

## DEMONSTRATE NUMERACY SKILLS

**UNIT CODE:** BUS/OS/AC/BC/02/6

### UNIT DESCRIPTION:

This unit describes the competencies required by a worker in order to apply a wide range of mathematical calculations for work; apply ratios, rates and proportions to solve problems; estimate, measure and calculate measurement for work; Use detailed maps to plan travel routes for work; Use geometry to draw and construct 2D and 3D shapes for work; Collect, organize and interpret statistical data; Use routine formula and algebraic expressions for work and use common functions of a scientific calculator

### ELEMENTS AND PERFORMANCE CRITERIA

| <b>ELEMENT</b>   | <b>PERFORMANCE CRITERIA</b>   |
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| <p>These describe the key outcomes which make up workplace function.</p> | <p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i><b>Bold and italicized terms are elaborated in the Range.</b></i></p>  |
| <p>1. Apply a wide range of mathematical calculations for work</p>       | <p>1.1 Mathematical information embedded in a range of workplace tasks and texts is extracted</p> <p>1.2 Mathematical information is interpreted and comprehended</p> <p>1.3 A range of mathematical and problem solving processes are select and used</p> <p>1.4 Different forms of fractions, decimals and percentages are flexibly used</p> <p>1.5 Calculation performed with positive and negative numbers</p> <p>1.6 Numbers are expressed as powers and roots and are used in calculations</p> <p>1.7 Calculations done using routine formulas</p> <p>1.8 Estimation and assessment processes are used to check outcome</p> <p>1.9 Mathematical language is used to discuss and explain the processes, results and implications of the task</p> |
| <p>2. Use and apply ratios, rates and proportions for work</p>           | <p>2.1 Information regarding ratios, rates and proportions extracted from a range of workplace tasks and texts</p> <p>2.2 Mathematical information related to ratios, rate and proportions is analyzed.</p> <p>2.3 Problem solving processes are used to undertake the task</p> <p>2.4 Equivalent ratios and rates are simplified</p> <p>2.5 Quantities are calculated using ratios, rates and proportions</p>  |

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|   | <p>2.6 Graphs, charts or tables are constructed to represent ratios, rates and proportions</p> <p>2.7 The outcomes reviewed and checked</p> <p>2.8 Information is record using mathematical language and symbols</p>  |
| <p>3. Estimate, measure and calculate measurement for work</p>            | <p>3.1 Measurement information embedded in workplace texts and tasks are extracted and interpreted</p> <p>3.2 Appropriate workplace measuring equipment are identified and selected</p> <p>3.3 Accurate measurements are estimate and made</p> <p>3.4 The area of 2D shapes including compound shapes are calculated</p> <p>3.5 The volume of 3D shapes is calculated using relevant formulas</p> <p>3.6 Sides of right angled triangles are calculated using Pythagoras' theorem</p> <p>3.7 conversions are perform between units of measurement</p> <p>3.8 Problem solving processes are used to undertake the task</p> <p>3.9 The measurement outcomes are reviewed and checked</p> <p>3.10 Information is recorded using mathematical language and symbols appropriate for the task</p> |
| <p>4. Use detailed maps to plan travel routes for work</p>                | <p>4.1 Different types of maps are identified and interpreted</p> <p>4.2 Key features of maps are identified</p> <p>4.3 Scales are identified and interpreted</p> <p>4.4 Scales are applied to calculate actual distances</p> <p>4.5 Positions or locations are determined using directional information</p> <p>4.6 Routes are planned by determining directions and calculating distances, speeds and times</p> <p>4.7 Information is gathered and identified and relevant factors related to planning a route checked</p> <p>4.8 Relevant equipment is select and checked for accuracy and operational effectiveness</p> <p>4.9 Task is planned and recorded using specialized mathematical language and symbols appropriate for the task</p>   |
| <p>5. Use geometry to draw 2D shapes and construct 3D shapes for work</p> | <p>5.1 A range of 2D shapes and 3D shapes and their uses in work contexts is identified</p> <p>5.2 Features of 2D and 3D shapes are named and described</p> <p>5.3 Types of angles in 2D and 3D shapes are identified</p> <p>5.4 Angles are drawn, estimated and measured using geometric instruments</p>   |

