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REPUBLIC OF SOUTH AFRICA

National Curriculum Statement
Grades 10–12
(General)

AGRICULTURAL TECHNOLOGY

Department of Education

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HOW TO USE THIS BOOK

This document is a draft policy document divided into four chapters. It is important for the reader must to read and integrate the information from the different sections in the document. The content of each chapter is described below.

Chapter 1 – Introducing the National Curriculum Statement

This chapter describes the principles and the design features of the National Curriculum Statement Grade 10–12 (General). It introduces the curriculum to the reader.

Chapter 2 – Introducing the Subject

This chapter describes the principles and the design features of the National Curriculum Statement Grade 10–12 (General). It introduces the curriculum to the reader.

Chapter 3 – Learning Outcomes, Assessment Standards, Content and Contexts

This chapter contains the Assessment Standards for each Learning Outcome and the, as well as content and contexts for the subject. The Assessment Standards are arranged to assist the reader to see the intended progression from Grade 10 to Grade 12. At the end of the chapter is the proposed content and contexts, which may be used to teach, learn and attain the Assessment Standards.

Chapter 4 – Assessment

This chapter deals with the generic approach to assessment being suggested by the National Curriculum Statement. At the end of the chapter is a table of subject-specific competence descriptions. Codes, scales and competence descriptions are provided for each grade. The competence descriptions are arranged to demonstrate progression from Grade 10 to Grade 12.

Symbols

The following are used to identify Learning Outcomes, Assessment Standards, grades, codes, scales, competence description, and content and context.

= Learning Outcome

= Assessment Standard

= Grade

= Code

= Scale

= Competence Description

= Content and Contexts

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ACRONYMS

AS	Assessment Standard
AET	Agriculture Education and Training
AIDS	Acquired Immune Deficiency Syndrome
CAD	Computer-Aided Draughting
CASS	Continuous Assessment
FET	Further Education and Training
FETC	Further Education and Training Certificate
FETI	Further Education and Training Institution
GET	General Education and Training
GETC	General Education and Training Certificate
HEI	Higher Education Institutions
HE	Higher Education and Training
HIV	Human Immunodeficiency Virus
HR	Human Rights
IKS	Indigenous Knowledge Systems
ISO	International Organisation for Standardisation
LO	Learning Outcome
LoLT	Language of Learning and Training
LP	Learning Programme
LPG	Learning Programme Guidelines
LSEN	Learners with Special Educational Needs
LTSM	Learning and Teaching Support Material
NCS	National Curriculum Statement
NOSA	National Occupational Safety Association
NQF	National Qualifications Framework
OBE	Outcomes-Based Education
OHS	Occupational Health and Safety
RNCS	Revised National Curriculum Statement
SABS	South African Bureau of Standards
SANS	South African National Standards
SAQA	South African Qualification Authority
SI	Système Internationale
SKVA	Skills, Knowledge, Values and Attitudes
TOP	Trade Occupational and Professional
CO	Critical Outcomes
DO	Developmental Outcomes

CHAPTER 1

INTRODUCING THE NATIONAL CURRICULUM STATEMENT

The adoption of the Constitution of the Republic of South Africa (Act 108 of 1996) provided a basis for curriculum transformation and development in South Africa. The Preamble states that the aims of the Constitution are to:

- heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights;
- improve the quality of life of all citizens and free the potential of each person;
- lay the foundation for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by law; and
- build a united and democratic South Africa able to take its rightful place as a sovereign state in the family of nations.

The Constitution further states that 'everyone has the right … to further education which the State, through reasonable measures, must make progressively available and accessible'.

The National Curriculum Statement Grades 10–12 (General) lays a foundation for the achievement of these goals by stipulating Learning Outcomes and Assessment Standards and by spelling out the key principles and values that underpin the curriculum.

1.1 PRINCIPLES

The National Curriculum Statement Grades 10–12 (General) is based on the following principles:

- social transformation;
- outcomes-based education;
- high knowledge and high skills;
- integration and applied competence;
- progression;
- articulation and portability;
- human rights, inclusivity and environmental and social justice;
- valuing indigenous knowledge systems; and
- credibility, quality and efficiency.

1.1.1 Social transformation

The imperative to transform South African society by making use of various transformative tools stems from a need to address the legacy of apartheid in all areas of human activity and in education in particular. Social transformation in education is aimed at ensuring that the educational imbalances of the past are redressed and of providing equal educational opportunities for all sections of our population. To achieve social transformation, all South Africans must receive an education which recognises their potential and removes artificial barriers to the attainment of qualifications.

1.1.2 Outcomes-based education

Outcomes-Based Education (OBE) forms the foundation of the curriculum in South Africa. It strives to enable all learners to reach their maximum learning potential by setting Learning Outcomes that must be achieved by the end of the education process. Outcomes-Based Education encourages a learner-centred and activity-based approach to education. The National Curriculum Statement builds its Learning Outcomes for Grades 10–12 on the Critical and Developmental Outcomes that were inspired by the Constitution and developed through a democratic process.

Critical Outcomes

The Critical Outcomes (CO) require learners to be able to:

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively with others as members of a team, group, organisation and community;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.

Developmental Outcomes

The Developmental Outcomes (DO) require learners to be able to:

- reflect on and explore a variety of strategies to learn more effectively;
- participate as responsible citizens in the life of local, national and global communities;
- be culturally and aesthetically sensitive across a range of social contexts;

- explore education and career opportunities; and
- develop entrepreneurial opportunities.

1.1.3 High knowledge and high skills

The National Curriculum Statement Grades 10–12 (General) aims to develop a high level of knowledge and skills in learners. It sets high expectations of what all South African learners can achieve. Social justice requires the empowerment of those sections of the population previously disempowered by the lack of knowledge and skills. The National Curriculum Statement specifies the minimum standards of knowledge and skills to be achieved at each grade and sets high, achievable standards in all subjects.

1.1.4 Integration and applied competence

Integration is achieved within and across subjects and Learning Fields. The integration of knowledge and skills across subjects and terrains of practice is crucial to achieve applied competence as defined in the National Qualifications Framework (NQF). Applied competence aims at integrating three discrete competences – namely, practical, foundational and reflective competences. In adopting integration and applied competence, the National Curriculum Statement Grades 10–12 (General) seeks to promote the integrated learning of theory, practice and reflection.

1.1.5 Progression

Progression refers to the process of developing more advanced and complex knowledge and skills. The Subject Statements show progression from one grade to another. Each Learning Outcome is followed by an explicit statement of what level of performance is expected for the Learning Outcome. Assessment Standards are arranged in a format that shows an increased level of expected performance per grade. The content and contexts of each grade also show progression from simple to complex.

1.1.6 Articulation and portability

Articulation refers to the relationship between qualifications in different National Qualifications Framework levels or bands which allows access from one qualification to another. This is especially important for qualifications falling within the same learning pathway. Given that the Further Education and Training (FET) Band falls between the General Education and Training (GET) and the Higher Education Training (HET) Bands, it is vital that the Further Education and Training Certificate (General) corresponds with the General Education and Training Certificate (GETC) and with qualifications in similar learning pathways of Higher Education. During the development of each Subject Statement, the exit level expectations of the General Education and

Training Learning Areas and the entrance level learning expectations of related disciplines in Higher Education were scrutinised to achieve this articulation.

Portability refers to the extent to which parts of a qualification (subjects or unit standards) can be transferred to another qualification in a different learning pathway of the same National Qualifications Framework band. To enhance the portability of subjects obtained in Grades 10–12, various mechanisms have been explored, for example, regarding a subject as a 20-credit unit standard. Subjects in the National Curriculum Statement Grades 10–12 (General) compare with appropriate unit standards registered on the National Qualifications Framework.

1.1.7 Human rights (HR), inclusivity and environmental and social justice

The National Curriculum Statement Grades 10–12 (General) seeks to promote human rights, inclusivity and environmental and social justice. All newly developed Subject Statements are infused with the principles and practices of social and environmental justice and human rights as defined by the Constitution of the Republic of South Africa. In particular, the National Curriculum Statement Grades 10–12 (General) is sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, disability and other factors.

The National Curriculum Statement Grades 10–12 (General) adopts an inclusive approach by specifying minimum requirements for all learners. It acknowledges that all learners should be able to develop to their full potential provided they receive the necessary support. The intellectual, social, emotional, spiritual and physical needs of learners should be addressed through the design and development of appropriate Learning Programmes (LPs) and through the use of appropriate assessment instruments.

1.1.8 Valuing indigenous knowledge systems (IKS)

In the 1960s, the theory of multi-intelligences illustrated to educationists that there are many ways to process information to make sense of the world and that if one were to redefine intelligence, one would have to take these different approaches into account. Up until then, the Western world had only valued logical, mathematical and specific linguistic abilities and rated people as 'intelligent' only if they were adept in these fields. Now, people recognise the wide diversity of knowledge systems through which people make sense of and attach meaning to the world in which they live. Indigenous knowledge systems in the South African context refer to a body of knowledge embedded in African philosophical thinking and social practices that have evolved over thousands of years. Therefore, the National Curriculum Statement Grades 10–12 (General) has infused indigenous knowledge systems into the Subject Statements. It acknowledges the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution. As many different perspectives as possible have been included to assist problem solving in all fields.

