



**education**

Department:  
Education  
REPUBLIC OF SOUTH AFRICA

# **NATIONAL CERTIFICATES (VOCATIONAL)**

## **ASSESSMENT GUIDELINES**

### **MATHEMATICAL LITERACY NQF LEVEL 2**

September 2007



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## SECTION A: PURPOSE OF THE SUBJECT ASSESSMENT GUIDELINES

This document provides the lecturer with guidelines to develop and implement a coherent, integrated assessment system for Mathematical Literacy in the National Certificates (Vocational). It must be read with the *National Policy Regarding Further Education and Training Programmes: Approval of the Documents, Policy for the National Certificates (Vocational) Qualifications at Levels 2 to 4 on the National Qualifications Framework (NQF)*. This assessment guideline will be used for National Qualifications Framework Levels 2-4.

This document explains the requirements for the internal and external subject assessment. The lecturer must use this document with the *Subject Guidelines: Mathematical Literacy* to prepare for and deliver Mathematical Literacy. Lecturers should use a variety of resources and apply a range of assessment skills in the setting, marking and recording of assessment tasks.

## SECTION B: ASSESSMENT IN THE NATIONAL CERTIFICATES (VOCATIONAL)

### 1 ASSESSMENT IN THE NATIONAL CERTIFICATES (VOCATIONAL)

Assessment in the National Certificates (Vocational) is underpinned by the objectives of the National Qualifications Framework (NQF). These objectives are to:

- Create an integrated national framework for learning achievements.
- Facilitate access to and progression within education, training and career paths.
- Enhance the quality of education and training.
- Redress unfair discrimination and past imbalances and thereby accelerate employment opportunities.
- Contribute to the holistic development of the student by addressing:
  - social adjustment and responsibility;
  - moral accountability and ethical work orientation;
  - economic participation; and
  - nation-building.

The principles that drive these objectives are:

- **Integration**

To adopt a unified approach to education and training that will strengthen the human resources development capacity of the nation.

- **Relevance**

To be dynamic and responsive to national development needs.

- **Credibility**

To demonstrate national and international value and recognition of qualification and acquired competencies and skills.

- **Coherence**

To work within a consistent framework of principles and certification.

- **Flexibility**

To allow for creativity and resourcefulness when achieving Learning Outcomes, to cater for different learning styles and use a range of assessment methods, instruments and techniques.

- **Participation**

To enable stakeholders to participate in setting standards and co-ordinating the achievement of the qualification.

- **Access**

To address barriers to learning at each level to facilitate students' progress.

- **Progression**

To ensure that the qualification framework permits individuals to move through the levels of the national qualification via different, appropriate combinations of the components of the delivery system.

- **Portability**

To enable students to transfer credits of qualifications from one learning institution and/or employer to another institution or employer.

- **Articulation**

To allow for vertical and horizontal mobility in the education system when accredited pre-requisites have been successfully completed.

- **Recognition of Prior Learning**

To grant credits for a unit of learning following an assessment or if a student possesses the capabilities specified in the outcomes statement.

- **Validity of assessments**

To ensure assessment covers a broad range of knowledge, skills, values and attitudes (SKVAs) needed to demonstrate applied competency. This is achieved through:

- clearly stating the outcome to be assessed;
- selecting the appropriate or suitable evidence;
- matching the evidence with a compatible or appropriate method of assessment; and
- selecting and constructing an instrument(s) of assessment.

- **Reliability**

To assure assessment practices are consistent so that the same result or judgment is arrived at if the assessment is replicated in the same context. This demands consistency in the interpretation of evidence; therefore, careful monitoring of assessment is vital.

- **Fairness and transparency**

To verify that no assessment process or method(s) hinders or unfairly advantages any student. The following could constitute unfairness in assessment:

- Inequality of opportunities, resources or teaching and learning approaches
- Bias based on ethnicity, race, gender, age, disability or social class
- Lack of clarity regarding Learning Outcome being assessed
- Comparison of students' work with other students, based on learning styles and language

- **Flexibility**

- **Practicability and cost-effectiveness**

To integrate assessment practices within an outcomes-based education and training system and strive for cost and time-effective assessment.

