Technical Support to the South African Department of Labour (DOL), Labour Centres (LCs) and CHIETA

Chemical Industries Sector Education and Training Authority (CHIETA) Writing of Qualifications and Unit Standards

Submitted to:

CHIETA

January 2004

Development Associates, Inc.

Funded under IQC Contract Number 674-I-00-00-00005-00, Task Order 009

Khulisa management services

JET EDUCATION SERVICES

CEPD

RTI INTERNATIONAL

USAID

Department of Labour

Executive Summary

This project was undertaken under funding from the United States Agency for International Development (USAID) in support of the Chemical Industries Education and Training Authority (CHIETA). The project was initiated to fast track the writing of two key chemical sector qualifications: the **National Certificate in Chemical Manufacturing at NQF Level 3;** and the **National Certificate in Chemical Manufacturing Supervision at NQF Level 4**.

The project used the following approach:

- Scoping the requirements of the Chemical Industry in terms of the National Certificates at NQF Level 3 and 4.
- Assessing the current available qualifications and unit standards that are available and evaluating their relevance to the qualifications and unit standards to be written.
- Evaluating the quality of the existing qualifications and unit standards to assess what could be used for these qualifications. For example, unit standards on Management, Supervisory and Communication skills could be used for the National Certificate at NQF Level 4. Particular focus was on the National Standards Body (NSB) 06 because of the relevance to the Chemical Sector.
- Writing and review of the Qualifications and Unit Standards in conjunction with key Industry Subject Matter Experts and Labour representatives.

Generally the consultant found this project extremely challenging due to limited time, and poor access to accurate, up-to-date and concise information. Many of the concerns and constraints experienced are similar to those experienced by the consultant involved in the CHIETA Research Project.

This project delivers two Qualifications in Chemical Manufacturing at NQF level 3 and 4 on CD Rom. This encompasses a total of 84 unit standards and/or unit standard titles applicable:

National Certificate in Chemical Manufacturing at Level 3:

- **9 Fundamental Unit Standards**
- **10 Core Unit Standards**
- **27 Elective Unit Standards**

National Certificate in Chemical Manufacturing Supervision at Level 4:

- **9 Fundamental Unit Standards**
- **20 Core Unit Standards**
- **9 Elective Unit Standards**

The unit standards encompass the broad spectrum of outcomes required within the chemical manufacturing arena. In addition, these unit standards focus on the areas of Quality, Safety, Health and Environment (SHE), Business skills, Management and Supervision, People skills, Logistics, Science and Technology, Basic computer skills, Hazardous material handling, Equipment handling, Basic maintenance, as well as productivity improvement.

In the **National Certificate in Chemical Manufacturing at Level 3**, a larger emphasis has been placed on the elective unit standards required for the diverse nature of the industry.

Acknowledgments

The following organisations and individuals have contributed to this project:

- **The Chemical Industry Sector Education and Training Authority (CHIETA)** has played an instrumental role in assisting with the co-ordination and planning activities ensuring that the reference group meetings took place according to schedule, as well as assisting with the resources required for these meetings. **David Duke's** contribution to these meetings and the project has been particularly significant and is much appreciated. (D. Duke was employed as the CHIETA project specialist during this time).
- Input was provided by members of the **Chemical Industries Standards Generating Body (CISGB)** and **CISGB EXCO** Committee, including **Catherine Martin** from **The Learning Network**.
- **Khulisa Management Services** have played an instrumental role in the co-ordination and planning of the reference group meetings, as well as site visits by the reference group delegates to key organisations during the course of this project. The assistance provided by **Gina Wilson** and **Moira Campbell** from **Development Associates,** is much appreciated.
- The **Project Reference Group** has made an extremely significant contribution to the writing of both qualifications. In particular, special thanks go to **Brandon Gillham** from **Unilever**, and **Amanda Dunleavy** from **Glaxo-Smithkline** who made a consistent and valuable contribution throughout the months required to complete both qualifications.
- The information provided by **Abeeda Holdstock** through the USAID-funded **Qualification and Unit Standard Research Project** has assisted in sourcing relevant data for incorporation into the qualifications and unit standards.

Disclaimer

Key Personnel

Ms. Diane Umpleby, Joint Education Trust (JET)

Ms Umpleby has been involved in the Pharmaceutical Manufacturing Industry for the past 12 years, working in various capacities within different sectors of the Industry. Her background has encompassed management functions within, amongst others, the following areas: Pharmaceutical manufacturing, packaging, quality assurance, validation, productivity improvement, planning and logistics, training, project management, managed healthcare and medicine regulatory work.

Ms Umpleby has also spent three years extensively involved in the work of South Africa Qualifications Authority (SAQA), initially providing subject matter expert input at Chemical Industry Standards Generating Group (SGG) meetings. Thereafter, she was elected onto the Chemical Industry Standards Generating Body (CISGB) as the Representative of the Pharmaceutical Industry. She was also elected as an EXCO member of the Labour Affairs Association of the Pharmaceutical Industry (LAAPI) during 2001.

Ms Umpleby previously ran her own consulting company (Diane and Associates) handling Pharmaceutical regulatory work, as well as new product development and marketing within the Pharmaceutical Industry.

Ms Umpleby is currently working at Qestmed, a Pharmaceutical Company, as Manager of Marketing and Professional Affairs. Her functions incorporate a broad spectrum of functions. These functions include ensuring that the legal and regulatory requirements of the Medicines Control Council are adhered to in terms of medicine registrations, as well as restructuring and developing the marketing department of the organisation to meet the diverse and changing needs of the Pharmaceutical Industry.

TABLE OF CONTENTS

APPENDICES

Based upon the size and nature of the deliverable in this project, a CD-Rom has been created as an appendix. This CD-Rom contains the following information:

- Qualification 1 – National Certificate in Chemical Manufacturing at level 3.
- Qualification 2 – National Certificate in Chemical Manufacturing Supervision at level 4.
- Unit Standards – National Certificate in Chemical Manufacturing at level 3.
- Unit Standards – National Certificate in Chemical Manufacturing Supervision at level 4.

ACRONYMS

CHIETA	Chemical Industries Education and Training Authority
CISGB	Chemical Industries Standards Generating Body
DOL	Department of Labour
FMCG	Fast-moving consumer goods
JET	Joint Education Trust
LAAPI	Labour Affairs Association of the Pharmaceutical Industry
MCC	Medicines Control Council
NLRD	National Learners' Records Database
NQF	National Qualifications Framework
NSB	National Standards Body
OSH	Occupational Safety and Health
SAQA	South African Qualifications Authority
SETA	Sector Education and Training Authority
SGG	Standards Generating Group
SHE	Safety, Health Environment
SME	Subject Matter Expert
USAID	United States Agency for International Development

1. Background

The Chemical Industries Education and Training Authority (CHIETA) expressed a need to be able to fast track the writing of qualifications and unit standards needed within the Chemical Industry. This project was initiated with the aim of utilising a consultant to work closely with the CHIETA, Chemical Industries Standards Generating Body (CISGB), as well as a selected Reference group who would provide the necessary input and expertise required to assist in the writing of these qualifications and unit standards. The consultant was to utilise all possible resources to source the available data, including the SAQA Website, NSB06 Website, as well as existing material previously generated by, and made available to, the CISGB and Standard Generating Groups (SGGs) working within the Chemical Industry. Particular emphasis was also placed on accessing the material supplied on CD-ROM by Abeeda Holdstock (JET) as part of CHIETA project no 1 (CHIETA Research) under the current USAID-funded Task Order. The material supplied by Abeeda Holdstock of JET encompassed many of the relevant competencies required for these qualifications, and included specific skills that could be used in a generic way across these qualifications.

2. Activities

The project set-up processes were discussed and completed early on in the project cycle during February and March. These processes included the confirmation of communication protocols, processes of working with reference groups, action plans with time frames, accountabilities and reporting protocols.

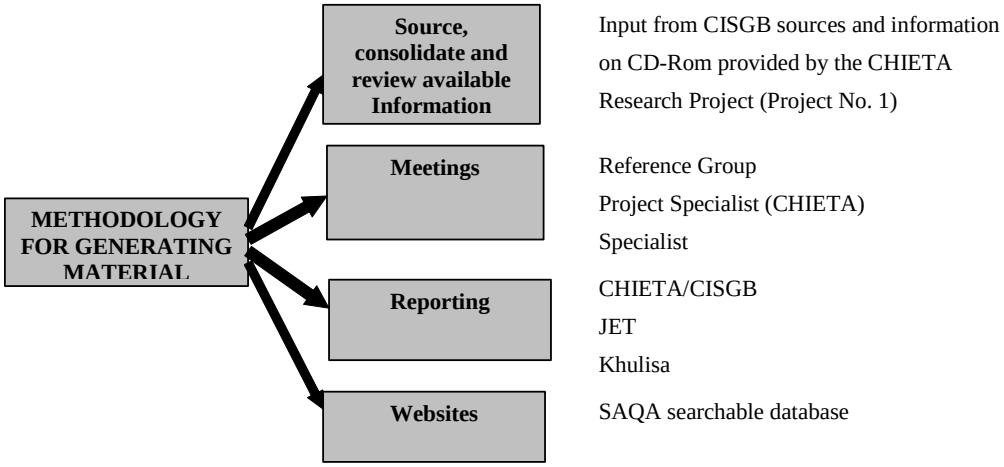
The initiation of the project commenced with consultation with the CHIETA project specialist to discuss and identify possible reference material, allocate proposed dates for the reference group meetings, as well as identify potential reference group delegates who would be closely involved throughout the entire process.

Reference group delegates included representatives and Subject Matter Experts (SME) from the Pharmaceutical Industry, the Fast Moving Consumer Goods (FMCG) Industry, the Surface Coatings Industry, as well as key labour representatives.

The proposed reference group delegates were communicated with, provided with existing material for further discussion, and notified of the times and venues for all upcoming meetings.

Reference Group meetings were held on a regular basis where all available information was consolidated and presented to the delegates. The delegates subsequently provided the relevant input to assist with initiating the required qualifications and unit standards.

The methodology used in generating the qualifications and unit standards is detailed below:



The sourcing, review and consolidation of available information presented many challenges since the information was not easily accessible, inadequate, inconsistent or dispersed over a wide range of sources.

Upon completion of the initial planning activities, the generation, review and finalisation of the specified qualifications and unit standards included the following:

- Sourcing and reviewing related qualifications and unit standards already submitted in terms of the relevance to the qualifications and unit standards to be drafted.
- Evaluating the CISGB's work-to-date on related qualifications and unit standards.
- Holding regular Bi-Monthly Reference group meetings to ensure coherence of activities and to address key issues and concerns highlighted by relevant stakeholders and reference group delegates.
- Holding regular review meetings with the CHIETA Project co-ordinator so as to ensure that project strategy and approach is agreed upon, information shared and progress evaluated.
- Holding discussions with the consultant working on the CHIETA Research Project involved in sourcing available qualifications and unit standards. This ensured that there was no unnecessary duplication of research, as well as ensured that all available information is shared and coherence achieved between the two projects.
- When requested, presentation on the progress of the project was made to the CISGB Committee at their bi-monthly meetings.
- Site meetings and presentations were held at Unilever (FMCG) and Dulux Paint (Surface Coatings) to evaluate their activities and ensure that agreement was reached on the relevance of the proposed qualifications and unit standards to their industry.

3. Deliverables Completed

The following deliverables were completed:

- Action plan with time-frames;

- Identification of various sources of information – hardcopy, electronic, Industry and stakeholder feedback, CISGB feedback, CHIETA feedback (D. Duke - Project Co-ordinator), CISGB EXCO feedback (C. Martin – The Learning Network).
- Collected, reviewed and consolidated various versions of existing qualifications and unit standards from a diversity of sources.
- Completed and submitted seven (7) monthly reports, three (3) quarterly reports and a final report.
- Produced the following 2 final qualifications for submission to the NSB:
    - National Certificate in Chemical Manufacturing at NQF Level 3
    - National Certificate in Chemical manufacturing Supervision at NQF Level 4
- Sourced, generated and/or amended the following Unit Standards for incorporation into the 2 Qualifications:
    - 46 Unit Standards (National Certificate in Chemical Manufacturing at NQF level 3).
    - 38 Unit Standards (National Certificate in Chemical Manufacturing Supervision at NQF level 4).

4. Accomplishments

In addition to the deliverables, the following was accomplished:

- Draft qualifications for both levels have been compiled and closely address the needs of the industry.
- Both the generic and specialised areas of the Qualifications have been agreed upon and allow for sufficient flexibility and transferability between the different sectors.
- Additional or outstanding unit standards have been written where these have not been available.
- Existing unit standards have been revised or re-written to comply with the requirements of SAQA and the CISGB.
- Available Unit Standards have been reformatted according to the latest format required by SAQA.

5. Constraints

There were a substantial number of constraints and challenges which delayed the progress and finalisation of the qualifications. Some of these challenges are listed below:

- The availability of suitable unit standards for incorporation into the qualifications has been totally inadequate. During the project introduction meeting in February, the consultant expressed her concerns about the availability of suitable unit standards and whether the time-allocation for the 2 projects would be sufficient. It was indicated that most of the unit standards to be incorporated had already been written, and that only a few would need to be either written or revised. Her experience has been that the majority of the standards have not been available, or and those that are available in draft have required extensive review. Rewriting of unit standards normally requires extensive

Industry consultation at SGG meetings comprised of Subject Matter Experts and other key personnel. There was insufficient time to utilise this route.