1.1.9 Credibility, quality and efficiency

The National Curriculum Statement Grades 10–12 (General) aims to achieve credibility through pursuing a transformational agenda and providing an education that is comparable in quality, breadth and depth to those of other countries. Quality assurance is regulated by the requirements of the South African Qualifications Authority Act (Act 58 of 1995), the Education and Training Quality Assurance Regulations and the General and Further Education and Training Quality Assurance Act (Act 58 of 2001).

1.2 THE KIND OF LEARNER THAT IS ENVISAGED

Of vital importance to our development as people are the values that give meaning to our personal spiritual and intellectual journeys. The Manifesto on Values, Education and Democracy (Department of Education, 2001: 9–10) states the following about education and values:

> *Values and morality give meaning to our individual and social relationships. They are the common currencies that help make life more meaningful than might otherwise have been. An education system does not exist to simply serve a market, important as that may be for economic growth and material prosperity. Its primary purpose must be to enrich the individual and, by extension, the broader society.*

The kind of learner that is envisaged is one who will be imbued with moral and ethical values and who will act in the interests of a society based on respect for democracy, equality, human dignity and social justice as promoted in the Constitution.

The learner emerging from the Further Education and Training Band must also demonstrate achievement of the Critical and Developmental Outcomes listed in this document. Subjects in the Fundamental Learning Component collectively promote the achievement of the Critical and Developmental Outcomes, while specific subjects in the Core and Elective Components individually promote the achievement of particular Critical and Developmental Outcomes.

In addition, learners emerging from the Further Education and Training band must:

- have access to and succeed in lifelong education and training of good quality;
- demonstrate an ability to think logically and analytically as well as holistically and laterally; and
- be able to transfer skills from familiar to unfamiliar situations.

1.3 THE KIND OF TEACHER THAT IS ENVISAGED

All teachers and educators are key contributors to the transformation of education in South Africa. The National Curriculum Statement Grades 10–12 (General) requires educators who are qualified, competent, dedicated and caring. These teachers are able to fulfil the various roles outlined in the *Norms and Standards for Educators.* These include being mediators of learning, interpreters and designers of

Learning Programmes and materials, leaders, administrators and managers, researchers and lifelong learners, community members, citizens and pastors, assessors and subject specialists.

1.4 STRUCTURE AND DESIGN FEATURES

1.4.1 Structure of the National Curriculum Statement

The National Curriculum Statement Grades 10–12 (General) consists of an Overview Document, the Qualifications and Assessment Policy Framework and the Subject Statements.

The subjects in the National Curriculum Statement Grades 10–12 (General) are categorised into Learning Fields.

What is a Learning Field?

A Learning Field is a category that serves as a home for related subjects and formulates the rules of combination for the Further Education and Training Certificate (General). The Learning Fields for Grades 10–12 were demarcated with due consideration of articulation with the General Education and Training and Higher Education Training Bands, and with classification schemes in other countries.

Although the development of the National Curriculum Statement Grades 10–12 (General) takes the twelve National Qualifications Framework organising fields as its point of departure, it should be emphasised that those organising fields are not necessarily Learning Fields or 'knowledge' fields, but rather are linked to occupational categories.

The following subject groupings were demarcated into Learning Fields to help with learner subject combinations:

- Agricultural Sciences
- Arts and Culture
- Business, Commerce and Management Studies
- Languages
- Manufacturing, Engineering and Technology
- Human and Social Studies
- Physical, Mathematical, Computer and Life Sciences
- Services.

What is a subject?

Historically, a subject has been defined as a specific body of academic knowledge. This understanding of a subject emphasised knowledge at the expense of skills, values and attitudes. Subjects were viewed by some as static and unchanging and with rigid boundaries. Very often, subjects focussed virtually exclusively on Western contributions to knowledge.

In an outcomes-based curriculum like the National Curriculum Statement Grades 10–12 (General), subject boundaries are blurred. Knowledge integrates theory, skills and values. Subjects are viewed as dynamic and always responsive to new and diverse knowledge, including knowledge that traditionally has been excluded from the formal curriculum.

A subject in an outcomes-based curriculum is broadly defined by Learning Outcomes and not only by its body of content. In the South African context, the Learning Outcomes should, by design, lead to the achievement of the Critical and Developmental Outcomes. Learning Outcomes are defined in broad terms and are flexible, allowing for the inclusion of local inputs.

What is a Learning Outcome?

A Learning Outcome is a statement of an intended result of learning and teaching. It describes knowledge, skills and values that learners should acquire by the end of the Further Education and Training Band.

What is an Assessment Standard?

Assessment Standards are criteria that collectively describe what a learner should know and be able to demonstrate at a specific grade. They embody the knowledge, skills, values and attitudes required to achieve the Learning Outcomes. Assessment Standards within each Learning Outcome collectively show how conceptual progression occurs from grade to grade.

1.4.2 Content of Subject Statements

Each Subject Statement consists of four chapters and a glossary:

- Chapter 1: Introducing the National Curriculum Statement – This generic chapter introduces the National Curriculum Statement Grades 10–12 (General).
- Chapter 2: Introducing the Subject – This chapter introduces the key features of the specific subject. It defines the subject and outlines its purpose, scope, educational and career links and Learning Outcomes.

- Chapter 3: Learning Outcomes, Assessment Standards, Content and Context – This chapter contains the Learning Outcomes with their associated Assessment Standards, Content and Context.
- Chapter 4: Assessment – This chapter deals with the generic approach to assessment being suggested by the National Curriculum Statement.
- Glossary: When appropriate, a list selected general and subject – specific terms are briefly defined.

1.5 LEARNING PROGRAMME GUIDELINES

A Learning Programme specifies the scope of learning and assessment for the three grades in the Further Education and Training Band. It is the plan that ensures that learners achieve the Learning Outcomes as prescribed by the Assessment Standards for a particular grade. The Learning Programme Guidelines (LPG) assists teachers and other Learning Programme developers to plan and design quality learning, teaching and assessment programmes.

CHAPTER 2

AGRICULTURAL TECHNOLOGY

2.1 DEFINITION

Agricultural Technology focuses on technological processes used in agriculture to create an understanding of how processes, equipment and structures are used with people, soil, plants, animals and their products to use the environment, to sustain and maintain quality of life and to promote economic, aesthetic and sound cultural values.

2.2 PURPOSE

Agricultural Technology will expose learners to skills, knowledge, values and attitudes relevant to the agricultural and farming environment. The subject takes cognisance of and relates to the Critical and Developmental Outcomes outlined in Chapter 1, by preparing learners to:

- understand the social contribution of Agricultural Technology to the promote human rights, economic growth, entrepreneurship and sustainability and improve quality of life and provide solutions that are responsive to individual and community needs;
- identify and solve problems in an Agricultural Technology environment using critical, innovative and creative thinking to, amongst others, develop the creative potential of learners;
- communicate effectively using verbal, written, visual and graphical communication and mathematical skills as applied in Agricultural Technology;
- organise and manage activities responsibly and effectively;
- collect, analyse, organise, critically evaluate and present information;
- use science and technology effectively and critically, showing responsibility and accountability to the sustainable use of the environment and the rights and health of others;
- manage the impact of Agricultural Technology on natural resources, cultural values and socio-economic development; and
- show an understanding of the indigenous knowledge, ethical considerations, values and attitudes which relate to Agricultural Technology.

Learners will be prepared for various career pathways and additional education and training opportunities by:

- applying knowledge and skills of Agricultural Technology in various farming related contexts;
- developing entrepreneurial skills;
- exploring education and career opportunities, thus becoming lifelong learners, learning to be sensitive to the rights of others including those living with and affected by HIV/Aids and Learners with Special Educational Needs (LSEN); and

- learning to manage and be sensitive to their own rights and responsibilities in terms of their own role in the community.

2.3 SCOPE

In Agricultural Technology learners apply the technological process to identify, investigate, design, make, evaluate and communicate by using skills to carry out practical projects, operate, repair and maintain equipment and design and construct structures in the agricultural environment as applicable to people, plants, animals, soil and their products.

The following generic concepts are embedded in Agricultural Technology:

- Identification and solving of problems using the technological process and relevant scientific principles,
- Safety rules and regulations applicable within agricultural environment, according to the Occupational, Health and Safety (OHS) Act No 85 of 1993, first aid and medical emergencies including HIV/Aids awareness.
- Safety measures in the transport of animals and livestock according to the relevant legislation.
- Basic operational knowledge and correct use of agricultural tools, equipment and machinery used in the production and processing of food and fibre.
- Effective communication techniques such as verbal, written, visual and graphical communication.
- Effective use of computer technology and measuring and surveying equipment related to agriculture
- Construction and maintenance of agricultural buildings and structures.
- Maintenance and repair of farm implements and machinery.
- Energy principles and their application in agriculture.
- Planning, construction and maintenance of animal handling facilities necessary for effective animal production.
- Prevention of soil erosion.
- Safe and effective use of agricultural equipment used in crop production, horticulture, orchards, vineyards, fodder crops and forestry.
- Planning, designing and maintenance of macro and micro irrigation and hydroponics systems.
- Planning, construction and maintenance of production plants to process agricultural products and to add value.
- Cost calculation in the agricultural environment.