## **2 ASSESSMENT FRAMEWORK FOR VOCATIONAL QUALIFICATIONS**

The assessment structure for the National Certificates (Vocational) qualification is as follows:

### **2.1 Internal continuous assessment (ICASS)**

Knowledge, skills values, and attitudes (SKVAs) are assessed throughout the year using assessment instruments such as projects, tests, assignments, investigations, role-play and case studies. The internal continuous assessment (ICASS) practical component is undertaken in a real workplace, a workshop or a "Structured Environment". This component is moderated internally and externally quality assured by Umalusi. All internal continuous assessment (ICASS) evidence is kept in a Portfolio of Evidence (PoE) and must be readily available for monitoring, moderation and verification purposes.

## **2.2 External summative assessment (ESASS)**

The external summative assessment is either a single or a set of written papers set to the requirements of the Subject Learning Outcomes. The Department of Education administers the theoretical component according to relevant assessment policies.

External summative assessments will be conducted annually between October and December, with provision made for supplementary sittings.

## **3 MODERATION OF ASSESSMENT**

### **3.1 Internal moderation**

Assessment must be moderated according to the internal moderation policy of the Further Education and Training (FET) college. Internal college moderation is a continuous process. The moderator's involvement starts with the planning of assessment methods and instruments and follows with continuous collaboration with and support to the assessors. Internal moderation creates common understanding of Assessment Standards and maintains these across vocational programmes.

### **3.2 External moderation**

External moderation is conducted by the Department of Education, Umalusi and, where relevant, an Education and Training Quality Assurance (ETQA) body according to South African Qualifications Authority (SAQA) and Umalusi standards and requirements.

The external moderator:

- monitors and evaluates the standard of all summative assessments;
- maintains standards by exercising appropriate influence and control over assessors;
- ensures proper procedures are followed;
- ensures summative integrated assessments are correctly administered;
- observes a minimum sample of ten (10) to twenty-five (25) percent of summative assessments;
- gives written feedback to the relevant quality assurer; and
- moderates in case of a dispute between an assessor and a student.

Policy on inclusive education requires that assessment procedures for students who experience barriers to learning be customised and supported to enable these students to achieve their maximum potential.

## **4 PERIOD OF VALIDITY OF INTERNAL CONTINUOUS ASSESSMENT (ICASS)**

The period of validity of the internal continuous assessment mark is determined by the *National Policy on the Conduct, Administration and Management of the Assessment of the National Certificates (Vocational)*.

The internal continuous assessment (ICASS) must be re-submitted with each examination enrolment for which it constitutes a component.

## **5 ASSESSOR REQUIREMENTS**

Assessors must be subject specialists and should ideally be certified as a competent assessor. If the lecturer conducting the assessments has not been declared a competent assessor, an assessor who has been declared competent may be appointed to oversee the assessment process to ensure the quality and integrity of assessments.

## **6 TYPES OF ASSESSMENT**

Assessment benefits the student and the lecturer. It informs students about their progress and helps lecturers make informed decisions at different stages of the learning process. Depending on the intended purpose, different types of assessment can be used.

### **6.1 Baseline assessment**

At the beginning of a level or learning experience, baseline assessment establishes the knowledge, skills, values and attitudes (SKVAs) that students bring to the classroom. This knowledge assists lecturers to plan learning programmes and learning activities.

## 6.2 Diagnostic assessment

This assessment diagnoses the nature and causes of learning barriers experienced by specific students. It is followed by guidance, appropriate support and intervention strategies. This type of assessment is useful to make referrals for students requiring specialist help.

## 6.3 Formative assessment

This assessment monitors and supports teaching and learning. It determines student strengths and weaknesses and provides feedback on progress. It determines if a student is ready for summative assessment.

## 6.4 Summative assessment

This type of assessment gives an overall picture of student progress at a given time. It determines whether the student is sufficiently competent to progress to the next level.

## 7 PLANNING ASSESSMENT

An assessment plan should cover three main processes:

### 7.1 Collecting evidence

The assessment plan indicates which Subject Outcomes and Assessment Standards will be assessed, what assessment method or activity will be used and when this assessment will be conducted.

### 7.2 Recording

Recording refers to the assessment instruments or tools with which the assessment will be captured or recorded. Therefore, appropriate assessment instruments must be developed or adapted.

