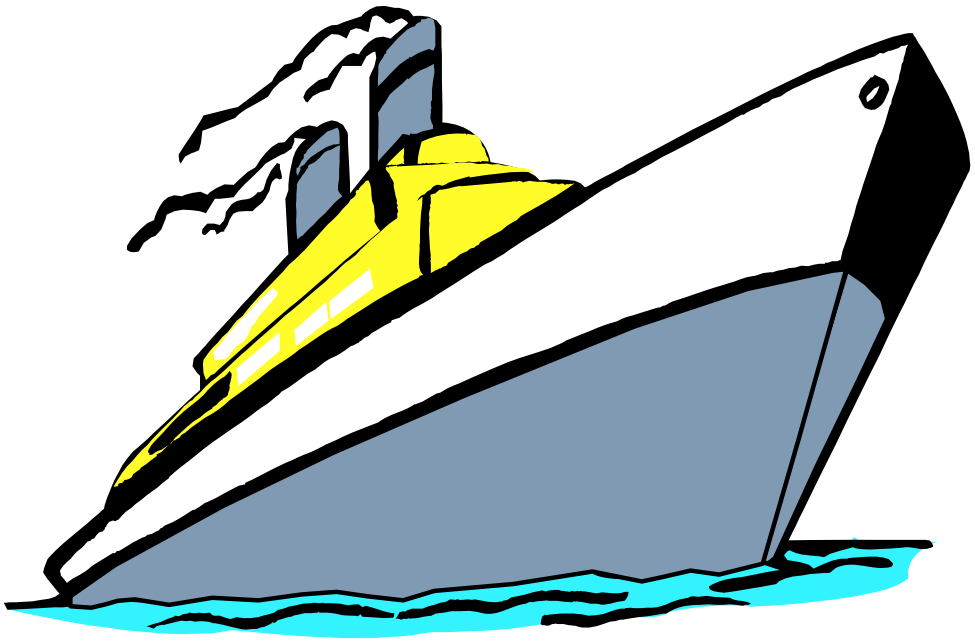
UMnyango WezeMfundo
Departement van Onderwys

Lefapha la Thuto
Department of Education

GAUTENG DEPARTMENT OF EDUCATION

MECHANICAL TECHNOLOGY GUIDELINE

SCHOOL - BASED ASSESSMENT



GAUTENG DEPARTMENT OF EDUCATION

SCHOOL-BASED ASSESSMENT

MECHANICAL T E C H N O L O G Y

CONTENTS

1. What is a learners evidence portfolio?

A portfolio is a collection of a learner's work and is determined by the Subject Assessment Guidelines (SAG).

A variety of items are organised in a certain format which will then form the learner's portfolio. It should be freely available in the classroom, so that the learners can work on it whenever they find it necessary to do so. Items, which can be included in such a portfolio, include investigation tasks, simulation tasks, small projects, tests and examinations, which are collected over a period of time and which serve a specific purpose.

Portfolios are also defined as an ongoing systematic collection of products which represent milestones in the learner's journey towards excellence. This collection includes items, which represent the whole terrain, and also shows how the learner's journey has progressed towards a specific aim.

The collection of portfolio items and from different components of the curriculum makes the portfolio an instrument for documentation and analysis, serving as a summary of the learner's progress throughout the year.

Portfolios enable the teacher to find out more about the learner as an individual, but the learners also find out more about themselves. It is a report on the learner's progress, as well as a report of that which the learner perceives to be important.

Arter and Spandel summarise the main characteristics of portfolios when they describe it as follows: "A portfolio is a purposeful collection of student work that tells the story of the student's efforts, progress or achievement in given area(s). This collection must include student participation in selection of portfolio content, the guidelines for selection, the criteria for judging merit and evidence of student self-reflection."