The following processes must be embedded in Agricultural Technology:

- Learn to solve problems in methodical, scientific and creative ways in the agricultural environment.
- Learn by dealing directly with inclusivity, human rights and social and environmental issues in theoretical and practical tasks.
- Use and engage with subject-related knowledge in a purposeful way.
- Use a variety of life skills when working on projects in an authentic context (e.g. decision making, critical thinking, co-operation and needs identification).
- Develop more positive attitudes and perceptions towards career pathways.

2.4 EDUCATIONAL AND CAREER LINKS

The study of Agricultural Technology builds on the systems, controls, structures and processes found in the Technology Learning Area Statement for the General Education and Training Band. The subject further develops learners' knowledge and understanding of agricultural machines, hydraulics and mechanisms. Learners are exposed to the safe and efficient use and application of mechanical advantage, designs and structures as applied in the designing process. Agricultural Technology prepares individuals to manage agricultural businesses with the application of sound technical, economical and environmental practices. Leading technology is applied to real-world problems with the emphasis on production.

Agricultural Technology provides many career opportunities for learners from diverse backgrounds, including Learners with Special Educational Needs.

The subject is designed to provide learners with a sound academic base that integrates theoretical and practical competencies. This provides a sound foundation for further studies at Higher Education and Training Institutions in fields such as:

- Agricultural Engineering
- Human Resource training in the field of Agricultural Technology
- Physical Science careers in the different engineering fields
- Landscape Engineering.

Examples of employment, although not exhaustive, are in the following fields:

- Agriculture
- Agricultural implements
- Maintenance of automotive and mechanised farm equipment
- Mechanisation
- Environmental conservation
- Construction of agricultural structures.

2.5 LEARNING OUTCOMES

Agricultural Technology will provide learners at Further Education and Training institutions with an opportunity that is directly related to the achievement of the following Learning Outcomes. The following four Learning Outcomes are integrated in such a way so that they are not dealt with in isolation.

Learning Outcome 1: Technology, society and the environment

The learner is able to express an awareness and show understanding of the interrelationship between Agricultural Technology, society and the environment.

In this Learning Outcome learners investigate the impact of technology on natural resources, cultural values and socio-economic development with particular reference to sustainability and indigenous knowledge systems.

This Learning Outcome also seeks to create awareness in learners about health, fairness and equal access to employment and services and prepare them for the work environment, entrepreneurial opportunities and further studies.

Learning Outcome 2: Technological process

The learner is able to understand and apply the technological process.

In this Learning Outcome learners develop the skill to identify, investigate, design, make and evaluate processes and products related to Agricultural Technology and to communicate the findings through the use of appropriate terminology and a variety of communication media.

Learning Outcome 3: Knowledge and understanding

The learner is able to show an understanding of knowledge, principles and concepts used in Agricultural Technology.

This Learning Outcome develops learners to make informed decisions and acquire a broader understanding of how Agricultural Technology relates to the different agricultural environments.

Learning Outcome 4: Application of knowledge

The learner is able to apply the principles, practices and skills used in Agricultural Technology by organising and managing activities responsibly and effectively.

This Learning Outcome enables learners to demonstrate and apply their knowledge and skills to engage with challenges encountered in Agricultural Technology.

CHAPTER 3

LEARNING OUTCOMES, ASSESSMENT STANDARDS, CONTENT AND CONTEXTS

INTERRELATEDNESS OF THE LEARNING OUTCOMES

All Learning Outcomes are equally important, but not all the Learning Outcomes have the same weighting in terms of time and resource allocation. Learning Outcome 3 reflects knowledge and understanding, whilst Learning Outcome 4 deals with the application of this knowledge. These two Learning Outcomes are underpinned by Learning Outcome 1, which reflects the interrelationship of technology, society and the environment and Learning Outcome 2, which outlines the technological process that is used as the organising concept.

THE NUMBERING SYSTEM

All Assessment Standards (ASs) are numbered in the following manner:

- The first number refers to the grade.
- The second number refers to the Learning Outcome.
- The third number refers to the Assessment Standard, for example 10.1.4 implies Grade 10, Learning Outcome 1 and Assessment Standard 4.

Grade 10

Learning Outcome 1

Technology, society and the environment

The learner is able to express awareness and show understanding of the interrelationship between Agricultural Technology, society and the environment.

Assessment Standards

We know this when the learner is able to:

- 10.1.1
  Describe the interrelationship between technology, society and the environment.
- 10.1.2
  Describe human rights issues.
- 10.1.3
  Describe, explain and respond to basic medical emergencies in context, taking cognisance of health issues such as HIV/Aids.
- 10.1.4
  Identify indigenous knowledge systems of different cultures.
- 10.1.5
  Describe entrepreneurship and its influence on society and environment.

Grade 11

Assessment Standards

We know this when the learner is able to:

- 11.1.1
  Discuss and evaluate the interrelationship between technology, society and the environment.
- 11.1.2
  Consider human rights issues and discuss fair and equal employment practices.
- 11.1.3
  Describe, explain and respond to medical emergencies in context, taking cognisance of health issues such as HIV/Aids.
- 11.1.4
  Compare how different cultures solved technological problems.
- 11.1.5
  Discuss the competencies required by entrepreneurs.

Grade 12

Assessment Standards

We know this when the learner is able to:

- 12.1.1
  Predict the impact of future development in technology on society and environment.
- 12.1.2
  Respect human rights issues and analyse issues relating to employment equity.
- 12.1.3
  Describe, explain and respond to necessary medical emergencies taking cognisance of health issues such as HIV/Aids.
- 12.1.4
  Analyse how solutions to technological problems in different cultures are combined into an optimum solution.
- 12.1.5
  Identify and investigate possible entrepreneurial opportunities.

Grade 10

Learning Outcome 2

Technological process

The learner is able to understand and apply the technological process.

Note: There is no progression in the Assessment Standards across the grades as the Learning Outcome 2 is a process. The progression across the grades is reflected in the degree of complexity of the content.

Assessment Standards

We know this when the learner is able to:

- 10.2.1
  Identify, investigate, define, analyse problems in a given real life situation.
- 10.2.2
  Generate and/or design possible solutions for problems.
- 10.2.3
  Make or improve products according to the selected design.
- 10.2.4
  Evaluate the product against the initial design.
- 10.2.5
  Present assignments by a variety of communication media.

Grade 11

Assessment Standards

We know this when the learner is able to:

- 11.2.1
  Identify, investigate, define, analyse problems in a given real life situation.
- 11.2.2
  Generate and/or design possible solutions for problems.
- 11.2.3
  Make or improve products according to the selected design.
- 11.2.4
  Evaluate the product against the initial design.
- 11.2.5
  Present assignments by a variety of communication media.

Grade 12

Assessment Standards

We know this when the learner is able to:

- 12.2.1
  Identify, investigate, define, analyse more problems in a given real life situation.
- 12.2.2
  Generate and/or design possible solutions for problems.
- 12.2.3
  Make or improve products according to the selected design.
- 12.2.4
  Evaluate the product against the initial design.
- 12.2.5
  Present assignments by a variety of communication media.

Grade 10

Learning Outcome 3

Knowledge and understanding

The learner is able to show an understanding of knowledge, principles and concepts used in Agricultural Technology.

Assessment Standards

We know this when the learner is able to:

- 10.3.1
  Safety
  Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.

- 10.3.2
  Materials and structures
  Know and understand the principles, concepts, properties of different materials and types of structures used in agriculture.

- 10.3.3
  Skills and construction processes
  Know and understand the application of basic skills and construction processes in the agricultural environment.

- 10.3.4
  Energy
  Show an understanding of basic principles and economic use of electrical energy in agriculture.

- 10.3.5
  Tools and equipment
  Identify the purpose and use of different basic tools, equipment and implements and knowledge of components of mechanised agricultural equipment and systems.

Grade 11

Assessment Standards

We know this when the learner is able to:

- 11.3.1
  Safety
  Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.

- 11.3.2
  Materials and structures
  Know and understand the principles, advanced concepts, properties of different materials and types of structures used in agriculture.

- 11.3.3
  Skills and construction processes
  Know and understand the application of the advanced skills and construction processes in the agricultural environment.

- 11.3.4
  Energy
  Know and understand equipment generating and distributing electrical energy in agriculture.

- 11.3.5
  Tools and equipment
  Know and understand the purpose and effective use of advanced tools, equipment, implements and components of mechanised agricultural equipment and systems.

Grade 12

Assessment Standards

We know this when the learner is able to:

- 12.3.1
  Safety
  Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.

- 12.3.2
  Materials and structures
  Know and understand the principles, more advanced concepts, properties of different materials and types of structures used in agriculture.

- 12.3.3
  Skills and construction processes
  Know and understand the application of more advanced skills and construction processes in the agricultural environment.

- 12.3.4
  Energy
  Know, understand and explain the use of alternative sources that generates electrical energy in agriculture.

- 12.3.5
  Tools and equipment
  Know and understand the purpose and effective use of more advanced tools, equipment, implements and components of mechanised agricultural equipment and systems.

Grade 10

Learning Outcome 3 (continued)

Knowledge and understanding

The learner is able to show an understanding of knowledge, principles and concepts used in Agricultural Technology.

Assessment Standards

We know this when the learner is able to:

- 10.3.6
  Irrigation
  Know and identify the types and applications of different irrigation systems.

- 10.3.7
  Communication
  Know and identify the use and purpose of different sources of information and communication systems used on a farm.

