Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

JUNIOR SECONDARY PHASE

AGRICULTURAL SCIENCE SYLLABUS

GRADE 8 & 9

For implementation:
Grade 8 in 2025
and
Grade 9 in 2026

Ministry of Education, Innovation, Youth, Sports, Arts and Culture
National Institute for Educational Development (NIED)
Private Bag 2034
Okahandja
Namibia

Agricultural science Syllabus Grade 8 & 9

ISBN: 978-99945-2-516-4

Printed by NIED
Website: http://www.nied.edu.na

Publication date: December 2024

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1. INTRODUCTION

This syllabus describes the intended learning and assessment for Agricultural Science in the Junior Secondary phase. As a subject, Agricultural Science is within the Natural Sciences area/areas of learning in the curriculum, but has thematic links to other subjects across the curriculum.

The subject Agricultural Science places strong emphasis on the learners' understanding of the physical and biological world around them at the local, regional and international levels. It thus includes how societies use natural resources to satisfy their needs, and how the environment may be changed in ecologically sustainable ways. At this phase and subject area, the application of scientific knowledge and attitudes to health is of special relevance for the individual, the family, and society as a whole.

2. RATIONALE

The particular features of Agricultural Science at this phase are as follows:

Learning experiences in the natural science area are focused upon promoting the teaching and learning for understanding. Namibia, like most African countries, is rich in natural resources. The exploration of these resources requires scientific knowledge and relevant skills. The acquisition of scientific knowledge and skills presents itself as a prerequisite for a progressive national economy and the improved standard of life for our people. It is thus important for our learners to acquire knowledge and skills which will foster their understanding of the interaction of human beings and the environment in order to satisfy human needs. It must be understood that the physical and biological world around us is quite complex and therefore needs to be understood in a holistic manner by the society in order to sustain natural resources.

The sustainability of our natural resources, however, requires advanced technology through the efficient and effective usage of equipment, materials and processes. Modern technology is required in order to assist our learners and society to solve problems through planning, design, realisation, and evaluation of activities and goals.

3. AIMS

The main aim of the syllabus in the Natural Sciences area is therefore to provide basic scientific background for our learners with the hope of producing the much-needed scientists for the country. The Namibian society needs to be scientifically literate if they are to cope with the challenges of appropriate global technology requirements.

The subject Agricultural Science, within the natural science area, promotes the following aims in the curriculum guide:

Knowledge with understanding

- develop knowledge, understanding, creativity, practical and experimental skills as a solid foundation for academic training to prepare learners for creative and meaningful adult life
- help learners develop self-confidence, self-knowledge and understanding of the world in which they live, through meaningful scientific activities

Values and attitudes

- develop a sense of responsibility towards the environment, relating scientific practices to sustainable use of natural resources
- demonstrate desirable behavioural patterns and frame of mind in interacting with the environment in a manner that is protective, preserving and nurturing
- develop attitudes and practices, further knowledge and activities that promote the physical and mental health of the society
- develop and enhance respect for, understanding of, and tolerance of other people's beliefs, cultures and ways of life

Scientific skills

- develop a lively, questioning, appreciative and creative intellect to enable learners to discuss issues rationally, make careful observations and analysis, think scientifically, solve problems and apply them to tasks
- promote Information Communication Technology (ICT) as a tool to enhance understanding of the learning content

Democratic principles

- promote equality of opportunity for males and females, enabling both sexes to participate equally and fully in all spheres of society and fields of employment
- lay a foundation for informed and responsible attitudes and choices towards the balance of population growth, ecological sustainability, and the quality of life for all citizens of Namibia

4. INCLUSIVE EDUCATION

Inclusive education is the right of every learner and promotes access to and participation in the full range of educational programmes and services offered by the education system in mainstream schools. It is based on the principle of supporting and celebrating the diversity found among all learners and removing all barriers to learning. The Agricultural Science teacher in the Junior Secondary phase should therefore accommodate learners with special educational needs by adapting this syllabus to the needs of learners through differentiation of teaching methods and material as indicated in the *Inclusive Education Curriculum Framework for (2023).* The adaptation for assessment of learners with special educational needs must be done as prescribed in the *Handbook for Centres (2022*) by the Directorate of National Examinations and Assessment (DNEA). The accommodations prescribed in this handbook are not only for external examinations, but apply to learners from Grade 1 to 12.

Learners who are so severely impaired that they cannot benefit from attending mainstream schools will be provided for according to their needs in learning support units, resource units or resource schools until such time that they can join a mainstream school structure, if possible.

Including gender perspectives is important for the science curriculum in order to raise awareness of gender stereotyping (e.g. gender roles we previously associated with doctors, nurses, farmers, artisans, mechanics, lawyers etc.). Teachers are obliged to promote gender equity in all spheres of life. In all activities carried out within the scientific area of study, female learners should experience the confidence, which will motivate them to continue in the agriculture education stream throughout their school career and beyond, particularly in the field of agriculture.

5. LINKS TO OTHER SUBJECTS AND CROSS-CURRICULAR ISSUES

The cross-curricular issues include environmental learning, HIV and AIDS, population education, Education for Human Rights and Democracy (EHRD), Information and Communication Technology (ICT), entrepreneurship, and road safety. These issues have been introduced to the formal curriculum, because each of the issues deals with particular risks and challenges in our Namibian society. They should be dealt with across all phases and in every subject where the topics overlap with the content of that subject.

Learners need to:

- understand the nature of these risks and challenges;
- know how they will impact our society and the quality of life of our people now and in the future;
- understand how these risks and challenges can be addressed on a national and global level; and
- understand how they can play a part in addressing these risks and challenges in their own school and local community.

The main risks and challenges have been identified as:

- mismanagement of natural resources;
- HIV and AIDS;
- health risks caused by pollution, poor sanitation and waste;
- democracy and social instability caused by inequity and governance that ignores rights and responsibilities;
- disobeying road safety measures; and
- globalisation.

School garden and animal unit (chicken house)

The school garden should serve as a source of food for school programme. This can be achieved provided that listed terms and conditions are met:

(a) Agricultural Science teachers need training that will award them with the qualification e.g. MASTEP

(b) A well secured garden with water source (water tank and taps), irrigation system, secured fence (mesh wire and or chicken mesh wire where applicable), lockable gate

(c) Storage infrastructures (storeroom for tools, materials and equipment) used by Agricultural Science teachers and learners only. This is because when the school shares the tools and equipment for Agricultural Science, they are sometimes lost.

(d) The budget (additional financial assistance for schools offering subjects with practical components) from the ministry should be specified regarding the amount allocated per subject especially for Agricultural Science

(e) Any infrastructure and / or materials to be donated or purchased for Agricultural Science practical skills should be done in a direct consultation with the Agricultural Science teachers

(f) Appropriate Personal Protective Equipment (PPE) such as Khaki / Green / Brown / Blue dust coats, masks, should be provided

(g) Enough materials and garden tools such as seeds, organic fertilisers, watering can, wheelbarrows, spade, hoe, hose pipe, garden forks, pliers, rake, pegs, measuring tapes, garden line, shovels, hammer, wires, nails, drinkers, feeders, feeds (for all stages of chickens)

(h) Pig sty for schools with hostel (boarding schools) can be established

(i) Safety security for the crop and animal production from theft

(j) There should be a balance between practical activities and commitment with the number of lessons for the participating teacher to avoid work overload

Since some subjects are more suitable to address specific cross-curricular issues, those issues will receive more emphasis in those particular syllabuses. In this syllabus the following cross-curricular issues are dealt with in the topics as indicated:

Cross-curricular issues	**Grade 8**	**Grade 9**
Environmental Learning	1.4 Conservation farming for sustainable agricultural production 2.2.1 Importance of fruits	1.2 Environmental factors and plant growth 2.2.7 Fertilising
HIV and AIDS	1.5 Impact of HIV and AIDS on agricultural workers	2.4 Impact of HIV and AIDS on food security
Population Education	1.1 History of agriculture	1.5 Population density and agriculture
EHRD	1.6 Condition of service of farm workers	1.3 Gender role in agriculture
Entrepreneurship	1.2 The farm as a production unit 1.3 Farming systems in Namibia 3.2.6 Marketing of pigs	2.2.1 Cash crops grown in Namibia 2.2.7 Record keeping 2.2.9 Harvesting, storing and marketing of cash crops 3.2.10 Preserving, storing and marketing fish 3.3.6 Marketing of dairy products
ICT	4.1 Use of farm tools and equipment	2.2.7 Record keeping 3.3.4 Dairy production 3.3.6 Marketing 4.1 Farm buildings

6. APPROACH TO TEACHING AND LEARNING

The approach to teaching and learning is based on a paradigm of Learner-Centred Education (LCE) described in ministerial policy documents and the learner-centred education conceptual framework. This approach ensures optimal quality of learning when the principles are put into practice.