- A major obstacle has been the unreliability of the SAQA Website, which has resulted in difficulty in accessing information on registered qualifications and unit standards. When the consultant did manage to get access, the search function was extremely slow or the system would just "hang" for long periods of time.
- A large number of unit standards listed in existing registered qualifications and the list from CHIETA project No. 1 have either not been written, or are totally inadequate and need extensive review.
- A lot of the listed unit standards have either not been allocated NLRD numbers, or the same standards have been allocated a number of different NLRD numbers.
- There is a lot of duplication with similar unit standards that have been written addressing the same need. A number of different versions also exist of draft unit standards and it is often difficult to determine which is the most recent or representative version.
- The details of which stakeholders have been involved in compiling the registered or draft unit standards are not always available, which impedes the process of determining the rationale behind the writing of these standards.
- The quality and format in the content of existing standards and qualifications is very inadequate and inconsistent. There is a substantial variation in the standard and quality that results in unreliable information.
- The timing of the CHIETA Research Project (Project No. 1) should have been co-ordinated to be completed before the commencement of these 2 projects, as a significant amount of the information that was utilised for these 2 projects was drawn from the CD-Rom generated from the Research project.
- The unit standard list generated from the CHIETA Research project, as well as the list of standards available from the SAQA website present additional limitations. These limitations relate to the fact that the title of the unit standard is often misleading and could suggest that it deals with a certain focus area when the emphasis is in fact on another aspect of the title. These limitations have made the sourcing of suitable unit standards incredibly time-consuming and frustrating, as well as resulting in a large amount of duplication of work already done.

In general, the abovementioned issues affected the availability of accurate and concise information on qualifications and unit standards. This has slowed down the writing process for these 2 qualifications considerably. It has also resulted in a considerable amount of duplication of work already done.

Due to the lack of availability of suitable unit standards of the required quality, it was considered necessary to rewrite the existing standards or consolidate a number of standards already written to make the information more fit-for purpose to meet our needs.

6. Conclusions

The end product of this project consists of 2 completed qualifications comprised of 84 Unit standards. Where a unit standard title has been listed but is not available, this is due to the fact that it was listed in the database from CHIETA project No. 1 but was not accessible at the time (either on the database or on the SAQA website). The qualifications do not just consist of unit standards from levels 3 and 4 respectively – several standards in levels below

and above the qualification levels have been included to adequately address the outcomes requirements of the qualifications.

The unit standards listed in detail in the tables at the end of the qualifications include the unit standards level, as well as the number of credits that can be obtained from that unit standard.

Where NLRD numbers are available, these have also been listed alongside the respective unit standards.

A certain proportion of the unit standards have been sourced from other NSB's where these standards are deemed to be appropriate for these qualifications. These specifically relate to unit standards that would typically be included in the fundamental components of the qualification, such as mathematics and communication.

The Level 3 qualification has included a larger proportion of elective unit standards specifically to cater for the more specialised sectors of the industry and allow for diversification into more specialised areas if required.

The Level 4 qualification has a larger focus on management, supervisory and people skills which are some of the key outcomes required to meet the requirements of the qualification.

The focus areas which form a substantial part of both qualifications are as follows:

- Quality
- SHE / OSH
- Business skills
- Management / supervisory skills
- People skills
- Logistics
- Quality
- Science and Technology
- Basic Computer Skills
- Productivity improvement
- Hazardous material storage, handling and transport
- Equipment handling
- Basic Maintenance

7. Recommendations

7.1. Within CHIETA / CISGB application

a. The CISGB/CHIETA are advised to review and utilise certain registered generic qualifications and unit standards that have been addressed by a number of SGB's within NSB06 due to the relevant skills areas and generic competencies that have already been addressed. Many of these qualifications and unit standards deal with manufacturing, engineering and technology environment and may be used in their current form. However, in other cases the qualifications and unit standards may have to be customised

for the CISGB. The qualification and unit standards generated by the following SGB's are particularly relevant:

- Manufacturing and Assembly processes;
- Plastics Manufacturing; and
- Food Manufacturing.

b. The CHIETA / CISGB are advised to assess the suitability of other registered qualifications and unit standards available from other NSBs which may be of value in addressing some of the skills needs within the chemical sector.

c. It is recommended that the CHIETA / CISGB maintains and updates the database of registered standards and qualifications as provided by the CHIETA Research project to ensure that it is kept current at all times. During the consultant's experience in utilising the database provided by the research project, she encountered a large number of changes in the registered data over a relatively short period of time.

d. The CHIETA is also advised to arrange a meeting with SAQA to share information about this available resource that they could access and assist them in further developing the NLRD.

7.2. Beyond CHIETA / CISGB application

a. The list of available and registered unit standards provided by the CHIETA Research project could be developed into an even more user-friendly resource which would allow for a broader application available for use by SAQA. It could be used to create and develop a searchable database. SAQA could utilise and broaden this resource by ensuring that it is kept current and regularly up-dated to address the needs of other users. The database should be used or made available for any similar initiatives within a broader context. Any further developments of this database resource should be done in consultation with, and under the guidance of, the DoL and SAQA.

b. SAQA should embark on a project to consolidate their current position in terms of available qualifications and unit standards, and use this information to streamline the qualification and unit standard generating process. SAQA is also advised to embark on initiatives to ensure that the required communication structures are put into place to allow for sharing of information between the various NSBs on work-in progress to allow for cross-pollination of ideas, information and resources. SAQA should tidy up the current database of unit standards and qualifications to eliminate duplication, errors, and ensure that all listed titles are actually current and available. Currently information is dispersed, duplicated, incomplete and inaccessible.

APPENDIX 1

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Title: National Certificate in Chemical Manufacturing

Field: Manufacturing, Engineering and Technology - NSB 06

Sub-field: Manufacturing and Assembly

Level: 3

Credit: 120

Issue date:

Review date:

Rationale of the qualification

This certificate reflects the need in the Chemical Industry for a person with the knowledge and skills required to manufacture and/or package chemical products, as well as co-ordinate and control these processes.

This is a need expressed by employers and employees to address current and future needs.
This qualification enables the learner to access employment within several sub-sectors of the Chemical Industry. The qualification further provides the flexibility to link to other manufacturing and process-related sectors (such as the F&B sector).

The level of flexibility within the range of electives will enable the individual to pursue a career in a broad spectrum within the Chemical Industry.

The qualification is appropriate for people who have an understanding of the Chemical Industry and intend to follow a career within this sector.

Purpose of the qualification

The understanding of the technology and its application will empower the learner to take responsibility (and make decisions) for co-ordinating a process in order to produce product.

The National Certificate in Chemical Manufacturing recognizes a learner's ability to:

- Operate and/or co-ordinate the operation of a number of variables in a manufacturing and/or packaging operation in the Chemical Industry.

- Be able to apply the principles of SHEQ (Safety, Health, Environment and Quality) in the context of the job function.

- Identify and solve problems within the scope of the job function.

Access to the Qualification
Access is open.
This is subject to the proviso that learners may have to comply with site specific requirements, legislation and regulations regarding health, safety and quality where these are applicable.

Learning assumed to be in place

A National Certificate in Chemical Manufacturing Operations at level 2, or equivalent.

Knowledge of technology, safety, health and environment, quality, housekeeping and hygiene practices will assist the learner to achieve this qualification.

Where this learning is lacking or the learner is not yet competent, appropriate additional learning interventions will be needed.

Exit level Outcomes

Exit level 1: Operate and/or co-ordinate a manufacturing and/or packaging process.

Associated Assessment Criteria

- Start up, operate, shut down and monitor a process according to defined standards. (the defines standards could include Site-specific standards, SOP's, Quality guidelines, Productivity guidelines).
- Conduct maintenance, perform changeovers, clean, set up and adjust equipment in line with the incumbent's work function.
- Explain and apply safety, health, environmental, quality and productivity practices that are relevant to the manufacturing and/or packaging process.
- Co-ordinate and /or control the necessary criteria to achieve all of the above functions.

Exit level 2: Demonstrate an understanding of, and integrate knowledge of, appropriate process-related technology within a chemical manufacturing and/or packaging environment.

Associated Assessment Criteria

- Apply technology that is appropriate within a chemical manufacturing and/or packaging operation.
- Demonstrate knowledge of process-related technology

Exit level 3: Integrate information and resources to control and optimise the process in a Chemical Manufacturing and/or Packaging operation.

Associated Assessment Criteria

- Apply and interpret available information, technology and resources to manage the process.
- Communicate with co-workers and co-ordinate the process within the scope of the job function.
- Identify problems and implement solutions based on an understanding of the process variables applicable to that operation.
- Consolidate the available information and resources in order to meet the required objective.
- Demonstrate knowledge of and apply understanding of basic productivity and work-study management techniques.

International comparability

Benchmarking was done against the New Zealand qualifications. The following results were found for a qualification on this level:

Lever Rexona in New Zealand was used as a comparison with regard to the chemically-related FMCG sector. The food and Related Products processing at Level 3 have similar qualifications due to the comparability of some of the processes, i.e. Food is produced through batch processes, and Food is packaged.

Integrated Assessment

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to operate and/or co-ordinate the operation of a process within a chemical manufacturing environment. This would include being able to maintain quality control and SHE practices, demonstrating and integrating knowledge of appropriate process-related technology and co-ordinating or conducting basic maintenance functions.

Appropriate methods and tools must be used to assess the practical, foundational and reflexive competence of the learner in all of the exit level outcomes listed above. This includes being able to determine a learner's ability to solve problems, work in a team, organize him/herself, use applied science, and understand the implications of actions and reactions in the world as a set of related systems. Such an assessment process will determine the development of the whole person, and the integration of applied knowledge and skills.

Assessors should develop, conduct, and ensure integration of, assessment by making use of a range of formative and summative assessment methods against the unit standards that make up the qualification. Combinations of applied, foundational and reflective competencies, including critical cross-field outcomes, should be assessed wherever possible.

Moderators should ensure that the assessment is valid, consistent and integrated into work or learning, and that there is sufficient and authenticated evidence of learner competence against the whole qualification.

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning, and work experience.

Articulation possibilities

This qualification will enable the qualifying candidate to progress to learning for related National Certificates at NQF Level 4, with specialization where appropriate, and further, on to relevant National Diplomas and degrees as indicated in the table below.

<table>
<tr><td>NQF Level</td><td>Process related engineering artisans</td><td colspan="2">Explosives Glass Specific Qualifications</td><td>Chemical Process Operations</td><td>Chemical Manufacturing</td><td>Production Management</td><td>Pharmaceuticals</td><td>Laboratory Assistant (Chemical analysis)</td><td>Technical (chemical related) sales/distribution</td></tr>
<tr><td>5/6</td><td>NC (NQF 5) or ND (NQF 5/6) in Engineering</td><td>NC in Ceramic Technology or new diploma</td><td>NC in Explosives Technology</td><td>NC in Chemical Process development or chemical product development or chemical process supervision (not yet mandated)</td><td>National Diploma in Chemical Engineering</td><td>ND Production Management from Management SGB</td><td>ND Pharmacy developed in Pharmacy SGB</td><td>National Diploma in Analytical Chemistry</td><td></td></tr>
<tr><td>4</td><td rowspan="3">Various engineering artisan related qualifications to be developed in conjunction with other SGBs</td><td>NC in glass production</td><td>NC in Explosives plant operation III</td><td>NC in chemical process operations</td><td colspan="2">NC in Chemical Manufacturing Supervision</td><td>NC Pharmacist's Assistant – post basic</td><td>NC in laboratory practice 3 *</td><td rowspan="3">Various sales/marketing related qualifications to be developed in conjunction with other SGBs</td></tr>
<tr><td>3</td><td>NC in molten glass production</td><td>NC in Explosives plant operation II</td><td>NC in chemical systems operation</td><td colspan="2">NC in Chemical Manufacturing</td><td>NC Pharmacist's Assistant - Basic</td><td>NC in laboratory practice 2 *</td></tr>
<tr><td>2</td><td>NC in batch mixing</td><td>NC in Explosives plant operation I</td><td>NC in chemical equipment operation</td><td colspan="3">NC in Chemical Manufacturing Operations</td><td>NC in laboratory practice 1 *</td></tr>
<tr><td>1</td><td></td><td colspan="7">National Certificate in chemical operations</td><td></td></tr>
</table>

Articulation is also practical between this qualification and manufacturing and/or packaging environments outside of the **Chemical industry** such as the **Food and Beverage** environments and **Chemical analysis**. Articulation is also possible with other specialised areas not specifically within manufacturing and/or packaging.

Moderation Options

- Anyone moderating the assessment of learners against this Qualification must be registered as a moderator with the relevant ETQA.
- Any institution offering learning that will enable the achievement of this Qualification must be accredited or recognized as a provider with the relevant ETQA.
- Assessment and moderation will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.
- Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.
- Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

Criteria for registration of assessors

In order to assess this qualification, the assessor needs:

- Well developed interpersonal skills, personal credibility, and a record of ethical behaviour
- Registration with the Education, Training and Development Practitioners' ETQA as a generic assessor.
- Competence against the unit standard "Plan and conduct assessment of learning outcomes."
- Detailed documentary proof of educational qualification, practical training undergone, and/or experience gained at an appropriate level of manufacturing operations, as per the relevant ETQA policies and guidelines. The subject matter expertise of the assessor can be established through the recognition of prior learning.
- Registration with, or recognition by, the Chemical Industries Education and Training Quality Assurance Body and uMalusi.

LEVEL OF QUALIFICATION

The following table is a summary of attributes of the unit standards listed below, which indicates that the qualification is at level 3.

