



SENIOR PHASE POLICY: MATHEMATICS

This policy is subject to the requirements of the Education Department and the assessment policy of the school.

PLANNING

- Planning is done for the school year and should be finalized before the beginning of the new school year, but not later than the first Friday of the first term.
- Planning includes the development of a learning programme, work schedule and lesson plan.
- All the educators in the Senior Phase should participate in the planning session. The educators in a grade group especially should work together closely.
- The requirements for Mathematics as set by the Education Department should be met throughout. To avoid confusion or lack of clarity, existing documents should be adapted as changes are brought about by the Education Department.
- The head of department for the Senior Phase should approve the learning programme, work schedule, lesson plan and assessment tasks before the principal or his or her deputies send them for processing.
- All the Senior Phase educators should send their planning for Mathematics to the head of the department daily for monitoring. Learners' workbooks and assessment tasks should be sent along sporadically or as requested from time to time by the head of the department.
- The head of department for the Senior Phase and/or the principal should request weekly or daily planning files for monitoring as deemed necessary.
- Educators should make provision on their planning sheets for intervention and indicate how learners with barriers for learning are involved.
- Planning sheets need not be similar for all the grades or classes, as long as the information referred to above as well as the learning outcomes, time per day, activities and resources are indicated.



THE DEVELOPMENT OF ASSESSMENT TASKS:

- Assessment is an integral part of teaching and learning and should be included at all levels of planning.
- Assessment should be reliable and continuous.
- Assessment should be transparent, so that both educator and learner know exactly what the expectations are for each task.
- Assessment tasks should be developed as prescribed by the Education Department and the assessment policy of the school should be adhered to.
- Educators in each grade group should work together to develop assessment tasks. Work should be done on a rotation basis. All the educators in each grade group should preferably get a turn to develop the documents.
- Assessment tasks, as well as the applicable learning programme, work schedule and lesson plan should be submitted to the head of the department for approval. Where possible memoranda should be attached.
- Assessment tasks, lesson plans, etc. should preferably be ready for monitoring during the last week of the previous term, but not later than the first school day of the term in which it should be completed.
- Learners' performance should be recorded as a code for the assessment task.
- Where necessary comments may be written for support purposes.
- Assessment tasks should be typed neatly before being submitted for approval.
- In the case of absence the learner should be allowed to complete an assessment task later. (A written excuse from the learner's parent or guardian or a medical certificate is required.)
- Educators should inform a learner's parents in writing if the learner still has not completed assessment tasks after repeated requests. These letters should be signed by the head of the department and a copy should be placed in the learner's profile and/or the educator's intervention file.

ASSESSMENT

INTRODUCTION

Assessment is a continuous planned process of identifying, gathering and interpreting information regarding the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching. Assessment should be both informal and formal. In both cases regular feedback should be provided to learners to enhance their learning experience. This will assist the learner to achieve the minimum performance level of 40% to 49% required in Mathematics for promotion purposes.



Types of assessment

The following types of assessment are very useful in Mathematics; as a result, Educators are encouraged to use them to serve the purpose associated with each.

Baseline assessment: Mathematics Educators who might want to establish whether their learners meet the basic skills and knowledge levels required to learn a specific Mathematics topic will use baseline assessment. Knowing learners' level of proficiency in a particular Mathematics topic enables the teacher to plan her/his Mathematics lesson appropriately and to pitch it at the appropriate level. Baseline assessment, as the name suggests, should therefore be administered prior to teaching a particular Mathematics topic. The results of the baseline assessment should not be used for promotion purposes.

Diagnostic assessment: It is not intended for promotion purposes but to inform the teacher about the learner's Mathematics problem areas that have the potential to hinder performance. Two broad areas form the basis of diagnostic assessment: content-related challenges where learners find certain difficulties to comprehend, and psychosocial factors such as negative attitudes, Mathematics anxiety, poor study habits, poor problem-solving behaviour, etc. Appropriate interventions should be implemented to assist learners in overcoming these challenges early in their school careers.