The aim of learner-centred education is to develop learning with understanding, and to impart the knowledge, skills and attitudes that contribute to the development of society. The starting point for teaching and learning is the fact that the learner brings to the school a wealth of knowledge and experience gained continually from the family, the community, and through interaction with the environment. Learning in school must involve, build on, extend and challenge the learner's prior knowledge and experience.

Learners learn best when they are actively involved in the learning process through a high degree of participation, contribution and production. At the same time, each learner is an individual with

his/her own needs, pace of learning, experiences and abilities. The teacher must be able to identify the needs of the learners and the learning that still needs to take place, and know how to shape learning experiences accordingly. Teaching strategies must therefore be varied and flexible within well-structured sequences of lessons.

The teacher must decide, in relation to the general and specific objectives to be achieved, when it is best to convey content directly; when it is best to let learners discover or explore information for themselves; when they need directed learning; when they need reinforcement or enrichment learning; when there is a particular progression of skills or information that needs to be followed; or when the learners can be allowed to find their own way through a topic or area of content.

Work in groups, in pairs, individually, or as a whole class must therefore be organised as appropriate to the task in hand. Co-operative and collaborative learning should be encouraged wherever possible. In such cases, tasks must be designed so that pair or group work is needed to complete it, otherwise the learners will not see any relevance in carrying out tasks together. As the learners develop personal, social and communication skills, they can gradually be given increasing responsibility to participate in planning and evaluating their work, under the teacher's guidance.

The learning content in this syllabus is based on the Namibian context, although the themes and topics are on a variety of scales to meet international standards. Teachers are therefore urged where appropriate to use local examples to illustrate scientific issues, concepts and processes.

7. END-OF-PHASE COMPETENCIES

A few learners might not be able to achieve all the specific objectives satisfactorily and must receive learning support through adapted teaching approaches, adapted materials, and assistance from peers. A small number of learners have special educational needs to a degree which requires greater individual attention, resources or assessment. Others will have impairments which do not necessarily limit cognitive and affective learning and development, e.g. the visually impaired, hearing impaired and physically challenged.

On completion of the Junior Secondary phase, learners are expected to be able to:

General Agriculture

- understand the historical background of agriculture, the value of a farm as a production unit including the socio-economic value of different farming systems;
- acquire an appreciation of Agriculture as a source of personal income and a base for national economic development through provision of food, clothing and other commodities;
- acquire knowledge and skills in the management and caring of the environment and its natural resources;
- understand the impact of HIV and AIDS, pollution and soil erosion including ways of conserving our natural resources;
- gain insight of the requirements for the labour act with regards to condition of service of farm workers including gender role in agriculture.

Plant studies

- acquire an understanding of the basic concepts and principles involved in the growth, processes, structure and reproduction including development and management of plants;
- acquire insight in the formation and composition of different types of soil used in plant production;
- gain skills in the correct use, storage, handling and servicing of commonly needed tools and equipment used in producing crops and fruits including the eradication of weeds, pests and diseases;
- demonstrate basic skills in inquiring, problem solving and critical thinking in addressing factors that hinder production.

Animal studies

- acquire knowledge and skills in rearing and managing animals such as pigs, fish and dairy farming to produce food and income;
- acquire knowledge and understanding of different animal breeding systems including fish farming techniques;
- understand the importance of protecting animals against predators, diseases and parasites to improve production and marketing of animal products;
- demonstrate basic skills in inquiring, problem solving and critical thinking in addressing factors that hinders production.

Farming technology

- acquire knowledge and skills in using farm tools and implements including the application of basic farm building technology to ensure maximum production of agricultural commodities.

8. SUMMARY OF THE LEARNING CONTENT

Teachers should realise that there are certain aspects of the syllabus that should not be taught as separate entities and at fixed times during the school year. These include incidental topics such as general knowledge, field trips, project work, investigations and observations including social events.

Summary of learning content for Grade 8 & 9 Agricultural Science

Grade 8	Grade 9
THEME 1: GENERAL AGRICULTURE	
1.1 History of agriculture 1.2 The farm as a production unit 1.3 Farming systems in Namibia 1.4 Conservation farming for sustainable agricultural production 1.5 Impact of HIV and AIDS on agricultural Sector 1.6 Condition of service for farm workers	1.1 The importance of sustainable agriculture 1.2 Environmental factors and plant growth 1.3 Gender roles in agriculture 1.4 Impact of HIV and AIDS on food security 1.5 Population density and agriculture
THEME 2: PLANT STUDIES	
2.1 General aspects 2.2 Fruit production	2.1 General aspects 2.2 Cash crops
THEME 3: ANIMAL STUDIES	
3.1 General aspects 3.2 Pig farming	3.1 General aspects 3.2 Fish farming (aquaculture) 3.3 Dairy farming
THEME 4: FARMING TECHNOLOGY	
4.1 Use of farm tools and implements	4.1 Farm buildings

9. LEARNING CONTENT

The learning content outlined below is designed to provide guidance to teachers as to what will be assessed in the overall evaluation of learners. It is not meant to limit, in any way, the teaching programme of any particular school.

Topics *and* ***Sub-topics*** refer to those components of the subject which learners are required to study/master. The **General objectives** are derived from the topic/skill and are the general knowledge, understanding and demonstration of skills on which learners will be assessed. The **Specific objectives** are the detailed and specified content of the syllabus, which learners need to master to achieve the general objectives, and on which they will be assessed.

Suggestions for practical activities or demonstrations are included at the end of each topic. These suggestions for practical activities **or** demonstrations **are considered essential** and all learners should be exposed to them, both during teaching and as preparation for assessment.