Attribute	**Level**	**Justification**
Skills		
Procedures		
Context		
Knowledge		
Information processing		
Problem Solving		
Orientation of activities		
Application of responsibility		
Orientation of scope of responsibility		
Average Level:		**Actual Level Assigned:**

Estimated Learning Time:

The estimated total hours required by the learner to achieve the required outcome:

Activity	**Hours**
Classroom Teaching	360-480
On-The-Job Training	360-840
Other (Simulate working environment such as a training centre)	0 –240
Total	1200

UNIT STANDARDS MAKING UP THE NATIONAL CERTIFICATE IN CHEMICAL MANUFACTURING OPERATIONS - NQF LEVEL 3

Fundamental				Core				Elective			
Title	**Level**	**Credits**	**NLRD ID**	**Title**	**Level**	**Credits**	**NLRD ID**	**Title**	**Level**	**Credits**	**NLRD ID**
Collect and use data to establish statistical and probability models and solve related problems.	3	5	7454	Operate a System within a Chemical Manufacturing and/or Packaging environment.	3	24	New	**ELECTIVES (General/ Management)**			
Identify and work with simple forms of complex numbers.	3	1	7455	Contribute to the Maintenance of a System.	3	10	New	Produce and use spreadsheets for business	3	5	7567
Work with a wide range of patterns and transformations of functions and solve related problems.	3	8	7457	Conform to and apply legislation and Operational Instructions in Chemical Processing.	3	4	New	Produce word processing documents for business.	3	5	7570
Use structured models to describe, represent and analyse Shape and Motion in 2- and 3-dimensional space.	3	4	7460	Respond to Hazardous Conditions or emergencies.	3	10	New	Apply Quality Procedures	3	8	13234 (Gen019)
Accommodate Audience and context needs in Oral communication.	3	5	8968 (FET07)	Solve Operating Problems using Process Chemistry and related technology.	3	10	New	Apply basic problem-solving techniques.	2	2	New
Interpret and use information from texts.	3	5	8969 (FET08)	Provide on-the job Training.	3	6	New	Demonstrate the ability to use Electronic Mail Software to send and receive messages.	2	3	7571
Write texts for a range of communicative contexts.	3	5	8970 (FET09)	Demonstrate an understanding of Supply Chain Management.	3	3	New	Communicate effectively in teams.	2	5	New
Use language and communication in occupational learning programmes.	3	5	8979	Demonstrate an understanding of employment relations in an organisation.	3	3	New				
Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations.	3	2	9010	Manage Interpersonal Conflict	3	4	New	**ELECTIVES (Basic Maintenance)**			
				Coach Learners	3	10	9926 (HRMP -ET3001)	Conduct Maintenance on Process Equipment.	3	10	New
								Perform Changeovers in a Chemical manufacturing environment.	3	5	New
								ELECTIVES (Process-Specific)			
								Produce Chemical Products using automated batching systems.	3	8	New
								Compress Granules or Powders to produce Tablets, Tablet Cores or Pressed Powders.	3	6	New
								Produce Hot-filled semi-moulded	3	6	New

								product.			
								Produce Lozenges.	3	6	New
								Fill and Pressurise Containers to produce Aerosols.	3	8	New
								Fill Suppositories in a Chemical Manufacturing environment.	2	8	New
								Produce extruded and packaged product in a Chemical Manufacturing environment.	2	6	New
								Control a neat soap production process (SOAPS).	3	8	New
								Control a Soap rework process (SOAPS)	3	3	New
								Produce powdered detergent using automated production equipment. (DETERGENTS)	3	6	New
								Monitor and maintain powdered detergent production. (DETERGENTS)	3	5	New
								Prepare and mix liquid personal products using computerised automated and manual equipment.	3	8	New
								Demonstrate knowledge of Tablet Technology.	2	2	New
								Demonstrate knowledge of Hard Gelatin Capsule Technology.	2	2	New
								Demonstrate knowledge of Soft Gelatin Capsule Technology.	2	2	New
								Demonstrate knowledge of Semi-solid preparations in a Pharmaceutical Manufacturing environment.	2	2	New
								Demonstrate knowledge of Suppositories.	2	3	New
								Demonstrate knowledge of Liquid Preparations.	2	3	New
								Demonstrate knowledge of basic Capsule filling technology.	2	3	New
								Electives (Packaging)			
								Package product using automated packaging equipment.	3	8	New
Available credits on level 3		**40**				**84**				**111**	
Total available credits		**40**				**84**				**152**	

NLRD numbers refer to registered unit standards.

APPENDIX 2

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Title: National Certificate in Chemical Manufacturing Supervision

Field: Manufacturing, Engineering and Technology - NSB 06

Sub-field: Manufacturing and Assembly

Level: 4

Credit: 120

Issue date:

Review date:

Rationale of the qualification

This certificate reflects the need in the Chemical Industry for a person with the knowledge and skills required to supervise, manufacture and/or package products, as well as co-ordinate and control these processes.

This is a need expressed by employers and employees to address current and future needs.
This qualification enables the learner to access employment within several sub-sectors of the Chemical Industry. The qualification further provides the flexibility to articulate to other manufacturing and process-related sectors.

The level of flexibility within the range of electives will enable the individual to pursue a career in a broad spectrum within the Chemical Industry and other manufacturing and process-related sectors.

The qualification is appropriate for people who have an understanding of the Chemical Industry and other process-related sectors, and who intend to follow a career in supervision and/or management within these sectors.

Purpose of the qualification

The understanding of the sector-specific technology and the principles of management, and their application, will empower the learner to take responsibility (and make decisions) for co-ordinating a process in order to produce product.

The National Certificate in Chemical Manufacturing recognizes a learner's ability to:

- Ensure that production targets are met by utilizing resources to satisfy customer demand. This requires the co-ordination of the manufacturing and/or packaging operation.
    - Resources includes people, process, technology, materials, financial.
- Be able to apply the principles of SHEQ and productivity in the context of the job function.

- Implement performance management tools to optimise individual and team functioning.

    - Performance management includes mentoring, coaching, counselling, target setting, conflict resolution, training and development.

Access to the Qualification
Access is open.
This is subject to the proviso that learners may have to comply with site-specific requirements, relevant legislation and regulations regarding health, safety, quality and employment relations where these are applicable.

Learning assumed to be in place

A National Certificate in Chemical Manufacturing at level 3, or equivalent.

Knowledge of appropriate technology, safety, health and environment, quality, productivity, housekeeping and hygiene practices, as well as labour-related legislation, is a requirement for the learner to achieve this qualification.

Where this learning is lacking or the learner is not yet competent, appropriate additional learning interventions will be needed.

Exit level Outcomes

Exit level 1: Supervise a manufacturing and/or packaging process to achieve production targets.

Associated Assessment Criteria

- Develop, Interpret and execute the production plan as required.
- Gather relevant information to make appropriate, justifiable decisions in a Chemical Manufacturing context.
- Co-ordinate and/or control the necessary resources to achieve all of the above functions.
- Understand and apply the principles of the supply chain and his/her role therein.

Exit level 2: Use appropriate productivity improvement tools, techniques and recording processes to ensure continuous improvement.

Associated Assessment Criteria

- Understand and apply productivity measurement techniques.
- Understand and apply continuous improvement methodologies.
- Collect, understand, analyse and interpret qualitative and quantitative information.

Productivity measures could include Waste management, Loss analysis, Cost of Non-compliance, Customer complaints, Down-time, Yield measurements, Line speed, Operational efficiency.

Continuous Improvement techniques could encompass TPM (Total Productive Manufacturing), TQM (Total Quality Management), ISO9002, ISO14001, ISO 18001, SABS accreditation, NOSA (National Occupational Safety Association) accreditation.

Exit level 3: Apply performance management tools to optimise individual and team functioning.

Associated Assessment Criteria

- Understand and apply an appropriate performance review system (individual and team).
  - This could include target setting, conducting performance appraisals, etc.
- Provide on-the job training and coaching.
- Plan and conduct assessment of learning outcomes, where appropriate.
- Contribute to ongoing development of individuals through mentoring, coaching, counselling and applying disciplinary procedures where appropriate.

Exit level 4: Demonstrate principles of personal effectiveness and leadership.

Associated Assessment Criteria

- Plan and conduct effective meetings.
- Write reports for the appropriate target audience and context.
- Demonstrate the ability to present and communicate information to a variety of audiences.
- Demonstrate an understanding of employment relations.
- Manage interpersonal conflict.
- Lead a team of individuals in a work environment.
- Motivate individuals and teams.
- Demonstrate Basic Financial awareness and understand the financial implications of actions.
- Be able to manage work time effectively.

International comparability

Benchmarking was done against the New Zealand qualifications.

Lever Rexona in New Zealand was used as a comparison with regard to the chemically-oriented FMCG sector.

Integrated Assessment

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to supervise, operate and/or co-ordinate the operation of a process within a chemical manufacturing environment. This would include being able to maintain quality control, productivity and SHE practices, demonstrating and integrating knowledge of appropriate process-related technology, as well as co-ordinating or conducting basic maintenance functions.

Appropriate methods and tools must be used to assess the practical, foundational and reflexive competence of the learner in all of the exit level outcomes listed above. This includes being able to determine a learner's ability to solve problems, work in a team, organize him/herself, use applied science, and understand the implications of actions and reactions in the world as a set of related systems. Such an assessment process will determine the development of the whole person, and the integration of applied knowledge and skills.

Assessors should develop, conduct, and ensure integration of, assessment by making use of a range of formative and summative assessment methods against the unit standards that make up the qualification. Combinations of applied, foundational and reflective competencies, including critical cross-field outcomes, should be assessed wherever possible.

Moderators should ensure that the assessment is valid, consistent and integrated into work or learning, and that there is sufficient and authenticated evidence of learner competence against the whole qualification.

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning, and work experience.

Articulation possibilities

This qualification will enable the qualifying candidate to progress to learning for related National Certificates at NQF Level 4, with specialization where appropriate, and further, on to relevant National Diplomas and degrees as indicated in the table below.

<table>
<tr><td>NQF Level</td><td>Process related engineering artisans</td><td colspan="2">Explosives Glass Specific Qualifications</td><td>Chemical Process Operations</td><td>Chemical Manufacturing</td><td>Production Management</td><td>Pharmaceuticals</td><td>Laboratory Assistant (Chemical analysis)</td><td>Technical (chemical related) sales/distribution</td></tr>
<tr><td>5/6</td><td>NC (NQF 5) or ND (NQF 5/6) in Engineering</td><td>NC in Ceramic Technology or new diploma</td><td>NC in Explosives Technology</td><td>NC in Chemical Process development or chemical product development or chemical process supervision (not yet mandated)</td><td>National Diploma in Chemical Engineering</td><td>ND Production Management from Management SGB</td><td>ND Pharmacy developed in Pharmacy SGB</td><td>National Diploma in Analytical Chemistry</td><td></td></tr>
<tr><td>4</td><td rowspan="3">Various engineering artisan related qualifications to be developed in conjunction with other SGBs</td><td>NC in glass production</td><td>NC in Explosives plant operation III</td><td>NC in chemical process operations</td><td colspan="2">NC in Chemical Manufacturing Supervision</td><td>NC Pharmacist's Assistant – post basic</td><td>NC in laboratory practice 3 *</td><td rowspan="3">Various sales/marketing related qualifications to be developed in conjunction with other SGBs</td></tr>
<tr><td>3</td><td>NC in molten glass production</td><td>NC in Explosives plant operation II</td><td>NC in chemical systems operation</td><td colspan="2">NC in Chemical Manufacturing</td><td>NC Pharmacist's Assistant - Basic</td><td>NC in laboratory practice 2 *</td></tr>
<tr><td>2</td><td>NC in batch mixing</td><td>NC in Explosives plant operation I</td><td>NC in chemical equipment operation</td><td colspan="3">NC in Chemical Manufacturing Operations</td><td>NC in laboratory practice 1 *</td></tr>
<tr><td>1</td><td></td><td colspan="7">National Certificate in chemical operations</td><td></td></tr>
</table>

Articulation is also practical between this qualification and manufacturing and/or packaging environments outside of the **Chemical industry** such as the **Food and Beverage** environments and **Chemical analysis**. Articulation is also possible with other specialised areas not specifically within manufacturing and/or packaging.

Moderation Options

- Anyone moderating the assessment of learners against this Qualification must be registered as a moderator with the relevant ETQA.
- Any institution offering learning that will enable the achievement of this Qualification must be accredited or recognized as a provider with the relevant ETQA.
- Assessment and moderation will be overseen by the relevant ETQA according to the ETQAs policies and guidelines for assessment and moderation; in terms of agreements reached around assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.
- Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.
- Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

Criteria for registration of assessors

In order to assess this qualification, the assessor needs:

- Well developed interpersonal skills, personal credibility, and a record of ethical behaviour.
- Registration with the Education, Training and Development Practitioners' ETQA as a generic assessor.
- Competence against the unit standard "Plan and conduct assessment of learning outcomes."
- Detailed documentary proof of educational qualification, practical training undergone, and/or experience gained at an appropriate level of manufacturing operations, as per the relevant ETQA policies and guidelines. The subject matter expertise of the assessor can be established through the recognition of prior learning.
- Registration with, or recognition by, the Chemical Industries Education and Training Quality Assurance Body and uMalusi.

LEVEL OF QUALIFICATION

The following table is a summary of attributes of the unit standards listed below, which indicates that the qualification is at level 3.

Attribute	Level	Justification
Skills		
Procedures		
Context		
Knowledge		
Information processing		
Problem Solving		
Orientation of activities		
Application of responsibility		
Orientation of scope of responsibility		
Average Level:		**Actual Level Assigned:**

Estimated Learning Time:

The estimated total hours required by the learner to achieve the required outcome:

Activity	Hours
Classroom Teaching	360-480
On-The-Job Training	360-840
Other (Simulate working environment such as a training centre)	0 –240
Total	1200

UNIT STANDARDS MAKING UP THE NATIONAL CERTIFICATE IN CHEMICAL MANUFACTURING SUPERVISION - NQF LEVEL 4

Fundamental				Core				Elective			
Title	**Level**	**Credits**	**NLRD ID**	**Title**	**Level**	**Credits**	**NLRD ID**	**Title**	**Level**	**Credits**	**NLRD ID**
Field of Communication and Language								ELECTIVES (General/ Management)			
Engage in sustained oral communication and evaluate spoken texts.	4	5	8968 (FET-13)	Oversee operations on a food production line.	4	7	New	Monitor the application of safety, health and environmental protection procedures	4	4	13224 (Gen 017)
Read, analyse and respond to a variety of texts.	4	5	8969 (FET-14)	Supervise workers at levels 2 and 3.	4	6	9482 (4.16)	Develop a production plan.	4	4	New
Write for a wide range of contexts.	4	5	8970 (FET-15)	Lead a team, plan, allocate resources and assess their work.	3	4	3.L.02 (000612)	Plan and conduct assessment of learning outcomes.	5	15	ASSMT01
Use language and communication in occupational learning programmes.	4	5	8979	Maintain production efficiencies.	5	12	9893	Develop the skills of a work team.	5	10	(Gen 027)
				Analyse Production and record data to improve equipment performance.	3	5	18938	Institute disciplinary action.	5	8	11286 (HRMP-LE5/002)
Field of Physical, Mathematical, Computer and Life Sciences				Manage and or supervise workplace operations.	5	5	New	Present data to stakeholders.	5	5	10055
Apply knowledge of Sequences and Series to interpret and solve problems in real and simulated situations.	4	2		Manage work time effectively	3	3	9530 (3.L.O5)	Operationalise productivity-improvement strategy, objectives and processes.	5	3	GM5/004
Work with a wide range of patterns and inverses of functions and solve related problems.	4	6	7470 (Math4002)	Plan teamwork functions and complete reports.	3	4	14019 (000887)	Promote productivity-improvement strategy and objectives.	5	13	GM6/004
Construct, analyse and calculate shape and motion in two and three-dimensional space in different contexts.	4	4		Apply the fundamental concepts of Supply Chain Management optimisation.	5	8	11273				
Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life-related problems.	4	6	9015 (00032/ MathLit4002)	Communicate with Clients and discuss work.	5	3	9407 (5.L.03)				
Measure, estimate and calculate physical quantities and explore, describe and represent, interpret and justify geometrical relationships in 2- and 3-dimensional space relevant to the life or workplace of the	4	4	9016 (12417)	Supervise work unit to achieve work unit objectives (individuals and teams).	4	12	10981/ HRMP-AD4/002				

community.											
				Manage Individual and Team performance.	4	8	11473/ 11405/ HRMP-AD4/003				
				Understand and interpret a production plan.	4	4	New				
				Develop self within the job role.	4	3	7821				
				Lead and develop a team of individuals.	4	10	New				
				Demonstrate knowledge of productivity and work-study techniques.	3	4	9527/ 12426				
				Communicate in an effective way with clients and fellow workers.	4	4	New				
				Communicate in an assertive manner with clients and fellow workers.	4	4	4.L.02				
				Plan and conduct meetings.	4	2	New				
				Setting personal goals.	4	2	New				
Available credits on level 4		**42**				**62**				**8**	
Total available credits		**42**				**110**				**62**	

NLRD numbers refer to registered unit standards.

