



Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

JUNIOR SECONDARY PHASE

TECHNICAL DRAWING SYLLABUS

GRADE 8 & 9

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

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

© Copyright NIED, Ministry of Education, Arts and Culture, 2024
Technical Drawing Syllabus Grade 8 & 9

ISBN: 978-99945-2-497-6

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

Publication date: December 2024

Table of contents

1.	Introduction	1
2.	Rationale	1
3.	Aims	1
4.	Inclusive education	2
5.	Links to other subjects and cross-curricular issues	2
6.	Approach to teaching and learning	3
7.	End-of-phase competencies	4
8.	Summary of the learning content	5
9.	Learning content	6
9.1	Grade 8 learning content	6
9.2	Grade 9 learning content	9
10.	Assessment	13
10.1	Types and methods of assessment	13
10.2	Grade descriptors	14
10.3	Assessment objectives	15
10.4	Continuous assessment: detailed guidelines	15
10.5	End-of-year examination: detailed guidelines	17
10.6	Specification grid	19
	Annexe 1: Glossary of terms	20
	Annexe 2: Abbreviations	22
	Annexe 3: List of drawing equipment and other resources	24
	Annexe 4: Assessment record sheet for grade 8	25
	Annexe 5: Assessment record sheet for grade 9	26

1. INTRODUCTION

This syllabus describes the intended learning and assessment for Technical Drawing in the Junior Secondary phase. As a subject, Technical Drawing is within the technological area of learning in the curriculum, but has thematic links to other subjects across the curriculum. Learning about technology includes applying knowledge of how to work more efficiently using tools, materials and processes. Technology is a specific way of solving problems through planning, design, realisation and evaluation. Learners develop the necessary knowledge, skills and attitudes to perform tasks using appropriate technology.

2. RATIONALE

The presentation of Technical Drawing at school is first and foremost an educational matter, with the overall goal being that learners attain proper adulthood in the society. As a result of the increasing industrialisation and mechanisation of modern times, technological knowledge and skills have become indispensable in everyday life.

The inclusion of Technical Drawing in the learners' curriculum does not aim at vocational training in the narrow sense of the word. It simply provides the learner with a broad educational foundation for further specialised training. It also provides the learners with a clear understanding of technology and assists them in becoming better adapted and prepared for life.

The integration of entrepreneurial concepts and activities lays the foundation for the development of human resources as a basis for studies, occupations or self-employment. Technical Drawing, together with entrepreneurial concepts and activities, empowers the individual to be creative and gain problem-solving skills.

The particular features of Technical Drawing at this phase are to enable the learners to achieve technological literacy through the development of technological knowledge and understanding, technological capacity and an awareness of the significance of Technical Drawing upon society

Learners should develop a thorough knowledge of basic concepts which they can apply in a wide range of situations. They must also develop the broad-based skills that are so important for effective functioning in the world of work. They must learn to identify and analyse problems and to explore and test solutions in a wide variety of contexts. This firm conceptual base is at the heart of the Technical Drawing curriculum and must be the focus on teaching and learning in the classroom.

3. AIMS

The Technical Drawing syllabus promotes the following aims in the curriculum:

- foster an awareness of local, regional and national needs of Namibia and contribute towards development
- equip learners to play an effective and productive role in the economic life of the nation
- promote positive attitudes towards the challenges of co-operation, work, entrepreneurship and self-employment

4. INCLUSIVE EDUCATION

Inclusive education is the right of every learner and promotes participation in, or access to, the full range of educational programs 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 Technical Drawing teacher in the Junior Secondary phase should therefore accommodate learners with special educational needs by adapting this syllabus to the needs of the learner through differentiation of teaching methods and material as indicated in the *Inclusive Education Curriculum Framework (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 in all social themes in order to raise awareness of gender stereotyping, how limitations are set on gender equity, and how to promote gender equity in all spheres of life.

All teaching/learning materials should be analysed to ensure that they promote gender equality.

5. LINKS TO OTHER SUBJECTS AND CROSS-CURRICULAR ISSUES

The cross-curricular issues include Environment Learning; HIV and AIDS; Population Education; Education for Human Rights and Democracy (EHRD); Information and Communication Technology (ICT). These have been introduced to the formal curriculum to be dealt with in each subject and across all phases, 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.