9.1 Learning content for grade 8

THEME 1: GENERAL AGRICULTURE		
TOPICS	**GENERAL OBJECTIVES** *Learners will:*	**SPECIFIC OBJECTIVES** *Learners should be able to:*
1.1 History of agriculture	• understand the historical progression of farming practices	• define agriculture as a practice of growing crops and rearing livestock for food, income, and raw materials • explain what is meant by a nomadic way of life (food gathering and hunting) and domestication of animals (animal herding) • discuss the historical progression of farming practices (including crops and animals, and marketing) • suggest reasons why people used to move from one place to another in the past
1.2 The farm as a production unit	• understand the value of the farm as a production unit	• visit a nearby farm and/or an agricultural enterprise and identify their products • identify the divisions on the farm: farmyard, animal, and plant • describe how animal and plant divisions of the farm can provide different sources of food and income • identify different hand tools (garden trowels, hand forks, spades, hoes, rakes, wheelbarrows); implements (ploughs, harrows, planters, fertilizer spreaders, harvesting machines, milking machines, sprayers) and feeding equipment (troughs, hay racks, feeders)
1.3 Farming systems in Namibia	• understand the value of various farming systems and their socio-economic impact in Namibia	• describe commercial, subsistence, and homestead farming, using examples of each system • discuss the significance of subsistence farming to the Namibian society and how it can be improved to generate more income • tabulate the advantages and disadvantages of each system

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
1.4 Conservation farming for sustainable agricultural production	• acquire knowledge and skills in the management and caring of the environment and our natural resources through the practice of conservation farming in agriculture	• explain what is meant by conservation farming • outline the aims of conservation farming practices in Namibia • discuss the limitations of natural resources such as land and water in Namibia • identify negative effects of soil erosion on farming practices • suggest methods of preventing erosion by filling dongas and building contour walls • describe how can agricultural practices such as overstocking, use of agro-chemicals, and deforestation can harm the environment • discuss sustainable agricultural methods (limited to mulching, drip irrigation, organic farming, rotational grazing)
1.5 Impact of HIV and AIDS on the agricultural sector	• understand the impact of HIV and AIDS on human resources	• distinguish between HIV and AIDS • explain how HIV and AIDS impact on human resources in agricultural sector
1.6 Condition of service of farm workers	• understand the requirements of the labour act on the living conditions of the farm workers	• analyse the legislation (laws) related to labour relations and conditions of service of farm workers in Namibia • investigate conditions of farm workers in relation to the provision of basic necessities to all workers within the agricultural sector • discuss the importance of preventing forced and child labour in the agricultural sector
THEME 2: PLANT STUDIES		
2.1 General aspects		
2.1.1 The structure of the plant	• understand the main structures and functions of different parts of the plant	• draw and identify the structures of a plant: root system, stem, leaves, flowers, and fruits • state the functions of different parts of a plant
2.1.2 Plant processes	• acquire knowledge of various plant processes and their importance to the plant growth and survival	• describe the following processes: photosynthesis, respiration, transpiration, osmosis, and translocation • explain the importance of photosynthesis, respiration, transpiration, osmosis, and translocation

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
2.1.3 Reproduction	• understand reproduction in plants	• define reproduction as a process by which plants produce new plants ensuring continuation of their species through sexual or asexual methods • distinguish between sexual and asexual reproduction • identify methods of asexual reproduction e.g. suckers, budding, cuttings, layering, and grafting • illustrate by means of diagrams to show the structures of a flower • describe the processes of pollination and fertilisation in plants
2.2 Fruit production		
2.2.1 The importance of fruits	• understand that fruits are important to human beings	• identify classes of fruits (citrus, tropical, subtropical, and deciduous) • describe the importance of fruits to humans and Namibian economy
(*cover only one of the following: citrus, tropical, subtropical or deciduous*)		
2.2.2 Soil and climatic requirements	• understand the soil and climatic requirements for propagating a selected fruit tree	• investigate favourable conditions required for growing a chosen fruit tree • compare the local conditions with those required by a chosen fruit tree • explain the optimal (ideal) soil and climatic conditions for the production of the chosen fruit tree
2.2.3 Soil preparation	• acquire knowledge and skills on the preparation of the soil for growing selected fruit trees	• explain why there is a need for good soil preparation • describe procedures to be followed in preparing the soil for planting fruit trees • suggest a suitable area for planting a selected fruit tree • identify tools and implements needed in growing fruit trees, e.g. spade, hoe, fork, pick, rake, watering can, hose pipe, pruning shears, machete, wheelbarrow, sprayer, and grass mower • describe the functions of the identified tools and implements

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
2.2.4 Growing of fruit trees	• gain the skills needed in the planting of seeds and seedlings/cuttings	• describe the correct methods of propagating a chosen fruit tree • describe the importance of using quality seeds and seedlings • outline the correct depth, time, and spacing when planting seeds and transplanting seedlings • collect seeds or seedlings and plant them using proper planting techniques
2.2.5 Management of fruit trees	• understand the importance of good management of fruit trees	• discuss the importance of safekeeping of seeds and seedlings • explain the importance of record keeping in tree planting, e.g. tree name, planting date, yield, problems, and remarks • explain the importance of fertiliser application (inorganic or organic) and watering of fruit trees regularly • define pruning as the removal of unwanted plant parts such as branches, buds, shoots to improve its shape, health and productivity • demonstrate the correct way of pruning trees • describe methods of controlling pests, diseases and weeds • specify the correct time and methods of harvesting and marketing fruits
THEME 3: ANIMAL STUDIES		
3.1 **General aspects**		
3.1.1 Species of farm animals	• acquire knowledge on various types of farm animals	• identify different types of farm animals • explain why specific animals are kept on the farm/homestead: - cattle: dairy (milk), beef, dual purpose, draught power - sheep: wool, mutton, pelts, dual purpose - pigs: pork - goats: milk, meat, mohair - poultry: layers (eggs), broilers (meat), dual purpose - horses, donkeys, mules: labour, transport - ostriches: skin, feathers, eggs, ornaments

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
3.1.2 Animal health	• acquire knowledge about animal health	• state the causes of animal diseases (bacteria, fungi, viruses) • discuss how animal diseases spread • describe signs of healthy and unhealthy animals • describe the most important ways of prevention, control and cure of animal diseases, including parasites, through: injection, vaccination, dosing, dipping, and cleaning of animal units
3.1.3 Animal nutrition	• understand the significance of animal feeding programs	• identify different types of animal feed (roughages and concentrate) and provide examples of each • describe ways of feeding farm animals • explain what is meant by a balanced ration/diet • name the sources and explain the functions of each of the following nutrients in the animal's body: minerals, water, proteins, vitamins, carbohydrates, fibre and fats • explain what is meant by deficiency diseases in animals • discuss common deficiency diseases that affect animals
3.1.4 Breeding and selection	• understand the importance of animal breeding and selection	• explain what is meant by animal breeding and artificial selection • outline qualities of suitable animals for breeding purposes

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
3.2 Pig farming		
3.2.1 Breeds	• acquire knowledge of different breeds of pigs found in Namibia and Southern Africa	• identify the indigenous and exotic breeds (limited to Large black and Large white, SA Landrace, Red Wattle) of pigs by visiting farms, collecting pictures, slides and photos • describe the characteristics of one breed suitable for the local area • distinguish between desirable and undesirable characteristics of pigs
3.2.2 Production	• understand the purpose of keeping a particular breed e.g. for bacon, pork and sausage production	• explain the purpose of keeping pigs • observe and describe the following practices: - finishing off for the market - weighing - slaughtering - grading - cutting carcasses
3.2.3 Handling of pigs	• know the techniques and methods of handling pigs	• state reasons for marking, dosing, immunising, castrating, teeth-clipping and regular inspection of pigs
3.2.4 Animal health	• gain knowledge of the common diseases and parasites affecting the chosen breed in their area	• describe the symptoms of pig diseases (pneumonia, swine fever, foot and mouth) • describe how to prevent and control diseases and parasites affecting pigs • discuss the role of veterinary services in animal health
3.2.5 Feeding of pigs	• gain knowledge of the types of feeds required by pigs at different stages	• outline feeds required by pigs at different stages as follows: - dry sows → maintenance ration - gestation → production ration - lactating sows → green feed, weaner meal, and / or production ration - piglet → creep + growing mash - off-breeding boars → maintenance ration - breeding boars → production ration - fattening → finisher + meal fattener • explain the importance of the different components of a balanced diet, including water