APPENDIX 3

TABLE OF CONTENTS
FINAL NATIONAL CERTIFICATE – CHEMICAL MANUFACTURING
LEVEL 3

30. Demonstrate an Understanding of the Use of Different Number Bases and Measurement Units and an Awareness of Error in the Context of Relevant Calculations
31. Identify and Work with Simple Forms of Complex Numbers
32. Work with a Wide Range of Patterns and Transformations of Functions and Solve Related Problems
33. Interpret and Use Information From Texts

1. Demonstrate knowledge of tablet technology		

SAQA Logo :

Registration No. :

NQF Level : 2

Credit(s) : 2

Field : NSB 06: Manufacturing, Engineering and Technology

Sub-Field : Manufacturing and Assembly

Issue Date :

Review Date :

PURPOSE STATEMENT:

A person credited with this unit standard is able to:

- Demonstrate knowledge of the characteristics of a quality tablet.
- Demonstrate knowledge of a tablet formula.
- Demonstrate knowledge of tablet manufacture.
- Demonstrate knowledge of the importance of in-process checks.

This unit standard is useful to operators and supervisors in a pharmaceutical production environment.

Range: Effervescent tablets, uncoated tablets, coated tablets.

Learning assumed to be in place

- People learning towards this standard are able to apply Good Manufacturing Practices (GMP) and demonstrate knowledge of Health and Safety within a Pharmaceutical or FMCG Environment.
- The learner will also have basic literacy (ABET 4 language and communication skills) and Numeracy (ABET 4 Mathematics) or equivalent competencies.

1. Demonstrate knowledge of tablet technology		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1: Demonstrate knowledge of the characteristics of a quality tablet.

Assessment Criteria:

1.1 The characteristics of a quality tablet meeting the required standards are explained.

Range: Uniform appearance
Absence of chipping
Accurate dosage delivered
Ability to withstand physical handling
Stable within specified parameters (temperature, humidity, etc)
Easy to swallow
Acceptable solubility
Chemically stable

Specific Outcome 2: Demonstrate knowledge of a tablet formula

Assessment Criteria:

2.1 The basic formula of a tablet is explained.

2.2 An example of each ingredient in a standard tablet is given and it's purpose identified.

Range: Active ingredient
Diluent
Binder / granulating liquid
Disintegrating agent
Lubricant
Coating materials
Flavourants
Colourants
Preservatives

Specific Outcome 3 : Demonstrate knowledge of tablet manufacture

Assessment Criteria:

3.1 The tablet manufacturing process is explained.

Range: Verifying the raw materials
Granulation (dry / wet)
Drying
Blending
Slugging
Compression
Coating

1. Demonstrate knowledge of tablet technology		

3.2 The importance of maintaining the correct environmental conditions during tablet manufacture and compression are explained.

Range: Positive / negative pressure
Relative Humidity (RH)
Temperature

Specific Outcome 4: Demonstrate knowledge of the importance of in-process checks

Assessment Criteria:

4.1 The importance of performing in-process checks during the manufacture of tablets is explained.

Range: In-process checks include:

Mass
Friability
Hardness
Thickness
Disintegration

RANGE STATEMENT:

1.1 Effervescent tablets

1.2 Coated tablets

1.3 Uncoated tablets

NOTES:

EMBEDDED KNOWLEDGE:

Knowledge considered to be critical to the outcome is addressed through the assessment criteria.

ABET 4 communication and mathematics.

GMP and Safety knowledge considered to be critical is addressed.

Knowledge of relevant legislation, such as the OHS Act.

DEFINITIONS:

Good Manufacturing Practice (GMP):

That part of Quality Assurance that ensures that a product is manufactured consistently and controlled to quality standards appropriate to their intended use.

1. Demonstrate knowledge of tablet technology		

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES:

The following critical crossfield outcomes are addressed in this Unit Standard::
 	
• Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made.
• Working effectively with others as a member of team, group, organisation or community.
• Organising and managing oneself and one's activities responsibly and effectively.
• Collecting, analysing, organising and critically evaluating information.
• Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion.
• Using science and technology effectively and critically, showing responsibility towards the environment and the health of others.
• Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
• Contributing to the full personal development of each learner and the social and economic development of society at large, by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
  • reflecting-on and exploring a variety of strategies to learn more effectively;
  • participating as responsible citizens in the life of local, national and global communities;
  • being culturally and aesthetically sensitive across a range of social contexts.

2. Demonstrate knowledge of liquid preparations		

SAQA Logo :

Registration No. :

NQF Level : 2

Credit(s) : 3

Field : NSB 06: Manufacturing, Engineering and Technology

Sub-Field : Manufacturing and Assembly

Issue Date :

Review Date :

PURPOSE STATEMENT:

Persons credited with this Unit Standard are able to:

- Describe mixing and milling equipment for liquid preparations.
- Demonstrate knowledge of solutions, emulsions and suspensions.
- Demonstrate knowledge of GMP and safety principles applied during the manufacture of liquid preparations.

This standard is useful to operators and supervisors in a pharmaceutical production environment.

LEARNING ASSUMED TO BE IN PLACE :

- Basic literacy (ABET 4 reading and writing)
- Numeracy (ABET 3 mathematics)
- Basic Pharmaceutical production knowledge including GMP and Safety.

2. Demonstrate knowledge of liquid preparations		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1:	**Describe the mixing and milling equipment used for liquid preparations.**

Assessment Criteria:

1.1 The different flow patterns of liquid preparations are described, i.e. radial, axial and tangential flow.

1.2 The different types of mixers are described.

1.3 The purpose of fluid jets, baffles, shape of container and the position of the mixer in the mixing vessels is explained.

1.4 The purpose of the colloid mill and homogeniser, and where they are used, is explained.

Specific Outcome 2:	**Demonstrate knowledge of solutions**

Specific Outcome 3	**Demonstrate knowledge of emulsions and suspensions.**

Assessment Criteria:

3.1 The basic formula of an emulsion and a suspension is described, an example of each ingredient is given, and its purpose identified.

Range: Ingredients include:

- Active ingredient
- Sweetener
- Acidifier
- Flavourant
- Colourant
- Preservatives
- Buffer
- Suspending agent
- Emulsifying agent
- Vehicle

3.2 The following terms are explained:

- Immiscible liquids
- Oil in water emulsions / Water in oil emulsions

3.3 The problems that may occur during emulsion manufacture are identified and explained.

Range: These problems could include:

- Cracking
- Creaming

2. Demonstrate knowledge of liquid preparations		

Specific Outcome 4	Demonstrate knowledge of the GMP and Safety principles applied in the manufacture of liquid preparations.

Assessment Criteria:

4.1 The GMP principles carried out prior to and during liquid manufacture are explained.

4.2 The procedure to be taken when any deviation occurs is explained.

4.3 The Safety procedures and Personal Protective Equipment (PPE) relevant to liquid manufacture are explained.

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Examination of an assessment portfolio.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

NOTES:

Definition of terms:

PPE: Personal protective equipment, including gloves, masks, overshoes, overcoats, safety shoes.

GMP: Good Manufacturing Practice. This includes that part of quality assurance that ensures that medical and pharmaceutical products are consistently produced and controlled to the quality standards appropriate to their intended use.

Relevant Legislation:

OHASA Act.

2. Demonstrate knowledge of liquid preparations		

RANGE STATEMENTS:

The learner utilizing this Unit Standard is expected to set-up, monitor, adjust and control a manufacturing process within the Chemical manufacturing industry. They will be expected to erffectively utilize all of the resources at their disposal including material, financial, equipment and personnel.

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems using critical and creative thinking.
  - *Solving problems and deviations occurring during manufacture.*

- Communicate effectively.
  - *Effective oral communication of knowledge during assessment.*

EMBEDDED KNOWLEDGE:

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria.
Candidates are unlikely to achieve all of the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge.
This means that for the most part, the possession, or lack of knowledge can be directly inferred from the quality of the candidate's performance.
Where direct assessment of knowledge is required, assessment criteria have been included in the body of the Unit Standard.

- GMP – *see assessment criterion 4.1*

3. Produce Chemical Products using Automated Batching Systems		

SAQA Logo	:	
Registration No.	:	
NQF Level	:	3
Credit(s)	:	8
Field	:	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	:	Manufacturing and Assembly
Issue Date	:	
Review Date	:	

PURPOSE STATEMENT:

This unit standard is intended for people who work, or intend to work, in a Chemical Manufacturing Environment. This unit will contribute ttowards the achievement of a National Certificate in Chemical Manufacturing at NQF Level 3.

People credited with this unit standard are able to:

- Prepare to mix ingredients for production
- Operate automated mixing systems to produce chemical products
- Stage bulk products for further processing or packing
- Shut down and clean automated systems

LEARNING ASSUMED TO BE IN PLACE :

Learners accessing this unit standard will have demonstrated competence at the equivalent of NQF 1 in Mathematics and Communications in English, and NQF 2 in Science and Technology.

3. Produce Chemical Products using Automated Batching Systems		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1:	**Prepare to mix ingredients for production**

Assessment Criteria:

1.1 The work environment is clean and free from hazards, in line with documented best practice and SOP's (Standard Operating Procedures).

1.2 Personal Protective Equipment (PPE) is worn so that it protects the operator and prevents the product from being contaminated. All protective equipment is used as described in the manufacturer's instructions, company policy and appropriate safety legislation.

1.3 The status of the batching system is established and all documentation completed according to Company requirements.

1.4 All mechanical and electronic equipment is checked to ensure that the settings are correct, and it is in good working order. Process parameters are verified to be suitable for the production run.

1.5 Any faults within the operator's scope are repaired. System faults, and faults which are not the responsibility of the operator, are reported to the designated personnel, as shown on the checklists or fault-finding guidelines.

Specific Outcome 2:	**Operate automated mixing systems to produce Chemical products**

Assessment Criteria:

2.1 Sufficient raw materials are ready and available for the product type, colour and size requirements of the batch scheduled for production.

2.2 Production services are established and the machinery stated, as per the manufacturer's requirements and product specifications.

2.3 Ingredients are added in the correct sequence and at the right time for the product specifications, as shown on the automated mixing system prompt.

2.4 The batch process is controlled so that production wastage is kept to a minimum. Every opportunity to rework non-conforming product is taken. Where there is waste, it is disposed of in line with standard operating procedures and environmental policies.

2.5 In-process checks are performed as and when required, and corrective action taken to ensure that product conforms to specifications.

2.6 The consequences of out of specification product are explained in terms of cost to production and consumer satisfaction.

2.7 Any differences from normal equipment performance are noted and normal adjustments are made. Differences that are not the responsibility of the operator are reported to the designated personnel, according to Company procedures.

Specific Outcome 3	Stage bulk products for further processing or packing

Assessment Criteria:

3.1 The holding vessel is appropriate to the product and clearly and legibly labelled, according to standard operating procedures.

3.2 Bulk products are checked for quantity, quality and physical appearance, and results are accurately documented.

3.3 Bulk products are staged in the correct area and conditions, and within the specified time, in accordance with company operating procedures.

3.4 Yield discrepancies are investigated, their nature and sources identified, and problems are reported to the designated personnel.

3.5 The product status is communicated to the designated personnel in accordance with Company-specific requirements.

Specific Outcome 4	Shut down and clean automated systems

Assessment Criteria:

4.1 The shut-down of automated packaging equipment is completed within the agreed time, in accordance with Standard Operating Procedures.

4.2 The cleaning of automated equipment ensures that it is free from microbiological contamination, in line with company policies and procedures, and the appropriate Professional body regulations.

4.3 The consequences of incorrect cleaning procedures are explained in relation to microbiological contamination, product quality and productivity.

4.4 Any problems or difficulties around the equipment shut-down, and the cleaning of equipment, are noted, and solutions are developed to improve performance.

4.5 Hand-over, quality and productivity documentation is completed accurately, as per the company-specific, and Professional body regulations.

3. Produce Chemical Products using Automated Batching Systems		

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Examination of an assessment portfolio.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

RANGE STATEMENTS:

- Mechanical and electronic equipment settings: micro switches, doors, magnetic switches, guards
- Process parameters: air and/or chilled water leaks and/or poor vacuum (1.4)
- Settings: micro switches, doors, magnetic switches, guards (1.4)
- Production services: temperature, pressure, vacuum (2.2)
- Appearance, odour, taste, pH (2.5)

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made by:
  - Solving common problems associated with the operation of automated Batching systems.

