

Domain	PLUMBING	Unit ID: 449
Title:	Perform calculations related to plumbing operations	
Level: 2		Credits: 2

Purpose

This unit standard is intended for those who perform calculations related to plumbing operations. People credited with this unit standard are able to calculate the mass and weight of solid objects and liquids, Use and convert the different scales of measurement used in plumbing measuring instruments and work out drainage gradient.

This unit standard is intended for those who work as plumbers.

Special Notes

1. Entry information:
 - Prerequisite
 - 434 - Apply Occupational Health and Safety in Working Environment.
2. To demonstrate competence, at a minimum, evidence is required of solving mathematical and scientific problems related to the:
 - calculation of the mass and weight of three (3) solid objects of different shapes and dimensions
 - calculation of the mass and weight of liquids in three (3) containers of different shapes and dimensions
 - reading and interpretation of the measurement scales of the listed measuring instruments listed in Special Notes 3
3. Tools may include but are not limited to a rule, tape measure, carpenter's square, builder's square, and adjustable square.
4. Materials may include but are not limited to different solids and liquids used in plumbing operations.
5. The metric system used in Namibia is based on the International Standards Organisation, referred to by its abbreviation 'ISO'.
6. Assessment evidence may be from a real workplace, or simulated real workplace or an appropriate simulated realistic working environment in which plumbing operations are carried out.
7. Performance of all elements in this unit standard must comply with all relevant workplace requirements and/or manufacturers' specifications.
8. Regulations and legislation relevant to this unit standard include the following:
 - Labour Act No. 11 of 2007

- Regulations relating to the health & Safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007 and all subsequent amendments

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority on www.nta.com.na.

Elements and Performance Criteria

Element 1: Calculate the mass and weight of solid objects and liquids

Performance criteria

- 1.1 Correct mathematical formulae are applied to perform calculations of the mass and weight of solid objects and liquids.
- 1.2 ISO units of measurement of mass and weight are converted.
- 1.3 The results of the calculations are recorded and validated.

Element 2: Use and convert the different scales of measurement used in plumbing measuring instruments

Performance criteria

- 2.1 Measurement scales used on different measuring tools are identified and explained.
- 2.2 The different scales on measuring instruments are converted, transferred and used to calculate the true dimensions, mass and volume of plumbing objects and materials.
- 2.3 Measurements are taken using the different measurement scales used in plumbing measuring tools and equipment.
- 2.4 The results of the calculations are confirmed and recorded.

Element 3: Work out drainage gradient

Performance criteria

- 3.1 Gradient is calculated as per specification.
- 3.2 The drainage pipes length and diameter is determined.

3.3 The drainage route is planned.

3.4 The slope of the ground is calculated using the contour lines.

Registration Data

Subfield:	Civil and Building Services Engineering
Date first registered:	15 November 2007
Date this version registered:	31 May 2018
Anticipated review:	2023
Body responsible for review:	Namibia Training Authority