education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CURRICULUM STATEMENT GRADES 10-12 (GENERAL)

SUBJECT ASSESSMENT GUIDELINES

AGRICULTURAL TECHNOLOGY

JANUARY 2008

PREFACE TO SUBJECT ASSESSMENT GUIDELINES

The Department of Education has developed and published Subject Assessment Guidelines for all 29 subjects of the National Curriculum Statement (NCS). These Assessment Guidelines should be read in conjunction with the relevant Subject Statements and Learning Programme Guidelines.

Writing Teams established from nominees of the nine provincial education departments and the teacher unions formulated the Subject Assessment Guidelines. The draft copies of the Subject Assessment Guidelines developed by the Writing Teams were sent to a wide range of readers, whose advice and suggestions were considered in refining these Guidelines. In addition, the Department of Education field-tested the Subject Assessment Guidelines in 2006 and asked for the comments and advice of teachers and subject specialists.

The Subject Assessment Guidelines are intended to provide clear guidance on assessment in Grades 10 to 12 from 2008.

The Department of Education wishes you success in the teaching of the National Curriculum Statement.

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1. PURPOSE OF THE SUBJECT ASSESSMENT GUIDELINES

This document provides guidelines for assessment in the National Curriculum Statement Grades 10 - 12 (General). The guidelines must be read in conjunction with *The National Senior Certificate: A Qualification at Level 4 on the National Qualifications Framework (NQF)* and the relevant Subject Statements. The Subject Assessment Guidelines will be applicable for Grades 10 to 12 from 2008.

The Department of Education encourages teachers to use these guidelines as they prepare to teach the National Curriculum Statement. Teachers should also use every available opportunity to hone their assessment skills. These skills relate both to the setting and marking of assessment tasks.

2. ASSESSMENT IN THE NATIONAL CURRICULUM STATEMENT

2.1 Introduction

Assessment in the National Curriculum Statement is an integral part of teaching and learning. For this reason, assessment should be part of every lesson and teachers should plan assessment activities to complement learning activities. In addition, teachers should plan a formal year-long Programme of Assessment. Together the informal daily assessment and the formal Programme of Assessment should be used to monitor learner progress through the school year.

Continuous assessment through informal daily assessment and the formal Programme of Assessment should be used to:

- develop learners' knowledge, skills and values
- assess learners' strengths and weaknesses
- provide additional support to learners
- revisit or revise certain sections of the curriculum and
- motivate and encourage learners.

In Grades 10 and 11 all assessment of the National Curriculum Statement is internal. In Grade 12 the formal Programme of Assessment which counts 25% is internally set and marked and externally moderated. The remaining 75% of the final mark for certification in Grade 12 is externally set, marked and moderated. In Life Orientation however, all assessment is internal and makes up 100% of the final mark for promotion and certification.

2.2 Continuous assessment

Continuous assessment involves assessment activities that are undertaken throughout the year, using various assessment forms, methods and tools. In Grades 10-12 continuous assessment comprises two different but related activities: informal daily assessment and a formal Programme of Assessment.

2.2.1 Daily assessment

The daily assessment tasks are the planned teaching and learning activities that take place in the subject classroom. Learner progress should be monitored during learning activities. This informal daily monitoring of progress can be done through question and answer sessions; short assessment tasks completed during the lesson by individuals, pairs or groups or homework exercises.

Individual learners, groups of learners or teachers can mark these assessment tasks. Self-assessment, peer assessment and group assessment actively involves learners in assessment. 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. In such instances, a simple checklist may be used to record this assessment. However, teachers may use the learners' performance in these assessment tasks to provide verbal or written feedback to learners, the School Management Team and parents. This is particularly important if barriers to learning or poor levels of participation are encountered.

The results of these assessment tasks are not taken into account for promotion and certification purposes.

2.2.2 Programme of Assessment

In addition to daily assessment, teachers should develop a year-long formal Programme of Assessment for each subject and grade. In Grades 10 and 11 the Programme of Assessment consists of tasks undertaken during the school year and an end-of-year examination. The marks allocated to assessment tasks completed during the school year will be 25%, and the end-of-year examination mark will be 75% of the total mark. This excludes Life Orientation.

In Grade 12, the Programme of Assessment consists of tasks undertaken during the school year and counts 25% of the final Grade 12 mark. The other 75% is made up of externally set assessment tasks. This excludes Life Orientation where the internal assessment component counts 100% of the final assessment mark.

The marks achieved in each assessment task in the formal Programme of Assessment must be recorded and included in formal reports to parents and School Management Teams. These marks will determine if the learners in Grades 10 and 11 are promoted. In Grade 12, these marks will be submitted as the internal continuous assessment mark. Section 3 of this document provides details on the weighting of the tasks for promotion purposes.

2.2.2.1 Number and forms of assessment required for Programmes of Assessment in Grades 10 and 11

The requirements for the formal Programme of Assessment for Grades 10 and 11 are summarised in Table 2.1. The teacher must provide the Programme of Assessment to the subject head and School Management Team before the start of the school year. This will be used to draw up a school assessment plan for each of the subjects in each grade. The proposed school assessment plan should be provided to learners and parents in the first week of the first term.