- Collect, analyse, organise and critically evaluate information by:
  - Evaluating if the operation of the automated batching system/s meet the Requirements provided in the SOP's. Monitoring and controlling the automated production process.

3. Produce Chemical Products using Automated Batching Systems		

- Work effectively with others as a member of a team, group, organisation or community by:
  - Preparing to mix ingredients for production
  - Operating an automated mixing system to produce a chemical product
  - Staging the bulk product for further processing and packing
  - Shutiing down and cleaning an automated system

- Collect, analyse, organise and critically evaluate information by:
  - Evaluating if the operation of the automated batching system/s meet the requirements provided.

- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations by:
  - Interpreting Documents
  - Completing documents pertaining to the operation of automated batching systems

- Use science and technology effectively and critically, showing responsibility towards the environment and health of others by:
  - Explaining the technology appropriate to the operation of the automated batching system and its significance on the overall operation.

- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation by:
  - Relating safety, health, environmental and quality best practice to the automated production process.

- Contribute to the full personal development of each learner and the social and economic development of the society at large.

EMBEDDED KNOWLEDGE:

Process Chemistry and related technology. Health, safety, environmental, productivity and quality principles relevant to each specific outcome.

4. Monitor and Maintain Powdered Detergent Production		

SAQA Logo :

Registration No. :

NQF Level : 3

Credit(s) : 5

Field : NSB 06: Manufacturing, Engineering and Technology

Sub-Field : Manufacturing and Assembly

Issue Date :

Review Date :

PURPOSE STATEMENT:

This unit standard is for people who are currently working, or who intend to work, in an FMCG environment which involves the use of specialised automated production equipment used to produce, monitor and maintain powdered detergent, and similar substances.

People credited with this unit standard are able to monitor and maintain the production of powdered detergent, and operate powder detergent production equipment.

LEARNING ASSUMED TO BE IN PLACE :

It is an advantage to have competence equivalent to:

- ABET 4 Language and ABET 3 Maths
- Standard No. PWM-B/03 *Implement health, hygiene and safety practices;* and
- Standard No. PWP/05 *Implement quality practices in a production environment;*

4. Monitor and Maintain Powdered Detergent Production		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1: Monitor Powdered Detergent Production

Assessment Criteria:

1.1 Equipment is operational and fit for purpose.

1.2 Materials are available, and are flowing in the correct quantity and condition to the correct location in accordance with the production schedule.

1.3 Potential equipment breakdowns are identified, and corrective action is taken with personnel responsible for the work area.

1.4 Upstream and downstream production team members are kept informed of the production status throughout powder detergent production in a manner and within a timeframe that promotes goodwill.

1.5 The product is of the correct granulation, colour, and chemical composition in accordance with product specifications.

1.6 Product waste is minimised, and opportunities to rework non-conforming product are maximised.

1.7 Monitoring of powder detergent production complies with organisational policies, procedures, and legislation.

Range:

Policies and procedures:

- work instructions
- manuals
- standard operating procedures
- quality standards

Specific Outcome 2: Maintain powdered detergent production

Assessment Criteria:

2.1 Production downtime due to maintaining powder detergent production is minimised.

2.2 Variations in specified technical performance of equipment and product are identified, and corrective action is taken within a timeframe that optimises performance.

Range:

Variations:

- qualitative
- quantitative
- safety

2.3 Powder detergent is maintained at the correct volume and flow for production.

2.4 Powder detergent is maintained at correct volume and flow for production.

4. Monitor and Maintain Powdered Detergent Production		

2.5 Equipment is operated and maintained in correct working order in accordance with equipment specifications.

2.6 Powder detergent integrity is maintained in accordance with product specifications.

2.7 Dust is minimised.

2.8 Maintenance of powder detergent production complies with organisational policies, Procedures, and legislation.
Range
Policies and Procedures:
- Work instructions
- Manuals
- Standard Operating Procedures
- Quality Standards

2.9 The work environmentg is clean and free from hazards
Range
Hazards:
- To personnel
- To product
- To plant
- Caused by personnel
- Caused by equipment
- Caused by ennvironment

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Short written answers to oral or written questions.
- Oral questions and answers in a structured interview.
- Examination of an assessment portfolio and other relevant documentation.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

4. Monitor and Maintain Powdered Detergent Production		

NOTES:

1. **Unit Standard Range:**

   Powders
   - detergent, concentrated, conventional, heavy, light, high density, low density, white, coloured.

2. **The following Unit Standard may be considered relevant to, and /or supportive of, this unit standard, but is not a prerequisite entry unit standard:**

   Produce powdered detergent using automated production equipment.

3. **In this Unit Standard, the word "agreed" indicates that a course of action is:**

   a. Agreed between 2 or more people (including the assessee), eg. Action completed in an agreed timeframe and/or
   b. Contained in stated policy and/or procedures (made known to the assessee) as being the required performance standard, eg location for filing documentation.

4. **In this Unit Standard, the use of "and/or" to separate items in a range statement Indicates that sufficient valid evidence must be gathered for at least one of the items listed, as required by the assessee's work role.**

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made.
- Collect, analyse, organise and critically evaluate information.
- Work effectively with others as a member of a team, group, organisation or community.
- Collect, analyse, organise and critically evaluate information.
- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations.
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.
- Contribute to the full personal development of each learner and the social and economic development of the society at large.

4. Monitor and Maintain Powdered Detergent Production		

EMBEDDED KNOWLEDGE:

Embedded Knowledge:

Technical:

- working knowledge of production services
- operation of a detergent production plant – setting lines, valves, pumps
- principles and operation of heat exchange system
- principles and application of cleaning (steam, air blow)
- autonomous maintenance of a detergent production plant

Quality:

- safety principles underpinning operation
- quality sampling and testing procedures involved in detergent production
- knowledge of materials and ingredients for detergent production
- knowledge and application of good housekeeping practices
- documentation – hand over books, lock out procedures, checklists, quality log sheets and system

Principles:

- principles and application of World Class Manufacturing
- knowledge and application of TPM principles
- knowledge and principles of visual performance measurement systems
- knowledge and application of value chain principles

5.

TITLE	**:**	**Fill and pressurize containers to produce aerosols in a Chemical Manufacturing Environment**.

Unit Standard Number	:	
NQF Level	:	3
Credits	:	8
Field	:	NSB06: Engineering**,** Manufacturing and Technology
Sub-Field	:	Manufacturing and Assembly
Issue Date	:	
Review Date	:	

Purpose:

This standard is aimed at people who work in, or intend to work in, an aerosol production environment within the Chemical Manufacturing Industry. People working in a manufacturing or product processing environment will find this unit standard especially useful.

Those learners who acquire the outcomes of this standard will be able to produce aerosols safely.

The qualifying learner is able to:

- Prepare production and filling machinery for aerosol production.
- Prepare to fill aerosol containers with product.
- Prepare to pressurize aerosol containers with propellant, where applicable.
- Fill aerosol containers with product.
- Pressurize aerosol containers with propellant, where applicable.
- Conduct post-filling activities.

Learning assumed to be in place:

Competence equivalent to the following is strongly recommended:

- ABET level 4 in Language and ABET level 3 in Mathematics
- Standard No. PP/06 (Implement Hygiene and Safety practices), or a similar Unit Standard

Specific Outcomes and Assessment Criteria:

Specific Outcome 1: Prepare production machinery for aerosol production

Assessment Criteria:

1.1 The condition of equipment is verified to be acceptable from handover procedures, documentation, work permits and logbooks / logsheets, where applicable.

1.2 The equipment is ensured to be free from faults and ready to use, in accordance with SOP's (Standard Operating Procedures) and other site-specific documentation.

Range: Oil/lubricant levels, safety systems, switches, chilled water leaks, vacuum systems, propellant delivery systems.

1.3 Any faults detected in the equipment or system are rectified and the equipment repaired within the operator's scope of operation. Repairs not within the scope of the Operator's functions are noted and reported to the appropriate personnel.

1.4 The hazards associated with each chemical category used in the process are discussed, and the appropriate measures and treatments described in cases of accidental human contact with such chemicals.

Range: Propellants (eg. Dichlorofluoromethane (P12), Hazardous active substances used in Pharmaceutical Inhalers, etc.

1.5 Machine settings are checked against the requirements for the particular product variant, as well as the production requirements. Adjustments are made promptly and accurately so as to ensure that production time is not lost.

Specific Outcome 2: Fill and pressurize aerosol containers with product

Assessment Criteria:

2.1 The production plan is available, and checked to make sure that it is current and complete.

2.2 The components are matched to the production plan, and checks are made to ensure that these components are sufficient and correct for the expected production.

Range: Components include cans, valves, actuators, caps, cartons, etc.

2.3 The batch components and materials are visually checked against the specifications to ensure they meet the required standards. Any out-of-specification materials are removed from the line and reported to the appropriate personnel to be actioned.

2.4 The equipment is loaded with a sufficient quantity of the appropriate filling components in accordance with the SOP's and other site-specific requirements.

2.5 Personal Protective Equipment (PPE) is worn so that it protects the operator. It also prevents the product from being contaminated. All protective equipment is worn or used as described in the respective SOP's, manufacturer's instructions, company policy and safety legislation.

2.6 Chemicals are handled in a safe and environmentally friendly manner, using the designated handling equipment and techniques.

2.7 Safety equipment and accessories are ready and available during the period of chemical handling, and their uses explained in the event of fire, spillages and leakages.

2.8 The product is filled and pressurized correctly and effectively according to the appropriate SOP's and other Site-specific instructions so as to ensure that there is minimal wastage.

2.9 In-process quality checks are performed at the required intervals so as to ensure that the final product meets specifications.

Specific Outcome 3: Conduct Post filling activities

Assessment criteria:

3.1 At the completion of production, the machinery is shut down safely and in accordance with the appropriate SOP's.

3.2 The production area, work-station and all equipment used is cleaned in preparation for the next production run.

3.3 A basic analysis of the operational status, and wear and tear, of the equipment is conducted, and where necessary, the equipment either repaired or labelled as faulty and reported to the appropriate personnel.

3.4 All documentation relating to the production run is completed on time and in accordance with company-specific procedures.

11. ACCREDITATION AND MODERATION OPTIONS:

The Educational Training Quality Assurance Body (ETQA), for the Chemical Industry in consultation with GEN/FETQA will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

Assessment Options include:

11.1 Short written answers to oral or written questions.
11.2 Oral questions and answers in a structured interview.
11.3 Direct observation in actual or simulated working conditions.
11.4 Examination and interpretation of relevant documentation.

12. NOTES:

- **Equipment:** Rotary filling, Vacuum head, Motors, Pumps, Lines, Filling Nozzles, Crimping Heads, Valve insertion, Steam bath.

- **Raw Materials:** Active Pharmaceutical Ingredients, Propellants, Perfumes, Alkalis, Lubricants, Hydrocarbons, Alcohol, Surfactants.

- **Products:`** Pharmaceutical Inhalers, Deodorants, Hairspray.

- **PPE:** Masks, Safety Shoes, PVC gloves, Ear Plugs, Anti-static clothing, goggles.

13. EMBEDDED KNOWLEDGE:

13.1 Technical knowledge

- Working knowledge of production services
- Working knowledge of Chemicals and raw materials used (eg. Propellants, perfumes, active ingredients)
- Principles of Aerosols
- Operation of filling and packing equipment – including changeover assistance, machine settings, loading of components
- Mechanical fault-finding for the above range of machines

- Basic first-line maintenance of the filling line – including pack glands on pumps, replacing blades, general lubrication, replacing small valves, resetting trip switches.

13.2 Quality

- Safety principles for filling and pressurizing aerosols
- Quality sampling and testing procedures
- Knowledge and application of Good Housekeeping practices
- Documentation – including hand-over documentation, lock-out procedures, checklists, quality log sheets and systems.

13.3 Principles

- Principles and application of World Class Manufacturing
- Knowledge and application of TPM (Total Productive Manufacturing) principles
- Knowledge and principles of visual performance measurement systems
- Knowledge and application of value chain principles

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made
- Work effectively with others as a member of a team and organization
- Organise and manage oneself and one's activities responsibly and effectively
- Collect, analyse, organise and critically evaluate information
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others
- Demonstrating an understanding of the world as a set or related systems by recognising that problem-solving contexts do not exist in isolation
- In order to contribute to the full personal development of each learner and the social and economic development of society at large, it must be the intention underlying any program of learning to make an individual aware of the importance of reflecting on, and exploring, a variety of strategies to learn more effectively; participating as responsible citizens in the life of local, national and global communities; being culturally and aesthetically sensitive across a range of social contexts

6. Demonstrate knowledge of semi-solid preparations in a Pharmaceuticals and FMCG Manufacturing environment		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	2
Credit(s)	**:**	2
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

This Unit Standard is intended for a person (operator or supervisor) who works, or intends to work, in a Pharmaceutical and FMCG manufacturing environment.

A person credited with this unit standard is able to:

- Demonstrate knowledge of the characteristics of quality semi-solid preparations.
- Demonstrate knowledge of a semi-solid preparation formula.
- Demonstrate knowledge of the general steps in the manufacture of semi-solid preparations.
- Demonstrate knowledge of the GMP principles applied in the manufacture of semi-solid preparations.
- Demonstrate knowledge of the importance of in-process checks in the manufacture of semi-solid preparations.

  Range: It is expected that knowledge and/or application of GMP, as well as Safety, Health and Hygiene regulations are assessed throughout this unit standard.

6. Demonstrate knowledge of semi-solid preparations in a Pharmaceuticals and FMCG Manufacturing environment		

Learning assumed to be in place

It is assumed that people learning towards this Unit standard have:

- Literacy NQF level 1 (ABET 4 language and communication skills)
- Numeracy NQF level 1 (ABET 4 Mathematics) or equivalent competencies.
- In addition, it is assumed that a person learning towards this unit standard is knowledgeable in, and able to apply, basic GMP (Good Manufacturing Principles) in a Pharmaceutical manufacturing environment; or is credited with the GMP Unit Standard (Pharma PP09).
- The learner should be able to demonstrate knowledge of Health and Safety principles.