- 10.3.8
  Drawings related to agriculture
  Know and understand basic freehand sketching and drawings related to agriculture.

- 10.3.9
  Measurements, calculations and calibrations
  Know and understand the concepts and principles of measurement and calculation used for expenditure and the calibration of tools and equipment in the agricultural environment.

Grade 11

Assessment Standards

We know this when the learner is able to:

- 11.3.6
  Irrigation
  Describe and demonstrate an understanding of the technical principles of the systems in irrigation, waste water, water supply and the different drainage systems in an agricultural environment.
- 11.3.7
  Communication
  Know and understand the effective use of communication technology in agriculture.
- 11.3.8
  Drawings related to agriculture
  Interpret and produce freehand sketches of orthographic and isometric drawings related to agriculture.
- 11.3.9
  Measurements, calculations and calibrations
  Interpret the concepts and principles of measurement and calculation used for maintenance expenditure and the calibration of tools and equipment in the agricultural environment.

Grade 12

Assessment Standards

We know this when the learner is able to:

- 12.3.6
  Irrigation
  Know and understand the effective use and purpose of the irrigation, waste water, water supply and different drainage systems in the agricultural environment.
- 12.3.7
  Communication
  Know and understand the effective use of communication technology in agriculture.
- 12.3.8
  Drawings related to agriculture
  Interpret and produce freehand sketches of assembly and sectional drawings related to agriculture.
- 12.3.9
  Measurements, calculations and calibrations
  Apply the concepts and principles of measurement and calculation used for maintenance expenditure and the calibration of tools and equipment in the agricultural environment.

Grade 10

Learning Outcome 4

Application of knowledge

The learner is able to apply the principles, practices and skills used in Agricultural Technology by organising and managing activities responsibly and effectively.

Assessment Standards

We know this when the learner is able to:

- 10.4.1
  Safety
  Apply the OHS Act and knowledge of working safely in the agricultural environment.

- 10.4.2
  Materials and structures
  Apply and use knowledge of concepts, principles and properties of different materials and their uses in making agricultural structures.

- 10.4.3
  Skills and construction processes
  Apply different basic skills and construction processes in the agricultural environment.

- 10.4.4
  Energy
  Apply basic principles and economic use of electrical energy in agriculture.

- 10.4.5
  Tools and equipment
  Demonstrate the use of basic agricultural tools, equipment and implements.

- 10.4.6
  Irrigation
  Demonstrate an understanding of different irrigation systems in the agricultural environment.

Grade 11

Assessment Standards

We know this when the learner is able to:

- 11.4.1
  Safety
  Apply the OHS Act and knowledge of working safely in the agricultural environment.
- 11.4.2
  Materials and structures
  Apply and use knowledge of advanced concepts, principles and properties of different materials and their uses in making agricultural structures.
- 11.4.4
  Skills and construction processes
  Apply different advanced skills and construction processes in the agricultural environment.
- 11.4.3
  Energy
  Apply and use of equipment generating and distributing electrical energy in agriculture.
- 11.4.5
  Tools and equipment
  Demonstrate the effective use of advanced tools, equipment, implements and components of mechanised agricultural equipment and systems.
- 11.4.6
  Irrigation
  Demonstrate an understanding of irrigation, waste water, water supply and different drainage systems in the agricultural environment.

Grade 12

Assessment Standards

We know this when the learner is able to:

- 12.4.1
  Safety
  Apply the OHS Act and knowledge of working safely in the agricultural environment.
- 12.4.2
  Materials and structures
  Apply and use knowledge of more advanced concepts, principles and properties of different materials and their uses in making agricultural structures.
- 12.4.3
  Skills and construction processes
  Apply different more advanced skills and construction processes in the agricultural environment.
- 12.4.4
  Energy
  Apply and use alternative sources that generate electrical energy in agriculture.
- 12.4.5
  Tools and equipment
  Demonstrate the effective use of more advanced tools, equipment, implements and mechanised agricultural equipment by diagnosis, fault finding and problem solving.
- 12.4.6
  Irrigation
  Demonstrate the effective use and maintenance of irrigation, waste water, water supply and different drainage systems in the agricultural environment.

Grade 10

Learning Outcome 4 (continued)

Application of knowledge

The learner is able to apply the principles, practices and skills used in Agricultural Technology by organising and managing activities responsibly and effectively.

Assessment Standards

We know this when the learner is able to:

- 10.4.7
  Communication
  Use and apply communication technology effectively on the farm.
- 10.4.8
  Drawings related to agriculture
  Application of basic freehand sketches and drawings related to agriculture.
- 10.4.9
  Measurements, calculations and calibrations
  Application of concepts and principles of measurement and calculation used for expenditure and the calibration of tools and equipment in the agricultural environment.

Grade 11

Assessment Standards

We know this when the learner is able to:

- 11.4.7
  Communication
  Use and apply communication technology effectively on the farm.
- 11.4.8
  Drawings related to agriculture
  Application of freehand sketches of orthographic and isometric drawings related to agriculture.
- 11.4.9
  Measurements, calculations and calibrations
  Application of concepts and principles of measurement and calculation used for maintenance expenditure and the calibration of tools and equipment as applied in the agricultural environment.

Grade 12

Assessment Standards

We know this when the learner is able to:

- 12.4.7
  Communication
  Use and apply communication technology effectively on the farm.
- 12.4.8
  Drawings related to agriculture
  Application of freehand sketches of assembly and sectional drawings related to agriculture.
- 12.4.9
  Measurements, calculations and calibrations
  Application of concepts and principles of measurement and calculation used for maintenance expenditure and the calibration of tools and equipment as applied in the agricultural environment.

CONTENT AND CONTEXTS FOR THE ATTAINMENT OF ASSESSMENT STANDARDS

In this section content and contexts are provided to support the attainment of the Assessment Standards. The content indicated needs to be dealt with in such a way to assist the learner to achieve the Learning Outcomes. Content must serve the Learning Outcomes and not be an end in itself. The contexts suggested will embed the content in situations, which are meaningful to learners and so assist learning and teaching. Educators should be aware of and use local contexts, which could be more suited to the experiences of learners. Content and context, when aligned to the attainment of the Assessment Standards, provide a framework for the development of Learning Programmes. The Agricultural Technology Learning Programme Guidelines (LPG) gives more detail in this respect.

Grade 10

Learning Outcome 1

Technology, society and the environment

The learner is able to express an awareness and show understanding of the interrelationship between Agricultural Technology, society and the environment.

Assessment Standards

The content and contexts could include:

- 10.1.1
  Describing the interrelationship between technology, society and the environment.

- 10.1.2
  Describing human rights issues.

- 10.1.3
  Describing, explaining and responding to basic medical emergencies in context, taking cognisance of health issues such as HIV/Aids.

- 10.1.4
  Identifying indigenous knowledge systems of different cultures.

- 10.1.5
  Describing entrepreneurship and its influence on society and environment.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.1.1
  Discussing and evaluating the interrelationship between technology, society and the environment.
- 11.1.2
  Considering human rights issues and discussing fair and equal employment practices.
- 11.1.3
  Describing, explaining and responding to basic medical emergencies in context, taking cognisance of health issues such as HIV/Aids.
- 11.1.4
  Comparing how different cultures solved technological problems.
- 11.1.5
  Discussing the competencies required by entrepreneurs.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.1.1
  Predicting the impact of future developments in technology on society and environment.
- 12.1.2
  Respecting human rights issues and analysing issues relating to employment equity.
- 12.1.3
  Describing, explaining and responding to basic medical emergencies in context, taking cognisance of health issues such as HIV/Aids.
- 12.1.4
  Analysing how solutions to technological problems in different cultures are combined into an optimum solution.
- 12.1.5
  Identifying and investigating possible entrepreneurial opportunities.

Grade 10

Learning Outcome 2

Technological process

The learner is able to understand and apply the technological process.

Note: This Learning Outcome captures the application of processes and skills to solve problems in the Agricultural Technology field. Basic mechanical, electrical, construction, irrigation, soil conservation and maintenance problems are identified through investigation and solutions are designed. Repairs, constructions and engineering methods are implemented, evaluated and communicated.

Assessment Standards

The content and contexts could include:

- 10.2.1
  Identifying, investigating, defining and analysing problems in a given real-life situation.
- 10.2.2
  Generating and/or designing possible solutions for problems.
- 10.2.3
  Making or improving products according to the selected design.
- 10.2.4
  Evaluating the final product against the initial design.
- 10.2.5
  Presenting assignments by a variety of communication media.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.2.1
  Identifying, investigating, defining and analysing problems in a given real-life situation.
- 11.2.2
  Generating and/or designing possible solutions for problems.
- 11.2.3
  Making or improving products according to the selected design.
- 11.2.4
  Evaluating the final product against the initial design.
- 11.2.5
  Presenting assignments by a variety of communication media.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.2.1
  Identifying, investigating, defining and analysing more problems in a given real-life situation.
- 12.2.2
  Generating and/or designing possible solutions for problems.
- 12.2.3
  making or improving products according to the selected design.
- 12.2.4
  Evaluating the final product against the initial design.
- 12.2.5
  Presenting assignments by a variety of communication media.

Grade 10

Learning Outcome 3

Knowledge and understanding

The learner is able to show an understanding of knowledge, principles and concepts used in Agricultural Technology.