Table 2.1: Number of assessment tasks which make up the Programme of Assessment by subject in Grades 10 and 11

SUBJECTS		TERM 1	TERM 2	TERM 3	TERM 4	TOTAL
Language 1: Home Language		4	4*	4	4*	16
Language 2: Choice of HL or FAL	HL	4	4*	4	4*	16
	FAL	4	4*	4	4*	16
Life Orientation		1	1*	1	2*	5
Mathematics or Maths Literacy		2	2*	2	2*	8
Subject choice 1**		2	2*	2	1*	7
Subject choice 2**		2	2*	2	1*	7
Subject choice 3		2	2*	2	1*	7

Note:

* One of these tasks must be an examination

** If one or two of the subjects chosen for subject choices 1, 2 or 3 include a Language, the number of tasks indicated for Languages 1 and 2 at Home Language (HL) and First Additional Language (FAL) are still applicable. Learners who opt for a Second Additional Language are required to complete 13 tasks in total: 4 tasks in term 1 and 3 tasks in each of terms 2, 3 and 4.

Two of the assessment tasks for each subject must be examinations. In Grades 10 and 11 these examinations should be administered in mid-year and November. These examinations should take account of the requirements set out in Section 3 of this document. They should be carefully designed and weighted to cover all the Learning Outcomes of the subject.

Two of the assessment tasks for all subjects, excluding Life Orientation, should be tests written under controlled conditions at a specified time. The tests should be written in the first and third terms of the year.

The remainder of the assessment tasks should not be tests or examinations. They should be carefully designed tasks, which give learners opportunities to research and explore the subject in exciting and varied ways. Examples of assessment forms are debates, presentations, projects, simulations, written reports, practical tasks, performances, exhibitions and research projects. The most appropriate forms of assessment for each subject are set out in Section 3. Care should be taken to ensure that learners cover a variety of assessment forms in the three grades.

The weighting of the tasks for each subject is set out in Section 3.

2.2.2.2 Number and forms of assessment required for Programme of Assessment in Grade 12

In Grade 12 all subjects include an internal assessment component, which is 25% of the final assessment mark. The requirements of the internal Programme of Assessment for Grade 12 are summarised in Table 2.2. The teacher must provide the Programme of Assessment to the subject head and School Management Team before the start of the school year. This will be used to draw up a school assessment plan for each of the subjects in each grade. The proposed school assessment plan should be provided to learners and parents in the first week of the first term.

Table 2.2: Number of assessment tasks which make up the Programme of Assessment by subject in Grade 12

SUBJECTS		TERM 1	TERM 2	TERM 3	TERM 4	TOTAL
Language 1: Home Language		5	5*	4*		14
Language 2: Choice of HL or FAL	HL	5	5*	4*		14
	FAL	5	5*	4*		14
Life Orientation		1	2*	2*		5
Mathematics or Maths Literacy		3	2*	2*		7
Subject choice 1**		2	2*	(2*) 3*		(6[#]) 7
Subject choice 2**		2	2*	(2*) 3*		(6[#]) 7
Subject choice 3		2	2*	(2*) 3*		(6[#]) 7

Note:

* One of these tasks in Term 2 and/or Term 3 must be an examination

** If one or two of the subjects chosen for subject choices 1, 2 or 3 include a Language, the number of tasks indicated for Languages 1 and 2 at Home Language (HL) and First Additional Language (FAL) are still applicable. Learners who opt for a Second Additional Language are required to complete 12 tasks in total: 5 tasks in term 1, 4 tasks in term 2 and 3 tasks in term 3.

[#] The number of internal tasks per subject differs from 6 to 7 as specified in Section 3 of this document.

Schools can choose to write one or two internal examinations in Grade 12. Should a school choose to write only one internal examination in Grade 12, a scheduled test should be written at the end of the term to replace the other examination. Internal examinations should conform to the requirements set out in Section 3 of this document. They should be carefully designed and weighted to cover all the Learning Outcomes of the subject.

Two of the assessment tasks for all subjects, excluding Life Orientation, should be tests written under controlled conditions at a specified time.

The remainder of the assessment tasks should not be tests or examinations. They should be carefully designed tasks, which give learners opportunities to research and explore the subject in exciting and focused ways. Examples of assessment forms are debates, presentations, projects, simulations, assignments, case studies, essays, practical tasks, performances, exhibitions and research projects. The most appropriate forms of assessment for each subject are set out in Section 3.

2.3 External assessment in Grade 12

External assessment is only applicable to Grade 12 and applies to the final end-of-year examination. This makes up 75% of the final mark for Grade 12. This excludes Life Orientation which is not externally examined.

The external examinations are set externally, administered at schools under conditions specified in the *National policy on the conduct, administration and management of the assessment of the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF)* and marked externally.

In some subjects the external assessment includes practical or performance tasks that are externally set, internally assessed and externally moderated. These performance tasks account for one third of the end-of-year external examination mark in Grade 12 (that is 25% of the final mark). Details of these tasks are provided in Section 3.

Guidelines for the external examinations are provided in Section 3.