Formative assessment: Formative assessment is used to aid the teaching and learning processes, hence assessment *for* learning. It is the most commonly used type of assessment because it can be used in different forms at any time during a Mathematics lesson, e.g. short class works during or at the end of each lesson, verbal questioning during the lesson. It is mainly informal and should not be used for promotion purposes. The fundamental distinguishing characteristic of formative assessment is constant feedback to learners, particularly with regard to learners' learning processes. The information provided by formative assessment can also be used by Educators to inform their methods of teaching.

Summative assessment: Contrary to the character of formative assessment, summative assessment is carried out after the completion of a Mathematics topic or a cluster of related topics. It is therefore referred to as assessment of learning since it is mainly focusing on the product of learning. The results of summative assessment are recorded and used for promotion purposes. The forms of assessment presented in Table 4.1 are examples of summative assessment.

Informal or daily assessment

Assessment for learning has the purpose of continuously collecting information on learner performance that can be used to improve their learning.

Informal assessment is a daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing.



Informal assessment should be used to provide feedback to learners and to inform planning for teaching, but need not be recorded. It should not be seen as separate from the learning activities taking place in the classroom.

Self-assessment and peer assessment actively allow learners to assess themselves. This is important as it allows learners to learn from, and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. The results of daily assessment tasks are not taken into account for promotion purposes.

4.4 Formal assessment

Formal assessment comprises School-Based Assessment (SBA) and End of the Year Examination. Formal assessment tasks are marked and formally recorded by the teacher for promotion purposes. All Formal Assessment tasks are subject to moderation for the purpose of quality assurance and to ensure that appropriate standards are maintained. The SBA component may take various forms.

However, **tests, examinations, projects, assignments** and **investigations** are recommended for Mathematics. The Senior Phase Mathematics minimum formal programme of assessment tasks are outlined in Table 4.1

Table 4.1: Minimum requirements for formal assessment: Senior Phase Mathematics

	Forms of Assessment	Minimum Requirements per term				Number of Tasks per Year	Weighting
		Term 1	Term 2	Term 3	Term 4		
SBA	Test	1	1	1		3	40%
	Examination		1			1	
	Assignment	1		1	1	3	
	Investigation		1		1	2	
	Project			1		1	
	Total	2	3	3	2	10*	
End of the year Examination						1	60%

*To be completed before the End of the year Examination

Tests and **examinations** are individualised assessment tasks and should be carefully designed to ensure that learners demonstrate their full potential in Mathematics content. The questions should be carefully spread to cater for different cognitive levels of learners. Tests and examinations are predominantly assessed using a memorandum.

The Assignment, as is the case with tests and examinations, is mainly an individualised task. It can be a collection of past questions, but should focus on more demanding work as any resource material can be used, which is not the case in a task that is done in class under supervision.



Projects are used to assess a range of skills and competencies. Through projects, learners are able to demonstrate their understanding of different Mathematics concepts and apply them in real-life situations. Caution should, however, be exercised not to give projects that are above learners' cognitive levels. The assessment criteria should be clearly indicated on the project specification and should focus on the Mathematics involved and not on duplicated pictures and facts copied from reference material. Good projects contain the collection and display of real data, followed by deductions that can be substantiated.

Investigation promotes critical and creative thinking. It can be used to discover rules or concepts and may involve inductive reasoning, identifying or testing patterns or relationships, drawing conclusions, and establishing general trends. To avoid having to assess work which is copied without understanding, it is recommended that whilst initial investigation could be done at home, the final write-up should be done in class, under supervision, without access to any notes. Investigations are assessed with rubrics, which can be specific to the task, or generic, listing the number of marks awarded for each skill. These skills include:

- organizing and recording ideas and discoveries using, for example, diagrams and tables.
- communicating ideas with appropriate explanations
- calculations showing clear understanding of mathematical concepts and procedures.
- generalizing and drawing conclusions,

The forms of assessment used should be appropriate to the age and cognitive level of learners. The design of these tasks should cover the content of the subject and designed to achieve the broad aims of the subject. Appropriate instruments, such as rubrics and memoranda, should be used for marking.