### 7.3 Reporting

All the evidence is put together in a report to deliver a decision for the subject.

## 8 METHODS OF ASSESSMENT

Methods of assessment refer to who carries out the assessment and includes lecturer assessment, self-assessment, peer assessment and group assessment.

<b>LECTURER ASSESSMENT</b>	The lecturer assesses students' performance against given criteria in different contexts, such as individual work, group work, etc.
<b>SELF-ASSESSMENT</b>	Students assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
<b>PEER ASSESSMENT</b>	Students assess another student or group of students' performance against given criteria in different contexts, such as individual work, group work, etc.
<b>GROUP ASSESSMENT</b>	Students assess the individual performance of other students within a group or the overall performance of a group of students against given criteria.

## 9 INSTRUMENTS AND TOOLS FOR COLLECTING EVIDENCE

All evidence collected for assessment purposes is kept or recorded in the student's Portfolio of Evidence (PoE).

The following table summarises a variety of methods and instruments for collecting evidence. A method and instrument is chosen to give students ample opportunity to demonstrate the Subject Outcome has been attained. This will only be possible if the chosen methods and instruments are appropriate for the target group and the Specific Outcome being assessed.

	METHODS FOR COLLECTING EVIDENCE		
	Observation-based (Less structured)	Task-based (Structured)	Test-based (More structured)
<b>Assessment instruments</b>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Class questions</li> <li>• Lecturer, student, parent discussions</li> </ul>	<ul style="list-style-type: none"> <li>• Assignments or tasks</li> <li>• Projects</li> <li>• Investigations or research</li> <li>• Case studies</li> <li>• Practical exercises</li> <li>• Demonstrations</li> <li>• Role-play</li> <li>• Interviews</li> </ul>	<ul style="list-style-type: none"> <li>• Examinations</li> <li>• Class tests</li> <li>• Practical examinations</li> <li>• Oral tests</li> <li>• Open-book tests</li> </ul>
<b>Assessment tools</b>	<ul style="list-style-type: none"> <li>• Observation sheets</li> <li>• Lecturer's notes</li> <li>• Comments</li> </ul>	<ul style="list-style-type: none"> <li>• Checklists</li> <li>• Rating scales</li> <li>• Rubrics</li> </ul>	<ul style="list-style-type: none"> <li>• Marks (e.g. %)</li> <li>• Rating scales (1-7)</li> </ul>
<b>Evidence</b>	<ul style="list-style-type: none"> <li>• Focus on individual students</li> <li>• Subjective evidence based on lecturer observations and impressions</li> </ul>	<p><b>Open middle:</b> Students produce the same evidence but in different ways.</p> <p><b>Open end:</b> Students use same process to achieve different results.</p>	Students answer the same questions in the same way, within the same time.

## 10 TOOLS FOR ASSESSING STUDENT PERFORMANCE

**Rating scales** are marking systems where a symbol (such as 1 to 7) or a mark (such as 5/10 or 50%) is defined in detail. The detail is as important as the coded score. Traditional marking, assessment and evaluation mostly used rating scales without details such as what was right or wrong, weak or strong, etc.

**Task lists** and **checklists** show the student what needs to be done. They consist of short statements describing the expected performance in a particular task. The statements on the checklist can be ticked off when the student has adequately achieved the criterion. Checklists and task lists are useful in peer or group assessment activities.

**Rubrics** are a hierarchy (graded levels) of criteria with benchmarks that describe the minimum level of acceptable performance or achievement for each criterion. It is a different way of assessment and cannot be compared to tests. Each criterion described in the rubric must be assessed separately. Mainly, two types of rubrics, namely holistic and analytical, are used.

## 11 SELECTING AND/OR DESIGNING RECORDING AND REPORTING SYSTEMS

The selection or design of recording and reporting systems depends on the purpose of recording and reporting student achievement. **Why** particular information is recorded and **how** it is recorded determine which instrument will be used.

Computer-based systems, for example spreadsheets, are cost and time effective. The recording system should be user-friendly and information should be easily accessed and retrieved.

## 12 COMPETENCE DESCRIPTIONS

All assessment should award marks to evaluate specific assessment tasks. However, marks should be awarded against rubrics and not simply be a total of ticks for right answers. Rubrics should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) a student must demonstrate to achieve each level of the rating scale.