2.4 Recording and reporting on the Programme of Assessment

The Programme of Assessment should be recorded in the teacher's portfolio of assessment. The following should be included in the teacher's portfolio:

- a contents page;
- the formal Programme of Assessment;
- the requirements of each of the assessment tasks;
- the tools used for assessment for each task; and
- record sheets for each class.

Teachers must report regularly and timeously to learners and parents on the progress of learners. Schools will determine the reporting mechanism but it could include written reports, parent-teacher interviews and parents' days. Schools are required to provide written reports to parents once per term on the Programme of Assessment using a formal reporting tool. This report must indicate the percentage achieved per subject and include the following seven-point scale.

RATING CODE	RATING	MARKS %
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

2.5 Moderation of the assessment tasks in the Programme of Assessment

Moderation of the assessment tasks should take place at three levels.

LEVEL	MODERATION REQUIREMENTS
School	The Programme of Assessment should be submitted to the subject head and School Management Team before the start of the academic year for moderation purposes. Each task which is to be used as part of the Programme of Assessment should be submitted to the subject head for moderation before learners attempt the task. Teacher portfolios and evidence of learner performance should be moderated twice a year by the head of the subject or her/his delegate.
Cluster/ district/ region	Teacher portfolios and a sample of evidence of learner performance must be moderated twice during the first three terms.
Provincial/ national	Teacher portfolios and a sample of evidence of learner performance must be moderated once a year.

3. ASSESSMENT OF AGRICULTURAL TECHNOLOGY IN GRADES 10–12

3.1 Introduction

The subject Agricultural Technology deals with the technological processes inherent in the making of products, providing services and systems in the agricultural environment. The subject focuses on technological processes from conceptual design to problem solving and maintenance, as well as the application of scientific principles.

This subject also strives towards the preparation of a learner with a range of skills, supplemented by a broad knowledge base, a positive attitude and values that will ultimately serve the learner to become an economically active, responsible and a participating member of society.

The four Learning Outcomes for Agricultural Technology are weighted as follows:

LEARNING OUTCOME	WEIGHTING
LO 1: Technology Society and the Environment	10%
LO 2: Technological process	15%
LO 3: Knowledge and understanding	40%
LO 4: Application of knowledge	35%

Agricultural Technology is a practically orientated subject and to fully assess all the knowledge, skills and values of the subject in an authentic manner a Practical Assessment Task is necessary. The Practical Assessment Task should showcase the learners' broad range of knowledge, skills and values acquired during the learning process. It also provides learners the opportunity to express their creativity and innovativeness.

Assessment tasks in Agricultural Technology have the following characteristics:

- Learners are expected to perform, produce, present, create or do something, e.g. construct or maintain a fence.
- Learners in a performance assessment are engaged in activities that require the demonstration of specific skills, e.g. welding.
- These demonstrations may take place in a controlled environment such as a technology centre or workshop and a farm or appropriate site, e.g. construction of a boiler or maintenance of vehicles in a workshop.
- Performance assessment allows the learner to illustrate complex learning where knowledge, skills, and values are integrated in a performance, e.g. choice of irrigation system or solve problem of erosion, which includes LO 1.
- Opportunities for creativity, innovation, invention and ingenuity are created, e.g. to design a locking mechanism for farm gates.
- Provide opportunities for learners to present their work, e.g. compiling a design portfolio for the Practical Assessment Task explaining the process

and operation of the completed projects to the rest of the class and for face moderation.

3.2 Daily assessment in Grades 10, 11 and 12

Daily assessment in Agricultural Technology provides learners with multiple opportunities to improve and master the knowledge, skills and values related to the subject and if needed to provide additional support to learners, by re-visiting or revising certain sections of the curriculum. This is particularly important if barriers to learning or poor levels of participation are encountered.

The following are examples of daily assessment tasks to develop learners' knowledge, skills and values:

- Question and answer sessions during class and practical sessions.
- Short assessment tasks at the beginning or end of the lesson to establish the level of prior knowledge, e.g. identification of parts from the steering system, use a rain gauge to verify pre-programmed calculations and calibrations on the irrigation systems.
- Tasks completed during the lesson by individuals, by pairs or in groups or through homework exercises on any Assessment Standard or topic in the agricultural environment, bearing in mind resources available, e.g. design of a drainage system for a milking parlour or piggery.
- A class test after completion of a whole topic or part of it to verify the level of understanding and competency.

Learner performance in daily assessment tasks does not need to be recorded. It is not taken into account for promotion and certification purposes. The use of checklists, qualitative rubrics and rating scales will be valuable in monitoring learner progress.

3.3 Assessment in Grades 10 and 11

3.3.1 Programme of Assessment in Grades 10 and 11

The Programme of Assessment for Agricultural Technology in Grades 10 and 11 comprises seven tasks which are internally assessed. The six tasks which are completed during the school year make up 25% of the total mark for Agricultural Technology. The seventh task is the end-of-year assessment which includes a Practical Assessment Task (PAT) and a written theory paper. Together these two tasks make up the remaining 75%.

