



**basic education**

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

# **MATHEMATICAL LITERACY**

# **EXAMINATION GUIDELINES**

**GRADE 12**

**2017**

**These guidelines consist of 18 pages.**

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## 1. INTRODUCTION

The Curriculum and Assessment Policy Statement (CAPS) for Mathematical Literacy outlines the nature and purpose of the subject Mathematical Literacy. This guides the philosophy underlying the teaching and assessment of the subject in Grade 12.

The purpose of these Examination Guidelines is to:

- Provide clarity on the depth and scope of the content to be assessed in the Grade 12 National Senior Certificate (NSC) Examination in Mathematical Literacy.
- Assist teachers to adequately prepare learners for the examinations.

This document deals with the final Grade 12 external examinations. It does not deal in any depth with the School-Based Assessment (SBA).

These Examination Guidelines should be read in conjunction with:

- *The National Curriculum Statement (NCS) Curriculum and Assessment Policy Statement (CAPS): Mathematical Literacy*
- *The National Protocol of Assessment: An addendum to the policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), regarding the National Protocol for Assessment (Grades R–12)*
- The national policy pertaining to the programme and promotion requirements of the National Curriculum Statement, Grades R–12

**2. ASSESSMENT IN GRADE 12****2.1 Overview**

- Question papers for Grades 10 and 11 are set, marked and moderated internally, unless otherwise instructed by provincial departments of education.
- The Grade 12 final end-of-year question papers are set, marked and moderated nationally.

**2.2 Time and mark allocation**

TABLE 1 below shows the number of question papers, stipulated marks and time allocations of the question papers (and control tests) for Grade 12.

**TABLE 1: Number of question papers and control tests with marks and duration for Grade 12**

<b>TERM</b>	<b>GRADE 12</b>	
<b>1</b>	<b>CONTROL TEST</b>	
<b>2</b>	Paper 1 2 hours (100 marks)	Paper 2 2 hours (100 marks)
<b>3</b>	Control Test	Control Test
	Paper 1 3 hours (150 marks)	Paper 2 3 hours (150 marks)
<b>4</b>	<b>EXTERNAL EXAMINATIONS</b>	
	Paper 1 3 hours (150 marks)	Paper 2 3 hours (150 marks)

### 2.3 Format of the question papers

The table below shows a summary of the differences between Paper 1 and Paper 2.

**TABLE 2: Summary of the differences between Paper 1 and Paper 2**

		<b>PAPER 1</b>	<b>PAPER 2</b>
<b>Intention</b>		'Basic skills' paper → assesses proficiency of content and/or skills	'Applications' paper → assesses ability to use both mathematical and non-mathematical techniques/ considerations to explore familiar and unfamiliar contexts.
<b>Structure and scope of content and/or skills</b>		<p><b>5 questions</b></p> <p>One question, with short contexts, that can be integrated over all topics but having only level-1 type questions.</p> <p>Followed by FOUR questions which deal with contexts relating to each of the following topics:</p> <ul style="list-style-type: none"> <li>• Finance</li> <li>• Measurement</li> <li>• Maps, plans and other representations of the physical world</li> <li>• Data handling</li> </ul> <p>The fifth question integrates content of all these topics.</p> <p>Likelihood will be examined in the context or one or more of the other questions.</p> <p>Each question can contain more than one context.</p>	<p><b>4 or 5 questions</b></p> <p>Each question deals with contexts drawing integrated content from all the topics:</p> <ul style="list-style-type: none"> <li>• Finance</li> <li>• Measurement</li> <li>• Maps, plans and other representations of the physical world</li> <li>• Data handling</li> </ul> <p>Likelihood will be examined in the context or one or more of the other questions.</p> <p>Each question can contain more than one context.</p>
<b>Taxonomy levels</b>	<b>Level 1</b>	60%	
	<b>Level 2</b>	35%	25%
	<b>Level 3</b>	5%	35%
	<b>Level 4</b>		40%
<b>Contexts</b>		'Familiar', i.e. limited to the contexts listed in the CAPS document.	Both 'familiar' and 'unfamiliar', i.e. not limited to the contexts listed in the CAPS document.