Formal assessments should cater for a range of cognitive levels and abilities of learners as shown in Table 4.2:



Table 4.2: Cognitive levels

DESCRIPTION AND EXAMPLES OF COGNITIVE LEVELS		
Cognitive levels	Description of skills to be demonstrated	Examples
<p>Knowledge (≈25%)</p>	<ul style="list-style-type: none"> • Estimation and appropriate rounding of numbers • Straight recall • Identification and direct use of correct formula • Use of mathematical facts • Appropriate use of mathematical vocabulary 	<ol style="list-style-type: none"> 1. Estimate the answer and then calculate with a calculator: $\frac{62\ 816}{325 + 279}$ [Grade 7] 2. Use the formula $A = \pi r^2$ to calculate the area of a circle if the diameter is equal to 10 cm. [Grade 8] 3. Write down the y-intercept of the function $y = 2x + 1$ [Grade 9]
<p>Routine procedures (≈45%)</p>	<ul style="list-style-type: none"> • Perform well-known procedures • Simple applications and calculations which might involve many steps • Derivation from given information may be involved • Identification and use (after changing the subject) of correct formula • Generally similar to those encountered in class 	<ol style="list-style-type: none"> 1. Determine the mean of 5 Grade 7 learners' marks if they have respectively achieved 25; 40; 21; 85; 14 out of 50. [Grade 7] 2. Solve x in $x - 6 = 9$ [Grade 8] 3. R600 invested at $r\%$ per annum for a period of 3 years yields R150 interest. Calculate the value of r if $SI = \frac{Pnr}{100}$. [Grade 9]
<p>Complex procedures (≈20%)</p>	<ul style="list-style-type: none"> • Problems involving complex calculations and/or higher order reasoning • Investigate elementary axioms to generalize them into proofs for straight line geometry, congruence and similarity • No obvious route to the solution • Problems not necessarily based on real world contexts • Making significant connections between different representations • Require conceptual understanding 	<ol style="list-style-type: none"> 1. Mr Mnisi pays R75 for a book which he marks up to provide 20% profit. He then sells it for cash at 4% discount. Calculate the selling price. [Grade 7] 2. A car travelling at a constant speed travels 60 km in 18 minutes. How far, travelling at the same constant speed, will the car travel in 1 hour 12 minutes? [Grade 8] 3. Use investigation skills to prove that the angles on a straight line are supplementary. [Grade 9]
<p>Problem solving (≈10%)</p>	<ul style="list-style-type: none"> • Unseen, non-routine problems (which are not necessarily difficult) • Higher order understanding and processes are often involved • Might require the ability to break the problem down into its constituent parts 	<ol style="list-style-type: none"> 1. The sum of three consecutive numbers is 87. Find the numbers. [Grade 7] 2. Mary travels a distance of km in 6 hours if she travels at an average speed of 20 km/h on her bicycle. What should be her average speed if she wants to cover the same distance in 5 hours? [Grade 8] 3. The combined age of a father and son is 84 years old. In 6 years time the father will be twice as old as the son was 3 years ago. How old are they now? [Grade 9]

MODERATION OF ASSESSMENT

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Moderation should be carried out internally at school and/or externally at district, provincial and national levels. Given that the promotion of learners in the Senior Phase is largely dependent upon the SBA (which contributes 40%); the moderation process should be intensified to ensure that:

- learners are not disadvantaged by the invalid and unreliable assessment tasks,



- quality assessment is given and high but achievable standards are maintained.