When lecturers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a Subject Outcome. The relevant Assessment Standard must be used to create the rubric to assess the task or question. The descriptions must clearly indicate the minimum level of attainment for each category on the rating scale.



### 13 STRATEGIES FOR COLLECTING EVIDENCE

A number of different assessment instruments may be used to collect and record evidence. Examples of instruments that can be (adapted and) used in the classroom include:

#### 13.1 Record sheets

The lecturer observes students working in a group. These observations are recorded in a summary table at the end of each project. The lecturer can design a record sheet to observe students' interactive and problem-solving skills, attitudes towards group work and involvement in a group activity.

#### 13.2 Checklists

Checklists should have clear categories to ensure that the objectives are effectively met. The categories should describe how the activities are evaluated and against what criteria they are evaluated. Space for comments is essential.

## SECTION C: ASSESSMENT IN MATHEMATICAL LITERACY

### 1 SCHEDULE OF ASSESSMENT

At NQF levels 2, 3 and 4, lecturers will conduct assessments as well as develop a schedule of formal assessments that will be undertaken in the year. All three levels also have an external examination that accounts for 75 percent of the total mark. The marks allocated to assessment tasks completed during the year, kept or recorded in a Portfolio of Evidence (PoE) account for the other 25 percent.

The Portfolio of Evidence (PoE) and the external assessment include written components. The practical assessment in Mathematical Literacy, must, where necessary, be subjected to external moderation by Umalusi or an appropriate Education and Training Quality Assurance (ETQA) body, appointed by the Umalusi Council in terms of Section 28(2) of the *General and Further Education and Training Quality Assurance Act, 2001 (Act No. 58 of 2001)*.

### 2 RECORDING AND REPORTING

Mathematical Literacy is assessed according to seven levels of competence. The level descriptions are explained in the following table.

#### *Scale of achievement for the Fundamental component*

RATING CODE	RATING	MARKS (%)
7	Outstanding	80 – 100
6	Meritorious	70 – 79
5	Substantial	60 – 69
4	Adequate	50 – 59
3	Moderate	40 – 49
2	Elementary	30 – 39
1	Not achieved	0 – 29

The programme of assessment should be recorded in the Lecturer's Portfolio of Assessment for each subject. The following should at least be included in the Lecturer's Assessment Portfolio:

- A contents page
- The formal schedule of assessment
- The requirements for each assessment task
- The tools used for each assessment task
- Recording instrument(s) for each assessment task
- A mark sheet and report for each assessment task

The college must standardise these documents.

The student's Portfolio of Evidence (PoE) must at least include:

- A contents page
- The assessment tasks according to the assessment schedule
- The assessment tools or instruments for the task
- A record of the marks (and comments) achieved for each task

Where tasks cannot be contained as evidence in the Portfolio of Evidence (PoE), its exact location must be recorded and it must be readily available for moderation purposes.

**ASSESSMENT OF MATHEMATICAL LITERACY**  
**LEVEL 2**

### 3 INTERNAL ASSESSMENT OF SUBJECT OUTCOMES IN MATHEMATICAL LITERACY – LEVEL 2

#### Topic 1: Numbers

SUBJECT OUTCOME	
<b>Use numbers correctly when working with problems in personal and familiar contexts.</b>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> <li>Numbers are used appropriately in context.</li> <li>Fractions, decimals and percentages are compared in terms of size and used in estimation.</li> <li>Different time notations are compared and understood.</li> </ul>	<ul style="list-style-type: none"> <li>Use numbers to count: order and estimate.</li> <li>Use fractions, decimals and percentages as measures of parts of a whole.</li> <li>Find decimal equivalents of any fraction using a calculator.</li> <li>Convert between decimal fractions and percentages.</li> <li>Write time using conventions: am/pm, 24 hour clock, analogue and digital.</li> <li>Convert between different time notations.</li> </ul>
<p><i>Note: The fractions used in problems should be limited to those fractions that arise naturally in the context of the student – it is anticipated that these will include: <math>\frac{1}{2}</math>; <math>\frac{1}{4}</math>; <math>\frac{3}{4}</math>; <math>\frac{1}{3}</math>; <math>\frac{2}{3}</math>; <math>\frac{1}{10}</math>; <math>\frac{1}{100}</math></i></p>	
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
These Assessment Standards and Learning Outcomes are integrated in all Mathematical Literacy assessment tasks.	