All our learners need to:

- understand the nature of these risks and challenges;
- know how they will impact on our society and on the quality of our people's lives now and in future;
- understand how these risks and challenges can be addressed on a national and global level
- understand how each learner 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:

- the challenges and risks we face if we do not care for and manage our natural resources;
- the challenges and risks caused by HIV and AIDS;
- the challenges and risks to health caused by pollution, poor sanitation and waste;

- the challenges and risks to democracy and social stability caused by inequity and governance that ignores rights and responsibilities
- the challenges and risks we face if we do not adhere to road safety measures
- the challenges and risks we face from globalisation.

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 can be dealt with in the topics as indicated:

Cross-curricular issues	HIV and AIDS	Environmental learning	EHRD	Entrepreneurship education	ICT
Grade 8	Safety	Drawing equipment	Safety	Job shadowing	Structural drawings
Grade 9	Safety and first aid	Drawing equipment	Safety and firstaid	Job observation	Structural drawings

6. APPROACH TO TEACHING AND LEARNING

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

The aim is to develop learning with understanding, and the knowledge, skills and attitudes to 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 social experience gained continually from the family, the community, and through interaction with the environment. Learning in school should 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, experience and abilities. The teacher must be able to sense the needs of learners, the nature of the learning to be done, and how to shape learning experience accordingly. Teaching strategies must therefore be varied but flexible within well-structured sequence of lessons.

The teacher should decide, in relation to the learning objectives and competencies in Technical Drawing to be achieved when:

- it is best to convey content directly
- it is best to let learners discover or explore information for themselves
- learners need directed learning
- there is a particular progression of skills or information that needs to be followed
- 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 whenever 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 evaluate their work, under the teacher's guidance.

Local content and context: Technical Drawing emphasises the re-use of locally available resources (recyclable materials) to conserve the environment and the content has been adapted to suit the local context.

7. END-OF-PHASE COMPETENCIES

On entry to the Junior Secondary phase, all learners are expected to have a basic awareness of and some practical skills in pre-vocational subjects within the Namibian school curriculum. They should consider the social and environmental impact of these subjects and also have basic entrepreneurial awareness.

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 demonstrate their competence in simple technological processes and have basic skills in technical drawing. They should be able to make informed choices about design and/or materials and evaluate a finished product in this area. They should also be able to use basic equipment and know the safety precautions in doing so.

8. SUMMARY OF THE LEARNING CONTENT

Topic	Grade 8	Grade 9
1. Technical Drawing	Introduction to Technical Drawing	Technical Drawing
2. Drawing instruments	Drawing instruments	Drawing instruments
3. Free-hand drawings	Basic free-hand drawings	Plane figures and isometric free-hand drawings
4. Drawing techniques	International Organization for Standardization (ISO) standards	International Organization for Standardization (ISO) standards and larger scales
5. Geometrical construction/solids	Draw shapes, circles and arcs	Draw regular polygons and tri-angles, squares and pentagons, ellipses, cords and tangents to circles
6. Axonometric drawings	Draw different types of isometric views of simple object	Draw different isometric views of various objects
7. Orthographic projections	Draw three-dimensional views (first angle orthographic projection)	Draw single objects, according to scale in first angle orthographic projection
8. Developments	Box-type and radial line method	Triangular method
9. Sectional drawings	Drawing of single items	Interpretation of isometric and orthographic views
10. Structural drawings	Structural drawings of foundations, walls, floors, arcs and lintels	Structural drawings of windows, doors and roof structures

9. LEARNING CONTENT

Introduction to 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. For skills-based subjects, specific objectives indicate what learners should be able to do at the end of the year.

9.1 Grade 8 learning content

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 8 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
1. Technical drawing	understand the basic terminologies used in technical drawings.	- explain the term technical drawing - list the field of use for technical drawing - identify and correctly use the abbreviations for the terms in technical drawings: - CAM - CAD - IOS - HEX - (see annexe 2 for more abbreviations)

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 8 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
2. Free-hand drawings	• know how to draw different free-hand sketches	• apply various free-hand drawing techniques to improve standard of drawings - rendering - coloring • sketch different hand tools freehand
3. Drawing instruments	• know drawing instruments to construct simple shapes/objects	• identify and use all drawing instruments appropriately • explain the safe use and maintenance of drawing instruments
4. Drawing techniques	• understand International Organization for Standardisation (ISO) standards regarding the application principles in technical drawings	• apply different scales used in the industry (e.g. 1:1; 1:2; 2:1) • apply ISO standards with printing and symbols • insert dimensions on various simple objects • use different types of lines appropriately
5. Geometrical construction (solids)	• know how to construct complex shape, circles and arcs	• define and interpret terminology used in geometrical constructions • use drawing instruments to construct: - circles through given points - arc to lines that form right angle, obtuse angle and acute angle • construct plane figures such as regular polygons e.g. triangles, squares pentagons and hexagons