TIME ALLOCATION

Senior Phase

The instructional time in the Senior Phase is as follows:

SUBJECT	HOURS
Home Language	5
First Additional Language	4
Mathematics	4,5
Natural Sciences	3
Social Sciences	3
Technology	2
Economic Management Sciences	2
Life Orientation	2
Creative Arts	2
TOTAL	27,5

Allocation of teaching time

Time has been allocated in the following way:

- 10 weeks per term, with 4,5 hours for Mathematics per week (10 x 4 x 4,5 hours = 180 hours per year)
- Between 6 and 12 hours have been allocated for revision and assessment per term
- Therefore, 150 hours of teaching have been distributed across the Content Areas
- The distribution of time per topic, has taken account of the weighting for the Content Area as specified for the Senior Phase in Section 2.
- The weighting of Content Areas represents notional hours; therefore, the recommended distribution of hours may vary slightly across grades.

Clarification notes with teaching guidelines

The tables below provide the teacher with:

- content areas and topics per grade per term;
- concepts and skills per term;
- clarification notes with teaching guidelines; and
- the duration of time allocated per topic in hours.



TIME ALLOCATION PER TOPIC: GRADE 7							
TERM 1		TERM 2		TERM 3		TERM 4	
Topic	Time	Topic	Time	Topic	Time	Topic	Time
Whole numbers	9 hours	Common fractions	9 hours	Numeric and geometric patterns	6 hours	Integers	9 hours
Exponents	9 hours	Decimal fractions	9 hours	Functions and relationships	3 hours	Numeric and geometric patterns	3 hours
Construction of Geometric figures	10 hours	Functions and relationships	3 hours	Algebraic expressions	3 hours	Functions and relationships	3 hours
Geometry of 2D shapes	10 hours	Area and perimeter of 2D shapes	7 hours	Algebraic equations	3 hours	Algebraic expressions	3 hours
Geometry of straight lines	2 hours	Surface area and Volume of 3D objects	8 hours	Graphs	6 hours	Algebraic equations	4 hours
				Transformation geometry	9 hours	Collect, organize and summarize data	4 hours
				Geometry of 3D objects	9 hours	Represent data	3 hours
						Interpret, analyse and report data	3,5 hours
						Probability	4,5 hours
Revision/ assessment	5 hours	Revision/ assessment	9 hours	Revision/ assessment	6 hours	Revision/ assessment	8 hours
TOTAL: 45 hours		TOTAL: 45 hours		TOTAL: 45 hours		TOTAL: 45 hours	

Allocation of teaching time

Time has been allocated in the following way:

- 10 weeks per term, with 6 hours for Mathematics per week
- Between 3 and 6 hours have been allocated for revision per term. In addition 6 hours have been allocated for summative assessment for all subjects in Terms 2 and 4.
- Therefore, 210 notional hours have been distributed across the content areas.
- The distribution of time per topic, has taken account of the weighting for the Content Area as specified for the Senior Phase in section 2.
- The weighting of content areas represents teaching hours; therefore, the recommended distribution of hours may vary slightly across grades.

Clarification notes with teaching guidelines

The tables below provide the teacher with:

- content areas and topics per grade per term;
- concepts and skills per term;
- clarification notes with teaching guidelines; and
- the duration of time allocated per topic in hours.



Weighting of content areas

The weighting of Mathematics content areas serves two primary purposes:

- guidance on the time needed to adequately address the content within each content area
- guidance on the spread of content in the examination (especially end-of-year summative assessment).

WEIGHTING OF CONTENT AREAS			
Content Area	Grade 7	Grade 8	Grade 9
Number, Operations and Relations	30%	25%	15%
Patterns, Functions and Algebra	25%	30%	35%
Space and Shape (Geometry)	25%	25%	30%
Measurement	10%	10%	10%
Data Handling	10%	10%	10%
	100%	100%	100%

RECORDING AND REPORTING

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates the learner's progress towards the achievement of the knowledge as prescribed in the National Curriculum and Assessment Policy Statements. Records of learner performance should provide evidence of the learner's conceptual progression within a grade and her/his readiness to be promoted to the next grade. Records of learner performance should also be used to verify the progress made by Educators and learners in the teaching and learning process.

Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders.

Primary schooling is a critical period for the acquisition of foundational Mathematics skills and conceptual knowledge.

Reporting of learner performance is therefore essential and should not be limited to the quarterly report card. Other methods of reporting should be explored, e.g. parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters. These extreme, but worthwhile modalities will ensure that any underperformance is communicated promptly and appropriate measures of intervention are implemented collaboratively by Educators and parents.

Formal reporting is done on a 7-point rating scale (see Table 4.3)



Table 4.3: Scale of achievement for the National Curriculum Statement Grades 4 - 6

RATING CODE	DESCRIPTION OF COMPETENCE	PERCENTAGE
7	Outstanding achievement	80 – 100
6	Meritorious achievement	70 – 79
5	Substantial achievement	60 – 69
4	Adequate achievement	50 – 59
3	Moderate achievement	40 – 49
2	Elementary achievement	30 – 39
1	Not achieved	0 – 29

PRINCIPLES FOR RECORDING AND REPORTING

The following principles underpin the approach to both recording and reporting:

1. Recording of learner performance is against the assessment task and reporting is against the mark obtained in a term, semester, or year.
2. Educators should show in their files that they have covered all the formal tasks set.
3. National codes and/or marks, percentages and comments can be used for recording and reporting purposes.
4. The following is applicable to recording and reporting per phase:
 - a. Foundation Phase (Grades R – 3): Record and report in national codes and their descriptions.
 - b. Intermediate Phase (Grades 4 – 6): Record and report in national codes and their descriptions and percentages.
 - c. Senior Phase (Grades 7 – 9): Record and report in national codes and their descriptions percentages.
 - d. Grades 10 – 12: Record in marks and report in percentages.
5. The schedule and the report card should indicate the overall level of performance of a learner.
6. In the case of Languages, each language that the learner offers should be recorded and reported on separately according to the different levels on which they are offered. For example, Home Language – English, First Additional Language – IsiXhosa, Second Additional Language – Afrikaans Second Additional Language.
7. The number of formal assessment tasks to be recorded in each phase is provided in *chapter 4* of the National Curriculum and Assessment Policy Statements.



8. The recorded pieces of evidence should reflect a variety of forms of assessment. More information on this is provided in *chapter 4* of the National Curriculum and Assessment Policy Statements.
9. Educators must report regularly to learners and parents on the progress of learners. Schools are required to provide feedback to parents on the programme of assessment using a formal reporting tool such as a report card. In addition to the report cards, other reporting mechanisms such as parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc. may be used. The school will determine the format of these reporting strategies.

RECORD SHEETS

1. Educators are expected to keep efficient and current mark sheets of the learners' progress. It is expected that carefully compiled records and/or evidence of learner performance be maintained to justify the final rating a learner receives at the end of the year.
2. Educators are expected to keep current records of learners' progress electronically/in files/books/folders or any other form the school has agreed on.
3. Record sheets must at least have the following information
 - a. Subject;
 - b. Grade and class;
 - c. Learners' names;
 - d. Dates of assessment;
 - e. Names of the formal assessment tasks;
 - f. The results of formal assessment tasks; and
 - g. Comments for support purposes when and where appropriate.

The record sheets should be used to compile a schedule that will in turn be used to compile reports once a term. Schools should therefore develop Record Sheets using the criteria specified in *subparagraph 3*.

LEARNERS' WORKBOOKS

- At the beginning of the year each learner should get a workbook to do activities for Mathematics in and to write or paste notes, etc. in.



