Australian Government

Department of Education, Employment and Workplace Relations

MSS024004A Process and present environmental data

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the ability to retrieve environmental data; evaluate formulae and perform scientific calculations; present and interpret information in tables, graphs and simple maps; and keep accurate records. The unit requires personnel to solve problems of limited complexity where the information may be not obvious, but not contradictory, and can be determined by direct reasoning.

Application of the Unit

This unit of competency is applicable to environmental technicians working in all industry sectors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

1	Retrieve and check environmental data	1.1	Store and retrieve data using appropriate files and/or application software
		1.2	Verify the quality of data using enterprise procedures

		1.3	Rectify errors in data using enterprise procedures
2	Calculate scientific quantities	2.1	Calculate statistical values for given data
		2.2	Calculate scientific quantities using given formulae and data and estimate uncertainties
		2.3	Ensure calculated quantities are consistent with estimations and expectations
		2.4	Report all calculated quantities using the appropriate units and correct number of significant figures
3	Present data	3.1	Present data in clearly labelled tables, charts and/or simple maps
		3.2	Graph data using appropriate scales to span the range of data or display trends
		3.3	Report all data using the appropriate units and number of significant figures
4	Interpret data variations and trends	4.1	Compare data with reference values or expected ranges
		4.2	Recognise and report significant variations and trends in data
		4.3	Interpret significant features of graphs, such as gradients, intercepts, maximum and minimum values, and limit lines
5	Keep accurate records and maintain confidentiality	5.1	Transcribe information accurately
		5.2	Verify the accuracy of records following enterprise procedures
		5.3	File and store workplace records in accordance with enterprise procedures
		5.4	File all reference documents logically and keep

them up-to-date and secured

5.5 Observe enterprise confidentiality standards

Required Skills and Knowledge

Required skills
Required skills include: • performing calculations of scientific quantities • using scientific notation • applying the concepts of metrology • applying calculations to the workplace • coding, recording and checking data accurately • presenting accurate results in the required format • preparing graphs, tables and charts (e.g. pie, bar and histogram), and/or simple maps • comparing data with reference values and interpreting variations and trends in data (e.g. seasonal, diurnal, location and non-conformance) • maintaining the confidentiality of data in accordance with enterprise and regulatory requirements • seeking advice when issues/problems are beyond scope of competence/responsibility
Required knowledge
Required knowledge includes: • concepts of metrology • the international system of units (SI) • relevant scientific and technical terminology • uncertainty associated with measurement steps • procedures for coding, entering, storing, retrieving and communicating data • procedures for verifying data and rectifying mistakes • converting units involving multiples and submultiples • significant figures, rounding off, estimating and approximating • transposing and evaluating formulae • calculations involving fractions, decimals, proportions and percentages • determining statistical values of data, such as mean, median, mode and standard deviation • procedures for maintaining and filing records, and maintaining security of data

Evidence Guide

Overview of assessment	Competency must be demonstrated in the ability to perform consistently at the required standard.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include: • coding, recording and checking the documentation of data • calculating statistical quantities relevant to the workplace and presenting accurate results in the required format • recognising anomalies, variations and trends in data • maintaining the confidentiality of data in accordance with workplace and regulatory requirements • keeping records up-to-date and secure.
Context of and specific resources for assessment	This unit of competency is to be assessed in the workplace or a simulated workplace environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. This unit of competency may be assessed with: • *MSL924002A Use laboratory application software* • **environmental monitoring units, such as:** • *MSL974007A Undertake environmental field-based monitoring* • *MSS024003A Apply an understanding of environmental principles to a site* • *MSS024006A Perform sampling and testing of water.* The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. Resources may include: • data sets and records • computer and relevant software or laboratory information system • relevant workplace procedures.
Method of assessment	The following assessment methods are suggested: • review of data worksheets, calculations, computer files (such as spreadsheets, databases and statistical analysis), graphs, tables, charts and/or simple maps

	prepared by the candidate • review of records transcribed, maintained or stored by the candidate • questions to assess understanding of relevant procedures and trends in data • feedback from supervisors and peers about the candidate's ability to consistently follow enterprise procedures • observation of the candidate as they process data, file and store records. In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work-like environment.
Guidance information for assessment	

Range Statement

Codes of practice	Where reference is made to industry codes of practice, and/or Australian/international standards, it is expected the latest version will be used
Standards, codes, procedures and/or enterprise requirements	**Standards, codes, procedures and/or enterprise requirements may include:** • Australian and international standards such as: • AS ISO 1000-1998 The international system of units (SI) and its application • ISO 5725 Accuracy (trueness and precision) of measurement methods and results • ISO/IEC Guide 98-3:2008 Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM) • sampling/testing methods, procedures, guidelines

	provided by enterprise or regulator • material safety data sheets (MSDS) • equipment manuals and warranty, supplier catalogues and handbooks • enterprise quality manual and customer quality plan • validation of the equipment and associated software, where applicable • validation of spreadsheets developed in-house for routine calculations
Concepts of metrology	Concepts of metrology may include: • that all measurements are estimates • measurements belong to a population of measurements of the measured parameters • repeatability • precision • accuracy • significant figures • sources of error • uncertainty • traceability
Environmental data	**Data may be recorded on:** • worksheets • spreadsheets • databases linked to information management systems **Data may include results of:** • observations • field tests and measurements • population surveys (type, species, age, sex and weight) • vegetation surveys (type, species, height, density and canopy) • dilution of working solutions and gases (odours) • laboratory analyses • quality assurance and control assessments **Data may be presented in the form of:** • graphs • tables • histograms • pie charts • bar charts

	• semi-quantitative observations and be expressed on a scale (e.g. 1 to 4 or + to ++++) • photographs
Calculations	Calculations may be performed: • with or without a calculator • using computer software, spreadsheets, databases and statistical packages
Calculations of scientific quantities	**Calculations of scientific quantities may include:** • converting units involving multiples and submultiples • significant figures, round off, estimate and approximate • transposing and evaluating formulae • fractions, decimals, proportions and percentages • percentage and absolute uncertainties in measurements and test results • statistical values of data, such as mean, median, mode and standard deviation • perimeters and angles, areas (m^2) and volumes (mL, L, m^3) of regular shapes • sampling times • dose (mg), average mass, mass percentage, density, specific gravity, moisture, relative and absolute humidity, viscosity and permeability • ratios, such as mass to mass, mass to volume and volume to volume percentages • concentration, such as molarity, g/100mL, mg/L, mg/μL, ppm, ppb, dilution mL/L • average count, colonies per swab surface and cell counts, such as live and dead/total • variables, such as pressure, gauge pressure, velocity and flow rates • biological oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbons (TOC) • % content of moisture, sulphur dioxide and trace metals, such as calcium or zinc
Records	Records could include information associated with: • purchase of equipment and materials • service records • safety procedures • history of calibration and test results

Occupational health and safety (OHS) and environmental management requirements	**OHS and environmental management requirements:** • all operations must comply with enterprise OHS and environmental management requirements, which may be imposed through state/territory or federal legislation - these requirements must not be compromised at any time • all operations assume the potentially hazardous nature of samples and require standard precautions to be applied • where relevant, users should access and apply current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health

Unit Sector(s)

Environmental

Custom Content Section

Not applicable.