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
3.2.6 Marketing of pigs	• apply knowledge and skills related to the marketing of pigs and their products	• explain the procedures to be followed in marketing pigs and their products • suggest where and how to market pigs and their products
THEME 4 : FARM TECHNOLOGY		
4.1 Use of farm tools and implements	• develop skills related to the use of farm tools and implements	• identify tools used on the farm limited to; - garden tools (hoe, rake, spade, wheelbarrow, hand fork, garden fork, garden line, watering can, hose pipe) - wood working tools and materials (file, claw hammer, wooden saw, plier, carpenter square, nails and screw, screw driver, measuring tape, vice grip) - metal tools and materials (hacksaw, hammer, metal working vice, file, soldering iron, chisel, welding helmet, electrodes, steel tape) - fencing tools and materials (wire strainer, fencing plier, steel wire, binding wire, wood saw, wire control wheel, poles, spade) - water installations tools and materials (pulley, block and tackle, vice grip, T-piece, elbow piece, pipe, pipe spanner, connector) • identify implements used on the farm such as ploughs, harvesters, harrows and trailers • describe the use and maintenance of the following tools and implements used on the farm: - tools: hoe, spade, garden fork, rake, wheelbarrow, pliers, wire strainer - implements: ploughs, harvester, trailer and harrows • describe the main use of ropes and demonstrate the methods of tying light knots (non-slip knot, slip knot, release knot)

9.2 Learning content for grade 9

THEME 1: GENERAL AGRICULTURE		
TOPICS	**GENERAL OBJECTIVES** *Learners will:*	**SPECIFIC OBJECTIVES** *Learners should be able to:*
1.1 The importance of sustainable agriculture	• understand the value of agriculture to society	• define *sustainable agriculture* as the production of food through farming methods that protect the environment and conserve natural resources so that they can be used by future generations • explain the contribution of agriculture to the family and the Namibian nation • discuss ways in which farmers can practice agriculture in a sustainable manner • outline ways in which crops and animals provide food, clothing and other commodities to people
1.2 Environmental factors and plant growth	• understand the environmental factors influencing plant growth	• identify environmental factors influencing plant growth, e.g. wind, temperature, humidity and rainfall • describe the effects of environmental factors on plant growth • explain why some areas in Namibia receive more rain than others
1.3 Gender roles in agriculture	• understand the role of gender in the social and leadership structures within the agricultural sector	• investigate the role of gender in the social and leadership structures within the agricultural sector • suggest how gender balance in social and leadership structures can be improved
1.4 Impact of HIV and AIDS on food security	• understand the impacts of HIV and AIDS on food security	• explain the meaning of food self-sufficiency and food security • discuss how HIV and AIDS impact on food production

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
1.5 Population density and agriculture	• gain knowledge of the effect of population density on efficiency of land use	• explain the effects of population increase on land use and food production in Namibia • suggest ways of increasing food production to cater for the increased population
THEME 2: PLANT STUDIES		
2.1 General aspects		
2.1.1 Types of rocks	• gain insight into the formation of different types of rocks	• describe how each of the following rock type is formed: igneous, sedimentary and metamorphic and give examples of each
2.1.2 Soil formation	• understand the formation of soil through the process of weathering	• explain what is meant by weathering • identify types and agents of weathering • describe how soil is formed through the process of weathering
2.1.3 Types of soil	• acquire knowledge of different types of soil	• determine the size of soil particles of sand, loam and clay, by means of an experiment • describe the characteristics of different types of soil such as sand, loam and clay
2.1.4 Soil profile	• understand the layout and composition of a simple soil profile	• define the term soil profile as a vertical section of the soil that show all of its horizons • dig a pit and identify various horizons of the soil profile in terms of topsoil, subsoil and underlying materials • describe the main features and importance of different horizons of the soil profile
2.1.5 Soil fertility	• acquire knowledge on the importance of soil nutrients	• describe the use of nitrogen, phosphorus and potassium by the plant • describe the deficiency symptoms of nitrogen, phosphorus and potassium

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
2.1.6 Plant structure	• understand the main structures of plants	• identify different structures of a plant • illustrate, by means of a diagram, how roots absorb minerals salts from the soil
2.2 Cash crops		
2.2.1 Cash crops grown in Namibia	• acquire knowledge about different cash crops grown in Namibia	• identify different cash crops (sugar cane, cotton, wheat, sunflower*)* grown in Namibia • list products and by-products of cash crops grown in Namibia • collect pictures and / or samples of the cash crops produced in Namibia
(choose one of the following cash crops suitable for the local area: cotton, sugarcane, wheat or sunflower)		
2.2.2 Importance of a chosen crop	• gain knowledge about the importance of a specific cash crop	• state the importance of a chosen crop to the economy of the country • describe how the raw materials from chosen cash crop can be processed
2.2.3 Cultivars	• realise that there are different cultivars for any particular crop	• explain what is meant by a cultivar • collect and identify different cultivars for a particular crop • explain the necessity of choosing the right cultivar for the local conditions
2.2.4 Soil and climatic requirements	• understand the optimal soil and climatic requirements needed for better production of chosen crops	• describe the soil and climatic requirements for a chosen crop • explain what is meant by irrigation and its necessity for plant growth • discuss the advantages and disadvantages of rainfall and irrigation for a chosen crop • explain the best irrigation method for a chosen crop
2.2.5 Preparation of soil for planting	• apply knowledge and skills to the preparation of soil for planting purposes	• explain the importance of preparing the soil before planting a chosen crop • demonstrate how to prepare the soil for planting a chosen cash crop: clearing the area, determining the soil pH, measuring the plot, digging, levelling and fertilizing

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
2.2.6 Planting cash crops	• understand the importance and use of using quality seeds/planting materials and the best planting method	• carry out an experiment to test seed viability and calculate germination percentage • explain how to plant seeds/cuttings according to the required time in the season, depth and spacing
2.2.7 Record keeping	• understand the importance of keeping records	• explain the importance of record keeping in crop production • design record sheets/cards and keep records of all activities manually or by using computer (where applicable)
2.2.8 Fertilising	• understand the effects of fertilisers	• identify different sources of plant nutrients: - organic (compost, green manure, and kraal manure) - inorganic [limestone ammonium nitrate; superphosphate; potassium sulfate; Nitrogen, Phosphorous and Potassium (NPK)] • discuss the advantages and disadvantages of organic and inorganic fertilisers • Explain why farmers apply fertilisers in the right way, correct amount and at the proper time
2.2.9 Pests, diseases and weed control	• gain insight of the negative effects of pests, diseases and weeds for a chosen crop	• identify pests, diseases and weeds that can attack a chosen crop • design a poster showing common pests, diseases and weeds that attacks a chosen crop • suggest methods of controlling diseases, pests and weeds (biological, chemical, cultural)
2.2.10 Harvesting, storing and marketing of cash crops	• understand when a particular cash crop is ready for harvesting, storing and marketing	• describe how to harvest a chosen crop • specify the correct conditions necessary for storing products of a chosen crop • investigate best ways to market the crop in order to get the highest price • calculate profit or loss from the sale of crop product aimed at generating income for the school

THEME 3: ANIMAL STUDIES		
TOPICS	**GENERAL OBJECTIVES** *Learners will:*	**SPECIFIC OBJECTIVES** *Learners should be able to:*
3.1 General aspects		
3.1.1 Animal nutrition	• understand the significance of good nutrition in animals	• define the concept *maintenance ration as a ration that contains sufficient nutrients for the animal to stay in good health and to keep all its body processes functioning normal without losing or gaining weight* • define the concept *balanced ration* as a ration consisting of all essential nutrients needed in animal's body in correct amount • state the importance of a balanced ration in animals • prepare a balanced ration from locally available foodstuffs • discuss the need for provision of fodder and supplementary feeds to animals in Namibia
3.1.2 Selection and judging livestock	• understand the importance of the selection of livestock for breeding purposes	• explain the importance of artificial selection • discuss factors to consider when choosing animals for breeding purposes
3.1.3 Breeding systems	• acquire knowledge of different breeding systems of livestock	• identify different breeding systems such as inbreeding, line breeding, cross breeding and upgrading • discuss the advantages and disadvantages of animal breeding systems • explain the importance of cross breeding in animal production
3.2 Fish farming (aquaculture)		
3.2.1 Importance of fish farming in Namibia	• understand why fish farming is important to Namibia	• explain the importance of fish farming to the local community and the economy of the country • identify fresh water fish (limited to cat fish, tilapia, carp, trout) • identify salt water fish found in Namibia (limited to snoek, horse mackerel, tuna, angel fish)