It is thus emphasised that a portfolio is an arrangement of the characteristics of authentic assessment. It makes continuous assessment possible and includes a rich variety of items as evidence of that which the students know and can do. The content of portfolios can be created within realistic contents. In addition, it can also be a reflection of the process of product development. It provides an excellent opportunity to transform assessment into a learning experience. Think of the portfolio as a mechanism whereby a story is told – a story that will communicate something about the learner to the reader.

2. Purpose

The primary reasons for using portfolios as one type of authentic assessment tool include:

- assessing learner's accomplishment of learning outcomes;
- assessing the quality of learner's sustained work;
- allowing learners to turn their own special interests and abilities into a show-case;
- encouraging the development of qualities such as pride in quality workmanship, ability to self-evaluate, and ability to accomplish meaningful tasks;
- providing a collection of work learners may use in the future for college or university application and job seeking; and
- documenting improvement of learners' work.

3. Assessment in Grade 12

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

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

The following diagram shows the annual assessment plan for Mechanical Technology:

Annual assessment plan for Mechanical Technology, Grade 12

Assessment Tasks		Term One	Term Two	Term Three	Term Four	% of final promotion mark
Tests		1		1		5
Examinations (mid-year and trial)			1	1		10
Practical tasks: Investigation/ Simulations/ Small projects		1	1			10
External Assessment	Written Theory Paper				1	50
	Performance Assessment Task (PAT)			1		25

PORTFOLIO (25%)

4. Content for learners evidence portfolios

The content for portfolios for Mechanical Technology is guided by the programme of assessment as stipulated in the Subject Assessment Guidelines (SAG).

The portfolio comprises:

- Two tests (first and third term);
- Two written examinations (midyear and trial); and
- Two practical tasks (one per term in terms 1 and 2).

5. Programme of Assessment in Grade 12

5.1 Tests

Two of the assessment tasks should be tests written under controlled conditions at a specified time. A test should last at least 60 minutes and count a minimum of 50 marks. Tests should include the theory of the technological process, principles and concepts and the application thereof in the production of mechanical product(s)/ artefact(s).

5.2 Practical Tasks

The practical tasks should be carefully designed tasks, which give learners opportunities to research and explore the subject in exciting and varied ways.

These tasks should be based on practical activities such as simulations, investigations and small projects and should focus on more than one area of specialisation, i.e. Motor Mechanics, Fitting and Turning, Welding and Metalworking and Metalwork or an integration of two to three of these areas.

5.2.1 Investigation tasks

- **What is an investigation task?**
  - ✓ Investigation: a search or examination in order to discover facts.
  - ✓ Research: systematic investigation to establish facts or principles or to collect information on a subject.
  - ✓ Experiment: test or investigation.
  - ✓ Testing and verifying construction principles/concepts.

- **Examples of investigation tasks.**
  - ✓ The OHS Act and personal safety.
  - ✓ The personal qualities of an entrepreneur.
  - ✓ The effect of carbon on iron and steel.
  - ✓ Non-metallic materials.
  - ✓ Practical welding methods on various materials.

  - ✓ Experiments:
    - ➢ Spark test to determine the type of material.
    - ➢ The function of a lubricant.
    - ➢ How to raise the temperature of the water coolant used in the internal combustion engine.
    - ➢ The cooling method used on air cooled engines.
    - ➢ Fundamental laws of jet propulsion (Newtons laws).

5.2.2 **Simulation tasks**

- **What is a simulation task?**
  - ✓ From Latin *simulare* – to copy.
  - ✓ Simulation is the replication of a real situation without being in it.
  - ✓ Model: representation, usually on smaller scale, of a device, structure, etc.
  - ✓ Simulations put theoretical knowledge to practical use and usually do not require conclusions to be made.
  - ✓ The purpose of applied theory is to display certain competencies and skills, eg. the correct use of various equipment for Mechanical Technology.
  - ✓ Simulations will therefore not include elaborate worksheets and conclusions but rather guidelines and criteria to what is required.