Assessment Standards

The content and contexts could include:

- 10.3.1

  Safety
  - OHS Act: Introduction
  - general safety and hazardous substances
  - first aid.

- 10.3.2

  Materials and structures

  Materials:
  - metals
  - wood
  - polymers
  - materials used in building.
  - materials used in construction.
  - materials used in fencing.

  Structures:
  - basic foundations
  - support structures
  - roof structures
  - maintenance of structures
  - fencing.

- 10.3.3

  Skills and construction processes

  Basic skills and construction processes used:
  - basic carpentry
  - basic gas-welding
  - basic arc-welding

Grade 11

Assessment Standards

The content and contexts could include:

- 11.3.1
  Safety
  - OHS Act: Application
  - general safety Regulations
  - medical emergencies.

- 11.3.2
  Materials and structures
  Materials:
  - metal treatment
  - wood treatment
  - adhesives
  - building mixtures
  - materials used in plumbing
  - materials used in fencing.

  Structures:
  - planning and maintenance of structures for animal production
  - basic knowledge of materials used and principles of plumbing
  - basic knowledge and uses of different types of fences.

- 11.3.3
  Skills and construction processes
  Advanced skills and construction processes used:
  - carpentry
  - gas and arc-welding
  - soldering and hard soldering
  - basic sheet metal work.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.3.1
  Safety
  - OHS Act: Application
  - general safety Regulations.

- 12.3.2
  Materials and structures
  Materials:
  - materials and materials for special use used in the agricultural environment.

  Structures:
  - building: Planning and maintaining structures for plant production, curing and storage facilities
  - fencing: Basic knowledge and uses of spesialised fences and its components.

- 12.3.3
  Skills and construction processes
  More advanced skills and construction processes used:
  - advanced carpentry
  - gas and arc-welding
  - CO2 welding.

Grade 10

Learning Outcome 3 (continued)

Knowledge and understanding

The learner is able to show an understanding of knowledge, principles and concepts used in Agricultural Technology.

Assessment Standards

The content and contexts could include:

- 10.3.4

  Energy
  - Basic principles of electrical energy
  - Economical and safe use of electrical energy.

- 10.3.5

  Tools and equipment
  - Purpose and use of basic tools and equipment
  - Purpose and use of animal-drawn implements
  - Knowledge and identification of components of mechanised equipment and systems.

- 10.3.6

  Irrigation
  - Types and uses of micro irrigation systems
  - Types and uses of macro irrigation systems.

- 10.3.7

  Communication
  - Information sources
  - Different types of communication.

- 10.3.8

  Drawings related to agriculture
  - Know and understand basic freehand sketches of drawings related to agriculture.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.3.4
  Energy
  - Utility equipment generating electrical energy
  - Utility equipment distributing electrical energy.
- 11.3.5
  Tools and equipment
  - Purpose and use of advanced tools and equipment
  - Purpose and effective use of mechanical crop cultivating implements and equipment
  - Knowledge of functions of components of mechanised equipment and systems.
- 11.3.6
  Irrigation
  - Technical principles of irrigation, waste water supply and drainage systems.
- 11.3.7
  Communication
  - Effective use of computer technology in agriculture.
- 11.3.8
  Drawings related to agriculture
  - Interpret and produce freehand sketches of orthographic and isometric drawings related to agriculture.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.3.4
  Energy
  - Alternative sources of electrical energy.
- 12.3.5
  Tools and equipment
  - Purpose and use of pneumatic and hydraulic tools
  - Purpose and use of specialized tools, equipment and crop cultivating implements
  - Mechanised equipment: maintenance, care, diagnose, fault finding and problem solving.
- 12.3.6
  Irrigation
  - Methods to solve problems related to irrigation, waste water, water supply and drainage systems.
- 12.3.7
  Communication
  - Advanced use of communication technology.
- 12.3.8
  Drawings related to agriculture
  - Interpret and produce freehand sketches of assembly and sectional drawings related to agriculture.

Grade 10

Learning Outcome 3 (continued)

Knowledge and understanding

The learner is able to show an understanding of knowledge, principles and concepts used in Agricultural Technology.

Assessment Standards

The content and contexts could include:

- 10.3.9

  Measurements, calculations and calibrations
  - Principles of measurement as needed
  - Basic expenditure and calculation
  - Calibration of tools and equipment.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.3.9
  Measurements, calculations and calibrations
  - Principles of measurement and calibration as applicable in tools, equipment and implements.
  - Calculations of projects and maintenance expenditure.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.3.9
  Measurements, calculations and calibrations
  - Problem solving and applying of data collected from measurements, calculations and expenditure.
  - Effective use of tools, equipment and implements due to correct measurement, calibration and adjustment.

Grade 10

Learning Outcome 4

Application of knowledge

The learner is able to apply the principles, practices and skills used in Agricultural Technology by organising and managing activities responsibly and effectively.

Assessment Standards

The content and contexts could include:

- 10.4.1
  Safety
  The application of the:
  - OHS Act: Introduction
  - general safety and hazardous substances
  - first aid.

- 10.4.2
  Materials and structures
  Materials:
  Correct applying of materials in:
  - metals
  - wood
  - polymers
  - materials used in building construction
  - materials used in construction
  - materials used in fencing

  Structures:
  - basic foundations
  - support structures
  - roof structures
  - maintenance of structures
  - fencing.

- 10.4.3
  Skills and construction processes
  Correct application of basic skills and construction processes:
  - basic carpentry
  - basic gas and arc-welding.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.4.1
  Safety
  The application of the:
  - OHS Act: Introduction
  - general safety and hazardous substances.

- 11.4.2
  Materials and structures
  Materials:
  Correct applying of skills in:
  - metal treatment
  - wood treatment
  - adhesives
  - building mixtures
  - materials used in plumbing
  - materials used in fencing

  Structures:
  Applying of skills in planning and maintaining:
  - handling and housing facilities for animal production
  - plumbing: water pipes and water storage
  - different types of fences and equipment.

- 11.4.3
  Skills and construction processes
  Correct application of advanced skills and construction processes:
  - carpentry
  - gas and arc-welding
  - soldering and hard soldering
  - basic sheet metal work.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.4.1
  Safety
  The application of the:
  - OHS Act: Introduction
  - general safety and hazardous substances.

- 12.4.2
  Materials and structures
  Materials:
  Correct applying of skills in:
  - materials involved in building constructions and its preservation
  - materials for special use
  - materials used in insulation and ventalation
  - materials for electric fencing

  Structures:
  Applying of skills in planning and maintaining:
  - plant production, curing and storage facilities

  Applying basic knowledge and use of specialised fences:
  - Spesialised electrical fences and their components.

- 12.4.3
  Skills and construction processes
  Correct application of more advanced skills and construction processes:
  - advanced carpentry
  - gas and arc-welding
  - CO2 welding.

Grade 10

Learning Outcome 4 (continued)

Application of knowledge

The learner is able to apply the principles, practices and skills used in Agricultural Technology by organising and managing activities responsibly and effectively.

Assessment Standards

The content and contexts could include:

- 10.4.4
  Energy
  Correct applying:
  - basic principles of electrical energy – symbols and units
  - economic and safe use of electric energy.

- 10.4.5
  Tools and equipment
  Correct application:
  - use of basic tools and equipment
  - use of animal-drawn implements
  - identification of components of mechanised equipment and systems.

- 10.4.6
  Irrigation
  Correct application:
  - uses of micro and macro irrigation systems.

- 10.4.7
  Communication
  Correct application:
  - use of information sources
  - use of different types of communication.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.4.4
  Energy
  Correct applying:
  - utility equipment generating electrical energy
  - utility equipment distributing electrical energy.

- 11.4.5
  Tools and equipment
  Correct application:
  - use of advanced tools and equipment
  - effective use of mechanical crop cultivating implements and equipment
  - knowledge of functions of components of mechanised equipment and systems.

- 11.4.6
  Irrigation
  Correct application:
  - technical principles of irrigation, waste water, water supply and drainage systems
  - use of relevant basic tools and equipment.

- 11.4.7
  Communication
  Correct application:
  - effective use of communication technology.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.4.4
  Energy
  Correct applying:
  - alternative sources of electrical energy.

- 12.4.5
  Tools and equipment
  Correct application:
  - use of pneumatic and hydraulic tools
  - effective use of specialised tools, mechani, crop cultivation implements and equipment.
  - maintenance, care, diagnose, fault finding and problem solving of mechanised equipment.

- 12.4.6
  Irrigation
  Correct application:
  - effective use and maintenance of irrigation, waste water, water supply and drainage systems.

- 12.4.7
  Communication
  Correct application:
  - effective use of computer technology.

Grade 10

Learning Outcome 4 (continued)

Application of knowledge

The learner is able to apply the principles, practices and skills used in Agricultural Technology by organising and managing activities responsibly and effectively.

Assessment Standards

The content and contexts could include:

- 10.4.8
  Drawings related to agriculture
  Correct application:
  - basic freehand sketches of drawings.

- 10.4.9
  Measurements, calculations and calibrations
  Correct application:
  - principles of measurement and calculation used for expenditure
  - calibration of tools and equipment.

Grade 11

Assessment Standards

The content and contexts could include:

- 11.4.8
  Drawings related to agriculture
  Correct application:
  - related freehand sketches of orthographic and isometric drawings.