SUBJECT OUTCOME	
<b>Perform calculations correctly to solve problems in personal and familiar contexts.</b>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> <li>Calculations are performed correctly and with confidence.</li> <li>Problems dealing with ratio/proportion, rate and percentage are solved.</li> </ul>	<ul style="list-style-type: none"> <li>Perform calculations correctly by means of paper, mental and calculator methods.</li> <li>Round numbers (round up, down and off) according to the requirements of the context.</li> <li>Apply addition and multiplication facts (distributive and associative properties) to simplify calculations where possible and useful.</li> <li>Estimate to anticipate answers and evaluate the result of a calculation or measurement.</li> <li>Estimate unknowns as necessary to solve problems.</li> <li>Use the following functions on a basic calculator: addition; subtraction; multiplication and division; percentage; memory; and “clear” and “clear all” keys.</li> <li>Solve problems that involve ratio/proportion (linear and inverse) and/or rate and/or percentage.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
These Assessment Standards and Learning Outcomes are integrated in all Mathematical Literacy assessment tasks.	

SUBJECT OUTCOME	
<b>Identify and use appropriate measuring tools and techniques to solve problems in personal and familiar contexts.</b>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> <li>Measuring instruments are selected and used to make direct measurements of length weight; volume/capacity; temperature; and time intervals to levels of precision appropriate to the context.</li> <li>Correct formulae are selected and used to calculate measurements and solve problems.</li> <li>Conversion between units is performed as needed.</li> </ul>	<ul style="list-style-type: none"> <li>Estimate anticipated measurements where possible based on a sense or “feel” for different dimensions (i.e. have a “feel” of dimensions in relation to common objects). <i>Instruments include: ruler; measuring tape; scale; measuring jugs and cups; thermometer; watch or stopwatch.</i></li> <li>Calculate the measurements using formulae as necessary and report.</li> <li>Calculate indirect measurements from information</li> </ul>

<ul style="list-style-type: none"> <li>Rates are appropriately applied and used to solve contextual problems.</li> </ul>	<p>available.</p> <ul style="list-style-type: none"> <li>Perform conversions using known relationships between: mm – cm – m – km; ml – l; g – kg – t; second – minute – hours – day.</li> <li>Calculate values using rates including: conversion rates, e.g. grams to kilograms; consumption rates, e.g. kilometres per litre; distance, time, speed rates e.g.: kilometres per hour; cost rates, e.g. rand per kilogram.</li> <li>Determine rates from given values/relationships.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
These Assessment Standards and Learning Outcomes are integrated in all Mathematical Literacy assessment tasks.	

**Topic 2: Patterns and Relationships**

<b>SUBJECT OUTCOME</b>	
<b>Identify and extend patterns for different relationships in personal and familiar contexts.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>Numerical and geometric patterns are investigated and extended.</li> <li>Patterns are described in words and/or through formulae.</li> <li>Patterns are generated from descriptions of them.</li> </ul>	<ul style="list-style-type: none"> <li>Patterns include: constant difference patterns (arithmetic progressions) e.g. the cost of a number of items; constant ratio patterns (geometric progressions) e.g. fixed deposit bank account with a fixed interest rate; and patterns associated with inverse and direct proportion relationships.</li> <li>Use both the relationship between consecutive terms and the relationship between the term's position and its value to find missing/additional terms in a pattern.</li> <li>Describe patterns in words (spoken and written) and through algebraic descriptions of them (formulae).</li> <li>Generate numerical and geometric patterns from descriptions given in words (instructions) and formulae.</li> </ul>
<b>ASSESSMENT TASK/ACTIVITY:</b>	
Investigation	

<b>SUBJECT OUTCOME</b>	
<b>Identify and use information from different representations of relationships of patterns and relationships to solve problems in personal and familiar contexts.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>Information is identified and selected from different representations of relationships to solve problems.</li> <li>Formulae are used with confidence.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and select information including: dependent variables for given independent variables; independent variables for given dependent variables from the following representations of relationships: tables; graphs; formulae and equations.</li> <li>Use formulae supplied to determine dependent variables for given independent variables and determine independent variables for given dependent variables by performing appropriate operations including basic arithmetic; operations; calculations with exponents, square and cube roots; solving equations.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Investigation	