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 8 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
6. Axonometric drawings	understand isometric drawings	- define isometric drawing, interpret terminology and apply features and lines used - draw different types of isometric views of simple object
7. Orthographic projections	know how to draw objects in first angle orthographic projection	draw three-dimensional views in first angle orthographic projection of different objects
8. Sectional drawings	understand sectional views of single items	define section and sectional view and apply examples of sectional views, regarding single items
9. Developments	understand the “parallel and radial line method “	- develop the patterns of plating and structural steel components using the following: parallel line method - square tube - round tube - rectangle tube - hexagonal tube - radial method - surface of a right cone - oblique cone - right pyramid
10. Structural drawings	know the construction of foundations, walls, floors	- define and draw strip foundations and foundation brickwork up to 1½ bricks - indicate the placing of damp-proof courses, damp-proof membrane and ant guards - draw sectional views of: - walls - floors

9.2 Grade 9 learning content

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 9 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
1. Technical drawing	know basic terminologies used in technical drawing	- identify and interpret from given examples the following component drawings: - component range - component detail - identify and interpret from given examples the types of assembly drawings
2. Free-hand drawings	know basic principles of freehand sketching to draw plane figures and isometric views	- apply techniques used to improve the standard of free-hand drawings - draw different types of hand tools and items from the building and engineering trades
3. Drawing instruments	understand how to use drawing instruments to construct various objects	draw with instruments, using the correct drawing techniques to construct simple objects
4. Drawing techniques	- know the International Organisation for Standardisation (ISO) standards regarding the application principles in technical drawings - understand reducing and enlarging scales	- print and insert appropriate symbols correctly - orthographic symbols - diameter symbol - radius symbol - identify different scales used in the industry (e.g. 1:5; 5:1 or 1:10; 10:1)

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 9 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
5. Geometrical constructions	understand how to construct complex shapes, circles and arcs	- define and interpret terminology used in geometrical constructions - use drawing instruments to: - transfer given angle - divide given line segment into an amount of even segments - complete the geometrical constructions with the aid of drawing instruments - construct plane figures such as regular polygons and triangles, squares and pentagons - draw ellipses (four centre method), cords and tangents to circles
6. Axonometric drawings	understand how to construct isometric, oblique and exploded views of objects in the industry	draw different isometric, oblique and exploded views of various objects [NB. Isometric circles and arcs are not required]
7. Orthographic projections	understand how to draw multiple views of first angle orthographic projections	- draw single objects, according to scale and in first orthographic projection from: - an isometric drawing given - two views given and the third to be constructed by means of projection - consider the following in drawing the above: - title, scale and orthographic projection symbol - hidden details may be required - centre lines to be inserted - dimensions may be required
8. Sectional drawings	know the basic principles to draw sectional views of objects sectioned	- define section and sectional view - interpret examples of sectional views, i.e. isometric and orthographic views - draw primary views of elementary, single machine parts according to scale in first angle orthographic projection which had been sectioned (parts should not have interpenetration curves or fillet radii)

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 9 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
9. Developments	• understand the triangulation method	• explain the principle of triangulation • define the term true length • identify components usually developed by the triangulation method • develop the patterns, using the triangulation method, of the following simple transitions: - square to round - round to square - square to square - square to rectangle
10. Structural drawings	• understand the construction of windows, doors, jams, roof structures, drainage system, gutters and downpipes	• draw vertical and horizontal sections of the following: - wooden casement window - steel windows - heads - jams - sills • draw elementary views and sections with various moulding of doors up to 4 panels and door frames: - batten doors - panel doors • identify and make neat drawings of some of the different types of roof trusses used in the building industry with ceiling and joist details

TOPIC	GENERAL OBJECTIVES <i>Learners will:</i>	GRADE 9 SPECIFIC OBJECTIVES <i>Learners should be able to:</i>
10. Structural drawings (continued)	understand the construction of windows, doors, jams, roof structures, drainage system, gutters and downpipes (continued)	- outline the principles of rainwater drainage system for simple dwellings - interpret various abbreviations for fittings - make neat drawings of various sections and fittings used in rainwater drainage system - draw rainwater structures (drainage, gutters and downpipes) used in building construction

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

In order to capture the full range and levels of competence, a variety of formal and informal continuous assessment situations are 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.