## 2.4 Contexts

The aim of Mathematical Literacy is to help learners develop the ability to use a variety of mathematical and non-mathematical techniques and/or considerations to explore and make sense of both familiar and unfamiliar real-life contexts. Therefore it is essential that assessment items and examinations draw on realistic and authentic contexts. Learners should be asked to make sense of newspaper articles, real bank statements, real plans and other authentic resources, rather than contrived problems containing only a semblance of reality.

## 2.5 Weighting of topics

The following minimum weightings are stipulated for each topic in examinations:

**TABLE 3: Minimum weighting per topic**

	TOPIC	WEIGHTING (%)
<b>Basic skills topics</b>	Interpreting and communicating answers and calculations	No weighting is provided for these topics. Rather, they will be assessed in an integrated way throughout the Application Topics.
	Numbers and calculations with numbers	
	Patterns, relationships and representations	
<b>Application topics</b>	Finance	35% ( $\pm 5\%$ )
	Measurement	20% ( $\pm 5\%$ )
	Maps, plans and other representations of the physical world	15% ( $\pm 5\%$ )
	Data handling	25% ( $\pm 5\%$ )
	Likelihood	Minimum 5%

## 2.6 Distribution of marks according to taxonomy levels

TABLE 4 shows the percentage of marks to be allocated to the different taxonomy levels for Grade 12.

**TABLE 4: Percentage of marks to be allocated to the different assessment taxonomy levels**

The four levels of the Mathematical Literacy assessment taxonomy	GRADE 12		
	PAPER 1	PAPER 2	OVERALL ALLOCATION
Level 1: Knowing	60% $\pm$ 5%		30% $\pm$ 5%
Level 2: Applying routine procedures in familiar contexts	35% $\pm$ 5%	25% $\pm$ 5%	30% $\pm$ 5%
Level 3: Applying multi-step procedures in a variety of contexts	5%	35% $\pm$ 5%	20% $\pm$ 5%
Level 4: Reasoning and reflecting	0	40% $\pm$ 5%	20% $\pm$ 5%

## 2.7 Order of the questions in the question paper

### Paper 1:

QUESTION 1 (30 marks  $\pm$  5 marks) Short context – mixed questions, ONLY Level 1.

QUESTION 2 – Finance

QUESTION 3 – Measurement

QUESTION 4 – Maps and Plans

QUESTION 5 – Data Handling

Probability will be dispersed in all five questions, where it is appropriate.

### Paper 2:

**Four or five questions will be set. All contexts have mixed questions.**

A concerted effort will be made to place the questions in order of level of difficulty, however, it must be noted that 'level of difficulty' is subjective.

## 3. ELABORATION OF THE CONTENT FOR GRADE 12 (CAPS)

Different taxonomy levels, according to topics, and some familiar topics/content applicable to Paper 1 follow on the next pages.

### 3.1 Taxonomy levels according to topics

The intention of this section is to provide greater clarity about the types of questions, calculations, applications and/or contexts that fall into the different levels of the Mathematical Literacy taxonomy. **It is essential to emphasise that the tables below do not provide a comprehensive or definitive list of all possible questions, calculations and/or tasks associated with the four levels of the taxonomy. They contain examples of a *small selection* of questions, calculations and/or tasks from the different topics in the curriculum that can be associated with the different levels.** These examples are meant to illustrate more clearly the difference between the demands of a question at the different levels of the taxonomy.