- **Examples of simulation tasks.**
  - ✓ Maintenance, eg. Adjustment to remove excessive slack from a belt or chain drive.
  - ✓ Select the correct measuring instrument to determine the end play on a crankshaft of four stoke engine and demonstrate the procedure of this exercise.
  - ✓ Joining of two pieces of flat bar by means of arc welding. Specify either a butt or a lap joint. Note indicate if a permanent or a none permanent joint is required.

5.3 **Examinations**

The mid-year and trial examinations for Grade 12 should consist of one paper of 6 questions and will count 200 marks. The suggested duration of the paper is 3 hours. All the questions are compulsory. The questions should be set in such a way that they cover the knowledge and skills of Learning Outcome 3, the investigative Assessment standard of Learning Outcome 2 and the values and attitudes of Learning Outcome 1 of the Mechanical Technology Subject Statement.

The trial examination needs to be closely related to the final examination in terms of time allocation, layout of the paper and subject requirements.

See the Subject Assessment Guidelines for an outline of the Grade 12 examination paper.

6. Learner's portfolio

The learners' portfolio should be well planned, organised and presented in a neat manner, for example, a file. It should include the following:

- a contents page;
- a continuous moderation report;
- a declaration by the learner;
- a summary of marks; and
- the assessment tasks.

7. Teacher's portfolio

It is required from the Department of Education that a teacher's portfolio should accompany the learners' portfolios. This portfolio should include the following:

- a contents page;
- the formal Programme of Assessment;
- the requirements of each of the assessment tasks (e.g. practical tasks, tests and examination papers);
- the tools used for assessment for each task (e.g. memorandums, checklists, rubrics); and
- record sheets for each class (working mark sheets).

8. Evaluating portfolios

Periodic evaluation of portfolios should be conducted at a time predetermined by the teacher and his learners. Logical times for evaluation would be at the conclusion of a project, the end of a programme or unit, term or academic year.

The teacher must make sure that every assessment task is marked and captured. Marks on the teacher's record sheets must correspond with the marks in the learners' portfolios.
Moderation of the assessment tasks should take place at three levels during the year.

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

The School – Based Assessment Guide was compiled by the following individuals:

Neels Welgemoed - Writer / Facilitator for Mechanical Technology

Support team

Louis J Grobler - Manager for Mechanical Technology in Gauteng

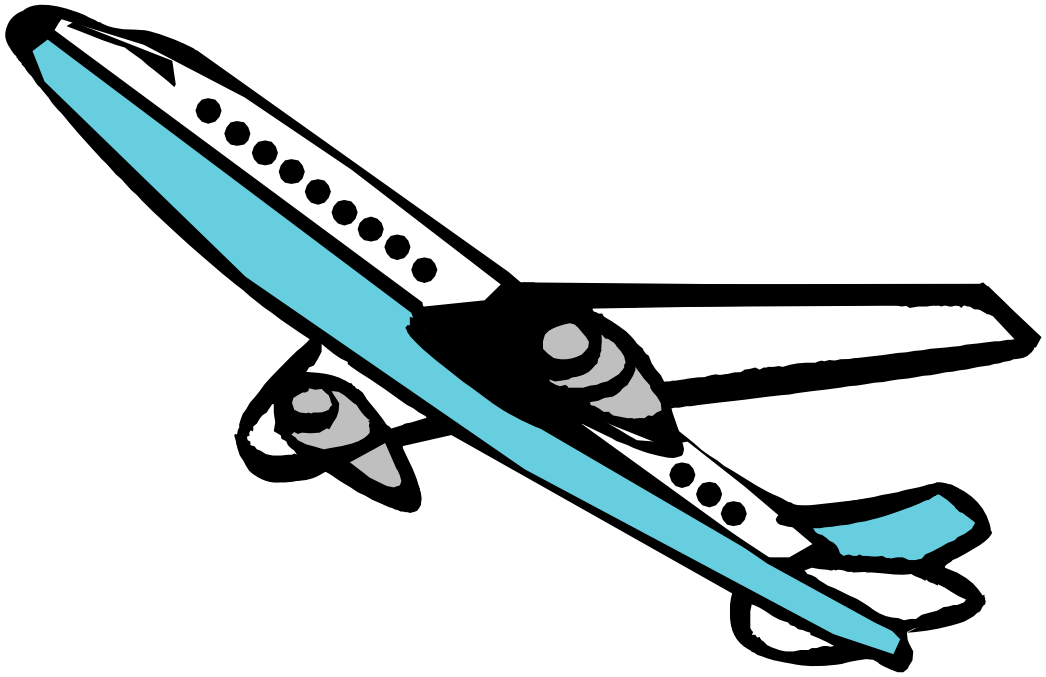
Piet Bosman - Facilitator for Mechanical Technology in districts