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
3.2.2 Suitable places for fish production	• gain knowledge of places where fish can be successfully produced	• identify suitable places for fish production such as dammed ponds and diverted water ponds • describe how to construct a small aquarium and / or pond at school • construct a simple fish pond and / or aquarium at school
3.2.3 Stocking and feeding fish	• acquire knowledge on fish stocking and feeding	• suggest the best time for stocking fingerlings • discuss factors that influence fish stocking rates • list types of fish feeds • outline advantages and disadvantages of floating and sinking pellets
3.2.4 Diseases, parasites and predators	• gain insight into different types of diseases, parasites and predators that attack fish	• list common diseases: Bacterial (tuberculosis or TB), Protozoan (trichodina), and Viral (lymphocystis) that attack fish • identify fish parasites such as fish lice, tapeworms, anchor worms, gill flukes and flatworms • identify fish predators (including eagles, tortoises, crocodiles, otters, catfish) • explain ways of controlling fish parasites by using substances such as formalin, acriflavin, and potassium permanganate • suggest ideas on how to protect fish from predators • discuss how to prevent water pollution to keep the fish in a healthy condition
3.2.5 Harvesting fish	• understand different methods of harvesting fish	• state the ideal time and conditions for harvesting fish • describe methods of harvesting fish using harvesting basins, traps, nets, hook and line
3.2.6 Preserving, storing and marketing fish	• apply knowledge and skills to fish preservation, storage and marketing	• explain ways of fish preservation such as refrigeration, deep freezing, canning, drying and smoking • suggest how to store dried and smoked fish • discuss ways of marketing fish

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
3.3 Dairy farming		
3.3.1 Breeds	• acquire knowledge of the different breeds in dairy cattle	• identify common dairy breeds (limited to Jersey, Friesian, Brown Swiss, Ayrshire, Sanga) • describe the desirable characteristics of a dairy breed
3.3.2 Handling dairy animals	• understand the techniques and methods of handling dairy cattle	• identify apparatus and/or facilities used for branding, ear tagging, immunising/vaccinating, castrating, dehorning, deworming, spraying and weaning • give reasons for branding, ear tagging, deworming, vaccinating, castrating, dehorning, spraying, weaning and regular inspection of dairy cattle • visit a local farm and find out the age of an animal by counting the number of permanent teeth • define artificial insemination as an introduction of semen into a female's reproductive track to achieve conception • explain the importance of artificial insemination in breeding of dairy cattle • tabulate advantages and disadvantages of artificial insemination in dairy cattle
3.3.3 Feeding	• acquire knowledge of various feeds required by dairy cattle at different stages	• describe different types of feed required by dairy cattle at each stage - gestation → production ration - lactation → production ration - newly born calf → colostrum - heifer → maintenance ration - bull → production ration • explain the importance of supplementary feeding such as mineral licks, hay, silage, cultivated pastures and concentrates • define *colostrum* as the first milk produced by a mother immediately following the delivery of a new born calf • outline the importance of colostrum to a newly born calf

TOPICS	GENERAL OBJECTIVES *Learners will:*	SPECIFIC OBJECTIVES *Learners should be able to:*
3.3.4 Dairy production	• understand the importance of milking techniques and dairy products	• describe the composition and nutritional value of milk • explain the processes used to make different dairy products, e.g. churning, preservation (drying and pasteurisation), cuddling, fermentation and skimming • explain the importance of hygiene in dairy production • collect and identify samples of different products obtained from dairy cattle • discuss the methods of weighing milk (measuring cup, kitchen scale, milk scale, milk meter, flow meter, weighing tanks, portable milk weighing devices) • suggest the method of keeping records for dairy production (manual recording or electronic devices)
3.3.5 Animal health	• acquire knowledge of common diseases and parasites affecting the dairy cattle	• identify symptoms of diseases in dairy cattle (limited to mastitis, ketosis, lumpy skin, hypomagnesaemia • list the common parasites in dairy cattle, external (ticks, flies, mites, lice) and internal parasites (roundworms, tapeworms, flukes) • explain how to prevent and control diseases and parasites affecting dairy cattle • discuss the role of veterinary services in animal health
3.3.6 Marketing	• gain insight into different ways of marketing dairy products	• explain ways of marketing dairy products • describe factors to consider when marketing dairy products (4Ps: product, price, place, promotion)
THEME 4: FARMING TECHNOLOGY		
4.1 Farm buildings		
4.1.1 Building tools	• develop skills on the usage of building tools on the farm	• Identify various building tools (limited to spirit level, building square, wheelbarrow, shovel, trowel, painting rollers, painting brush, wood and metal float) used on the farm • Describe the uses of buildings tools

TOPICS	**GENERAL OBJECTIVES** *Learners will:*	**SPECIFIC OBJECTIVES** *Learners should be able to:*
4.1.2 Bricks and concrete	• understand the processes of concrete mixing and brick making	• outline the correct procedures of mixing concrete; - for floor (1:3:6) ratio (1 part of cement, 3 parts of sand and 6 parts of gravel) - for bricks making (1:2:3) (1 part of cement, 2 parts of sand and 3 parts of gravel) • describe the process of making bricks from locally available materials
4.1.3 Plastering and painting	acquire knowledge and skills in the painting and plastering of building structures	• distinguish between plastering and painting • outline reasons for plastering and painting • demonstrate skills in plastering and painting structures
4.1.4 Roofing materials	know how to use locally available materials to make roofs	• state the reasons for using locally available materials to make roofs • collect roofing materials and demonstrate how to use them • design a model of a simple farm structure (grain storage or animal house)

10. ASSESSMENT

A learner-centred curriculum and learner-centred teaching encompass a broad range of knowledge and skills which are relevant to the knowledge-based society. The specific objectives in the syllabus state what understanding and skills a learner must demonstrate as a result of this teaching-learning process, and which objectives will be assessed. However, it is intended that the curriculum should focus on learning, not on assessment and examination. Assessment and examination are only to support learning.

10.1 Types and methods of assessment

Continuous Assessment (CA)

In order to capture the full range and levels of competence, a variety of formal and informal continuous assessment situations is needed to give a complete picture of the learner's progress and achievements in all subjects. Continuous assessment must be clear, simple and manageable, and explicitly anchored in learner-centred principles and practice. Teachers must provide a reliable and valid assessment of the learner's performance in the specific objectives. The information gathered about the learners' progress and achievements should be used to give feedback to the learners about their strong and weak points, i.e. where they are doing well, and why, and where, how and why they need to improve. The parents should be informed regularly about the progress of their children in all subjects, be encouraged to acknowledge achievements, and given suggestions as to how they can support the child's learning activities.

The learner's progress and achievements in this subject must be reported to parents in the school report.

Formative and summative assessment

The two modes of assessment used are formative continuous assessment and summative assessment. Formative continuous assessment is any assessment made during the school year in order to improve learning and to help shape and direct the teaching-learning process. Assessment has a formative role for learners if and when:

- it is used to motivate them to extend their knowledge and skills, establish sound values, and to promote healthy habits of study;
- assessment tasks help learners to solve problems intelligently by using what they have learnt ;
- the teacher uses the information to improve teaching methods and learning materials.