Informal and formal methods

The teacher must assess how well each learner is mastering the specific objectives described in the syllabus and from this 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.

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.

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.

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.

10.3 Assessment objectives

The four assessment objectives for Technical Drawing are:

Assessment objective A: Knowledge with understanding

Learners should be able to:

- demonstrate the ability to state facts, recall and name items, recall and describe processes;
- demonstrate the ability to apply and relate knowledge to basic design and manufacturing;
- make reasoned arguments and anticipate consequences about outcomes of the design and realisation process;
- demonstrate a crucial awareness of the interrelationship between design and the needs of society.

Assessment objective B: Design problem solving

Learners should be able to:

- identify clearly, from a situation, a specific need for which a solution is required and compose a design brief;
- analyse a problem by considering any relevant functional, aesthetic, human, economic and environmental design issues and draw up a design specification;
- generate a range of outline solutions to a design problem, giving consideration to the constraints of time, skills and resources;
- test and refine the functional and aesthetic effectiveness of design solutions.

Assessment objective C: Design communication

Learners should be able to:

- recognise information in one form and where necessary change it into a more applicable form;
- propose and communicate ideas graphically;
- Develop ideas and represent details of form, shape, constructive movement, size and structure through graphical presentation.

Assessment objective D: Realisation

Learners should be able to:

- plan and organise the work procedure involved in the realisation of a solution;
- select, from a range of resources, those appropriate for the realisation of the product;
- demonstrate appropriate manipulative skills by showing an understanding of materials and their characteristics in relation to their use;
- Demonstrate appropriate manipulative skills by showing the ability to correctly and efficiently use instruments and tools used in the realisation of a product.

10.4 Continuous assessment: detailed guidelines

A specified number of continuous assessment activities per term should be selected, graded and recorded. Not more than three 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. 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 40% of the continuous assessment may be based on tests, which include topic tests and end-of-term tests.

Types of continuous assessment

In Technical Drawing, Junior Secondary phase, the continuous assessment tasks are as follows:

Exercises can be:

- **Observations/worksheets or 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 of a topic. They may well include assessment involving specific objectives to do with locating information or presenting information graphically. This will involve assessment of specific objectives in all assessment objectives; however, not all assessment objectives need to be present in every topic task.
- **Practicals:** These are assessments of practical skills done during practical activities where learners are required to sketch/draw. After each topic, a practical exercise should be conducted to evaluate learners' skills.

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. Teaching must continue, but no homework should be assigned during the time of writing the end-of-term tests.

Summary of continuous assessment tasks

Continuous assessment Grade 8						
	Term 1		Term 2		Term 3	
Components	Number & marks	Total	Number & marks	Total	Number & marks	Total
Observations/worksheets or topic tasks	2×25	50	2×25	50	2×25	50
Practicals	4×20	80	4×20	80	4×20	80
Topic tests	2×10	20	2×10	20	2×10	20
End-of-term tests	100÷2	50	100÷2	50		
Term marks		200		200		150
Weighted term marks (report marks)		(200÷2) 100		(200÷2) 100		

Continuous assessment Grade 9						
	Term 1		Term 2		Term 3	
Components	Number & marks	Total	Number & marks	Total	Number & marks	Total
Observations/worksheets or topic tasks	2×25	50	2×25	50	2×25	50
Practicals	4×20	80	4×20	80	2×20	40
Topic tests	2×10	20	2×10	20	1×10	10
End-of-term tests	100÷2	50	100÷2	50		
Term marks		200		200		100
Weighted term marks (report marks)		(200÷2) 100		(200÷2) 100		

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

10.5 End-of-year examination: detailed guidelines

In Grade 8 there will be an internal end-of-year examination and at the end of Grade 9 a semi-external examination. The Grade 9 papers will be set by DNEA/Regions and marked regionally. 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 these examinations should not take up more than two weeks altogether right at the end of the year.