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|   | <p>5.5 Angle properties of 2D shapes are named and identified</p> <p>5.6 Angle properties are used to evaluate unknown angles in shapes</p> <p>5.7 Properties of perpendicular and parallel lines are applied to shapes</p> <p>5.8 Understanding and use of symmetry is demonstrated</p> <p>5.9 Understanding and use of similarity is demonstrated</p> <p>5.10 The workplace tasks and mathematical processes required are identified</p> <p>5.11 2D shapes is drawn for work</p> <p>5.12 3D shapes is constructed for work</p> <p>5.13 The outcomes are reviewed and checked</p> <p>5.14 Specialized mathematical language and symbols appropriate for the task are used</p>   |
| 6. Collect, organize, and interpret statistical data for work | <p>6.1 Workplace issue requiring investigation are identified</p> <p>6.2 Audience / population / sample unit is determined</p> <p>6.3 Data to be collected is identified</p> <p>6.4 Data collection method is selected</p> <p>6.5 Appropriate statistical data is collected and organized</p> <p>6.6 Data is illustrated in appropriate formats</p> <p>6.7 The effectiveness of different types of graphs are compared</p> <p>6.8 The summary statistics for collected data is calculated</p> <p>6.9 The results / findings are interpreted</p> <p>6.10 Data is checked to ensure that it meets the expected results and content</p> <p>6.11 Information from the results including tables, graphs and summary statistics is extracted and interpreted</p> <p>6.12 Mathematical language and symbols are used to report results of investigation</p> |
| 7. Use routine formula and algebraic expressions for work     | <p>7.1 Understanding of informal and symbolic notation, representation and conventions of algebraic expressions is demonstrated</p> <p>7.2 Simple algebraic expressions and equations are developed</p> <p>7.3 Operate on algebraic expressions</p> <p>7.4 Algebraic expressions are simplified</p> <p>7.5 Substitution into simple routine equations is done</p> <p>7.6 Routine formulas used for work tasks are identified and comprehended</p> <p>7.7 Routine formulas are evaluate by substitution</p> <p>7.8 Routine formulas transposed</p> <p>7.9 Appropriate formulas are identified and used for work related</p>   |

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|   | tasks<br>7.10 Outcomes are checked and result of calculation used  |
| 8. Use common functions of a scientific calculator for work | 8.1 Required numerical information to perform tasks is located<br>8.2 The order of operations and function keys necessary to solve mathematical calculation are determined<br>8.3 Function keys on a scientific calculator are identified and used<br>8.4 Estimations are referred to check reasonableness of problem solving process<br>8.5 Appropriate mathematical language, symbols and conventions are used to report results |

## 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   |
|---|---|
| <ul style="list-style-type: none"> <li>Geometry includes but not limited to:</li> </ul> | May include but not limited to: <ul style="list-style-type: none"> <li>Scale drawing</li> <li>Triangles</li> <li>Simple solid</li> <li>Round</li> <li>Square</li> <li>Rectangular</li> <li>Triangle</li> <li>Sphere</li> <li>Cylinder</li> <li>Cube</li> <li>Polygons</li> <li>Cuboids</li> </ul> |

## 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:

- Applying Fundamental operations (addition, subtraction, division, multiplication)

- Using calculator
- Using different measuring tools

### 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.

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| 1. Critical aspects of Competency | Assessment requires evidence that the candidate :<br>1.1 Applied a wide range of mathematical calculations for work<br>1.2 Demonstrated the ability to use and apply ratios, rates and proportions for work<br>1.3 Estimated, measured and calculated measurement for work<br>1.4 Demonstrated the ability to use detailed maps to plan travel routes for work<br>1.5 Demonstrated the ability to use geometry to draw 2D shapes and construct 3D shapes for work<br>1.6 Collected, organized, and interpreted statistical data for work<br>1.7 Demonstrated the ability to use routine formula and algebraic expressions for work. |
| 2. Resource Implications          | 2.1 Calculator<br>1.2 Basic measuring instruments   |
| 3. Methods of Assessment          | Competency may be assessed through:<br>3.1 Written Test<br>3.2 Interview/Oral Questioning<br>3.3 Demonstration  |
| 4. Context of Assessment          | Competency may be assessed in an off the job setting  |

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| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |
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