Summative assessment is an assessment made at the end of the school year based on the accumulated total of the progress and achievements of the learner throughout the year in a given subject, together with any end-of-year tests or examinations. The result of summative assessment is a single end-of-year promotion grade.

Informal and formal methods

The teacher must assess how well each learner is mastering the specific objectives described in the syllabus for the teacher to gain a picture of the all-round progress of the learner. To a large extent, this can be done in an informal way and in their participation in general, through structured observation of each learner's progress in learning and practice situations while they are investigating things, interpreting phenomena and data, applying knowledge, communicating and making value judgements.

When it is necessary to structure assessment more formally, the teacher should as far as possible use situations similar to ordinary learning and practice situations to assess the competency of the learner. Formal written and oral tests can be used to assess only a limited range of specific objectives and therefore should not take up a great deal of time. Short tests should be limited to part of a lesson and only in exceptional cases use up a whole lesson.

Evaluation

Information from informal and formal continuous assessment is to be used by the teacher to ascertain where it is necessary to adapt methods and material to the individual progress and needs of each learner. At the end of each main unit of teaching and at the end of each term, the teacher, together with the learners, should evaluate the learning-teaching process in terms of tasks completed, participation, what the learners have learnt, and what can be done to improve the working atmosphere in and achievements of the class.

Criterion-referenced grades

When grades are awarded in continuous assessment, it is essential that they reflect the learner's actual level of achievement in the specific objectives, and are not related to how well other learners are achieving these objectives or to the idea that a fixed percentage of the learners must always be awarded a Grade A, B, C, and so on (norm-referencing). In criterion-referenced assessment, each letter grade must have a descriptor for what the learner must demonstrate in order to be awarded the grade. Grade descriptors must be developed for each subject for each year. It is important that teachers in each department/section work together to have a shared understanding of what the grade descriptors mean, and how to apply them in continuous assessment, so that grades are awarded correctly and consistently across subjects. Only then will the assessment results be reliable.

10.2 Grade descriptors

The learner's summative achievement in the specific objectives will be shown in letter grades A to E, where A is the highest and E the lowest grade for learners achieving minimum competency level. In cases where a learner has not reached the minimum level of competency a U will be awarded. When letter grades are awarded, it is essential that they reflect the learner's actual level of achievement in relation to the specific objectives. The relation between the letter grades and specific objectives is shown in the table below. As far as possible a letter grade should be used as the mark instead of a percentage.

Grade	% Range	Grade descriptions
A	80%+	**Achieved objectives exceptionally well.** The learner is outstanding in all areas of competency.
B	70-79%	**Achieved objectives very well.** The learner's achievement lies substantially above average requirements and the learner is highly proficient in most areas of competency.
C	60-69%	**Achieved objectives well.** The learner has mastered the specific objectives and can apply them in unknown situations and contexts.
D	50-59%	**Achieved objectives satisfactorily.** The learner's achievement corresponds to average requirements. The learner may be in need of learning support in some areas.
E	40-49%	**Achieved the minimum number of objectives to be considered competent.** The learner may not have achieved all the specific objectives, but the learner's achievement is sufficient to exceed the minimum competency level. The learner is in need of learning support in most areas.
U	0-39%	**Ungraded.** The learner has not been able to reach a minimum level of competency in the objectives, even with extensive help from the teacher. The learner is seriously in need of learning support.

Conducting and recording assessment

Continuous assessment should be planned and programmed at the beginning of the year, and kept as simple as possible. Marks given for class activities, practical activities, project work, assignments, homework and short tests may be recorded for continuous assessment.

10.3 Assessment objectives

The assessment objectives for Agricultural Science are:

Assessment objective A: Knowledge with understanding

Learners should be able to demonstrate knowledge and understanding in relation to:

- scientific language, terminology, symbols, quantities and units;
- instruments and apparatus, including techniques of operation and aspects of safety;
- the use of scientific facts, concepts, patterns and principles.

The objective is made up of specific objectives which require learners to identify, give examples, name, list, state, indicate, give reasons, suggest ways, recognise, define, discuss and to outline.

Assessment objective B: Handling information, application and solving problems

The learners, using written, symbolic, graphical and numerical material, should be able to:

- analyse novel situations in a logical and deductive manner;
- locate, select, organise and present information from a variety of sources;
- translate information from one form to another;
- use information to identify patterns, report trends and draw inferences;
- present reasoned explanations for phenomena, patterns and relationships;
- make a value judgement about scientific and technological applications and their social, economic and environmental implications;
- solve problems.

This objective is made up of specific objectives which require learners to predict, relate, describe, calculate, find, estimate, determine, sketch, and select, analyse, extract and analyse, synthesize, compare and discuss, deduce, explain, distinguish, suggest, interpret, and evaluate.

Assessment objective C: Practical (experimental and investigative) skills

Learners should be able to:

- use and organise techniques, apparatus and materials;
- observe, measure and record;
- handle, process and evaluate experimental observations and data;
- plan investigations.

10.4 Continuous assessment: detailed guidelines

A specified number of continuous assessment activities per term should be selected, graded and recorded. Not more than two assessments per term are to be topic tests. These continuous assessments must be carefully planned and marked according to a marking scheme, marking criteria or memorandum. Detailed guidance can be found in the Continuous Assessment Manual for Agricultural Science. The criteria used to assess activities other than tests should be given to the learner before the assessment activity. Evidence of the work produced by good, average and low-achieving learners, as well as the written assignment and marking scheme, has to be kept at school until the end of the next year. Teachers can choose to grade and/or record more than the required continuous assessments if it is necessary for formative purposes. An end-of-year summative grade will be based only on the assessment tasks described in the syllabus. Not more than forty percentages (40%) of the summative grade may be based on tests, which include topic tests and end-of-term tests.

Types of continuous assessment tasks

In Agricultural Science in the Junior Secondary phase the continuous assessment tasks are as follows:

Practical exercises: A practical exercise requires candidates to be involved in tasks and activities in which they demonstrate skills which will be assessed and will generate evidence of the demonstration of the skill for demonstration. Assessment of the practical exercises by the teacher needs to take place at the time of the performance of the skill by candidates in order to ensure that the assessment is authentic. The evidence of the practical exercise should indicate that the candidate skills in such practical agricultural work, and also when the work was carried out.

Topic tasks: These are activities that most teachers already use in their day-to-day teaching. These are recorded, assessed activities that could introduce a topic, be used during the teaching of a topic and /or revision a topic. They may well include assessment involving specific objectives to do with locating information, conducting surveys, analysing information or presenting information. Topic tasks will involve assessments of specific objectives in all assessment objectives; however, not all assessment objectives need to be present in every topic task. The greatest emphasis should be placed on assessment objectives B and C to meet the weighting shown in the Test Specification Grid.

Practical investigation: The practical investigation is a major piece of work and should be investigatory in nature. The main aim of the investigation is that it should be done by the individual candidate, in connection with some particular study problem. The report produced should be presented carefully and include a hypothesis/objectives/research questions, plan for how the investigation was carried out (aligned to the hypothesis/objectives/research questions), a record and analysis of data collected and conclusions made.

Topic tests: Completed topics should be concluded with a test indicating the achievements of the learners in these topics.

End-of-term test: This will be a more comprehensive topic test of the term's work. No homework should be assigned during the time of writing the end-of-term tests.

Summary of continuous assessment tasks

Continuous assessment Grade 8 & 9						
	Term 1		**Term 2**		**Term 3**	
Components	**Number & marks**	**Total**	**Number & marks**	**Total**	**Number & marks**	**Total**
Practical exercises	2×15	30	2×15	30		
Practical Investigation					1×30	30
Topic tasks	2×10	20	2×10	20	1×10	10
Topic tests	1×20	20	1×20	20	1×10	10
End-of-term test	65	130(65×2)	65	130(65×2)		
Term marks		200		200		50
Weighted term marks	200÷2	100	200÷2	100		

The CA marks for one term is converted to a mark out of 100 (weighted mark). Only this should be used for the report at the end of term 1 and 2. Learners should not write an examination at the end of the first and second term, but only an end of term test.