TOPIC: FINANCE				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Financial documents and tariff systems</b>	<ul style="list-style-type: none"> <li>* Read information directly from an electricity bill (e.g. <i>date; name of account holder; electricity consumption for the month</i>).</li> <li>* Show how the 'Total Due' on the electricity bill has been calculated by adding together all items listed on the bill.</li> <li>* Show how the VAT value listed on the electricity bill has been calculated when told that VAT is 14% of the value excluding VAT (that is, calculating a direct percentage of an amount).</li> </ul>	<ul style="list-style-type: none"> <li>* Use a given formula to show how the amount charged for electricity consumption shown on the bill has been determined.</li> <li>* Complete a table of values to show the cost of various quantities of electricity consumption.</li> <li>* Use the table of values to construct a graph to represent the cost of electricity consumption.</li> <li>* Increasing/Decreasing by a given percentage</li> </ul>	<ul style="list-style-type: none"> <li>* Replicate the calculations/values shown on the bill for a different electricity consumption value.</li> <li>* Without any scaffolded or guiding questions, draw a graph to represent the cost of electricity on a particular electricity system.</li> </ul>	<ul style="list-style-type: none"> <li>* Choose an appropriate strategy (e.g. <i>tables of values, graphs, and interpreting points of intersection</i>.) to compare the electricity costs of two different electricity systems and make a decision about which system is the most cost effective for a user with particular needs.</li> <li>* Analyse a newspaper article describing proposed increases in electricity tariffs and make deductions about the implications of these increases for consumers.</li> <li>* Rework the answer if the initial conditions change.</li> </ul>
<b>Income, expenditure, profit/loss, income-expenditure statements and budgets</b>	<ul style="list-style-type: none"> <li>* Classify items on an income and expenditure statement as fixed, variable and occasional income and expenditure.</li> <li>* Show how total income, expenditure and profit/loss values on an income and expenditure statement or budget have been determined.</li> </ul>	<ul style="list-style-type: none"> <li>* Construct an income and expenditure statement for an individual or a household.</li> <li>* Construct a budget for a small household project.</li> </ul>	<ul style="list-style-type: none"> <li>* Construct an income and expenditure statement for a business that includes a comparison of income and expenditure values over a two-year period.</li> <li>* Construct a budget for a large fundraising event.</li> <li>* Revise a budget if conditions change</li> </ul>	<ul style="list-style-type: none"> <li>* Analyse a budget for a household or business and make recommendation as to how the expenditure should be changed to improve the finances of the household/business.</li> <li>* Compare income and expenditure values for a business or organisation over a two-year period and describe differences and/or trends.</li> <li>* Analyse projected versus actual budget values and explain differences.</li> </ul>



TOPIC: FINANCE				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Cost price and selling price</b>	<ul style="list-style-type: none"> <li>* Determine the cost price of an item by adding together given cost values for the component parts of the item.</li> <li>* Determine the income generated from the sale of an item based on a given sales price and given sales volumes.</li> </ul>	<ul style="list-style-type: none"> <li>* Compare the difference between the cost and selling price of an item by calculating the percentage mark-up in price of the selling price from the cost price.</li> <li>* Construct a table of values to show how the cost price of an item changes depending on the number of items made.</li> <li>* Draw a graph from a given table.</li> </ul>	<ul style="list-style-type: none"> <li>* Draw graphs, without scaffolded or guiding questions, to show the costs involved in producing an item and money generated from the sale of the item.</li> <li>* Investigate, through research, the various costs involved in manufacturing an item, and decide on an appropriate selling price for the item.</li> <li>* Calculate profit if only one of income or expenses is given and the other still needs to be calculated.</li> </ul>	<ul style="list-style-type: none"> <li>* Conduct market research on a group of people and use the results of the research to defend a particular selling price for a product.</li> <li>* Interpret graphs showing the cost of production and income generated from the production and sale of an item, and use the graphs to make decisions about the business (e.g. <i>how many items must be manufactured and sold to cover all production costs</i>).</li> </ul>
<b>Break-even analysis</b>	<ul style="list-style-type: none"> <li>* Define 'break-even' in the context in which a problem is posed (e.g. <i>in the context of a business, 'break-even' refers to the income that must be generated to cover all expenses</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Determine the break-even point of a business from a given table of income and expenditure values.</li> <li>* When given two graphs that intersect, read off the value of the independent and dependent variables at the break-even point (point of intersection) of the graphs.</li> </ul>	<ul style="list-style-type: none"> <li>* Draw two or more graphs and identify the point of intersection of those two graphs in order to compare different options (e.g. <i>income vs. expenditure; cellphone contract options; electricity tariff system</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Explain the relevance of the break-even point of two graphs in relation to the problem or context for which the graphs have been drawn.</li> <li>* Explain the meaning of different regions on a graph (that is, between different points of intersection) in relation to the problem or context for which graphs have been drawn.</li> <li>* Rework the answer if the initial conditions change.</li> </ul>
<b>Interest, bank loans and investments</b>	<ul style="list-style-type: none"> <li>* Define 'interest' and the 'interest rate'.</li> <li>* Identify interest rate values quoted on bank statements.</li> </ul>	<ul style="list-style-type: none"> <li>* Perform simple interest calculations manually (that is, without the use of a calculator) over multiple time periods.</li> <li>* Read values off graphs showing simple and compound investment scenarios.</li> <li>* Calculate compound interest compounded annually.</li> <li>* Increase or decrease a given amount by a certain percentage.</li> </ul>	<ul style="list-style-type: none"> <li>* Perform compound interest calculations manually (that is, without the use of a formula) over multiple time periods.</li> <li>* Complete a table that models a loan scenario and include consideration of a monthly interest calculation, monthly repayment, and monthly amount outstanding on the loan.</li> <li>* Draw graphs from given tables of values to represent loan scenarios.</li> <li>* Calculate compound growth/decline</li> </ul>	<ul style="list-style-type: none"> <li>* Construct a model of a loan or investment scenario without scaffolded or guiding questions.</li> <li>* Investigate and describe the impact of increasing the monthly repayments on the total cost of the loan/investment.</li> <li>* Investigate and describe the impact of making a lump sum payment into a loan/investment during the first half of the loan/investment period on the total cost of the loan/investment.</li> <li>* Rework the answer if need be.</li> </ul>