<table>
<tr><th colspan="3">PROGRAMME OF ASSESSMENT (400 marks)</th></tr>
<tr><th>ASSESSMENT TASKS</th><th colspan="2">END-OF-YEAR ASSESSMENT</th></tr>
<tr><th>25% (100 marks)</th><th colspan="2">75% (300 marks)</th></tr>
<tr><td rowspan="3">2 tests
1 exam (mid-year)
2 practical tasks
1 research task</td><th>PAT</th><th>EXAM PAPER</th></tr>
<tr><th>25% (100 marks)</th><th>50% (200 marks)</th></tr>
<tr><td>Design project (main focus LO4)
• Portfolio (50)
• Products/ Artefacts (50)</td><td>• Written exam LO1-4
• Main focus LO3</td></tr>
</table>

The Programme of Assessment comprises:

- Two tests (first and third term)
- One midyear examination (written)
- Two practical tasks (one per term in terms 2 and 3)
- One research task (term 1)
- The end-of-year assessment task (which includes a Practical Assessment Task and a written examination)

Example of an annual Programme of Assessment for Grades 10 and 11:

ASSESSMENT TASKS		TERM ONE	TERM TWO	TERM THREE	TERM FOUR	% OF FINAL PROMOTION MARK
Tests		1		1		5
Midyear examination (written)			1			5
Practical tasks: Simulations/ Modelling/ Fabrication/ Manufacturing/ Demonstrations/ Small projects			1	1		10
Research task		1				5
End-of-year assessment	Written examination				1	50
	Practical Assessment Task				1	25

3.3.2 Examples of assessment tasks in Agricultural Technology

Tests

The tests in Agricultural Technology must be substantive in terms of time and marks. For example, a test should last at least 60 minutes and count a minimum of 50 marks. Tests should include the theory of the technological process, principles and concepts and the application thereof in the production of product(s)/ artefact(s).

Practical tasks

The practical tasks should incorporate both the design (planning and development) and the production of a product or artefact. These tasks should be based on practical activities such as projects, simulations, modelling, fabrication, manufacturing and demonstration and should focus on a variety of technological themes relating to an agricultural context. Practical tasks such as simulations put theoretical knowledge to practical use and usually do not require conclusions to be made, for example to connect a star delta starter. Therefore, simulations will not include elaborate worksheets and conclusions but should rather generate guidelines and criteria of what is required.

See Appendix 1 for examples of practical tasks.

Research task

The research task in Agricultural Technology could include a case study, which is used as a basis for questions, investigations, interpretation and conclusion.

A typical case study can be environmentally related and focus on LO 1 which integrates with the knowledge of LO 3 and problem solving in LO 2.

The following table provides suggested topics for research tasks:

GRADE	CONTENT
Grade 10	• Communication systems and sources of agricultural information • Different types of hazardous substances used in the Agricultural sector; warning and information symbols related and storage regulations and safety regulations regarding the handling. • Types of irrigation systems for a particular area. • Types of fences for different purposes.
Grade 11	• Safety in the workplace. • Fire control. • The calibration of a specialised tool or equipment.

Practical Assessment Task (100 marks)

The Practical Assessment Task comprises a design project which leads to the design and development of products and counts 25% of the total promotion mark in Grades 10 and 11. This task should take the form of problem solving and realisation (making) and should be completed in the first three terms and handed in by the middle of the fourth term. The task should have utilitarian value and must be based on real-life situations, for example the development of a welding-chipping hammer which is used in arc welding as well as gas welding. The learners should know the assessment criteria before they start with the task.

A Practical Assessment Task allows the teacher to directly and systematically observe learner applied competence. The assessment of performance is based on the demonstration of specific technological skills. Practical Assessment Tasks allow the learner to illustrate complex learning where knowledge, skills, and values are integrated.

The Practical Assessment Task in Grades 10 and 11 is **internally** set, assessed and moderated. The project is completed under controlled conditions and is assessed by means of a rubric.

The Practical Assessment Task counts 100 marks and consists of a design portfolio (50 marks) and the final product (50 marks). The Practical Assessment Task therefore focuses on the development of the design portfolio as well as the product, including manipulative skills.

The design portfolio should include evidence of how the development of the product was approached, that is:

- The planning process
- The knowledge and skills accumulated in the process
- The technological process followed
- The materials used

- The safety and environmental aspects considered
- The calculations used – if applicable, sketches or diagrams
- The starting time and ending time – how long it took to complete from start to finish
- The investigations or research undertaken, and
- Any other information that is relevant to the project.

It is suggested that prior to the start of the year a cluster group sets five different design projects each based on the knowledge and skills that will be covered during the year. This is to ensure that all aspects of possible applied theory are covered during the year. Learners must choose **ONE** of the five given design projects and complete the project using the following phases:

Phase 1: Learners must identify the problem or need in their chosen project, investigate the project, generate ideas and arrive at possible design solutions to make or produce and evaluate and communicate the solution to the problem or need. The evidence of this phase will be located in the design portfolio and this phase will be undertaken during term 1 and the start of term 2.

Phase 2: Learners develop the actual product or artefact at the start of the second term and finalise it by the end of term 3. If the design solution does not lend itself to a full-scale artefact, a scaled model or a representation can be produced. However, in the latter instance, the learner is expected to provide full-size sections showing construction details including relevant surface finishing. A model can indicate the context in which the product is to be used.