10.5 End-of-year examinations: detailed guidelines

In Grade *8 and 9* there will be an end-of-year examination. The purpose of this examination is to focus on how well learners can demonstrate their thinking, communication, and problem-solving skills related to the areas of the syllabus which are most essential for continuing in the next grade. Preparing for and conducting this examination should not take up more than two weeks altogether right at the end of the year.
The description of the various papers for the written examination is as follows:

Written examination Grade 8 & 9			
Grades	**Description of paper**	**Duration**	**Marks**
8 and 9	Written Examination This will consist of ONE paper consisting of two sections: **Section A:** 30 Multiple choice questions (30 marks) **Section B:** Variety of structured questions (100 marks)	2 hours 30 minutes	130

Promotion marks

For Agricultural Science in grade *8 & 9* continuous assessment contributes 35% to the summative assessment mark and the end-of-year examination contributes 65%.The weighting of each assessment component is as follows:

Component	**Description**	**Marks**	**Weighting**
Written examination	Section A:	30	15%
	Section B:	100	50%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations, Practical Exercises	70	35%
Total Marks		**200**	**100%**

The promotion marks are calculated as follows:

	Promotion mark for Grade 8 & 9			
	Term 1	**Term 2**	**Term 3**	**Total**
Term mark	70	70	50	190
CA mark	(Total÷190)×70			70
End-of-year examination	130 Marks			130
Promotion mark	Average Term Mark + End-of-Year Examination ÷ 2 200÷2			**100**

10.6 Specification grid

The Specification grid below indicates the approximate weighting allocated to each objective for both continuous assessment and for the written examination.

Assessment objectives for written examination			
Components	**Weighting**	**Paper 1 Section A**	**Paper 1 Section B**
Objective A Knowledge with understanding	30%	9 marks	30 marks
Objective B Handling information, application & solving problems	65%	20 marks	65 marks
Objective C Practical (experimental and investigative) skills	5%	1 mark	5 marks
Total	100%	30 marks	100 marks

Assessment objectives for continuous assessment	
Components	**Weighting**
Objective A Knowledge with understanding	10%
Objective B Handling information, application & solving problems	40%
Objective C Practical (experimental and investigative) skills	50%
	100%

11. ASSESSMENT CRITERIA

The following five criteria should be assessed and marked (out of a maximum of three marks per criteria)

- **Responsibility** - the ability to assume responsibility for the task in hand, and to work with given instructions without detailed supervision and help
- **Initiative** - the ability to cope with problems arising in connection with the task, to see what needs to be done and to take effective action
- **Technique** - the ability to tackle a practical task in a methodical, systematic way and to handle tools skilfully and to good effect
- **Perseverance** - the ability to see the task through to a successful conclusion with determination and sustained effort
- **Quality** - the ability to attend to detail, so that the work is well-finished and well-presented

Guide to marking practical work

1. Responsibility	
• follows written or verbal instructions without the need for help • carries out appropriate safety procedures • works well in a group, assumes responsibility easily and leads in the group	3
• follows written or verbal instructions with a little help • is aware of the need for safety procedures but has difficulty in recognizing them without guidance • works within the group, shows responsibility for the work	2
• follows written or verbal instructions with considerable help • shows little regard for safety procedures, even when told • works alone, shows some responsibility for the work	1 or 0

2. Initiative	
• offers solutions or explanations for unexpected problems • recognises, and is able to anticipate problems • solves problems without help • comments on imperfections of practical work • can plan an investigation involving variables and a control	3
• offers solutions or explanations for unexpected problems after seeking advice • solves problems with help • recognises faults in experimental methods, given some indicators • can plan an investigation with help	2
• is uncertain how to proceed and requires considerable help • recognises only the most obvious errors in experimental methods after considerable guidance • can plan an investigation, but in outline only	1 or 0

3. Technique	
• approaches tasks methodically and systematically • handles tools/apparatus skilfully and confidently • carries out practical procedures with dexterity	3
• handles tools /apparatus effectively • carries out practical procedures adequately	2
• handles tools /apparatus clumsily • carries out practical procedures with difficulty	1 or 0

4. Perseverance	
• completes all the required practical tasks and attendant written work • has a positive attitude and is well motivated • carries out repetitive procedures willingly	3
• completes the required practical tasks and attendant written work with a little encouragement • carries out repetitive procedures willingly	2
• does not complete the required practical tasks and attendant written work • is somewhat disinterested /impatient when carrying out work and is disinclined to repeat procedures	1 or 0

5. Quality	
• performs practical work thoroughly, pays attention to detail and produces a very good final result • produces accurate, clear and neatly presented written work	3
• performs practical work thoroughly for the most part and produces a satisfactory to good final result • produces mostly accurate and clearly presented written work	2
• performs practical work in a rushed and superficial way and shows little concern for the finished product • produces inaccurate and poorly presented written work	1 or 0

ANNEXES

Annexe 1: Glossary of terms used in science teaching and assessment activities

Analyse	examine information in detail to discover patterns and relationships, or to study and determine relationship or accuracy
Apply / use	emphasises the correct use of equipment, procedures, rules or facts, e.g. a child may be able to use a Bunsen burner, but not do so correctly or have no regard to safety
Calculate	a numerical answer is required - working must be shown
Classify	to arrange or organise according to systematic groups, classes, properties, characteristics or categories
Collect data / samples	pose questions, select sources and/or design questionnaires. Physically collect samples
Compare / differentiate	to explain the resemblances, similarities or differences between two or more numbers, objects, or figures by considering their attributes/characteristics; or to determine if two or more items, entries or variables are the same and if not, identify differences and give a reason for your answer
Distinguish / identify	tell apart, show or indicate the difference between, find out what is unique about a material or situation Example: distinguish between a heat and solar energy
Construct / draw / record	make an accurate drawing, graphs, tables, charts or representation by using mathematical instruments and/or rules. In case of diagrams, make detailed drawing with heading and all relevant labels. In graph work or charts, an accurate to scale curves or lines should be given with a heading and relevant labels and units. In tables the heading and labels should be given. In tables the units should give in the heading of the columns or with each entry but not both
Convert	change from one unit of measure to another
Deduce	use the information provided to come to a conclusion, e.g. reference to a law or principles, or the necessary reasoning is to be included in the answer
Define	a literal statement is required
Describe / observe	write down what you do, or what you would see, hear, feel, smell and taste, in as much detail as possible with due regards to safety
Design	make a plan or drawing to show the appearance of something before it is made
Determine	use the information given to work out the answer – no working
Discuss	give a critical account of the points involved in the topic
Estimate	implies a reasoned statement or calculation about something. Produce an approximate answer using rational, logical procedures (e.g., rounding for numbers and benchmarks for measures)
Evaluate	use the information provided to make a judgement about something
Explain	give a reason for your answer

Find	a general term which means calculate, determine or measure
Give / state / write down / express	write down your answer
Interpret	reasoning or some reference to theory, depending on the content; explain the meaning of something
Investigate	examine a problem in a systematic way
List	give a number of points, generally each of one word
Name	identify by mentioning the name of something
Outline	give a brief answer writing down the main points
Predict	to determine the next step or value (to make an educated guess), based on evidence or a pattern; Make a logical deduction either from your own knowledge or from the information given in the question or both
Recognise	be aware of a fact or problem
Select	choose from a number of alternatives
Sketch	make a rough drawing that shows the salient or distinguishing features of an object. In diagrams, make a simple, freehand drawing and in graph work, the shape and/or position of the curve should be given
Study	use the information or data provided to investigate a problem in a systematic way
Suggest	use your knowledge of the context of the problem and mathematical procedures to give what you think is the best strategy to use or answer to the question. Use your knowledge of science and the information in the question to give what you think is the best answer

Annexe 2: Numbers

The decimal point will be placed on the line, e.g. 52.35.
Numbers from 1000 to 9999 will be printed without commas or spaces.
Numbers greater than or equal to 10 000 will be printed without commas. A space will be left between each group of three whole numbers, e.g. 4 256 789.

