DEMONSTRATE NUMERACY SKILLS

UNIT CODE: MATH/OS/AS/BC/02/6/A

UNIT DESCRIPTION

This unit describes the competencies required to demonstrate numeracy skills. It involves; applying a wide range of mathematical calculations for work; applying ratios, rates and proportions to solve problems; estimating, measuring and calculating measurement for work; using detailed maps to plan travel routes for work; using geometry to draw and construct 2D and 3D shapes for work; collecting, organizing and interpreting statistical data; using routine formula and algebraic expressions for work and using common functions of a scientific calculator.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the Range.***
1. Apply a wide range of mathematical calculations for work	1.1 Mathematical information embedded in a range of workplace tasks and texts is extracted as per workplace procedures. 1.2 Mathematical information is interpreted and comprehended as per job specifications 1.3 A range of mathematical and problem solving processes are selected and used as per job specification 1.4 Different forms of fractions, decimals and percentages are flexibly used as per SOPs 1.5 Calculation performed with positive and negative numbers as per SOPs 1.6 Numbers are expressed as powers and roots and are used in calculations as per SOPs 1.7 Calculations done using routine formulas as per SOPs 1.8 Estimation and assessment processes are used to check outcome as per workplace procedures 1.9 Mathematical language is used to discuss and explain the processes, results and implications of the task as per workplace procedures

2. Use and apply ratios, rates and proportions for work	2.1 Information regarding ratios, rates and proportions extracted from a range of workplace tasks and texts as per SOPs 2.2 Mathematical information related to ratios, rate and proportions is analysed as per SOPs 2.3 Problem solving processes are used to undertake the task as per workplace procedures 2.4 Equivalent ratios and rates are simplified as per SOPs 2.5 Quantities are calculated using ratios, rates and proportions as per SOPS 2.6 Graphs, charts or tables are constructed to represent ratios, rates and proportions as per SOPs 2.7 The outcomes reviewed and checked as per job specifications 2.8 Information is record using mathematical language and symbols as per workplace procedures
3. Estimate, measure and calculate measurement for work	3.1 Measurement information embedded in workplace texts and tasks are extracted and interpreted as per job specifications 3.2 Appropriate workplace measuring equipment are identified and selected as per job specifications 3.3 Accurate measurements are estimated and made as per SOPs 3.4 The area of ***2D shapes*** including compound shapes are calculated as per SOPs 3.5 The volume of 3D shapes is calculated using relevant formulas as per SOPs 3.6 Sides of right angled triangles are calculated using Pythagoras' theorem as per SOPs 3.7 conversions are perform between units of measurement as per job specification 3.8 Problem solving processes are used to undertake the task as per workplace Procedures 3.9 The measurement outcomes are reviewed and checked as per workplace procedures 3.10 Information is recorded using mathematical language and symbols appropriate for the task as per workplace procedures

4. Use detailed maps to plan travel routes for work	4.1 Different types of maps are identified and interpreted as per job requirements 4.2 Key features of maps are identified as per job requirements 4.3 Scales are identified and interpreted as per job requirements 4.4 Scales are applied to calculate actual distances 4.5 Positions or locations are determined using directional information as per job requirements 4.6 Routes are planned by determining directions and calculating distances, speeds and times as per job requirements 4.7 Information is gathered and identified and relevant factors related to planning a route checked as per job requirements 4.8 Relevant equipment is select and checked for accuracy and operational effectiveness as per job requirements 4.9 Task is planned and recorded using specialized mathematical language and symbols appropriate for the task as per job requirements
5. Use geometry to draw 2D shapes and construct 3D shapes for work	5.1 A range of 2D shapes and 3D shapes and their uses in work contexts is identified as per job specifications 5.2 Features of 2D and 3D shapes are named and described as per job specifications 5.3 Types of angles in 2D and 3D shapes are identified as per job specifications 5.4 Angles are drawn, estimated and measured using geometric instruments as per job requirements 5.5 Angle properties of 2D shapes are named and identified as per SOPs 5.6 Angle properties are used to evaluate unknown angles in shapes as per SOPs 5.7 Properties of perpendicular and parallel lines are applied to shapes as per SOPs 5.8 Understanding and use of symmetry is demonstrated as per SOPs

	5.9 Understanding and use of similarity is demonstrated as per SOPs 5.10 The workplace tasks and mathematical processes required are identified as per workplace procedures 5.11 2D shapes is drawn for work as per job specification 5.12 3D shapes is constructed for work as per job specification 5.13 The outcomes are reviewed and checked as per workplace procedures 5.14 Specialized mathematical language and symbols appropriate for the task are used as per SOPs
6. Collect, organize, and interpret statistical data for work	6.1 Workplace issue requiring investigation are identified as per workplace procedures 6.2 Audience / population / sample unit is determined as per workplace procedures as per workplace procedures 6.3 Data to be collected is identified as per workplace procedures 6.4 Data collection method is selected as per workplace procedures 6.5 Appropriate statistical data is collected and organized as per SOPs 6.6 Data is illustrated in appropriate formats as per SOPs 6.7 The effectiveness of different types of graphs are compared as per SOPs 6.8 The summary statistics for collected data is calculated as per SOPs 6.9 The results / findings are interpreted as per SOPs 6.10 Data is checked to ensure that it meets the expected results and content as per workplace procedures 6.11 Information from the results including tables, graphs and summary statistics is extracted and interpreted as per workplace procedure 6.12 Mathematical language and symbols are used to report results of investigation as per workplace procedure

7. Use routine formula and algebraic expressions for work	7.1 Understanding of informal and symbolic notation, representation and conventions of algebraic expressions is demonstrated as per SOPs 7.2 Simple algebraic expressions and equations are developed as per job specification 7.3 Operate on algebraic expressions as per job requirement 7.4 Algebraic expressions are simplified as per job requirement 7.5 Substitution into simple routine equations is done as per SOPs 7.6 Routine formulas used for work tasks are identified and comprehended as per SOPs 7.7 Routine formulas are evaluate by substitution as per SOPs 7.8 Routine formulas transposed as per SOPs 7.9 Appropriate formulas are identified and used for work related tasks as per workplace procedures 7.10 Outcomes are checked and result of calculation used as per workplace procedures
8. Use common functions of a scientific calculator for work	8.1 Required numerical information to perform tasks is located as per job specification 8.2 The order of operations and function keys necessary to solve mathematical calculation are determined as per job specification 8.3 Function keys on a scientific calculator are identified and used as per SOPs 8.4 Estimations are referred to check reasonableness of problem solving process as per workplace procedures 8.5 Appropriate mathematical language, symbols and conventions are used to report results as per workplace procedures

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. 2D shapes may include but not limited may include but not limited to:	• Triangles • Square • Rectangle • Triangle

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Measuring
- Logical thinking
- Computing
- Drawing of graphs
- Applying mathematical formulas
- Analytical

Required knowledge

The individual needs to demonstrate knowledge of:

- Types of common shapes
- Differentiation between two dimensional shapes / objects
- Formulae for calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Fundamental operations (addition, subtraction, division, multiplication)
- Rounding techniques
- Types of fractions
- Different types of tables and graphs
- Meaning of graphs, such as increasing, decreasing, and constant value
- Preparation of basic data, tables & graphs

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1. 1Developed communication strategies to meet the organization requirements and applied in the workplace 1. 2Established and maintained communication pathways for effective communication in the workplace 1. 3 Used communication strategies involving exchanges of complex oral information
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4. Context of Assessment	Competency may be assessed: 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.