- Work as included in the assessment tasks should first be taught thoroughly in the workbooks.
- Workbooks should be covered and kept neat.
- Each educator can make a front page of his or her choice for writing books.
- If a learner loses or damages his or her workbook, his or her parents should replace it themselves.
- Educators should mark learners' workbooks regularly and meticulously or supply the correct answers in the case of self or peer assessment.
- Corrections should be made by the learners where necessary.

INTERVENTION

- Educators should throughout be able to provide evidence of how they accommodate the learners with barriers for learning (e.g. extra activities to address problem areas, errors that are corrected, discussion with EST, letters or discussions with parents).
- Intervention should also be supported by a suitable instrument that proves attempts to support learners.

EDUCATOR'S FILE

1. All Educators are expected to keep a file containing evidence of their teaching and assessment, viz. Annual teaching plan, Assessment plan, Formal assessment tasks and memoranda, Indication of Textbook(s) and any resources used, Record sheet containing learners' marks for each formal assessment task and informal notes or any intervention that is planned by the teacher to assist learners who require additional support (where they exist). It is the Educators' responsibility to ensure that the information in their assessment files is kept up to date.
2. A teacher assessment file may be a file, a folder, a box, or any other suitable storage system.
3. The formally recorded assessment tasks should be clearly marked or indicated in the teacher's file. Stickers, coloured paper, etc. may be used for this purpose.
4. Educators' files should be available on request at all times for moderation and accountability purposes.

LEARNER PROFILE

A Learner Profile is a continuous record of information that gives a holistic impression of a learner and a learner's progress and performance. It assists the teacher in the next grade or school to understand the learner better and therefore to respond appropriately to the learner.



ADMINISTRATION

1. Learner Profiles should be kept at school and will be moved from one school to the next on the request of the principal of the next school.
2. The school management of the receiving school has an obligation to request the Learner's Profile from the previous school within three months of the learner's admittance.
3. The Learner Profile for every learner must be safeguarded and should accompany learners throughout their schooling career. The security of the Learner Profiles and the updating of required information rest with the school management.
4. The parents and other stakeholders have a right to access and view the Learner Profile on request. However, this should be done in the presence of the school management.
5. The Learner Profile is a confidential document and should be treated as such. Under no circumstances should sensitive information such as the health status of the learner be divulged to anyone without the written permission of the parents or guardians.
6. Under no circumstances should the profile be moved from the school unless it is for reasons mentioned in *subparagraph 1*.
7. The Provincial Departments of Education are responsible for providing pre-printed files /folders for the Profiles.
8. The pre-printed files/folders should be designed such that a Learner Profile includes the following information:
 - a. personal information;
 - b. medical history;
 - c. schools attended and record of attendance;
 - d. participation and achievements in extra-curricular activities;
 - e. areas needing additional support; and
 - f. learner performance.
9. In cases where the files/folders need repair, the school principal concerned should make a request to the district office for a replacement.



10. The compilation of Learner Profiles should be started at Grade R and should continue until the learner completes Grade 12.
11. Once the learner has passed Grade 12 or exited the schooling system for any reason whatsoever, the learner profile should be stored in the last school attended for a period of three years where after it should be destroyed. If the learner within this specified period re-enters the schooling system to further his or her studies, the provisos stated in *subparagraphs 1 and 3* will apply.
12. The Learner Profile replaces all previous continuous record documents that have been used by schools, such as record cards, tutor cards, Edlab cards, etc.

PHASE MEETINGS / DISCUSSIONS

- Meetings should be held at least once per month, but more often if necessary.
- Attendance is compulsory for all the educators of the foundation phase. Written excuses should be submitted the previous day.
- Minutes should be kept at each meeting by a person indicated for the specific meeting and distributed amongst the educators for filing in their educators' portfolios.

This policy was adopted by the School Management on

This policy has been made available to school personnel and is readily accessible to parents and learners on request.

This policy will be reviewed and updated every year.

Signed _____
School Management

Date: _____

Signed _____
Principal

Date: _____

Signed _____
Educator Representative

Date: _____