TOPIC: FINANCE				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Inflation</b>	<ul style="list-style-type: none"> <li>* Define the term 'inflation'.</li> </ul>	<ul style="list-style-type: none"> <li>* Show by calculation how the price of an item might change if affected by inflation (that is, increasing a value by a percentage).</li> </ul>	<ul style="list-style-type: none"> <li>* Calculate compound growth/decline.</li> </ul>	<ul style="list-style-type: none"> <li>* Show by calculation how the price of an item might change if affected by inflation over multiple time periods</li> <li>* Use knowledge of inflation rates to argue and justify a particular salary</li> <li>* Rework the answer if the initial conditions change.</li> </ul>
<b>Taxation</b>	<ul style="list-style-type: none"> <li>* Identify the name of the employee listed on a pay slip and the month for which the pay slip has been issued.</li> <li>* Identify the employee's monthly salary.</li> <li>* State how the employees 'taxable income' has been determined by referring to the salary and deduction values shown on the payslip.</li> <li>* Define the terms 'gross pay', 'net pay', 'deductions', and 'taxable income' shown on a payslip.</li> </ul>	<ul style="list-style-type: none"> <li>* Read appropriate tax values from given income tax deduction tables.</li> <li>* Identify the income tax bracket into which an individual falls based on a given monthly and/or annual income.</li> </ul>	<ul style="list-style-type: none"> <li>* Use formulae provided on income tax bracket tables to calculate an individual's annual and monthly income tax.</li> <li>* Investigate through calculation how the tax rebate value is determined.</li> <li>* Calculate compound growth/decline.</li> </ul>	<ul style="list-style-type: none"> <li>* Compare income tax tables over different financial periods and explain how an individual's tax may have changed from one period to another.</li> <li>* Investigate the effect that an increase in salary has on increased tax payments.</li> <li>* Analyse graphs showing changes in income tax over different time periods and explain differences</li> </ul>
<b>Exchange rates</b>	<ul style="list-style-type: none"> <li>* Identify the exchange rate between two currencies from a given table or rate board.</li> </ul>	<ul style="list-style-type: none"> <li>* Use a given exchange rate to determine the value of one currency for a specific quantity of another currency.</li> </ul>	<ul style="list-style-type: none"> <li>* Perform currency conversion calculations, taking into account currency exchange fees charged by banks and other financial institutions.</li> </ul>	<ul style="list-style-type: none"> <li>* Explain how the Big Mac Index' provides a tool for determining the worth of one currency in relation to another currency;</li> <li>* Explain why it is not necessarily accurate when a South African tourist in America exclaims that a can of cool drink that costs \$2,00 (R14,00) is much cheaper in South Africa.</li> </ul>