Note: Learners submit the product or artefact for assessment by the end of the third term. The accompanying planning done in phase 1 (design portfolio) must also be submitted for assessment at this time.

Examinations

The mid-year and end-of-year examinations for Grades 10 and 11 should consist of one paper of 6 questions. The mark allocation of the midyear paper is 150 marks for Grade 10 and 200 marks for Grade 11, while the end-of-year paper counts 200 marks for both grades. All questions are compulsory. The suggested duration of the midyear paper is 2 hours for Grade 10 and 3 hours for Grade 11, while the end-of-year paper is 3 hours for both grades. The examination papers should test the knowledge and skills covered in the Agricultural Technology LO 1-4. The format of the written examination paper must be similar to that found in Grade 12.

The following table suggests the outline for the written examination paper in Grades 10 and 11:

EXAMINATION GUIDELINES FOR AGRICULTURAL TECHNOLOGY

GENERAL REMARKS

- These guidelines are applicable to Grades 10-11 in Agricultural Technology.
- Integration of LOs 1-4 must be reflected in the questions.
- The emphasis of the examination paper will be on the 9 ASs of LO 3.
- The applicable COs and the ASs of LO 1-4 are infused and can be used as contexts for formulating questions in the theory papers.

SPECIFICATIONS

- One paper

Duration:	▪ Midyear examination	▪ End-of-year examination
	▪ Grade 10: 2 hours ▪ Grade 11: 3 hours	▪ Grades 10 and 11: 3 hours
Marks:	▪ Grade 10: 150 ▪ Grade 11: 200	▪ 200

- 15 Multiple choice questions with value of 45 marks of the total marks (200).
- All the questions have to be answered.
- Sketches must be neat.
- All calculations and units must be indicated.
- The questions will not necessarily count for the same marks, as each section of the work has a different weighting.

SUGGESTED EXAMINATION PAPER FORMAT

QUESTION	ASs	CONCEPTS COVERED IN LO 3	MARKS
Q 1	1-9	Multiple choice questions can cover **all ASs**	**45**
Q 2	1, 2, 8 & 9	**Materials & Structures** and related drawings, measurements and safety	**35**
Q 3	3	**Electrical energy** and related tools, materials and safety	**20**
Q 4	1, 4, 8 & 9	**Skills & Construction Processes** and related tools, materials, drawings, measurements and safety	**35**
Q 5	1, 5, 8 & 9	**Tools, Implements & Equipment** and related tools, materials, drawings, calibrations and safety	**35**
Q 6	6, 7, 8 & 9	**Irrigation** and related tools, materials, drawings and measurements and **Communication**	**30**
		TOTAL	**200**

The table below suggests how levels of complexity can be addressed in the setting of examination questions:

CATEGORIES OF COMPLEXITY	DESCRIPTION OF CATEGORIES	SOME EXAMPLES	WEIGHTING
Basic cognitive skills.	Merely assessing the recall of basic knowledge.	Give labels, list, name, state or identify functions, recognise. Concepts, processes, mechanisms, etc.	**± 20%**
Comprehension	More than recall of facts including understanding and insight into routine and familiar content/situations.	Describe or explain concepts, classify, processes, mechanisms; Make direct deductions from data given; do calculations, etc.	**± 40%**
Application	Application of components and systems to new, novel or familiar and unfamiliar situations.	Interpreting data; Explaining adaptations or environmental factors influencing effectiveness; draw flow charts or mind maps to illustrate processes or mechanisms; constructing tables and graphs to organise and present data; drawing diagrams to investigate concepts; communicate findings and applying formulae.	**± 25%**
Higher Intellectual Abilities.	Analysis of data Synthesis of data Evaluation of data against given criteria.	Problem solving; Formulate a hypothesis; design experiments/ investigations; analyse; predict; argue and evaluate.	**±15%**
		TOTAL	**100%**

3.4 Assessment in Grade 12

In Grade 12, assessment consists of two components: a Programme of Assessment which makes up 25% of the total mark for Agricultural Technology and external assessment which makes up the remaining 75%. The Programme of Assessment for Agricultural Technology comprises six tasks which are internally assessed. The external assessment component comprises two components: a Practical Assessment Task and a written theory paper. Together these two tasks make up the remaining 75%.

PROGRAMME OF ASSESSMENT (100 marks)	EXTERNAL ASSESSMENT (300 marks)	
ASSESSMENT TASKS	**EXTERNAL ASSESSMENT TASKS**	
25% (100 marks)	**75% (300 marks)**	
	PAT	**EXAM PAPER**
	25% (100 marks)	**50% (200 marks)**
2 tests 2 exams (mid-year and trial) 1 practical task 1 research task	Design project (main focus LO4) • Portfolio (50) • Products/ Artefacts (50)	• Written exam LO1-4 • Main focus LO3

Together the Programme of Assessment and the external assessment component make up the annual assessment plan for Grade 12.

The annual assessment plan comprises:

- One test (first term)
- Two written examinations (midyear and trial)
- Two practical tasks (terms 2 and 3)
- One research task (term 1)
- The external assessment task (which includes a Practical Assessment Task and a written examination)

In Grade 12 one of the tasks in Term 2 and/or Term 3 must be an internal examination. In instances where only one of the two internal examinations is written in Grade 12, the other examination should be replaced by a test at the end of the term.