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1:	**Demonstrate knowledge of the characteristics of quality semi-solid preparations.**

Assessment Criteria:

1.1 The purpose of a semi-solid preparation is explained as either containing an active ingredient, or as mechanical protection, or for cosmetic use.

1.2 The effect of formulation on the physical and chemical stability of the product is explained.

Range: Factors for evaluation include:
- Stability of ingredients
- Viscosity
- Incompatibilities of ingredients
- PH
- Microbial contamination

1.3 The need for a smooth product is explained.

1.4 The relationship between the ease of application and the type of preparation is explained.

1.5 The selection of a suitable base is explained.

1.6 The importance of the uniform distribution of active throughout the base and the effect of particle size are explained.

Specific Outcome 2: Demonstrate knowledge semi-solid preparation formulation

Assessment Criteria:

2.1 A definition of an ointment, gel, paste and cream is provided and the differences described.

2.2 The difference between an oil in water, and a water in oil system is explained.

6. Demonstrate knowledge of semi-solid preparations in a Pharmaceuticals and FMCG Manufacturing environment		

Specific Outcome 3 : Demonstrate knowledge of the general steps in the manufacture of semi-solid preparations

Assessment Criteria:

3.1 The stages of the semi-solid preparations manufacturing process are described.

3.2 The principles of Geometric dilution to obtain optimal homogeneity are explained.

3.3 The determination of the mixing temperature of the phases with respect to the melting point of the ingredients is explained.

3.4 The stage at which an emulsion inversion occurs is explained.

3.5 The importance of adding heat-sensitive ingredients during the cooling phase is explained.

3.6 The problems that may occur during, and after, manufacture of semi-solid preparations are described.

Range:

- The identification of factors causing aeration and the prevention and correction thereof is explained.
- The effect of excessive mixing or homogenisation on viscosity is explained.
- The term “cracking” is explained.

3.7 The safety procedures and personal protective equipment (PPE) relevant to semi-solid manufacture are explained.

Specific Outcome 4: Demonstrate knowledge of the GMP principles applied in the manufacture of semi-solid preparations.

Assessment Criteria:

4.1 The GMP principles carried out prior to, and during, the manufacture of semi-solid preparations are explained.

4.2 The procedure to be taken when any unusual mass, or other deviation occurs, is explained.

4.3 The correct environmental conditions of the semi-solid manufacturing area are specified.

Range:

- Temperature
- Relative Humidity (RH)
- Positive / negative pressure

4.4 The storage requirements, and conditions of storage of the semi-solid preparation, prior to packaging, are explained.

6. Demonstrate knowledge of semi-solid preparations in a Pharmaceuticals and FMCG Manufacturing environment		

Specific Outcome 5 : Demonstrate knowledge of the importance of in-process checks in the manufacture of semi-solid preparations.

Assessment Criteria:

5.1 The importance of in-process checks during the manufacture of semi-solid preparations, is explained.

Range:
- Viscosity
- Spreadability
- Colour
- Consistency

NOTES:

Accreditation and moderation options:

Assessment options:

1. Oral or written questions.
2. Direct observations in simulated or actual working conditions.
3. Examination of relevant documentation.

Embedded knowledge:

A person wanting to complete this standard id required to have the GMP standard (Pharma PP09) and the Unit Standard for Health and Safety Regulations in a manufacturing environment (FMCG).

Relevant Legislation:

OHS Act

Terminology

Standard Operating Procedure (SOP):
Controlled documentation, reflecting tasks, which are specific to the process and/or equipment being used.

Good Manufacturing Practise (GMP):
That part of Quality Assurance that ensures that a product is manufactured consisitently and controlled to Quality standards appropriate to their intended use.

Personal Protective Equipment (PPE):

This includes gloves, masks, overshoes, overcoats, safety shoes, etc.

6. Demonstrate knowledge of semi-solid preparations in a Pharmaceuticals and FMCG Manufacturing environment		

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES:

The following critical crossfield outcomes are addressed in this Unit Standard::

- Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made.
- Working effectively with others as a member of team, group, organisation or community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion.
- Using science and technology effectively and critically, showing responsibility towards the environment and the health of others.
- Showing responsibility towards oneself and others in accordance with the Health and Safety legislation and regulations.
- Understand how the incorrect storage of product can have a negative impact on products, clients, customers and business.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- Contributing to the full personal development of each learner and the social and economic development of society at large, by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
  - reflecting-on and exploring a variety of strategies to learn more effectively;
  - participating as responsible citizens in the life of local, national and global communities;
  - being culturally and aesthetically sensitive across a range of social contexts.

7.

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Produce word processing documents for business

SAQA US ID
UNIT STANDARD TITLE

7570
Produce word processing documents for business

SGB NAME
ABET BAND
PROVIDER NAME

SGB Information Systems and Technology
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Information Technology and Computer Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-ITC-0-SGB IST
Regular
Level 3
5

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2000-12-06
2003-12-06
7570
SAQA 0933/00

PURPOSE OF THE UNIT STANDARD

People credited with this unit standard are able to :?

demonstrate knowledge of the uses and advanced features of a word processing package on a personal computer (including use of spell-check and grammar checking tools)?

create and use bulleted and numbered lists and tables?

import and position pictures, images and objects into a word processing document?

use the mail merge feature?

Save the document in a format that it can be used in other applications

LEARNING ASSUMED TO BE IN PLACE

Open.

The credit value of this unit is based on a person having the prior knowledge and skills to produce and use word processing documents using basic functions.

UNIT STANDARD RANGE

UNIT STANDARD OUTCOME HEADER

Change appearance of document

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Change appearance of document.

OUTCOME NOTES

OUTCOME RANGE

Page and section numbers, date author, file name, symbol

SEQUENCE NUMBER

OUTCOME ID

0

2991

ASSESSMENT CRITERIA

1. Borders are added to a document.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2864

ASSESSMENT CRITERIA

2. An appropriate document template is chosen or created and used for a specific task.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61625

ASSESSMENT CRITERIA

3. Existing styles are applied to document.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61626

ASSESSMENT CRITERIA

4. Headers and footers are inserted into document and formatted.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61627

ASSESSMENT CRITERIA

5. Page breaks and section breaks are inserted.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61628

ASSESSMENT CRITERIA

6. Symbols, date and time and page numbers are inserted in the text.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61629

ASSESSMENT CRITERIA

7. Endnotes and footnotes are inserted.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61630

SPECIFIC OUTCOME 2

Check document for spelling and grammar.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2993

ASSESSMENT CRITERIA

1. Spell-check tool is used and appropriate changes are made.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2866

ASSESSMENT CRITERIA

2. Grammar tool is used and changes are made where appropriate.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61631

ASSESSMENT CRITERIA

3. Thesaurus is used.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61632

SPECIFIC OUTCOME 3

Create lists and tables in document.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2994

ASSESSMENT CRITERIA

1. Bulleted or numbered lists are inserted into document.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2867

ASSESSMENT CRITERIA

2. Bullets and numbers are formatted.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61633

ASSESSMENT CRITERIA

3. A standard table is created.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61634

ASSESSMENT CRITERIA

4. Table cell attributes are changed.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61635

ASSESSMENT CRITERIA

5. Rows and columns are inserted and deleted.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61636

ASSESSMENT CRITERIA

6. Borders are added to table.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61637

ASSESSMENT CRITERIA

7. Automatic table formatting tool is used.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61638

SPECIFIC OUTCOME 4

Add and manipulate Pictures, Images and Objects in a document.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2995

ASSESSMENT CRITERIA

1. A picture, image or graphics file is added to document.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Change line colours, line style, width and fill colours

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2868

ASSESSMENT CRITERIA

2. Autoshapes are added to document and manipulated.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Move, Re-size, Re-orientate

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61622

ASSESSMENT CRITERIA

3. A spreadsheet or derived image, chart or graph is added to a document.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61623

ASSESSMENT CRITERIA

4. An image within a document is manipulated.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61624

SPECIFIC OUTCOME 5

Use Mail Merge feature.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2996

ASSESSMENT CRITERIA

1. A mailing list or data file is created.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2869

ASSESSMENT CRITERIA

2. A letter or label list is created by merging mailing or data list with letter, label document or envelope.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61640

SPECIFIC OUTCOME 6

Document is saved in a different file format.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

3001

ASSESSMENT CRITERIA

1. Document is saved in a different file format.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Text file (.txt), Rich Text Format (.rtf), Document Template, Software type, Version

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2873

ASSESSMENT CRITERIA

2. Document is saved in format appropriate for viewing by a web browser.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Hyper Text Markup Language (.htm or .html)

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61639

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

UNIT STANDARD DEVELOPMENTAL OUTCOME

UNIT STANDARD LINKAGES

CRITICAL CROSS-FIELD OUTCOMES (CCFO):

UNIT STANDARD CCFO IDENTIFYING

UNIT STANDARD CCFO WORKING

UNIT STANDARD CCFO ORGANIZING

UNIT STANDARD CCFO COLLECTING

UNIT STANDARD CCFO COMMUNICATING

UNIT STANDARD CCFO SCIENCE

UNIT STANDARD CCFO DEMONSTRATING

UNIT STANDARD CCFO CONTRIBUTING

UNIT STANDARD ASSESSOR CRITERIA

UNIT STANDARD NOTES

UNIT STANDARD DOCUMENT NUMBER

UNIT STANDARD SEQUENCE NUMBER

0

8.

1. TITLE: Solve operating problems using process chemistry and related technology

---

2. UNIT STANDARD NUMBER:

3. LEVEL ON THE NQF: 3

4. CREDITS: 10

5. FIELD: Engineering, Manufacturing and Technology

Sub Field: Manufacturing and Assembly

6. ISSUE DATE:

7. REVIEW DATE:

8. PURPOSE:

This standard is aimed at people who work or intend to work within Manufacturing and/or Paackaging environment wwithin the Chemical or similar Industry. It will enable them to seek recognition for skills essential for operating within a chemical system.

Those learners who acquire the outcomes of this standard will know about and be able to solve operating problems using process chemistry and related technology, pertaining to the chemical or related Industries.

The qualifying learner is able to:

- Identify and quantify the process variables deviating from the standard during process operation
- Establish and execute the optimum action to be taken
- Select solutions
- Implement solutions and carryout follow-up activities

9. LEARNING ASSUMED TO BE IN PLACE

Learners accessing this unit standard will have demonstrated competence in the following Unit Standards or the equivalent:

- Application process chemistry and related technology in the chemical industry
- Operate a system within the Chemical Manufacturing and/or Packaging environment.
- Contribute to the Miantennace of a system
- Operate Equipment - Establish start up conditions
    - Start up and shut down equipment
    - Contribute to maintenance of equipment
- Maintaining health, hygiene and safety in a chemical environment

10. SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

Specific Outcome 1: **Identify and quantify the process variables deviating from the standard during process operation**

Assessment Criteria

1.1 Potential deviations from process and or operating specifications are noted

1.2 Trends (changes) of process and operating conditions are monitored and recorded

1.3 Extent of deviations are quantified

Specific Outcome 2: **Establish and execute the optimum action to be taken**

Assessment Criteria

2.1 Factors that influence the deviating variable(s) are identified

2.2 Factors are investigated to establish deviation from operating ‘norms’

2.3 (Probable) cause(s) of deviations are explained in terms of deviation from the norms of factors

Specific Outcome 3: **Select appropriate solutions**

Assessment Criteria

3.1 Possible actions to rectify deviations from 'norms' are explained

3.2 Expected result from each possible action are explained on the basis of applied process chemistry and experience of the operation

3.3 Appropriate and informed courses of action are chosen from the possible actions

3.4 Chosen actions are checked for compliance with the Operating Instructions and Standard Operating Procedures (SOP's)

Specific Outcome 4: **Implement solutions and carryout follow-up activities**

4.1 Chosen actions are applied

4.2 Changes of variables monitored are noted

4.3 Changes are evaluated against the expected results

4.4 Appropriate action is taken

11. ACCREDITATION AND MODERATION:

The Educational Training Quality Assurance Body (ETQA), for the Chemical Industry in consultation with GEN/FETQA will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

12. RANGE STATEMENT:

- Deviations are variations from the specified value or range of values that do not change during normal/stable operation.
- Trends are changes of values that occur over time (short or long duration)
- Process and operating specifications are the measurements and indications of all variables monitored during operations including temperatures, pressures flow rates, power consumption, noise, vibration and visual inspection …

- Changes are measurements and indications that may occur suddenly or over a period of time including changes within and beyond the limits specified in the (standard) operating instructions
- Changes exclude major changes that must be addressed in terms of (standard operating instructions or emergency drills)
- Quantifying deviations include amount of change and rates of change of the variable(s)
- Factors influence the deviation are included in the equipment/system or process operation are included in specific operating instructions and training
- Investigation includes indication of how factors change to influence results
- Explanation of probable causes includes the relationship between the technical causes indicated from investigating the factors and the deviations quantified
- Explanations include the changes to the variables that are expected to result from changing the factor(s) based on knowledge of process chemistry assumed to be in place

13. <u>NOTES:</u>

All problem solving must comply with (standard operating) instructions
Actions include making alterations required or permitted in terms of (standards operating instructions and safety training) and emergency actions
Appropriate actions include informing other people, recording information and additional problem solving

<u>EMBEDDED KNOWLEDGE:</u>

- Chemistry and process technology related to the chemical process
- Purpose and application of equipment used in the process
- Operation of the process and equipment

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made towards ensuring process operation
- Work effectively with others as a member of a team and organisation to avoid hazardous and emergency situations occurring and efficient process operation
- Organise and manage oneself and one's activities responsibly and effectively,
- Collect, analyse, organise and critically evaluate information
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion as part of the problem solving process
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others by addressing problems before they become hazardous or cause emergency situations
- Demonstrating and understanding the chemical process as a set or related systems
- In order to contribute to the full personal development of each learner and the social and economic development of society at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of identifying deviations from good practice and address this timeously

9.