TOPIC: MEASUREMENT				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Conversions</b>	<ul style="list-style-type: none"> <li>* Convert between mm, cm, m and km.</li> <li>* Convert between g and kg.</li> <li>* Convert between ml and litres.</li> </ul>	<ul style="list-style-type: none"> <li>* Convert from °C to °F (and vice versa) using given formulae.</li> <li>* Convert between different systems using given conversion factors (e.g. <i>convert from m<sup>3</sup> to litres using the fact that 1 m<sup>3</sup> = 1 000 litres</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Convert between different systems using given conversion tables, where it is necessary to first identify and then use an appropriate conversion factor from the table.</li> </ul>	<ul style="list-style-type: none"> <li>* Compare solutions to a problem expressed in different units and make a decision about what unit is the most appropriate or useful for the particular context in which the problem is posed.</li> </ul>
<b>Measure length, weight, volume and temperature</b>	<ul style="list-style-type: none"> <li>* Measure accurately using appropriate measuring instruments (e.g. <i>ruler; tape measure; kitchen scale; jug</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Perform calculations involving measured values (e.g. <i>working out how much longer one piece of wood is than another piece</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Use measured values in conjunction with other content or skills to complete a larger project (e.g. <i>measure the dimensions of a bedroom to determine the running metres of carpet needed for the floor</i>).</li> <li>* Make adjustments to calculated values to accommodate measurement errors and inaccuracies due to rounding.</li> </ul>	<ul style="list-style-type: none"> <li>* Make decisions about the need for accuracy when performing a measurement in a particular context.</li> <li>* Interpret a measured value and make a decision based on the value (e.g. <i>measure the temperature of a child and decide if the child should be taken to hospital</i>).</li> </ul>
<b>Perimeter, area and volume</b>	<ul style="list-style-type: none"> <li>* Define terms (e.g. <i>'area', 'perimeter', 'volume', 'radius'</i>).</li> <li>* Identify from a list of given formulae which formulae relate to perimeter calculations, which relate to area calculations, etc.</li> <li>* Determine the radius of a circle from a given diameter.</li> <li>* Know that area is expressed in units<sup>2</sup> (e.g. cm<sup>2</sup>) and volume in units<sup>3</sup> (e.g. cm<sup>3</sup>).</li> <li>* Know and use formulae for perimeter, area and volume.</li> </ul>	<ul style="list-style-type: none"> <li>* Calculate perimeter, area and volume by substituting given values into given formulae.</li> <li>* Describe relationships between input and output values in a table of data concerning space, shape and measurement.</li> </ul>	<ul style="list-style-type: none"> <li>* Perform preliminary calculations to determine dimensions required in perimeter/area/volume calculations and then calculate perimeter/area/volume (e.g. <i>when asked to determine the volume of concrete needed for the foundations of a house, interpret top view plans of the foundation trench of a house, use the plans to determine the dimensions of the trench, and then calculate the volume of the trench</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Use perimeter, area and/or volume calculations to complete a project, where it is not stated specifically what type of calculation is required (e.g. <i>when asked to determine the amount of paint needed to paint a building, first interpret plans to determine dimensions of the walls, then calculate the surface area of the walls, then use the paint conversion ratio on the back of the paint tin to determine the required number of litres of paint required</i>).</li> </ul>
<b>Time</b>	<ul style="list-style-type: none"> <li>* Read time values on a clock or watch.</li> <li>* Converting between seconds, minutes and hours</li> </ul>	<ul style="list-style-type: none"> <li>* Record time values and perform calculations with time.</li> </ul>	<ul style="list-style-type: none"> <li>* Interpret time values on a bus timetable to determine departure, arrival and travelling times.</li> </ul>	<ul style="list-style-type: none"> <li>* Perform time calculations in conjunction with maps and other travel resources in order to plan a trip (e.g. <i>determine approximate travelling times, appropriate stopping points for refuelling, the time to start a journey in order to arrive at a destination at a particular time</i>).</li> </ul>