<b>SUBJECT OUTCOME</b>	
<b>Translate between different representations of relationships in personal and familiar contexts.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>• Representations of relationships are converted from one form to another to reveal features of patterns and relationships to solve problems.</li> <li>• Representations of relationships are selected and developed to solve a problem and/or communicate/illustrate a result.</li> </ul>	<ul style="list-style-type: none"> <li>• Translate between representations of relationships as follows: complete a table of values by reading values from the graph; complete a table of values for formulae and/or descriptions of relationships and plot a graph from the values in a table of values.</li> <li>• Choose and develop a representation from among tables and graphs that most effectively communicate and/or illustrate a result or finding.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Investigation	

### Topic 3: Finance

<b>SUBJECT OUTCOME</b>	
<b>Manage finances with confidence in personal and/or familiar context.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>• Sources of personal income are identified, recorded and managed.</li> <li>• Personal expenses are listed and managed.</li> <li>• Personal finances are planned for and monitored.</li> </ul>	<ul style="list-style-type: none"> <li>• Distinguish between fixed (salary; rental) income and variable (interest; commission; sales) income. <i>Sources of income include salary, wages, commission, gifts and pocket money.</i></li> <li>• Account for how or where income is kept (bank account; cash). <i>Sources of income are categorised as fixed or variable.</i></li> <li>• Records of income are maintained (e.g. recorded in a note book or filed).</li> <li>• Distinguish between fixed expenses (repayments; rent) and variable or occasional expenses (services (electricity, water, sewerage); haircuts; entertainment; food). <i>Expenses include: living expenses (food; rental; clothing etc.); accounts (services – water; electricity; etc); bank/loan repayments; salary/wage deductions; entertainment; savings.</i></li> <li>• Understand the importance of saving for future or occasional expenses. <i>Expenses are categorised as fixed and variable.</i></li> <li>• Records of expenses are maintained (e.g. recorded in a note book or filed).</li> <li>• Develop and maintain income and expenditure statements.</li> <li>• Develop budgets based on previous income and expenditure statements.</li> <li>• Develop a budget for personal activities (e.g. ingredients for a recipe; materials for a DIY project; planning a trip or excursion.)</li> <li>• Explain variations between budgeted and actual income and expenditure.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Control test	

<b>SUBJECT OUTCOME</b>	
<b>Read, interpret and act on financial information presented in documents in a personal and familiar context.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>• Documents are read and appropriate information identified and/or selected.</li> <li>• Information is identified in and selected from documents including: pay slips/bank; statements and accounts; cheques and receipts.</li>   <li>• Information from documents is selected and interpreted to answer questions relating to a context. Financial documents are completed.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify balance on a statement and distinguish between credit and debit.</li> <li>• Identify the following: income/credit and expenses/debit; balance; beneficiaries and recipients; payments due; date/time period.</li> <li>• Identify the minimum payment required on an account.</li> <li>• Determine how much a particular bus, plane or train trip will cost.</li> <li>• Analyse which transactions contribute most significantly to bank charges on a bank statement. <i>Documents include: cheques; withdrawal and deposit slips; other documents related to personal finance (e.g. account application forms).</i></li> <li>• Calculate the credit available on an account.</li> <li>• Distinguish between valid and stale cheques.</li> <li>• Decide which taxi, bus, train or plane trip is most cost and time effective from rates and timetable brochures.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Control test	

#### Topic 4: Space, Shape and Orientation

<b>SUBJECT OUTCOME</b>	
<b>Use and apply the vocabulary of space, shape and orientation appropriately.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>• The vocabulary of space, shape and orientation is applied correctly.</li> </ul>	<ul style="list-style-type: none"> <li>• Know and use the following vocabulary:               <ul style="list-style-type: none"> <li>▪ Space: block; rectangular prism; pyramid; cone; cylinder; sphere; cube; prism; base</li> <li>▪ Shape: rectangle; square; triangle; circle</li> <li>▪ Attributes: length; breadth; height; side; perimeter; diagonal; area; angle; centre; radius; diameter; circumference; volume; perpendicular; parallel; scale; column; row; co-ordinates/grid reference; weight (mass)</li> <li>▪ Representation: grid; map; plan; scale drawing; diagram</li> <li>▪ Time: 24 or 12 hour clocks and conventions</li> </ul> </li> </ul>
<p><i>Note: It is assumed that the knowledge listed in the Assessment Standards will be taught in an integrated way with the other Space, Shape and Orientation Subject Outcomes. The vocabulary listed should be assessed in the context of problems and not as dictionary definitions.</i></p>	
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
These Assessment Standards and Learning Outcomes are integrated in all Mathematical Literacy assessment tasks.	