1. TITLE: Conform to and apply legislation and operational instructions in Chemical processing

---

2. UNIT STANDARD NUMBER:

3. LEVEL ON THE NQF: 3

4. CREDITS: 4

5. FIELD: Engineering, Manufacturing and Technology
Sub Field: Manufacturing and Assembly

6. ISSUE DATE:

7. REVIEW DATE:

8. PURPOSE:

This standard is aimed at people who work, or intend to work, within a Manufacturing and/or Packaging environment with the Chemical or similar Industry. It will enable them to seek rfecognition for skills essential for operating within a chemical system.

Those learners who acquire the outcomes of this standard will know about and be able to conform to and apply legislation and operational instructions in chemical processing.

For the purpose of this standard the following is understood as a system:

- Equipment operated in combination to achieve a desired result in a chemical or related process operation
- Operating a system included the integrated operation of the equipment that makes up the system

The qualifying learner is able to:

- Explain relevant legislation and related standard operating procedures
- Review compliance in the workplace with relevant legislation and related standard operating procedures in a critical manner
- Comply with relevant legislation and related standard operating procedures
- Comment on compliance with relevant legislation and related standard operating procedures

9. <u>LEARNING ASSUMED TO BE IN PLACE</u>

- Learners accessing this unit standard will have demonstrated competence against the following Unit Standard:
  - *Maintain health, hygiene and safety practices in a chemical environment or the equivalent*
- Learners working towards the full qualification will have demonstrated competence against the unit standards in the National Certificate in Chemical Equipment Operations – NQF Level 2 or equivalent

10. SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

Specific Outcome 1: **Explain relevant legislation and related standard operating procedures**

Assessment Criteria

1.1 The purpose of Acts applicable to the chemical industry in broad terms are explained

1.2 The requirements of legislation and standard operating procedures are explained with reference to their application by a chemical process operator

1.3 The process followed to establish which legislation and standard operating procedures are applicable to at a work site is explained

Range:

- *Acts include SHE (Safety, health and environment), water, pollution, employment, operating equipment and the industry-specific legislation*
- *Legislation and standard operating procedures include requesting information, training, issue of relevant information by employer, role of the Department of Labour / Department of Mineral and Energy Affairs and other government departments if applicable*

Specific Outcome 2: **Review compliance in the workplace with relevant legislation and related standard operating procedures in a critical manner**

Assessment Criteria

2.1 The role and responsibilities of the appointed / responsible people in the learner's working environment are explained

2.2 The compliance of each person or group of people in the workplace in terms of the legislation and standard operating procedures are commented on

2.3 Reasons for non-compliance are explained

Range:

- *Responsible people include those in the learner's personal working environment*

Specific Outcome 3: **Comply with relevant legislation and related standard operating procedures**

Assessment Criteria

3.1 Standard operating procedures are complied when operating a chemical system or process

3.2 Deviations are found acceptable in terms of standard operating instructions for the site

Specific Outcome 4: **Comment on compliance with relevant legislation and related standard operating procedures**

Assessment Criteria

4.1 Productivity achieved in relation to legislation and related standard operating procedures are comment on

4.2 Relevance of legislation to process operations in personal working environment is commented on

4.3 Personal contributions are commented on

11. ACCREDITATION AND MODERATION:

The relevant Educational Training Quality Assurance Body (ETQA), will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

12. RANGE STATEMENT:

- Range statements applicable to the unit standard titles, specific outcomes and assessment criteria are found beneath the applicable assessment criteria.

13. NOTES:

- **EMBEDDED KNOWLEDGE:**

- Legislation applicable to the chemical process carried out on site
- Regulations applicable to the chemical process carried out on site
- Rule, policies, standard operating procedures pertaining to the site

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made towards identifying hazardous conditions, assessing and taking of appropriate action
- Work effectively with others as a member of a team and organisation to accept and interpret standard operating procedures correctly and to request assistance with making safe in an appropriate manner as a team member
- Organise and manage oneself and one's activities responsibly and effectively, while indicating what tools and personnel protective equipment is required and communicate to fellow workers his / her intentions
- Collect, analyse, organise and critically evaluate information to reconcile the information from the visual examination and constantly evaluate the changing situations
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion with the relevant personnel with regard to the reporting of hazards and sub-standard conditions which will indicate his / her proficiency in effective communication
- Demonstrating an understanding of the world as a set or related systems by recognising that problem solving contexts do not exist in isolation

10.
1. TITLE: Contribute to the maintenance of a system

2. UNIT STANDARD NUMBER:

3. LEVEL ON THE NQF: 3

4. CREDITS: 10

5. FIELD: Engineering, Manufacturing and Technology
Sub Field: Manufacturing and Assembly

6. ISSUE DATE:

7. REVIEW DATE:

8. PURPOSE:

This standard is aimed at people who work or intend to work within a Manufacturing and/or Packaging environment within the Chemical or similar industry It will enable them to seek recognition for skills essential for operating within a chemical system.

Those learners who acquire the outcomes of this standard will know about and be able to contribute to the maintenance of a system, pertaining to the chemical industry.

For the purpose of this standard the following is understood as a system:

- Equipment operated in combination to achieve a desired result in a chemical or related process operation
- Operating a system included the integrated operation of the equipment that makes up the system

The qualifying learner is able to:

- Explain the role of an operator in the maintenance function
- Prepare the system for maintenance
- Prepare the work area for maintenance
- Accept system back after maintenance is completed

9. <u>LEARNING ASSUMED TO BE IN PLACE</u>

- Learners accessing this unit standard will have demonstrated competence against the following unit standards or the equivalent:
  - Operate a system within a chemical manufactruing and/or packaging environment
  - Establish equipment start up conditions
  - Start up equipment
  - Shut down equipment

- Learners working towards the full qualification will have demonstrated competence against the unit standards in the National Certificate in Chemical Equipment Operations – NQF Level 2 or equivalent.

10. SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

Specific Outcome 1: **Explain the role of an operator in the maintenance function**

Assessment Criteria

1.1 The need for maintenance is explained

1.2 The consequences of maintenance on production and productivity are explained

1.3 The benefits of efficient maintenance are explained

1.4 The role of the operator in achieving the benefits are described with reference to the Site Operating Instructions or other site specific instructions

1.5 The importance of adhering to time scales is described

1.6 The effect of operating conditions on the equipment preparation and the operating principles of the equipment concerned are described

1.7 The effect of the physical and chemical properties of in-process materials on people and the environment is explained

1.8 The importance of complying with statutory regulations is explained

1.9 The importance of site procedures being implemented is described

1.10 Use of a permit system for regulating maintenance is explained

Range:

The benefits of efficient maintenance include safety, productivity, profitability, efficiency

Specific Outcome 2: **Prepare the system for maintenance**

Assessment Criteria

2.1 Equipment to work on is identified for maintenance personnel and appropriate personnel are notified about equipment to be prepared and are advised promptly of significant delays

2.2 The permit to work procedures are followed and the permits are cancelled if conditions are adversely changed or violated

2.3 Isolation procedures for all pertinent items of equipment is explained and correct items of equipment are isolated from process and energy source

2.4 Abnormal occurrences during isolation, venting, purging, draining or flushing are identified, described and equipment is drained, flushed, purged, vented and then isolated according to procedures

Range:

- *Site procedures include permit to work procedures, isolating procedures, flushing procedures, draining, venting and purging and flushing procedures, SOP's (Standard Operating Procedures).*
- *This unit standard applies to competency being displayed within a complex, specialised or automated operating system, or a system comprising a number of different pieces of Equipment within the Chemical Manufacturing and/or Packaging environments..*

Specific Outcome 3: **Prepare the work area for maintenance**

Assessment Criteria

3.1 Work areas are cleared of obstructions and the work area is prepared as specified by the permit to work procedures and entry is controlled

3.2 Hazardous materials to be removed are identified and hazardous material is removed from the area

3.3 How hazardous conditions can arise in previously cleared and prepared area is described

3.4 Any equipment that could be adversely affected by maintenance activities is securely shielded

3.5 Work area identified as hazardous is cordoned off when work presents a hazard to others, and when required by procedures

3.6 Permits are cancelled when conditions are adversely changed or violated

3.7 Appropriate personnel are informed of work area preparation and promptly advised of significant delays and of further information as requested

Specific Outcome 4: **Accept system back after maintenance is completed**

Assessment Criteria

4.1 Implications of accepting back an incomplete system are described

4.2 Outstanding faults are remedied and reported to appropriate personnel

4.3 System is checked to ensure that any maintenance equipment is removed

4.4 System is checked to ensure that debris is removed

4.5 System is checked to confirm integrity before accepting back

4.6 Permit conditions to commence production are fully met

11. ACCREDITATION AND MODERATION:

The relevant Educational Training Quality Assurance Body (ETQA), will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

12. RANGE STATEMENT:

- Range statement applicable to unit standard titles, specific outcomes and assessment criteria are found beneath the applicable assessment criteria.

- Site check tests include visual inspection, equipment integrity test and line up

13. NOTES:

EMBEDDED KNOWLEDGE:

- An in depth understanding of the terminology associated with appropriate systems
- A comprehensive understanding of operating principles and procedures
- A broad understanding of the plant and instrumentation diagrams
- A comprehensive understanding of the equipment used

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made towards the contribution of plant maintenance
- Work effectively with others as a member of a team and organisation to conduct, communicate and respond to plant activities during the contribution of plant maintenance
- Organise and manage oneself and one's activities responsibly and effectively, while contributing to plant maintenance
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion, with regards to reporting and recording of information and contribute to maintenance and conditions during the contribution of chemical plant
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others contributing to plant maintenance
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others during
- Demonstrating and understanding the chemical process as a set or related systems by
- In order to contribute to the full personal development of each learner and the social and economic development of society at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of

11.

1. TITLE: Respond to hazardous conditions or emergencies

2. UNIT STANDARD NUMBER:

3. LEVEL ON THE NQF: 3

4. CREDITS: 10

5. FIELD: Engineering, Manufacturing and Technology
Sub Field: Manufacturing and Assembly

6. ISSUE DATE:

7. REVIEW DATE:

8. PURPOSE:

This standard is aimed at people who work or intend to work within a Mnufacturing and/or Packaging environment within the Chemical or similar Industry. It will enable them to seek recognition for skills essential for operating within a chemical system.

Those learners who acquire the outcomes of this standard will know about and be able to respond to hazardous conditions or emergencies, pertaining to the chemical industry.

The qualifying learner is able to:

- Demonstrate an understanding of hazardous conditions and emergencies
- Report incidents, hazardous conditions or emergencies
- Respond to incidents, hazard conditions or emergencies
- Correct incidents, hazardous conditions or emergencies

9. <u>LEARNING ASSUMED TO BE IN PLACE</u>

- Learners accessing this unit standard will have demonstrated competence against the following Unit Standards or the equivalent
  - Operate a system within a Chemical Manufacturing and/or packaging environment.
  - Establish equipment start up conditions
  - Start up equipment
  - Shut down equipment
  - Contribute to maintenance of equipment
- Learners working towards the full qualification will have demonstrated competence against the unit standards in the National Certificate in Chemical Equipment Operations – NQF Level 2 or equivalent

10. SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

Specific Outcome 1: **Demonstrate an understanding of hazardous conditions and emergencies**

Assessment Criteria

1.1 Hazardous conditions are described in general

1.2 Hazardous conditions for a specific site are identified and described

1.3 Risks and dangers are identified and described with focus on risk to life, health, environment, equipment plant and productions/profitability in general terms

1.4 Potential incidents within the area of responsibility and action taken is explained

1.5 Immediate action activities are explained for the different hazardous conditions and emergency situations identified

Range:

- *Hazardous conditions and emergencies include incidents, emergencies and other significant unintended occurrences that affect production health safety and the environment if not attended to urgently.*
- *Examples of hazardous conditions used in this standard must include those that are specific to the site where the learner is working and learning takes place*
- *Description of immediate action activities are described in accordance with Standard Operating Instructions or other site specific instructions*

Specific Outcome 2: **Report incidents, hazardous conditions or emergencies**

Assessment Criteria

2.1 Nature, location and scope of incident is verified

2.2 Incidents, hazardous conditions and emergencies are reported immediately

2.3 Alarms are raised within specified time frames

2.4 The types of incidents, hazardous conditions or emergencies which should be reported are identified and described

2.5 How the alarm should be raised for each type of incident is explained

Range:

- *Incidents, hazardous conditions or emergencies may include fire, flood, toxic vapour and liquid release, uncontrolled release of chemical substance(s), explosion, injured person, major plant or service failure, control room equipment failure.*

Specific Outcome 3: **Respond to incidents, hazard conditions or emergencies**

Assessment Criteria

3.1 Alarms are raised in the prescribed manner

3.2 The initial response to the incident, hazardous conditions or emergencies is explained

3.3 The need for specified safety equipment is explained

3.4 His / her designated role during emergencies are identified and explained

3.5 Alarm should be raised is explained in accordance with the procedure specified

Specific Outcome 4: **Correct incidents, hazardous conditions or emergencies**

Assessment Criteria

4.1 Incidents, hazardous conditions or emergencies are corrected without compromising safety

4.2 The incident, hazard, emergency is minimised and the situation handled to minimise waste and loss

4.3 Appropriate people are informed as actions are taken

4.4 Appropriate procedure is followed after assessment of situation

4.5 The correct actions, according to relevant procedures are taken to make the process safe and deal with the incident, without endangering self and others

4.6 Appropriate first aid response to casualties are identified, explained and demonstrated

11. ACCREDITATION AND MODERATION:

The relevant Educational Training Quality Assurance Body (ETQA), will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

12. RANGE STATEMENT:

- Range statements, which are applicable to unit standard titles, specific outcomes and assessment criteria are found beneath the applicable assessment criteria.

The following range statements are general to the qualification:

- Section procedures may include sectional or emergencies plans, environmental procedures, plant emergency procedures
- Sectional records may include verbal and written
- Emergency equipment may include specialized safety apparatus

13. NOTES:

As it is not practical to assess this standard during normal operations, the following alternative assessment is recommended:

- Knowledge issues should be assessed through appropriate question and answers.
- Skills and practice should be assessed through appropriate simulations

EMBEDDED KNOWLEDGE:

- Plant operating manual
- Emergency procedures for plant and site
- Radio procedures
- Hazardous / first aid to relevant chemicals or toxic hazards
- Emergency procedures, plant, equipment and personnel

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made towards
- Work effectively with others as a member of a team and organisation to conduct, communicate and respond to activities
- Organise and manage oneself and one's activities responsibly and effectively, while
- Collect, analyse, organise and critically evaluate information on
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion, with regards to
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others during
- Demonstrating and understanding the chemical process as a set or related systems by
- In order to contribute to the full personal development of each learner and the social and economic development of society at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of

12. Operate a System within a Chemical Manufacturing and/or Packaging environment		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	3
Credit(s)	**:**	24
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

This unit standard is intended for people who work, or intend to work, in a Chemical Manufacturing Environment. This unit standard will contribute towards the achievement of a National Certificate in Chemical Manufacturing at NQF Level 3.