The description for the various papers for the written examination is as follows:

Written examination			
Grade	Description of papers	Duration	Marks
8	This paper will consist of three sections: Section A: Section A will consist of 2 or 3 simple freehand drawings and or short answer, compulsory questions intended to assess knowledge (20 marks) Section B: Section B will consist of four questions of which a learner will be required to answer 2 (20 marks x 2 = 40 marks) Section C: Section C will consist of five or six structured questions with subdivisions (40 marks).	2 h 30 min	100

9	This paper will consist of three sections: Section A: Section A will consist of 2 or 3 simple freehand drawings and or short answer, compulsory questions intended to assess knowledge (20 marks) Section B: Section B will consist of four short answer questions (40 marks) Section C: Section C will consist of five or six structured questions with subdivisions (40 marks)	2 h 30 min	100

Promotion mark

For Technical Drawing in Grades 8 & 9 continuous assessment contributes 50% and the end-of-year examination 50% to the promotion mark. The weighting of each assessment component is as follows:

Component	Description	Marks	Weighting
Written examination	Section A	20	50%
	Section B	40	
	Section C	40	
Continuous assessment	Observation/report, work sheets, practical, topic tests, end-of-term test	100	50%
	Total marks	200	100%

The promotion marks are calculated as follows:

Promotion mark Grade 8				
	Term 1	Term 2	Term 3	Total
Term mark	150	150	150	450
CA mark	$(450 \div 4.5)$			100
End-of-year examination				100
Promotion mark	$(\text{CA mark} + \text{end-of-year examination}) \div 2$ $(200 \div 2)$			100

Promotion mark Grade 9				
	Term 1	Term 2	Term 3	Total
Term mark	150	150	100	450
CA mark	$(450 \div 4.5)$			100
End-of-year examination				100
Promotion mark	$(\text{CA mark} + \text{end-of-year examination}) \div 2$ $(200 \div 2)$			100

10.6 Specification grid

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

Components	Weighting	Total (marks)
Assessment objectives for written examination		
Objective A Knowledge with understanding	40%	40
Objective B Design problem solving	16%	16
Objective C Design communication	22%	22
Objective D Realisation	22%	22
Assessment objectives for continuous assessment		
Objective A Knowledge with understanding	16%	16
Objective B Design problem solving	42%	42
Objective C Design communication	16%	16
Objective D Realisation	26%	26

ANNEXE 1: GLOSSARY OF TERMS

acquaint	to make somebody aware of or familiar with something
aesthetics	how something looks, especially when considering how pleasing it is
analyse	examine information in detail to discover patterns or relationships
axonometric	used to describe a method of drawing a 3-dimensional object so that the vertical and horizontal axes are drawn to scale but the curves and diagonals appear distorted
CAD	Computer Aided Drafting, used to make sketches with the help of a computer e.g. building plans
calculate	a numerical answer is required - working must be shown
CAM	Computer Aided Manufacturing, used where instructions for manufacturing is given via a computer
classify	to assign things or people to classes or groups
communication (graphical)	the exchange of information between individuals, by means of speaking or using a system of signs or behavior (drawing)
compare	find resemblances and differences
conceptualise	to arrive at a concept or generalisation as a result of things seen experienced or believed
define	give the exact meaning of
demonstrate	to show or prove something clearly and convincingly
describe	write down what you do, or what you would see, in as much detail as possible
determine	use the information given to work out the answer
discuss	give a critical account of the points involved in the topic
display	to make something visible or available for others to see
distinguish	show the difference between one or more variables
ergonomics	the study of how a workplace and the equipment used there can best be designed for comfort, safety, efficiency and productivity
evaluate	use the information provided to make a judgement about something
explain	give a reason for your answer
give/state/write	write down your answer
identify	find out what is unique about a material or situation / recognise

interpret	reasoning or some reference to theory, depending on the context / explain the meaning of something
investigate	examine a problem in a systematic way
list	name or write a number of items to form a record
media	the various means of mass communication thought of as a whole, including radio, television, magazines and newspapers, together with the people involved in their production
oblique	sloping or joining something at an angle that is not a right angle
pictorial/isometric	containing illustrations or photographs as opposed to written text (3-D sketches)
principle	the basic way something works
recognise	be aware of a fact or problem
relate	find the relationship between one or more variables
report	to give information about something that has happened
research	methodical investigation into a subject in order to discover facts, to establish or revise a theory or to develop a plan of action based on the facts discovered
scale	a ratio representing the size of an illustration or reproduction, especially a map or a model, in relation to the object it represents
select	choose from a number of alternatives
sketch	in case of diagrams, make a simple, freehand drawing and in graph work, the shape and/or position of the curve should be given
specification	a detailed description of a particular thing, especially one detailed enough to provide somebody with the information needed to make that thing
technology	scientific knowledge used in practical ways in industry
time management	to plan and execute a task within a given period
triangulation	a navigation technique that uses the trigonometric properties of triangles to determine a location or course by means of compass bearings from two points a known distance apart.
wasting	misuse / use to no purpose / extravagant or ineffective use of an asset or materials