- 11.4.9
  Measurements, calculations and calibrations
  Correct application:
  - principles of measurement and calibration used for tools and equipment and implements
  - calculation of projects and maintenance expenditure.

Grade 12

Assessment Standards

The content and contexts could include:

- 12.4.8
  Drawings related to agriculture
  Correct application:
  - interpreting of related assembly and section drawings.

- 12.4.9
  Measurements, calculations and calibrations
  Correct application:
  - problem solving and applying of data collected
  - effective use of tools, equipment and implements due to correct measurements, calibrations, adjustments and maintenance expenditure.

CHAPTER 4

ASSESSMENT

4.1 INTRODUCTION

Assessment is a critical element of the National Curriculum Statement Grades 10–12 (General). It is a process of collecting and interpreting evidence to determine a learner's progress in learning and to evaluate a learner's performance. Evidence can be collected at different times and places, using various methods, instruments, modes and media.

To ensure that assessment results can be accessed and used for various purposes at a future date, the results have to be recorded. There are various approaches to recording learners' performances. Some of these are explored in this chapter. Others are dealt with in a more subject-specific manner in the Learning Programme Guidelines.

Many stakeholders have an interest in how learners perform in Grades 10–12. These include the learners themselves, parents, guardians, sponsors, provincial departments of education, the Department of Education, the Ministry of Education, employers and higher education and training institutions. Therefore, assessment results have to be reported to facilitate access to learners' overall performances and to infer learners' competences. There are many ways of reporting. The Learning Programme Guidelines and the *Qualifications and Assessment Policy Framework for Grades 10–12 (General)* discuss ways of recording and reporting on school-based and external assessment and guide assessment issues specific to the subject.

4.2 WHY ASSESS

Before a teacher assesses learners, it is crucial that the purposes of the assessment be clearly and unambiguously established. When the purpose of the assessment is understood, a method of assessment can be appropriately matched to the purpose. In turn, decisions and conclusions made based on the assessment will be fair and appropriate to the particular purpose or purposes.

There are many reasons why a learner's performance is assessed. These include monitoring progress and providing feedback; diagnosing or remediating barriers to learning; selecting, guiding and supporting learning; certification and promotion.

In this curriculum, learning and assessment are very closely linked. Assessment helps learners to measure the effectiveness of their learning. It informs them about their own progress and empowers them to take control of and decide about their learning. In this sense, assessment provides information about whether teaching and learning support the achievement of specified Learning Outcomes. When assessment indicates a lack of progress, teaching and learning plans should be changed accordingly.

4.3 TYPES OF ASSESSMENT

This section discusses the following types of assessment:

- Baseline assessment
- Diagnostic assessment
- Formative assessment
- Summative assessment.

4.3.1 Baseline assessment

Baseline assessment is important at the start of a grade but can occur at the beginning of any learning cycle. It is used to establish what learners already know and can do. It helps in the planning of activities and developing of Learning Programmes. Baseline assessment is usually recorded informally.

4.3.2 Diagnostic assessment

Any assessment can be used for diagnostic purposes – that is, to discover the cause or causes of a learning barrier. Diagnostic assessment assists in deciding on support strategies or identifying the need for professional help or remediation. It acts as a gauge to redefine Learning Programme goals or to discover what learning has not taken place to put intervention strategies in place.

4.3.3 Formative assessment

Any form of assessment that is used to give feedback to the learner is fulfilling a formative purpose. Formative assessment is a crucial element of teaching and learning. It monitors and supports the learning process. This type of assessment informs all stakeholders about learners' progress. Constructive feedback is a vital component of formative assessment.

4.3.4 Summative assessment

When assessment is used to record a judgment of the learner's competence or performance, it serves a summative purpose. Summative assessment gives a picture of a learner's competence or progress at any specific moment. It can occur at the end of a single learning activity, unit, cycle, term, semester or year of learning. Summative assessment should be planned and a variety of assessment instruments and strategies should be used to enable learners to demonstrate competence.

4.4 WHAT ASSESSMENT SHOULD BE AND DO

Assessment should:

- be understood by the learner and by the broader public;
- be clearly focused;
- be integrated with teaching and learning;
- be based on pre-set criteria of the Assessment Standards;
- use a variety of instruments;
- use a variety of methods;
- allow for expanded opportunities for learners;
- be learner-paced and fair; and
- be flexible.

4.5 HOW TO ASSESS

Teachers' assessment of learners' performances must be reliable. This means that teachers' judgments of learners' competences should be consistent across different times, assessment items and markers. The judgments made through assessment should also be valid; that is, they should be made on the aspects of learning that were assessed.

As each assessment cannot be totally valid or reliable by itself, decisions on learner progress must be based on more than one assessment. This is the principle behind continuous assessment (CASS). Continuous assessment bases decisions about learning on a range of different assessment activities and events that happen at different times throughout the learning process. It involves assessment activities that are spread throughout the year, using various kinds of assessment instruments and methods such as tests, examinations, projects and assignments. Oral, written and performance assessments are included. The different pieces of evidence that learners produce as part of the continuous assessment process can be included in a portfolio. Different subjects have different requirements for what should be included in the portfolio. The Learning Programme Guidelines discuss these requirements further.

Continuous assessment is classroom-based and school-based and focuses on the ongoing manner in which assessment is integrated into the process of teaching and learning. Teachers get to know their learners through day-to-day teaching, questioning, observation and interactions.

Continuous assessment should be applied to those sections of the curriculum that are best assessed through written tests and assignments and those that are best assessed through other methods such as by performance, using practical or spoken evidence of learning.

4.6 METHODS OF ASSESSMENT

4.6.1 Self-assessment

As all Learning Outcomes and Assessment Standards are transparent, learners know what is expected of them. Therefore, through self-assessment, learners can 'pre-assess' their work before the teacher does the final assessment. Reflection on one's own learning is a vital component of learning.

4.6.2 Peer assessment

Peer assessment, using a check list or rubric, helps both the learners whose work is being assessed and the learners who are doing the assessment. The sharing of the criteria for assessment empowers learners to evaluate their own and others' performances.

4.6.3 Group assessment

The ability to work effectively in groups is one of the Critical Outcomes. Assessing group work involves looking for evidence that the group of learners co-operate, assist one another, divide work, and combine individual contributions into a single, composite assessable product. Group assessment looks at the process and the product. It involves assessing social skills, time management, resource management and group dynamics as well as the output of the group.

4.6.4 Teacher assessment

Teachers will do continuous and final assessment of learner's performances which must therefore be as valid, reliable and consistent as possible considering all factors and requirements.

4.7 METHODS OF COLLECTING ASSESSMENT EVIDENCE

There are various methods of collecting evidence. Some of these are discussed below.

4.7.1 Observation-based assessment

Observation-based assessment tends to be less structured and develops of a record of different kinds of evidence for different learners at different times. This kind of assessment is often based on tasks that require learners to interact with one another in pursuit of a common solution or product. Observation has to be intentional and should be conducted with the help of an appropriate observation instrument.

4.7.2 Test-based assessment

Test-based assessment is more structured and enables teachers to gather the same evidence for all learners in the same way and at the same time. This kind of assessment creates evidence of learning that is verified by a specific score. If used correctly, tests and examinations are an important part of the curriculum because they give precise evidence of what has been learned.

4.7.3 Task-based assessment

Task-based or performance assessment methods aim to show whether learners can apply the skills and knowledge they have learned to unfamiliar contexts or in contexts outside of the classroom. Performance assessment also covers the practical components of subjects by determining how learners put theory into practice. The criteria, standards or rules by which the task will be assessed are described in rubrics or task check lists and help the teacher to assess each learner's performance.

4.8 RECORDING AND REPORTING

Recording and reporting involves the capturing of data collected during assessment so that it can be logically analysed and published in an accurate and understandable way.

4.8.1 Methods of recording

There are different methods of recording. It is often difficult to separate methods of recording from methods of evaluating learners' performances.

The following are examples of different types of recording instruments:

- Rating scales
- Task lists or check lists
- Rubrics.

Rating scales

Rating scales are any marking system where a symbol (such as A or B) or a mark (such as 5/10 or 50%) is defined in detail to link the coded score to a competence description which outlines what is required to achieve that score. The detail is more important than the coded score in the process of teaching and learning; it gives learners a much clearer idea of what has been achieved and where and why learning has fallen short of the target. Traditional marking tended to use rating scales without the descriptive details, making it difficult to have a sense of the learners'

strengths and weaknesses in terms of intended outcomes. A seven-point scale is used in the National Curriculum Statement Grades 10–12 (General).

Task lists or checklists

Task lists or checklists consist of discrete statements describing the expected performance in a particular task. When a particular statement (criterion) on the check list can be observed as having been satisfied by a learner during a performance, the statement is ticked off. All the statements that have been ticked off on the list (as criteria that have been met) describe the learner's performance. These check lists are very useful in peer or group assessment activities.

Rubrics

Rubrics combine rating codes and descriptions of standards. They consist of a hierarchy of standards with benchmarks that describe the range of acceptable performance in each code band. Rubrics require teachers to know exactly what is required by the Learning Outcome. Rubrics can be holistic, giving a global picture of the standard required, or analytic, giving a clear picture of the distinct features that make up the criteria, or can combine both. The Learning Programme Guidelines give examples of subject-specific rubrics.