Example of an annual assessment plan for Grade 12:

ASSESSMENT TASKS		TERM ONE	TERM TWO	TERM THREE	TERM FOUR	% OF FINAL PROMOTION MARK
Tests		1				5
Examinations (midyear and trial)			1	1		10
Practical task: Simulations/ Modelling/ Fabrication/ Manufacturing/ Demonstrations/ Small projects			1	1		10
Research task		1				
External assessment	Written examination				1	50
	Practical Assessment Task			1		25

3.4.1 Programme of Assessment in Grade 12

Tests

The tests in Agricultural Technology must be substantive in terms of time and marks. For example, a test should last at least 60 minutes and count a minimum of 50 marks. Tests should include the theory of the technological process, principles and concepts and the application thereof in the production of product(s)/ artefact(s).

Practical Tasks

The practical tasks should incorporate both the design (planning and development) and the production of a product or artefact. These tasks should be based on practical activities such as projects, simulations, modelling, fabrication, manufacturing and demonstration and should focus on a variety of technological themes relating to an agricultural context. Practical tasks such as simulations put

theoretical knowledge to practical use and usually do not require conclusions to be made, for example to connect a star delta starter. Therefore, simulations will not include elaborate worksheets and conclusions but should rather generate guidelines and criteria to what is required.

See Appendix 1 for examples of practical tasks.

Research task

The research task in Agricultural Technology could include a case study, which is used as a basis for questions, investigations, interpretation and conclusion.

A typical case study can be environmentally related and focus on LO 1 which integrates with the knowledge of LO 3 and problem solving in LO 2.

The following table provides suggested topics for research tasks:

GRADE	CONTENT
Grade 12	• Alternative energy sources used in agriculture. • Electrical fences. • Possible correct irrigation system for a particular area (including type of crop, topography and contours, erosion, ground water and contamination).

Examinations

The mid-year and trial examinations for Grade 12 should consist of one paper of 6 questions and will count 200 marks. The suggested duration of the paper is 3 hours. All the questions are compulsory.

The trial examination needs to be closely related to the final examination in terms of time allocation, layout of the paper and subject requirements. See Section 3.4.2.2 for an outline of the Grade 12 examination paper.

3.4.2 External assessment in Grade 12

The external assessment task in Grade 12 consists of a Practical Assessment Task (25%) and an externally written paper (50%).

3.4.2.1 Practical Assessment Task

Schools will be informed of the list of projects at the beginning of the first term of each academic year. Schools will choose one option from given choices.

The Practical Assessment Task comprises a design project which leads to the design and development of products and counts 25% of the total promotion mark in Grades 10 and 11. This task should take the form of problem solving and realisation (making) and should be completed in the first three terms and handed in by the middle of the fourth term. The task should have utilitarian value and must be based on real-life situations, for example the construction of a gas braai, a trough for animals to drink from, etc. The learners should know the assessment criteria before they start with the task.

The Practical Assessment Task in Grade 12 is **externally** set and moderated, but internally assessed. The project is completed under controlled conditions and is assessed by means of a rubric.

The Practical Assessment Task counts 100 marks and consists of a design portfolio (50 marks) and the final product (50 marks). The Practical Assessment Task therefore focuses on the development of the design portfolio as well as the product, including manipulative skills.

The design portfolio should include evidence of how the development of the product was approached, that is:

- The planning process
- The knowledge and skills accumulated in the process
- The technological process followed
- The materials used
- The safety and environmental aspects considered
- The calculations used – if applicable, sketches or diagrams
- The starting time and ending time – how long it took to complete from start to finish
- The investigations or research undertaken, and
- Any other information that is relevant to the project.

The design project should be completed over the following three phases:

Phase 1: Learners must identify the problem or need in their chosen project, investigate the project, generate ideas and arrive at possible design solutions to make or produce and evaluate and communicate the solution to the problem or need. The evidence of this phase will be located in the design portfolio and this phase will be undertaken during term 1 and the start of term 2.

Phase 2: Learners develop the actual product or artefact at the start of the second term and finalise it by the end of term 3. If the design solution does not lend itself to a full-scale artefact, a scaled model or a representation can be produced. However, in the latter instance, the learner is expected to provide full-size sections showing construction details including relevant surface finishing. A model can indicate the context in which the product is to be used.

Note: Learners submit the product or artefact for assessment by the end of the third term. The accompanying planning done in phase 1 (design portfolio) must also be submitted for assessment at this time.

3.4.2.2 External examination

The external examination for Grade 12 will consist of one paper which contains six questions and counts 200 marks. The duration of the paper will be 3 hours. All the questions are compulsory. The examination papers should test the knowledge and skills covered in Agricultural Technology LO 1-4.

EXAMINATION GUIDELINES FOR AGRICULTURAL TECHNOLOGY

GENERAL REMARKS

- These guidelines are applicable to Grade 12 in Agricultural Technology.
- Integration of LOs 1-4 must be reflected in the questions.
- The emphasis of the examination paper will be on the 9 ASs of LO 3.
- The applicable COs and the ASs of LO 1-4 are infused and can be used as contexts for formulating questions in the theory papers.