Annexe 3 Symbols, units, and definitions of physical quantities

Quantity	Symbol	Unit	Name
Length	*l, h*	*km, m, cm, mm*	kilometre, metre, centimetre, millimetre
Area	*A*	m^2, cm^2	square metre, square centimetre
Volume	*V*	m^3, cm^3, dm^3	cubic metre, cubic centimetre, cubic decimetre
Weight	*W*	*N*	newton
Mass	*M*	*kg, g*	kilogram, gram
Time	*T*	*h, min, s*	hour, minute, second
Density	ρ	kg/m^3, g/cm^3	kilogram per cubic metre, gram per cubic metre
Speed/ velocity	*V*	*km/h, m/s, cm/s*	kilometre per hour, metre per second, centimetre per second
Acceleration	*A*	m/s^2	metre per second squared
constant of gravitational force of 10 N on 1 kg of mass (10 N/kg) on or near the surface of the Earth, or the acceleration of free fall	*G*	m/s^2 *or N/kg*	metre per second squared or Newton per kilogram
Force	*F*	*N*	newton
work done	*W*	*J*	joule
Energy	*E*	*J*	joule
Power	*P*	*W*	watt
Temperature	*T*	^oC, *K*	degree Celsius, Kelvin
potential difference/voltage	*V*	*V, mV*	volt, millivolt
Current	*I*	*A, mA*	ampere, milliampere

Annexe 4: Examples of suggested activities for grade 8 & 9

Examples of suggested activities for grade 8

THEME 1: GENERAL AGRICULTURE
• write down the names and occupations of about ten family members within your local area, indicating who among them relies directly or indirectly on agriculture for their income and livelihood • collect pictures/labels/samples and make posters showing food and clothing people obtain from crops and animals • visit local shops and identify at least six agricultural products imported into Namibia, find out why these commodities are not produced and processed in Namibia • draw a map of a farm (school farm or any other) and show plans of the layout of each division
THEME 2: PLANT STUDIES
• conduct experiments to demonstrate plant processes such as photosynthesis, respiration, transpiration, osmosis, and translocation • collect and classify different types of fruits such as citrus, deciduous, tropical or subtropical • design the layout of an orchard or nursery • prepare seedbeds and plant fruit trees • conduct a germination test of seeds for different fruit trees • identify and use tools for the planting and pruning of fruit trees
THEME 3: ANIMAL STUDIES
• visit a nearby farm and observe different species and breeds of available farm animals; discuss with the farmer the different methods of caring for these animals • collect and distinguish different kinds of external parasites; discuss their harmful effects on animals, their prevention and their control • use pictures to distinguish different kinds of internal parasites; discuss their harmful effects on animals, their prevention and their control • visit a pig sty and identify diseases according to their symptoms • observe the following practices: finishing off for the market, weighing animals, slaughtering, grading and cutting carcasses
THEME 4: FARM TECHNOLOGY
• perform simple maintenance of farm tools and implements • use tools to maintain cages, pens, and nest-boxes in clean and tidy conditions • construct low cost tools /models using locally available materials

Examples of suggested activities for grade 9

THEME 1: GENERAL AGRICULTURE
• investigate the effect of wind on plants by conducting a simple experiment: place two identical well-watered pot plants, one in the room and another in front of the fan and then observe and record the outcome of each • conduct a simple experiment to investigate the effect of temperature on evaporation • design a poster depicting the negative impact that HIV and AIDS might have on food security in Namibia
THEME 2: PLANT STUDIES
• collect and identify different types of available rocks • visit surrounding areas of the school and observe signs of weathering processes where applicable • dig a pit, identify and discuss various horizons of the soil profile in terms of topsoil, subsoil and underlying materials • conduct a simple experiment to determine the texture of the soil in your school garden • sow or plant seeds/cuttings of different cash crops according to the required time of season, depth and space • conduct an experiment to determine the germination percentages (viability) of seeds • design a poster displaying different products of cash crops • record and analyse weather data in the area (temperature, rainfall, evaporation, wind speed, and humidity)
THEME 3: ANIMAL STUDIES
• prepare a balanced ration for the animals • visit local farms and collect pictures, slides and photos of different species of fish to make posters • identify common dairy breeds (Jersey, Friesian, Ayrshire, Brown Swiss, and Sanga) by visiting farms or collecting pictures, slides and photos and / or watching videos • demonstrate how to catch and bring down cattle while observing safety measures • investigate and deduce ways of marketing different dairy products • construct a small pond and / or aquarium at school and stock it with finger lings • prepare fish rations and feed the fish • demonstrate the use of correct tools and / or facilities in performing the following practices: branding, ear tagging, deworming, vaccinating, spraying, castrating and dehorning of animals • demonstrate or observe the use of hand and machine milking
THEME 4: FARM TECHNOLOGY
• demonstrate the use of the following tools: spirit level, builder's square, spot board, lump hammer, bolster, mason's pins and twine, trowel, tape measure, wheelbarrow and shovel • demonstrate the process of concrete-mixing using the correct ratio of materials • make bricks by using locally available materials: sun dried mud bricks, soil cement bricks, and fire-baked bricks

ANNEXE 5: ASSESSMENT RECORD SHEET FOR GRADE 8 & 9 (Term 1 & 2)

ASSESSMENT RECORD SHEET FOR AGRICULTURAL SCIENCE

Grade: ………… **Year:** .... **School:** .... **Teacher:** ....

		Practical exercises			**Topic Task**			**Topic Test**				**CA Mark**	**End of Term Test**	**Term Mark**	**Weighted term mark**
Name of Learner		1	2	Total	1	2	Total	1	2	Total	(40÷2)		(65×2)	(70 + 130)	(200÷2)
	Mark	15	15	**30**	10	10	**20**	20	20	**40**	**20**	70	130	200	**100**
	1														
	2														
	1														
	2														
	1														
	2														
	1														
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	1														
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	1														
	2														
	1														
	2														

Term 1
Moderator: ………………………..…………… Rank: ………………….

Signature: …………………….……………………… Date: …………………

Term 2
Moderator: ………………………..…………… Rank: ………………….

Signature: …………………….……………………… Date: …………………

ANNEXE 6: ASSESSMENT RECORD SHEET FOR GRADE 8 & 9 (Term 3)

ASSESSMENT RECORD SHEET FOR AGRICULTURAL SCIENCE

Grade: …… **Year:** ..... **School:** ..... **Teacher:** .....

	Practical investigation	**Topic Task**	**Topic Test**	**Term 3 Mark**	**Term 2 Mark**	**Term 1 Mark**	**Total Term Mark**	**Total CA Mark**	**End of year exam mark**	**Total** [CA + Exam]	**Promotion Mark**
Name of Learner	1	1	1				T3+T2+T1	(Total÷190)×70		(70 + 130)	(200÷2)
	30	**10**	**10**	50	70	70	190	**70**	**130**	200	**100**

Term 3

Moderator: ……..……..…… Signature: …….. Rank: ……. Date: ……

The National Institute for Educational Development
Private Bag 2034
Okahandja
NAMIBIA

Telephone: +264 62 509000
Facsimile: +264 62 509073

E-mail: media@nied.edu.na
Website: http://www.nied.edu.na