TOPIC: MAPS, PLANS AND OTHER REPRESENTATIONS OF THE PHYSICAL WORLD				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Scale</b>	<ul style="list-style-type: none"> <li>* Explain the meaning of a given scale (e.g. <i>explain what the scale 1 : 100 means in terms of the measurements on a plan and actual dimensions</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Use a given scale to determine actual measurements when given measured values, or measured values from given actual values.</li> </ul>	<ul style="list-style-type: none"> <li>* Use a given scale in conjunction with measurement on a plan/map to determine length/dimensions.</li> <li>* Determine the scale of a map or plan.</li> <li>* Use a given scale in conjunction with other content or skills to complete a project (e.g. <i>use a given scale to determine the dimensions in which to draw a 2-dimensional plan of an object, and then draw the plan</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Critique the scale in which an object has been drawn and offer an opinion as to a more appropriate scale.</li> <li>* Decide on an appropriate scale to which to draw a picture or build a model, and then complete the project.</li> </ul>
<b>Maps</b>	<ul style="list-style-type: none"> <li>* Identify the labels/names of national roads (e.g. N3) that must be travelled on to travel between two locations.</li> <li>* Identify the names of the towns on the route between two locations.</li> <li>* Identify the scale of a map.</li> </ul>	<ul style="list-style-type: none"> <li>* Identify the position of two locations on a map and use given distance values on the map to determine the travelling distance between the two locations.</li> <li>* Interpret a given set of directions and describe what location the directions lead to.</li> <li>* Provide a set of directions to travel between two locations in a town using street names.</li> </ul>	<ul style="list-style-type: none"> <li>* Use a map in conjunction with a distance chart to determine the shortest route to travel between two locations.</li> <li>* Identify a possible route between two locations on a map, measure the distance between the locations, and use a given scale to estimate the distance between the two locations.</li> <li>* Estimate travelling times between two or more locations based on estimated travelling speed and known or calculated distances.</li> </ul>	<ul style="list-style-type: none"> <li>* Critique a proposed travel route in relation to distance, estimated travelling times, etc. and suggest and justify possible alternative routes.</li> <li>* Use maps in conjunction with other travel resources (e.g. <i>exchange rate information; distance chart; bus timetable</i>) and financial information (e.g. <i>fare tables; petrol price</i>) to plan and cost a trip.</li> <li>* Make decisions regarding appropriate stopping points during a journey based on considerations of fatigue, petrol consumption travelling time, etc.</li> </ul>
<b>Plans</b>	<ul style="list-style-type: none"> <li>* Identify the scale of a plan.</li> <li>* Define terms (e.g. <i>floor plan; elevation plan; layout plan; etc.</i>).</li> <li>* Read off the value(s) of given dimensions on the plan (e.g. <i>the length of the wall is 4 m</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Use a given key to identify the number of windows/doors/rooms shown on a plan for a building.</li> <li>* Identify on which plan a particular structure is shown (e.g. <i>the door is shown on the North elevation plan</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Measure dimensions on a plan and use a given scale to determine actual dimensions.</li> <li>* Use plans in conjunction with other content, skills or applications to complete a project (e.g. <i>interpret plans to determine the dimensions of a room in order to establish the amount of carpet needed for the floor of the room</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Describe an item represented in a plan.</li> <li>* Critique the design of a structure shown on a plan.</li> <li>* Decide on an appropriate scale in which to draw a plan and then draw the plan.</li> <li>* Make connections between plans showing different views of the same structure (e.g. <i>explain which wall shown on a floor plan is represented on a particular side view plan</i>).</li> </ul>

TOPIC: MAPS, PLANS AND OTHER REPRESENTATIONS OF THE PHYSICAL WORLD				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Models</b>	* Measure the dimensions of a structure for which a model or 2D drawing will be constructed.	* Build a model using a given table of dimensions or a given net/cut-out.	* Use a given scale to determine the dimensions in which to build a model or make a 2D drawing, and complete the project. * Build a model and use the model in conjunction with other content, skills or applications to solve a problem (e.g. <i>build a model of a container and use the model to investigate different types of packaging arrangements; or build a model of a container and determine the surface area and volume of the model to investigate the amount of storage space available in the container</i> ).	* Decide on an appropriate scale in which to build a model or make a 2D drawing, use the scale to determine dimensions, and complete the project. * Construct and compare two models in terms of storage space and materials used and make a decision about which model will be the better choice for packaging an item. * Analyse a model and critique the layout of the structure shown in the model.

TOPIC: DATA HANDLING				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
<b>Developing questions and collecting data</b>	* Read information directly from a given questionnaire/survey (e.g. <i>the name of the organisation for which the questionnaire is being conducted</i> ). * Complete a given questionnaire.	* Conduct a given questionnaire/survey with a group of people.	* Decide on appropriate questions to include on a questionnaire/survey, construct and then conduct the questionnaire/survey.	* Critique the questions/layout of a questionnaire/survey.
<b>Classifying and organising data</b>	* Sort data from smallest to biggest. * Count the number of values in a data set. * State the difference between categorical data and numerical data; discrete and continuous data. * Read information from frequency tables.	* Sort data according to two categories (e.g. <i>sort a set of data separately for females and males</i> ). * Complete a given frequency table. * Calculate percentage values to represent the relative sizes of different categories of data.	* When given a raw set of data, sort the data, decide on appropriate intervals (if necessary), and construct a frequency table to organise the data. If necessary, use the frequency table to draw an appropriate graph to represent the data.	* Make a deduction about whether collected information is biased or valid based on the structure of instrument used to collect the data and the way in which the data was collected. * Explain with justification whether data is discrete or continuous. * Analyse data organised in tables and make deductions about trends in the data.