To design a rubric, a teacher has to decide the following:

- What Learning Outcomes are being targeted?
- What Assessment Standards are targeted by the task?
- What kind of evidence should be collected?
- What are the different parts of the performance that will be assessed?
- What different assessment instruments best suit each part of the task (such as the process and the product)?
- What knowledge should be evident?
- What skills should be applied or actions taken?
- What opportunities for expressing personal opinions, values or attitudes arise in the task and which of these should be assessed and how?
- Should one rubric target all the Learning Outcomes and Assessment Standards of the task or does the task need several rubrics?
- How many rubrics are needed for the task?

It is crucial that a teacher shares the rubric or rubrics for the task with the learners before they do the required task. The rubric focuses both the learning and the performance and becomes a powerful tool for self-assessment.

4.8.2 Reporting performance and achievement

Reporting performance and achievement informs all those involved with or interested in the learner's progress. Once the evidence has been collected and interpreted, teachers need to record the learner's achievements. Sufficient summative assessments need to be made so that the standard achieved by the learner can be reported.

The National Curriculum Statement Grades 10–12 (General) adopts a seven-point scale of achievement. The scale is shown in Table 4.1.

Table 4.1 Scale of achievement for the National Curriculum Statement Grades 10–12 (General)

Rating Code	Description of Competence	Marks (%)
7	Outstanding	80–100
6	Meritorious	70–79
5	Satisfactory	60–69
4	Adequate	50–59
3	Partial	40–49
2	Inadequate	30–39
1	Not achieved	0–29

4.9 SUBJECT COMPETENCE DESCRIPTIONS

To evaluate the achievement of Learning Outcomes in Grades 10–12, subject competences have been described to distinguish the grade expectations of what learners must know and be able to achieve. Seven levels of competence have been described for each subject for each grade. These descriptions will assist teachers to assess learners and place them in the correct rating. The descriptions summarise what is spelled out in detail in the Learning Outcomes and the Assessment Standards and stipulate the distinguishing features that indicate a particular rating has been achieved. The various achievement levels and their corresponding percentage bands are as shown in Table 4.1.

In line with the principles and practice of outcomes-based assessment, all assessment – both school-based and external – should primarily be criterion-referenced. Marks can be used to evaluate specific assessment tasks but the tasks should be assessed against rubrics instead of simply ticking correct answers and awarding marks in terms of the number of ticks. The statements of competence for a subject describe the minimum skills, knowledge, values and attitudes that a learner should demonstrate to achieve each level of the rating scale.

When teachers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a particular Learning Outcome. The relevant Assessment Standard or

Standards must be used to create an assessment rubric for the task or question. The descriptions clearly indicate the minimum level of attainment for each category on the rating scale.

The competence descriptions for this subject appear at the end of this chapter.

4.10 PROMOTION

Although, promotion at Grade 10 and Grade 11 level will be based on internal assessment only, it must be based on the same conditions as stipulated for promotion to attain the Further Education and Training Certificate. The requirements, conditions and rules of combination and condonation are spelled out in the *Qualification and Assessment Policy Framework.*

4.11 WHAT REPORT CARDS SHOULD LOOK LIKE

There are many ways to structure a report card but the simpler the report card the better, providing that all pertinent information is included. Report cards should include information about a learner's overall progress, including the following:

- the learning achievement against Learning Outcomes;
- the learner's strengths;
- the support needed or provided where relevant;
- constructive feedback commenting on the performance in relation to the learner's previous performance and the requirements of the subject; and
- the learner's developmental progress in learning how to learn.

In addition, report cards should include the following:

- Name of school
- Name of learner
- Learner's grade
- Year and term
- Space for signature of parent or guardian
- Signature of teacher and of principal
- Date
- Dates of closing and re-opening of school
- School stamp
- School attendance profile of learner.

4.12 ASSESSMENT OF LEARNERS WHO EXPERIENCE BARRIERS TO LEARNING

Learners who experience any barriers to learning are assessed in accordance with the recommended alternative and/or adaptive methods as stipulated in the *Qualifications and Assessment Policy Framework for Grades 10–12 (General)*.

4.13 COMPETENCE DESCRIPTIONS FOR AGRICULTURAL TECHNOLOGY

The Competence Descriptions are a reporting tool. They report on the learner's level of achievement based on the Assessment Standards and the Learning Outcomes.

Grade 10

Scale	Code	Competence Descriptions
7	80–100% Outstanding	**At the end of Grade 10 the learner with Outstanding Achievement can independently with an in-depth understanding:**

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
7 (continued)	**80–100% Outstanding**	**At the end of Grade 10 the learner with Outstanding Achievement can independently with an in-depth understanding:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment.
		■ Show understanding of principles of basic skills and construction processes and application.
		■ Show understanding of the principles and applications of basic carpentry in agriculture.
		■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
7 (continued)	**80–100% Outstanding**	**At the end of Grade 10 the learner with Outstanding Achievement can independently with an in-depth understanding:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Outstanding Achievement can independently with an in-depth understanding:

agriculture.

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
7 (continued)	**80–100% Outstanding**	**At the end of Grade 10 the learner with Outstanding Achievement can independently with an in-depth understanding:**

- Know and use freehand sketches and drawings.
- Show understanding of the principles of measurements used.
- Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
- Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Outstanding Achievement can independently with an in-depth understanding:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

Grade 10

Code	Scale
6	70–79% Meritorious

Competence Descriptions

At the end of Grade 10 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
6 (continued)	**70–79% Meritorious**	**At the end of Grade 10 the learner with Meritorious Achievement can independently with an in-depth understanding:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment.
		■ Show understanding of principles of basic skills and construction processes and application.
		■ Show understanding of the principles and applications of basic carpentry in agriculture.
		■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
6 (continued)	**70–79% Meritorious**	**At the end of Grade 10 the learner with Meritorious Achievement can independently with an in-depth understanding:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
6 (continued)	70–79% Meritorious	**At the end of Grade 10 the learner with Meritorious Achievement can independently with an in-depth understanding:**

- Know and use freehand sketches and drawings.
- Show understanding of the principles of measurements used.
- Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
- Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Meritorious Achievement can independently with an in-depth understanding;

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Meritorious Achievement can independently with an in-depth understanding:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

Grade 10

Code	Scale	Competence Descriptions
5	60–69% Substantial	**At the end of Grade 10 the learner with Substantial Achievement can confidently:**

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Substantial Achievement can confidently:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Substantial Achievement can confidently:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
5 (continued)	**60–69% Substantial**	**At the end of Grade 10 the learner with Substantial Achievement can confidently:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment. ■ Show understanding of principles of basic skills and construction processes and application.
		■ Show understanding of the principles and applications of basic carpentry in agriculture. ■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Substantial Achievement can confidently:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Substantial Achievement can confidently:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
5 (continued)	**60–69% Substantial**	**At the end of Grade 10 the learner with Substantial Achievement can confidently:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Substantial Achievement can confidently:

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Substantial Achievement can confidently:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
5 (continued)	**60–69% Substantial**	**At the end of Grade 10 the learner with Substantial Achievement can confidently:**

- Know and use freehand sketches and drawings.
- Show understanding of the principles of measurements used.
- Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
- Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Substantial Achievement can confidently:

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Substantial Achievement can confidently:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

Grade 10

Code	Scale
4	50–59% Adequate

Competence Descriptions

At the end of Grade 10 the learner with Adequate Achievement can occasionally:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Adequate Achievement can occasionally:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Adequate Achievement can occasionally:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
4 (continued)	**50–59% Adequate**	**At the end of Grade 10 the learner with Adequate Achievement can occasionally:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment.
		■ Show understanding of principles of basic skills and construction processes and application.
		■ Show understanding of the principles and applications of basic carpentry in agriculture.
		■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Adequate Achievement can occasionally:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Adequate Achievement can occasionally:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
4 (continued)	**50–59% Adequate**	**At the end of Grade 10 the learner with Adequate Achievement can occasionally:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Adequate Achievement can occasionally:

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Adequate Achievement can occasionally:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
4 continued	**50–59% Adequate**	**At the end of Grade 10 the learner with Adequate Achievement can occasionally:**
		■ Know and use freehand sketches and drawings.
		■ Show understanding of the principles of measurements used.
		■ Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
		■ Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Adequate Achievement can occasionally:

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Adequate Achievement can occasionally:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

Grade 10

Code	Scale
3	40–49% Moderate

Competence Descriptions

At the end of Grade 10 the learner with Moderate Achievement can occasionally:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Moderate Achievement can occasionally:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Moderate Achievement can occasionally:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
3 (continued)	**40–49% Moderate**	**At the end of Grade 10 the learner with Moderate Achievement can occasionally:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment.
		■ Show understanding of principles of basic skills and construction processes and application.
		■ Show understanding of the principles and applications of basic carpentry in agriculture.
		■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Moderate Achievement can occasionally:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Moderate Achievement can occasionally:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
3 (continued)	40–49% Moderate	**At the end of Grade 10 the learner with Moderate Achievement can occasionally:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Moderate Achievement can occasionally:

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Moderate Achievement can occasionally:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
3 (continued)	40–49% Moderate	**At the end of Grade 10 the learner with Moderate Achievement can occasionally:**
		■ Know and use freehand sketches and drawings.
		■ Show understanding of the principles of measurements used.
		■ Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
		■ Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Moderate Achievement can occasionally:

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 12 the learner with Moderate Achievement can occasionally:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

Grade 10

Code	Scale
2	30–39% Elementary

Competence Descriptions

At the end of Grade 10 the learner with Elementary Achievement can seldom and with difficulty:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
2 (continued)	**30–39% Elementary**	**At the end of Grade 10 the learner with Elementary Achievement can seldom and with difficulty:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment.
		■ Show understanding of principles of basic skills and construction processes and application.
		■ Show understanding of the principles and applications of basic carpentry in agriculture.
		■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
2 (continued)	**30–39% Elementary**	**At the end of Grade 10 the learner with Elementary Achievement can seldom and with difficulty:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
2 (continued)	**30–39% Elementary**	**At the end of Grade 10 the learner with Elementary Achievement can seldom and with difficulty:**
		■ Know and use freehand sketches and drawings.
		■ Show understanding of the principles of measurements used.
		■ Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
		■ Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 11 the learner with Elementary Achievement can seldom and with difficulty:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

Grade 10

Code	Scale	Competence Descriptions
1	0–29% Not Achieved	**At the end of Grade 10 the learner who did Not Achieve can rarely:**

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- List materials, their basic properties and their uses in the agricultural environment.
- Show understanding and application of principles, concepts, materials and types of structures used in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge of advanced concepts and correct applications of materials according to their properties in the agricultural environment.
- Show understanding of the planning and design of structures used for animal production on the farm.

Grade 12

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Identify and describe concepts and inter-relationships of Agricultural Technology, environment and society with regards to:
  - indigenous knowledge systems of different cultures;
  - entrepreneurship and its influence;
  - issues related to human rights;
  - basic medical emergencies;
  - health issues including HIV/Aids; and
  - the importance of environmental issues.
- Use the technological process (identify, investigate, design, make, evaluate and communicate) to solve elementary problems and designs.
- Demonstrate awareness and knowledge of working safely in the agricultural environment according to the OHS Act.
- Show knowledge and correct application of materials for special use in the agricultural environment.
- Show understanding of the planning and design of structures used for plant production, curing or storage facilities.

Grade 10

Code	Scale	Competence Descriptions
1 (continued)	**0–29% Not Achieved**	**At the end of Grade 10 the learner who did Not Achieve can rarely:**
		■ Describe different types, principles and materials used in basic fencing in the agricultural environment. ■ Show understanding of principles of basic skills and construction processes and application. ■ Show understanding of the principles and applications of basic carpentry in agriculture. ■ Show understanding of the principles and applications of basic welding in agriculture.

Grade 11

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Show understanding of principles, concepts and materials used in plumbing and its application in agriculture.
- Show understanding of principles, concepts and materials used in the maintenance of structures and its application in agriculture.
- Show understanding of principles, advanced concepts and materials used in different types of fencing in the agricultural environment.
- Show understanding of principles of advanced skills and construction processes and application.
- Show understanding of the principles and applications of carpentry in agriculture.
- Show understanding and application of welding in agriculture.
- Show understanding of the principles and applications of soldering in agriculture.
- Show understanding of the principles and applications of basic sheet metal work in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Show understanding of principles, more advanced concepts and materials used in the maintenance of facilities and structures and its application in agriculture.
- Describe and design different principles and types of specialised fencing used in the agricultural environment.
- Show understanding of principles of more advanced skills and construction processes and application.
- Show understanding of the principles and applications of advanced carpentry in agriculture.
- Show understanding and application of advanced welding in agriculture.

Grade 10

Code	Scale	Competence Descriptions
1 (continued)	**0–29% Not Achieved**	**At the end of Grade 10 the learner who did Not Achieve can rarely:**
		■ Show understanding of basic principles and economic use of electrical energy in agriculture.
		■ Name and identify basic tools and equipment and their uses in the agricultural environment.
		■ Know and identify animal-drawn implements and their uses in agriculture.
		■ Know and identify the various components and systems of mechanised farm equipment.
		■ Identify types and applications of different irrigation systems.
		■ Identify different sources of information on agriculture.
		■ Know and use different types of communication on the farm.

Grade 11

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Show understanding of the application of equipment generating and distributing electrical energy in agriculture.
- Name and identify advanced tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show understanding and knowledge of the functions of components and systems of mechanised farm equipment.
- Know and apply principles to operate irrigation, waste water, drainage and water supply systems on a farm.
- Show effective use of computer technology in agriculture.

Grade 12

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Show knowledge and application of alternative sources of electrical energy used on the farm.
- Know and use pneumatic and hydraulic tools.
- Name and identify specialised tools and equipment and their uses in the agricultural environment.
- Show understanding and effective use of mechanical crop cultivation implements and equipment.
- Show an understanding of diagnosis and fault-finding techniques in solving problems and maintenance on operational systems of mechanised farm equipment.
- Show understanding of and solve problems in the maintenance of irrigation, waste water, drainage and water supply systems.
- Show effective use of computer technology in agriculture.

Grade 10

Code	Scale	Competence Descriptions
1 (continued)	**0–29% Not Achieved**	**At the end of Grade 10 the learner who did Not Achieve can rarely:**
		■ Know and use freehand sketches and drawings.
		■ Show understanding of the principles of measurements used.
		■ Show understanding of the principles of calibrating tools and equipment in the agricultural environment.
		■ Show understanding of principles of basic expenditure and related calculations.

Grade 11

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Interpret and produce freehand sketches of orthographic and isometric drawings.
- Interpretation and application of measurements.
- Show understanding of principles in calibration of tools and equipment in the agricultural environment.
- Do calculations for maintenance expenditure.

Grade 12

Competence Descriptions

At the end of Grade 10 the learner who did Not Achieve can rarely:

- Interpret and produce freehand sketches of assembly and sectional drawings.
- Use data to calculate, interpret and compare facts with regards to expenditure, measurement and calibration as applicable in the agricultural environment.

GLOSSARY

adhesive – substance used to permanently bond different objects or materials

agribusiness – operations and businesses associated with farming systems

agriculture – occupation, business or science of cultivating land, producing crops and/or raising livestock

agronomy – the science of soil management, land cultivation and crop production

artefact – an object made by a human being, for example, a tool or ornament, especially one that has archaeological or cultural interest

assignment – a task or duty that has been given for someone to do

bill of rights – a written declaration of the rights and privileges of the citizens of the country

calibration – the checking of measuring instrument against an accurate standard to determine any deviations and correcting errors

carpentry – the work or occupation of building and repairing things made of wood

communication – the exchange of information between individuals, for example, by means of speaking, writing, using the Internet or using a common system of signs

conservation – preservation, management and care of natural resources, for example water, soil and plants

content – the various issues, topics or questions dealt with in speech, discussion or a piece of writing

context – statement of a particular standard or requirement that a solution must satisfy

control systems – a set of components functioning together

criteria – an accepted standard used to make decisions or judgments about something

data – information, often in the form of facts or figures obtained from experiments or surveys, used to make calculations or draw conclusions

demonstrate – to show or prove something clearly and convincingly

design – to work out or create the form or structure of something

dimension – a measurement of something in one or more directions, for example its length, width or height

entrepreneur – somebody who sets up and finances new commercial enterprises to make profit

environment – natural world, within which people, animals and plants live

equipment – the tools, clothing or other items needed for a particular purpose

ethics – the study of moral standards and how they affect conduct

ferrous – Fe2+- ion, found in oxidised iron or rust

forestry – the science or skill of planting and growing trees or managing forest

human rights – a person's right to humanity, equity, fairness and rights held to be justifiably

hydraulics – operated by a device in which pressure applied to a piston is transmitted by a fluid to a larger piston, giving rise to a larger force

hydroponics – growing of plants in nutrient liquid without soil and other supporting media

implements – a useful article of equipment, usually a specially shaped object, to do a particular task

indigenous knowledge – knowledge originating in and typical of a region or country

interrelationship – relate of two or more things to each other

investigation – an official examination or enquiry into something

irrigation – a process of bringing a supply of water to a dry area

machine – device with moving parts, often powered by electricity, used to perform a task, especially one that was previously done by hand

maintain – cause to continue, keep up or preserve a state of affairs, an activity

maintenance – work that is done regularly to keep a machine, building or piece of equipment in good condition and working order

mechanism – a machine or part of a machine that performs a particular task

medical emergency – an unexpected happening that calls for immediate medical treatment

metalwork – the craft of making objects out of metal

non-ferrous – materials not containing or related to iron

outcome – the way that something turns out in the end (result)

plumbing – pipes and fixtures that carry or use water or gas in a building

pneumatics – the branch of physics dealing with the mechanical properties of air and other gases

pressure – the application of force on a square area

property – a characteristic quality or distinctive feature of something

pulley – a mounted rotating wheel with a grooved rim over which a belt or chain can move to change the direction of the pulling force

renewable energy – any form of energy obtained from the sun, wind, waves or another natural renewable source, in contrast to energy generated from fossil fuels

safety – inability to cause or result in harm, injury or damage

skill – the ability to do something well, usually gained through experience and training

soil erosion – removal of the topsoil by wind or water

structure – a building, bridge, framework or other object that has been made from many different parts and materials

tool – an object designed to do a particular kind of work

woodwork – items or components made of wood, for example frames of windows, staircases and doors