Roger Mckuur - Facilitator for Mechanical Technology in districts

Manie Steyn - Facilitator for Mechanical Technology in districts

SCHOOL / SKOOL: _____

MECHANICAL TECHNOLOGY
MEGANIESE TEGNOLOGIE



PORTFOLIO / PORTEFEULJE

NAME / NAAM:

_____

GRADE / GRAAD: _____

INDEX / INHOUDSOPGAWE

MECHANICAL TECHNOLOGY / MEGANIESE TEGNOLOGIE

Portfolio / Portefeulje

Continuous moderation report / Deurlopende modereringsverslag

School moderation / Skoolmoderering:		
Date / Datum	**Signature / Handtekening**	**Comments / Opmerkings**

Cluster moderation / Groepsmoderering:		
Date / Datum	**Signature / Handtekening**	**Comments / Opmerkings**

2

MECHANICAL TECHNOLOGY

DECLARATION BY LEARNER

SCHOOL: _____

NAME OF LEARNER: _____
(Surname and First name)

EDUCATOR'S NAME: _____

I hereby declare that all pieces contained in this portfolio, are my own, original work and that if I have made use of any source, I have acknowledged this.

I agree that if it is determined by the competent authorities that I have engaged in any fraudulent activities whatsoever in connection with my Continuous Assessment mark, then I shall forfeit completely the marks gained for this assessment.

_____ _____
CANDIDATE'S SIGNATURE **DATE**

As far as I know, the above statement by the candidate is true and I accept that the work offered is his / her own.

_____
EDUCATOR'S SIGNATURE

_____
DATE

SCHOOL STAMP

MEGANIESE TEGNOLOGIE

VERKLARING DEUR LEERDER

SKOOL: _____

NAAM VAN LEERDER: _____
(Van en voorname)

NAAM VAN OPVOEDER: _____

Hiermee verklaar ek dat alle werkstukke soos ingesluit in my portefeulje my eie oorspronklike werk is en indien ek van enige bron gebruik gemaak het, ek daaraan erkenning verleen het.

Ek stem toe dat indien die bevoegde gesagsdraers sou vasstel dat ek betrokke is in enige oneerlike bedrywighede van watter aard ookal betreffende my deurlopende assesseringspunt, ek al die punte vir hierdie assessering sal verbeur.

_____ _____
HANDTEKENING VAN LEERDER **DATUM**

Hiermee verklaar ek, sover my kennis strek, dat bogenoemde verklaring deur die leerder waar is en dat die werk vervat in die portefeulje sy / haar eie werk is.

_____
HANDTEKENING VAN OPVOEDER

_____
DATUM

SKOOLSTEMPEL

MECHANICAL TECHNOLOGY / MEGANIESE TEGNOLOGIE

PORTFOLIO / PORTEFEULJE

Assessment Tasks / Assesseringstake:

Tests / Toetse

1	Term one / Eerste kwartaal		100		
2	Term three / Derde kwartaal		100		
	Total / Totaal		200		5

Practical tasks / Praktiese opdragte

1	Term one / Eerste kwartaal		100		5
2	Term two / Tweede kwartaal		100		5

Examinations / Eksamens

1	Midyear Examination / Halfjaareksamen		200		5
2	Preparatory Examination / Voorbereidende Eksamen		200		5

Av / Gem		**25**