SPECIFICATIONS

- One paper

Duration:	3 hours
Marks:	200

- 15 Multiple choice questions with value of 45 marks of the total marks (200).
- All the questions have to be answered.
- Sketches must be neat.
- All calculations and units must be indicated.
- The questions will not necessarily count for the same marks, as each section of the work has a different weighting.

SUGGESTED EXAMINATION PAPER FORMAT

QUESTION	ASs	CONCEPTS COVERED IN LO 3	MARKS
Q 1	1-9	Multiple choice questions can cover **all ASs**	**45**
Q 2	1, 2, 8 & 9	**Materials & Structures** and related drawings, measurements and safety	**35**
Q 3	3	**Electrical energy** and related tools, materials and safety	**20**
Q 4	1, 4, 8 & 9	**Skills & Construction Processes** and related tools, materials, drawings, measurements and safety	**35**
Q 5	1, 5, 8 & 9	**Tools, Implements & Equipment** and related tools, materials, drawings, calibrations and safety	**35**
Q 6	6, 7, 8 & 9	**Irrigation** and related tools, materials, drawings and measurements and **Communication**	**30**
		TOTAL	**200**

3.5 Promotion

For promotion and certification purposes learners should achieve at least a level 2 rating (Elementary Achievement: 30-39%) in Agricultural Technology.

3.6 Moderation

All Grade 10 and 11 tasks are internally moderated, while Grade 12 tasks should be externally moderated. The subject head for Agriculture Technology or Head of Department for technology subjects at a school will generally manage this process.

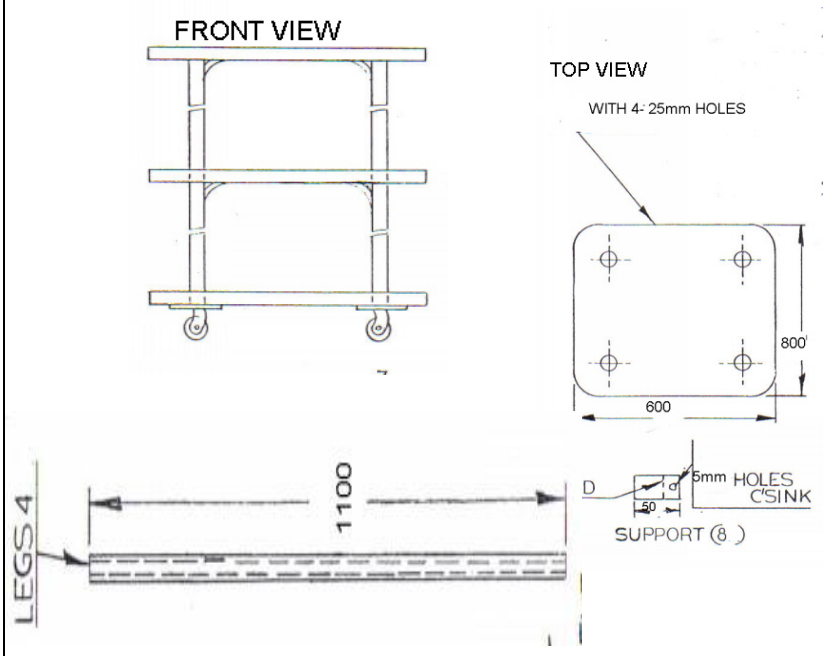
APPENDIX 1: EXAMPLES OF PRACTICAL TASKS

Activity 1: RELATED TO BASIC CARPENTRY

Activity outcomes:
Learners apply theoretical knowledge on types of wood.
Learners use drawings and sketches.
Learners demonstrate knowledge of measurements, cutting, jointing, assembling and possible use of templates.
Learners demonstrate use of basic hand tools.
Learners demonstrate knowledge and awareness of safety and housekeeping in workshop.
Learners evaluate own artefact, compile a portfolio report and present project on request.

Suggested Project: Three tiered table with the following variations -

a) Possible dividers for stationary
b) Possible trolley wheels

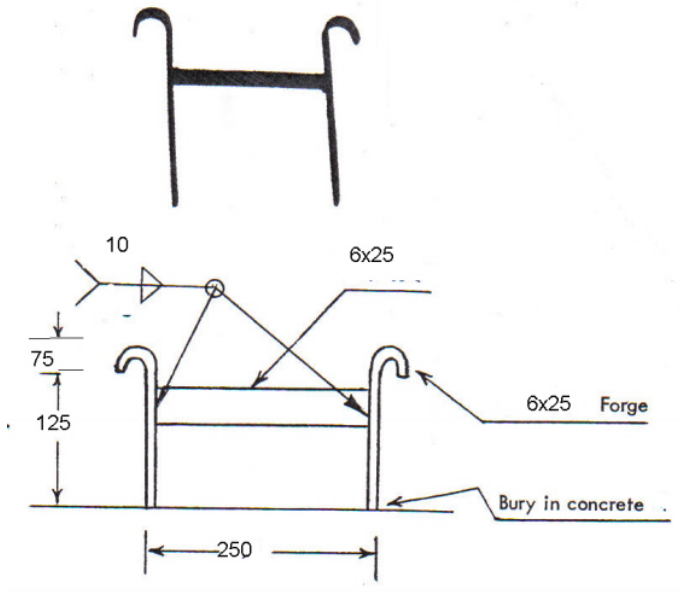
Material used:	▪ 25 mm diameter wooden doles/broomstick: x 4 ▪ Processed wood (1000mm x 800 mm x 25): x 4 ▪ Trolley wheels: x 4
Tools needed:	▪ Drill ▪ Drill bits ▪ Wood saw ▪ Measuring tape ▪ Pencil ▪ Screw driver.
Sundries:	▪ Glue ▪ Screws ▪ Sanding paper.
Layout Drawing:	 THREE TIER TABLE