<b>SUBJECT OUTCOME</b>
<b>Perform space, shape and orientation calculations correctly to solve problems in personal and familiar contexts.</b>

ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> <li>Space, shape and orientation calculations are performed to solve problems in personal contexts.</li> </ul>	<ul style="list-style-type: none"> <li>Calculate the following with appropriate conversions and rounding (see Numbers) <ul style="list-style-type: none"> <li>Area: rectangle; triangle; circle</li> <li>Volume: rectangular prisms; cylinders</li> <li>Time: elapsed time</li> <li>Distance (using scale) and direction</li> </ul> </li> </ul>
<p><i>Note: Space, shape and orientation provide a context for the attainment of the Subject Outcomes, Assessment Standards and Learning Outcomes of the calculations and measurement topic.</i></p>	
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Control test	

SUBJECT OUTCOME	
<b>Read, interpret and use representations to make sense of and solve problems in personal and familiar contexts.</b>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> <li>Information required is read from representations and used.</li> </ul>	<ul style="list-style-type: none"> <li>Use maps (e.g. road maps) to determine location and distance between two positions using the scale of the map.</li> <li>Use plans (e.g. layout and house plans) to determine: dimensions and positions</li> <li>Use diagrams (e.g. assembly diagrams such as those found in manuals and brochures).</li> <li>Identify parts and objects, and follow instructions.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Assignment	

SUBJECT OUTCOME	
<b>Make physical and diagrammatic representations to investigate problems and/or illustrate solutions in personal and familiar contexts.</b>	
ASSESSMENT STANDARDS	LEARNING OUTCOMES
<ul style="list-style-type: none"> <li>Diagrammatic and physical representations of shapes and objects are made to investigate problems.</li> <li>Diagrammatical representations are used to illustrate solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Make 2D scale cut outs of the top view of 3D objects to investigate packing problems (e.g. arranging furniture in a room).</li> <li>Make 3D scale models of objects from 2D plans of the object to visualise the object (e.g. make a model of a house from its plan).</li> <li>Make rough sketches of objects and/or areas in order to make scale drawings (e.g. rough maps and plans).</li> <li>Make maps, plans and diagrams according to scale from rough sketches and/or objects.</li> </ul>
<p><i>Note: In terms of investigation, physical representations – models – are made for two reasons: 3D-scale models made from 2D-diagrams or plans helps with the visualisation of the object and scale models can help to investigate problems and develop solutions.</i></p> <p><i>Modelling – the use of models to investigate problems – is an important skill and attribute of mathematically literate persons.</i></p>	
<b>ASSESSMENT TASK/ACTIVITY:</b>	
Assignment and/or investigation	

### Topic 5: Information Communicated Through Numbers, Graphs and Tables

The philosophy that underlies this topic is to develop in individuals the ability to critically engage with the information (communicated through numbers or graphs and tables) they face so that they can be more effective self-managing individuals, contributing workers, lifelong students and critical citizens.

In order to understand how information (communicated through numbers or graphs and tables) is generated, individuals should have some experience with collecting, organising and interpreting information. However, it is not anticipated that individuals in their daily lives will regularly be involved in this process and so the



Subject Outcomes and Assessment Standards give greater focus to interpreting information than to gathering and/or generating it.

To develop a healthy cynicism toward arguments based on information (communicated through numbers or graphs and tables) individuals should be aware that information can be represented and interpreted (and misrepresented) in different ways.)