ANNEXE 2: ABBREVIATIONS

ISO	International Organization for Standardization
CAD	Computer-Aided Design/Drawing
CAM	Computer-Aided Manufacturing
DWG	Drawing (AutoCAD file format)
CP	Center Point
DIA	Diameter
R	Radius
HID	Hidden
SEC	Section
MFG	Manufacturing
I.D.	Inside Diameter
O.D.	Outside Diameter
SYM	Symmetrical
LH	Left Hand
RH	Right Hand
FV	Front view
LV	Left View
ELEV	Elevation
ASSY	Assembly
DIM	Dimension
THK	Thickness
C	Center
C.L.	Center Line
DIA	Diameter
R	Radius
ANG	Angle
TAN	Tangent
PAR	Parallel
CONC	Concentric
SYM	Symmetrical

HORIZ	Horizontal
VERT	Vertical
PL	Perpendicular Line
L	Length
W	Width
H	Height
DP	Depth
RECT	Rectangle
SQ	Square
CIR	Circle
POLY	Polygon
TRI	Triangle
QUAD	Quadrilateral (generic term for a four-sided polygon)
PENT	Pentagon
HEX	Hexagon
HEPT	Heptagon
OCT	Octagon
NON	Nonagon
DEC	Decagon
MH	Manhole
PVC	Polyvinylchloride
FV	Flashing valve
GT	Grease trap
GL	Ground level
G	Gully
IE	Inspection eye
RE	Roding eye
RWP	Rain water pipe
VP	Ventilating pipe
WC	Water closet

ANNEXE 3: LIST OF DRAWING EQUIPMENT AND OTHER RESOURCES

- A3 drawing board
- A3 drawing paper
- T-square
- ruler
- masking tape/clips
- compasses, set
- protractors
- pencils (H/2H/3H),
- erasers (soft)
- set squares (30°/60° and 45°)
- graph paper (isometric + orthographic)

ANNEXE 4: ASSESSMENT RECORD SHEET FOR GRADE 8

Assessment record sheet: Technical Drawing

Grade 8.....

Year:.....

School:.....

Teacher:

Name of learner	Term	Observations/ worksheets or topic tasks		Practicals				Topic tests		CA marks	End-of-term test	Term mark (CA + end of term test)	Weighted term mark (200÷2)	Total CA marks	CA mark (450÷4.5)	End-of-year examination	CA + Examination	Promotion mark (200÷2)
		25	25	20	20	20	20	10	10	150	50	200	100	450	100	100	200	100
	1																	
	2																	
	3																	
	1																	
	2																	
	3																	
	1																	
	2																	
	3																	
	1																	
	2																	
	3																	

Term 1

Term 2

Term 3

Moderator: Rank:

Moderator: Rank:

Moderator: Rank:

Signature: Date:

Signature: Date:

Signature: Date:

ANNEXE 5: ASSESSMENT RECORD SHEET FOR GRADE 9

Assessment record sheet: Technical Drawing

Grade 9.....

Year:.....

School:.....

Teacher:

Name of learner	Term	Observations/ worksheets or topic tasks		Practicals				Topic tests		CA marks		End-of-term test	Term mark (CA + end of term test)	Weighted term mark (200÷2)	Total CA marks (all terms)	CA mark (450÷4.5)	End-of-year examination	CA + Examination	Promotion mark (200÷2)
		25	25	20	20	20	20	10	10	150	100	50	200	100	450	100	100	200	100
	1																		
	2																		
	3																		
	1																		
	2																		
	3																		
	1																		
	2																		
	3																		
	1																		
	2																		
	3																		
	1																		
	2																		
	3																		

Term 1
Moderator: Rank:
Signature: Date:

Term 2
Moderator: Rank:
Signature: Date:

Term 3
Moderator: Rank:
Signature: Date:



The National Institute for Educational Development

P/Bag 2034

Okahandja

NAMIBIA

Telephone: +264 62 509000

Facsimile: +264 62 509073

E-mail: info@nied.edu.na

Website: <http://www.nied.edu.na>