Activity 2: RELATED TO BASIC METAL WORK

Activity outcomes:
Learners apply theoretical knowledge on types of metal.
Learners use drawings, sketches and welding symbols.
Learners demonstrate knowledge of measurements, cutting, bending, jointing, assembling and possible use of templates.
Learners demonstrate use of basic hand tools and welding equipment. It is suggested that the learner demonstrate competency in both arc and gas welding.
Learners demonstrate knowledge and awareness of safety and housekeeping in a workshop. Learners evaluate own artefact, compile a portfolio report and present project on request.

NB: The teacher must be present at all times during the making of the product and fire prevention precautions must be implemented.

Suggested Project: Foot scraper with decorations, curls and figure cutting.

Material used:	▪ 10 mm diameter steel rod x 500 mm long: x 2 ▪ Sheet metal (800mm x 25mm x 3mm): x 4 ▪ Trolley wheels: x 4
Tools & equipment needed:	▪ Arc welding and gas welding equipment ▪ Cutting torch ▪ Square ▪ Steel ruler ▪ Hacksaw ▪ File ▪ Scriber ▪ Welding hammer& Hammer
Sundries:	▪ Welding rods ▪ Sand paper.
Layout Drawing:	 FOOT SCRAPER TO BE USED ON THE FARM

Other examples of practical tasks

The following table provides guidance on the types of practical tasks that Grade 10 learners can engage in:

Content	Practical Activities	INTEGRATED ASSESSMENT STANDARDS	SKILLS INVOLVED AND TO BE ASSESSED
Sketching Skills & handling of tools & equipment • Basic carpentry • Basic welding	Suggested tasks: 1:Related to basic carpentry 2:Related to basic welding	• Safety • Sketching • Materials • Electrical energy • Communication • Measurements • Cost & Calculation	• Tool handling skills • Communication skills • Critical thinking skills • Logical thinking skills • Creative thinking skills • Finishing-off skills • Cleaning-up skills • Technological skills • Safety application skills • Finishing skills • Evaluation skills • Technical skills
• Building of structures - Materials - Foundations -Support structures - Roof structures • Fencing	Suggested tasks: 1:Related to building 2:Related to fencing (maintenance is included in both)		
• Manual tools & equipment • Mechanised equipment - engines - driving systems	Suggested tasks: 1:Related to manual tools & equipment 2:Related to mechanised equipment	• Safety • Calibration of tools • Communication • Measurements • Materials • Cost & Calculation	
• Irrigation systems - Micro & Macro	Suggested tasks: 1:Choose an activity relating to one of the following: Micro & Macro irrigation systems 2: Irrigation pumps		

Possible design projects that can be considered for the Practical Assessment Task include:

Project 1: (Grade 10 & 11) (Can also be a group activity)
Ten 3-month old calves have to be sheltered for the next six months in order to get them ready for the market.

TASK:

- Plan the shelter
- Make detailed free hand sketches of possible solutions
- Supply a list of the materials and tools/equipment needed to perform the task
- Supply a cost analysis of the task
- Choose the best solution and make a scale model showing:
  - foundations and walls
  - roof structure and roof
  - insulation
  - ventilation and windows
  - gates
  - water supply and drainage.

finishing off **Total [100]**

Project 2: (Grade 10)
You have to secure a house and outside buildings on a farm.

TASK:

- Plan an electric fence
- Include a detailed free hand sketch of such a fence and its electric wiring
- Supply a list of the materials and tools/equipment needed to perform the task
- Supply a cost analysis of the task
- Make a scale model showing:
  - type of wire and support for the fence
  - warning and protection system
  - alternative source of electrical energy and maintenance

type of entrance gate used. **Total [100]**

Project 3: (Grade 10)
You have to secure the entrance through the door of a workshop on a farm.

TASK:

- Plan such a security gate
- Make detailed free hand sketch of such a security gate
- Supply a list of the materials and tools/equipment needed to perform the task
- Supply a cost analysis of the task
- Make the security gate and finish it off.

Total [100]

Project 4: (Grade 10)
You have to restore a mechanised implement.

TASK:

- Plan the restoration
- Supply a list of the materials and tools/equipment needed to perform the task
- Supply a cost analysis of the task
- Restore and calibrate the implement.

Total [100]

Project 5: (Grade 10)
You have to repair an engine / system

TASK:

- Plan reparation
- Supply a list of the materials and tools/equipment needed to perform the task
- Supply a cost analysis of the task
- Do the reparation and calibrate engine/system.

Total [100]