<b>SUBJECT OUTCOME</b>	
<b>Collect and organise information to answer questions in personal and familiar contexts.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>Information is collected to answer questions.</li> </ul> <p><i>Notes:</i> Students should recognise that the method of information collection, the sample used, the method(s) used to summarise the information; and the choice of representation will all influence the answer to the initial question. Students should realise that collecting and comparing prices from a range of shops for a possible purchase is as much an information activity as conducting a census.</p> <ul style="list-style-type: none"> <li>Collected information is organised, summarised and represented.</li> </ul> <ul style="list-style-type: none"> <li>Information represented in different ways is interpreted to answer questions.</li> </ul>	<ul style="list-style-type: none"> <li>Develop sets of questions for collecting information, aware that the way in which the questions are posed will influence the answer.</li> <li>Compile and use an information collection tool (e.g. survey; questionnaire; tally list) to collect information.</li> <li>Select appropriate samples from the population for collecting data, aware of the impact that the choice of sample will have on the information collected.</li> </ul> <ul style="list-style-type: none"> <li>Organise information using tables.</li> <li>Summarise information by calculating the mean, median and mode, aware of how the choice of summary statistic will affect the answer to the question.</li> <li>Represent information using: tables pie charts; bar graph; line and broken line graph as appropriate to the information collected, aware of how the choice of representation will affect the impression it creates.</li> <li>Use summarised and/or represented information to develop and substantiate answers to the questions that led to the collection of the information.</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>	
Research task and/or project	

<b>SUBJECT OUTCOME</b>	
<b>Critically interpret information presented (and misrepresented) in various forms in personal and familiar contexts.</b>	
<b>ASSESSMENT STANDARDS</b>	<b>LEARNING OUTCOMES</b>
<ul style="list-style-type: none"> <li>Information represented through graphs, tables and statistics is read and interpreted.</li> <li>Information represented through graphs, tables and statistics is critically analysed.</li> </ul>	<ul style="list-style-type: none"> <li>Read and select information from tables and graphs answer questions.</li> <li>Correctly interpret the meaning of the following statistics in text: mean; median; mode.</li> <li>Recognise how the choice of representation and/or statistic(s) affects the impressions created and conclusion(s) that can be drawn.</li> <li>Ask questions about the information collection, organisation, summarising and representation processes to reveal sources of error, bias or misinterpretation.</li> </ul>

<p>Notes:</p> <p>Students should know that:</p> <ul style="list-style-type: none"> <li>• Pie charts reveal relationships between different characteristics of the information but do not reveal the population or sample size.</li> <li>• Bar graphs reveal the population or sample size but do not show the relationship as effectively.</li> <li>• The choice of scale on the axes and/or the point at which the axes cross, etc. impact on the impression created by the graph.</li> <li>• Tables will often have more information than graphs but trends or patterns are less easy to observe.</li> </ul> <p>Students should know to ask questions about:</p> <ul style="list-style-type: none"> <li>• Which statistic was used in text that uses the word “average”</li> <li>• The range (spread) of the information</li> <li>• What was done with outliers in the information</li> <li>• The size of the sample</li> <li>• How representative the sample is</li> <li>• How the information was grouped</li> <li>• The method of information collection</li> <li>• The neutrality of the information collection process</li> <li>• Whether the information collected was fact or opinion</li> </ul>
<b>ASSESSMENT TASK OR ACTIVITY:</b>
Research task and/or project

#### 4 SPECIFICATIONS FOR EXTERNAL ASSESSMENT IN MATHEMATICAL LITERACY – LEVEL 2

A National Examination is conducted in October or November each year by means of a paper(s) set externally and marked internally. At Level 2 and 3, the examination is moderated internally and at Level 4, the examination is moderated externally. The examination will be structured as follows:

	<b>Knowing 30%</b>	<b>Applying routine procedures in familiar contexts 30%</b>	<b>Applying multi-step procedures in a variety of contexts 20%</b>	<b>Reasoning and reflecting 20%</b>
<b>Numbers 20%</b>	<b>Paper 1 (150 marks)</b>		<b>Paper 2 (150 marks)</b>	
<b>Patterns and relationships 20%</b>				
<b>Finances 20%</b>	<b>Paper 1 is intended to be a basic knowing and routine applications paper</b>		<b>Paper 2 is intended to be an applications and reasoning and reflecting paper</b>	
<b>Space, Shape and Orientation 20%</b>				
<b>Information communicated ... 20%</b>				