<b>TOPIC: DATA HANDLING</b>				
<b>Section</b>	<b>Level 1: Knowing</b>	<b>Level 2: Applying routine procedures in familiar contexts</b>	<b>Level 3: Applying multi-step procedures in a variety of contexts</b>	<b>Level 4: Reasoning and reflecting</b>
<b>Measuring data/ Summarising data</b>	<ul style="list-style-type: none"> <li>* Identify the maximum and minimum values in a set of data.</li> <li>* Identify the mode for arranged data.</li> <li>* Identify the median for odd data that has already been arranged.</li> </ul>	<ul style="list-style-type: none"> <li>* Calculate mean and range.</li> <li>* Calculate the median for even data.</li> <li>* Calculate the median if the data is not arranged.</li> <li>* Calculate the quartile values for arranged data.</li> <li>* Calculate the inter-quartile range when quartile values are given.</li> </ul>	<ul style="list-style-type: none"> <li>* Calculate the mean, median and modal average for a set of data and decide with reasons which average provides the most accurate representation of the data.</li> <li>* Use data presented on a graph to determine the mean, median, mode and range of a data set.</li> <li>* Calculate the quartile values for data that is not arranged.</li> <li>* Calculate the inter-quartile range when the quartile values are not given.</li> </ul>	<ul style="list-style-type: none"> <li>* Analyse measures of central tendency and spread and make deductions about trends in the data.</li> <li>* Interpret tables and charts showing percentile/quartile values and explain what those values represent in relation to the scenario represented in the table/chart.</li> <li>* Compare measures of central tendency/spread calculated for two or more sets of data and use these measures to explain differences between the data sets.</li> </ul>
<b>Representing data</b>	<ul style="list-style-type: none"> <li>* Read values directly from the values provided on graphs.</li> </ul>	<ul style="list-style-type: none"> <li>* Draw a specified graph from a given table of data.</li> <li>* Estimate values from given graphs.</li> </ul>	<ul style="list-style-type: none"> <li>* Organise data using an appropriate table, decide on the most appropriate format for representing the data (that is, actual values or percentages), and decide on the most appropriate graph needed to represent the data.</li> </ul>	<ul style="list-style-type: none"> <li>* Analyse graphs and make deductions about trends in the data and predictions for the future.</li> <li>* Identify and describe the use and misuse of statistics and make justified recommendations.</li> </ul>

TOPIC: PROBABILITY				
Section	Level 1: Knowing	Level 2: Applying routine procedures in familiar contexts	Level 3: Applying multi-step procedures in a variety of contexts	Level 4: Reasoning and reflecting
Expressions of probability/ Prediction/ Evaluate expressions of probability	<ul style="list-style-type: none"> <li>* Identify the percentage chance of rain for a particular town from a weather report in a newspaper.</li> <li>* State the meaning of terms associated with probability (e.g. <i>event</i>; <i>outcome</i>).</li> </ul>	<ul style="list-style-type: none"> <li>* Express the probability of an event using fraction, percentage and decimal notation.</li> <li>* Identify all of the possible outcomes of a particular event (e.g. <i>rolling a dice</i>; <i>gambling game</i>).</li> <li>* Explain whether or not a particular rainfall prediction indicates that it is more or less likely to rain.</li> </ul>	<ul style="list-style-type: none"> <li>* Conduct an experiment to compare the experimental probability of an event to its theoretical probability.</li> <li>* Identify appropriate values from a given table of data values (e.g. <i>on motor vehicle fatalities in South Africa</i>) and express the probability of certain events shown in the table.</li> <li>* Develop a game involving probability and play the game with another learner in the class.</li> <li>* Design simple contingency tables and use them to calculate probabilities.</li> <li>* Draw tree diagrams and use them to calculate probabilities</li> </ul>	<ul style="list-style-type: none"> <li>* Analyse a table of rainfall data for a town and make predictions about the chance of rain in that town during a particular month during the year.</li> <li>* Explain whether the statement 'if I take the same lottery numbers every week then my chances of winning increase' makes sense.</li> <li>* Critique the use of references to probability values in newspaper articles.</li> <li>* Analyse a table showing risk assessment profiles of people in different age groups and explain why particular age groups are classified as higher risks than others.</li> <li>* Analyse a game involving probability and make a deduction about the fairness of the game.</li> </ul>

