scientific notation is used to manipulate very large and very small numbers.

Outcome 2

Solve mensuration problems in an extractive industries workplace.

Performance criteria

2.1 Areas of regular objects are calculated.

Range triangles, squares, rectangles, rhombuses, circles, annuli.

2.2 Volumes of regular objects are calculated.

Range objects may include but are not limited to – prisms, cones, pyramids, stock piles, windrows, stopes and pillars.

2.3 Masses of various objects encountered in the workplace are calculated using volume and density.

Range may include but is not limited to – dams, bins, stockpiles; blocks, stopes and pillars in situ.

Outcome 3

Solve trigonometrical problems in an extractive industries workplace.

Performance criteria

3.1 Trigonometrical ratios are used to solve problems in the workplace.

Range sine, cosine, tangent, gradients.

Outcome 4

Solve geometrical problems in an extractive industries workplace.

Performance criteria

4.1 Geometrical properties of lines, angles, polygons, and circles are calculated and used to solve problems in the workplace.

4.2 Pythagoras' Theorem is used to solve relevant workplace problems.

Range may include but is not limited to – shafts, drifts, haul roads, mast heights, slope distances.

Outcome 5

Use algebra to solve workplace problems in an extractive industries workplace.

Performance criteria

5.1 Workplace problems are solved using linear equations.

Range algebraic language and concepts, find unknowns.

5.2 Formulae are used to solve workplace problems.

Range simple power, air and water flow, ventilation, mechanics; geometry formulae are used and transposed as required.

Planned review date	31 December 2022
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 November 2000	31 December 2017
Review	2	24 November 2005	31 December 2017
Rollover and Revision	3	16 July 2010	31 December 2017
Review	4	18 June 2015	N/A
Rollover	5	25 January 2018	N/A

Consent and Moderation Requirements (CMR) reference	0114
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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 MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.