## 3.2 Some familiar topics

<b>SOME FAMILIAR TOPICS</b>		
<b>FINANCE</b>	<b>Financial documents and tariff systems</b>	Household bills; shopping documents; banking documents; household budgets Documents relating to workplace and small business finance Documents relating to national/global and more complex financial topics Municipal tariffs, telephone tariffs; transport tariffs – two or more comparisons
	<b>Income, expenditure, profit/loss, income- and expenditure statements and budgets</b>	Small business – baking bread, tuck shop, street vendor, flea-market stall, cellphone container; garden services; painting; washing cars, catering; crèche; Personal income and expenditure Business and/or workplace income and expenditure Income and expenditure for larger organisations
	<b>Cost price and selling price</b>	Small business – baking bread, tuck shop, street vendor, flea-market stall, cellphone container; garden services; painting; car wash, catering; crèche;
	<b>Break-even analysis</b>	Small home industry Small business Subsistence farming Tariff systems – electricity, telephone, rental options, etc.
	<b>Interest bank loans and investments</b>	Hire purchase agreements and loans Investments – fixed deposit accounts only Bank accounts with a changing balance Other investments – retirement annuities, funeral plans, etc. All banking topics – credit cards, loans, etc.
	<b>Inflation</b>	Influence of inflation on personal/household, business and global financial activities
	<b>Taxation</b>	VAT, UIF, Personal Income Tax
	<b>Exchange rates</b>	Planning trips/holidays in other countries



<b>MEASUREMENT</b>	<b>Conversions</b>	Household, school and wider community projects – baking, cooking, catering, building, etc.
	<b>Measure length, weight, volume and temperature</b>	Household, school and wider community projects – baking, cooking, catering, building, etc.
	<b>Perimeter, area and volume</b>	Household, school and wider community projects – baking, cooking, catering, building, etc.
	<b>Time</b>	Household, school and wider community projects – baking, cooking, catering, building, etc.
	<b>Maps and Scales</b>	Maps showing: <ul style="list-style-type: none"> <li>• Seating plan and/or layout of a classroom</li> <li>• Layout of buildings and or sports fields at a school</li> <li>• Layout of stores in shopping centres</li> <li>• Seating plans in cinemas and sport stadiums, examinations, weddings, matric dances, etc.</li> <li>• Street maps with and without a grid reference</li> <li>• National and provincial road and rail maps</li> <li>• Strip charts showing distance on a portion of road</li> <li>• Elevation maps – e.g. comrades marathon route</li> <li>• Residential or housing estate</li> </ul>
	<b>Plans</b>	Instruction and assembly diagrams containing words and/or pictures Also all the contexts covered in Maps and Scales
	<b>Models</b>	Packaging containers – fruit juice containers, chocolate boxes, etc.

<b>DATA HANDLING</b>	<b>Classifying and organising data</b>	Test and exam results School sports results
	<b>Summarising data</b>	National and Provincial:
	<b>Representing data</b>	<ul style="list-style-type: none"> <li>• Health statistics</li> <li>• Education statistics</li> <li>• Accidents</li> <li>• Population</li> <li>• Historical inflation and/or exchange rate data</li> <li>• Growth charts for babies and children</li> </ul>
<b>PROBABILITY</b>	<b>Expressions of probability/Prediction/Evaluate expressions of probability</b>	Games with coins and dice Weather prediction Pregnancy test/drug test National lottery gambling scenarios – PowerBall, slot machines, etc. Risk assessments – insurances Newspaper articles

#### **4. CONCLUSION**

This examination guidelines document is meant to articulate the assessment aspirations espoused in the CAPS document. It is therefore not a substitute for the CAPS document which educators should teach to.

Qualitative curriculum coverage as enunciated in the CAPS cannot be over-emphasised.