People credited with this unit standard are able to perform and/or co-ordinate the following:

- Prepare and start up a number of different pieces of equipment within a manufacturing and/or packaging system
- Complete checks and tests for the system start-up, communicate the results of such checks and report abnormal pre-strt-up system conditions
- Start up a system and ensure it attains normal operating conditions, communicate the results of the start-up and correct abnormal system start-up conditions.
- Operate an automated system, as well as a number of pieces of equipment within the manufacturing and/or packaging system
- Monitor and maintain system condiitions during the process
- Shut down the system to a specified state, communicate the results of the shut-down and correct abnormal shut-down conditions.
- Clean the equipment and components within the system
- Conduct and co-ordinate post-manufacturing processes

For the purpose of this qualification, the following is considered to be a system:

- Equipment Operated in combination to achieve a desired result in a Chemical or related process operation.
- Operating a system includes the integrated operation of the equipment that makes up the system.

12. Operate a System within a Chemical Manufacturing and/or Packaging environment		

LEARNING ASSUMED TO BE IN PLACE :

Learners accessing this unit standard will have demonstrated competence at the equivalent of ABET 4 in Mathematics and language and communication. It is also an advantage to have competence equivalent to NQF 2 in Science and Technology.

The learner will also have demonstrated comptence against the following Unit Standards, or equivalent:

- Contribute to the maintenance of a system
- Conform to and apply legislation and operational instructions in Chemical processing
- Respond to Hazardous conditions or emergencies

Learners working towards the full qualification will have demonstrated competence against the Unit Standards in the National Certificate in Chemical Equipment Operations – NQF Level 2 or Equivalent.

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1: Plan the Manufacturing and/or Packaging process

Assessment Criteria:

1.1 The process is planned against production schedule requirements.

1.2 The availability of materials, tools and equipment necessary for the process is checked and ensured to be available.

1.3 Materials, tools and equipment and tasks are appropriately allocated.

1.4 Requirements are communicated to the appropriate personnel timeously and effectively.

Specific Outcome 2: Set up the Manufacturing and/or Packaging process

Assessment Criteria:

2.1 Material requirements and specifications are determined.

2.2 Process parameters are checked and set accordingly.

Range: Temperature, humidity, viscosity, flow, pressure, emissions, cycle times, tonnage, consumption of auxiliary services, quality specifications, mass.

2.3 Process set up meets specifications.

2.4 Process tools, consumables and material are available timeously and utilized according to operational requirements.

12. Operate a System within a Chemical Manufacturing and/or Packaging environment		

Specific Outcome 3	Control, co-ordinate and monitor the process

Assessment Criteria:

3.1 Process variables and deviations are monitored, controlled and corrected where necessary.

3.2 Process performance is monitored and trends analysed and compared. Suggestions for optimisation of equipment operation and process performance are provided.

3.3 Process flow is monitored and adjusted.

3.4 Process variations are identified and corrected.

3.5 Process is controlled to ensure continuous production flow.

3.6 The process and equipment is shut down in accordance with operational instructions and standard operating procedures.

3.7 Production goals are met.

3.8 Manufacturing process cycle time meets customer and company requirements.

Specific Outcome 4	Inspect product-in-process against quality specifications

Assessment Criteria:

4.1 Interpret sample analysis

Range: Inspection activities include visual checks, measuremnet of product dimensions, mass, density, shape, hardness, dissolution, friability, requirements pertaining to specific materials and components, product properties, tensile.

4.2 Product complies with customer specifications.

4.3 Product inspection procedures are adhered to.

Specific Outcome 5	Recognize and respond to process problems

Assessment Criteria:

5.1 Idenmtify the root cause ofr quality problems

5.2 Make the necessary adjustments ciorrectly and timeously in order to bring the

process operation back within the required parameters.

5.3 Adjustements to the process are made to comply with company and customer requirements.

5.4 Test the corrective action made to determine if the problem has been solved.

Specific Outcome 6	Complete the changeover process

Assessment Criteria:

6.1 Instruct and discuss forward actions with the team members to ensure that they Carry out the required functions correctly and timeously.

4.4

Specific Outcome 7	Work safely with due care for self, fellow workers, equipment, materials and the environment.

Assessment Criteria:

7.1 Procedures for working safely within the working environment are followed and adhered to.

Specific Outcome 8	Record all activities and results

Assessment Criteria:

8.1 Procedures for recording of information and completioon of documentation are adhered to.

8.2 Documentation is systematically, timeously and correctly completed.

8.3 Documentation is kept up-to-date and results are recorded and monitored.

12. Operate a System within a Chemical Manufacturing and/or Packaging environment		

Specific Outcome 9	**Discuss and explain information relating to planning of the process, setting up, controlling the process and the products produced.**

Assessment Criteria:

9.1 Procedures for setting up, controlling, inspecting of product and changeover are followed and adhered to.

9.2 Staff are communicated to timeously and effectively regarding the planned process and the operating requirements.

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Examination of an assessment portfolio.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

RANGE STATEMENTS:

The learner utilizing this Unit Standard is expected to set-up, monitor, adjust and control a manufacturing process within the Chemical manufacturing industry. They will be expected to erffectively utilize all of the resources at their disposal including material, financial, equipment and personnel.

12. Operate a System within a Chemical Manufacturing and/or Packaging environment		

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made by:
  - Solving common problems associated with the operation of a complex opearting system .

- Collect, analyse, organise and critically evaluate information by:
  - Evaluating if the operation of the system meets the requirements provided in the SOP's. Monitoring and controlling the operation of the system.

- Work effectively with others as a member of a team, group, organisation or community by:
  - Preparing to start up the system
  - Operating the system to produce a chemical product
  - Shutting down the system
  - Cleaning of the system
  - Problem solving
  - Optimizing system operation
  - Improving quality and productivity
  - Co-ordinating and controlling all of the above functions

- Collect, analyse, organise and critically evaluate information by:
  - Evaluating if the operation of the system meets the requirements provided.

- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations by:
  - Interpreting Documents
  - Completing documents pertaining to the operation of the systems

- Use science and technology effectively and critically, showing responsibility towards the environment and health of others by:
  - Explaining the technology appropriate to the operation of the system and its significance on the overall operation and the nature of the product/s being manufactured.

- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation by:
  - Relating safety, health, environmental and quality best practice to the automated production process.

- Contribute to the full personal development of each learner and the social and economic development of the society at large.

EMBEDDED KNOWLEDGE:

Process Chemistry and related technology. Health, safety, environmental, productivity and quality principles relevant to each specific outcome.

13. PHARMACEUTICAL SUBSECTOR

Title:	Fill Suppositories in a Chemical Manufacturing Environment
Note:	This unit standard is suitable for use mainly in a Pharmaceutical manufacturing environment .
Level:	2
Credit:	8
Field:	NSB06: Manufacturing, Engineering and Technology
Sub Field:	Manufacturing and Assembly
Issue date:	
Review date:	
Learning assumptions:	It is assumed that people learning towards this unit standard, have: ➢ Literacy NQF level 1 (ABET 4 language and communication skills) ➢ Numeracy NQF level 1 (ABET 4 Mathematics) or equivalent competencies ➢ In addition, it is assumed a person learning towards this unit standard is knowledgeable in, and able to apply, Good Manufacturing Practices (GMP) in a pharmaceutical environment, or is credited with the GMP unit standard (PHARMA PP09). ➢ The person should be able to demonstrate knowledge of Health and Safety principles (FMCG unit standard) ➢ The person should have an understanding of product - specific technology relating to suppositories (PHARMA PP13).
Purpose:	This unit standard is for a person who works or intends to work in a Chemical or Pharmaceutical manufacturing environment (Refer note above). A person credited with this unit standard is able to: • Prepare to fill suppositories • Fill suppositories • Conduct post-suppository filling processes
Range statement:	It is expected that knowledge and / or application of GMP and Safety, Health and Hygiene regulations are assessed throughout this unit standard.

Specific Outcomes and Assessment Criteria

Specific Outcome 1: Prepare to fill suppositories.

Range: Preparation is limited to equipment checks, preparation of the work area, preparation of self, as well as encapsulation materials and components. Preparation may include additional weighing.

Assessment Criteria:

1.1 Correct dress code, safety and personal health and hygiene requirements are complied with in accordance with company specific requirements.

1.2 All production documentation for the job is verified, relevant and consistent with production requirements, SOP's (Standard Operating Procedures) and other company-specific requirements.

1.3 The work area is ensured to be clean, tidy and free from contamination from other products or materials in accordance with SOP's. Environmental conditions are checked to be in compliance with SOP's. Corrective action is taken where necessary in accordance with SOP's and deviations are reported to designated personnel where appropriate.

1.4 The suppository filling equipment, as per the Batch Manufacturing Record (BMR), is verified as having been cleaned and in good working order in accordance with company SOPs.

1.5 The calibration status of the scales and other measuring equipment is checked and verification performed in accordance with SOPs. Discrepancies are reported to the designated personnel and appropriate corrective action taken where necessary.

Range:
Corrective action involves actual calibration and/ or arranging for calibration.

1.6 Equipment is set within the specified parameters in accordance with the BMR (Batch Manufacturing Record). Relevant settings and / or adjustments are described in terms of the effect on product quality. The cleaning, maintenance and calibration of equipment is carried out in accordance with the relevant SOP's.

1.7 Bulk product and packaging materials are checked to be of the right type, quantity, quality and batch or lot number, in accordance with the BMR. Bulk product is transferred to the manufacturing area on schedule. Restricted bulk product is ensured to be issued by the designated personnel and transferred to the manufacturing area.

Range:
Restricted bulk product includes any raw material that has limited access eg Schedule 6 & 7 materials, hazardous materials, environmentally sensitive or security-sensitive materials.

1.8 The preparation process is completed as per the relevant documentation. The documentation accurately reflects the status of each preparation stage, is signed off and where and when required, and the status of the preparation process is communicated to the designated personnel.

1.9 The importance of thorough preparation, and the consequences of poor preparation, is described in terms of the effect on safety, quality and efficacy of product, as well as the impact on productivity.

Specific Outcome 2: Fill suppositories

Assessment Criteria:

2.1 The documented steps are followed sequentially, documentation is completed, and the relevant steps are authorised by designated personnel at designated stages.

2.2 Bulk product and packaging materials are checked, weighed if applicable, and processed as per the BMR and in accordance with SOP's.

Range:
Checking includes the label identity, temperatures where applicable, as well as physical appearance.

2.3 Samples are taken according to the BMR and SOP's.

2.4 In-process checks are performed as and when required in accordance with the BMR and SOP's.

2.5 Deviations from the BMR and / or machine breakdowns, should they occur, are recorded and communicated to the designated personnel, and the relevant corrective measures are ensured to have been taken before proceeding.

Specific Outcome 3: Conduct post-suppository filling processes

Assessment Criteria:

3.1 Documentation is completed accurately and in accordance with SOP's.

3.2 The containers used are verified to be appropriate to the product and correctly labelled in accordance with the BMR and SOP's.

3.3 Filled suppositories are checked for correct quantity, quality and physical appearance and the results are accurately documented. Should deviations from the BMR occur, these are to be recorded and reported to the designated personnel and corrective measures are ensured to have been taken.

3.4 Filled suppositories are staged in the correct area and under the correct conditions as specified in the BMR.

Range :
Stage means intermediate storage before further processing.

3.5 The product status is communicated timeously to the designated personnel, where applicable.

3.6 The suppository filling equipment is cleaned, checked for defects, labelled and stored after use, in accordance with the SOP's. Defects are recorded and reported to the designated company personnel.

3.7 The work area is cleaned in accordance with SOP's.

NOTES:

Accreditation and moderation options:

Assessment options:

1. Oral or written questions.
2. Direct observations in simulated or actual work conditions
3. Examination of relevant documentation.

Critical crossfield outcomes:

The following critical crossfield outcomes are addressed in this unit standard:

a. Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made.
b. Working effectively with others as a member of a team.
c. Organising and managing oneself and one's activities responsibly and effectively
d. Communicating effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion
e. Using science and technology effectively and critically, showing responsibility towards the environment and health of others
f. Show responsibility towards oneself and others in accordance with the Health and Safety legislation and regulations.
g. Understand how the incorrect storage and handling of products will have a negative impact on products, clients, customers and business.
h. Contributing to the full personal development of each learner and the social and economic development of the society at large, by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
   (i) reflecting on and exploring a variety of strategies to learn more effectively;
   (ii) participating as responsible citizens in the life of local, national and global communities;
   (i) (iii) being culturally and aesthetically sensitive across a range of social contexts

Embedded Knowledge:
A person wanting to complete this standard is required to have GMP standard (PHARMA PP09) and the Health and Safety regulations in a manufacturing environment unit standard (FMCG).

Relevant Legislation

- OHS Act

Terminology

***Batch Manufacturing Record (BMR)**:*

Sometimes called Manufacturing Order, Master Manufacturing Instruction or Work's Order. It refers to the recipe, method, specifications and record of production.

***Standard Operating Procedure (SOP)**:*
Controlled documentation, reflecting tasks, which are specific to the process and / or equipment being used.

Batch:
Sometimes called Lot, identifies the defined portion of the production run.

***Good Manufacturing Practices (GMP)*:**
That part of Quality Assurance that ensures a product is manufactured consistently and controlled to quality standards appropriate to their intended use.

Suppositoriy:
A semi-solid pharmaceutical preparation intended for rectal administration.

14

TITLE: Apply quality procedures

UNIT STANDARD NUMBER: **Generic019**

LEVEL ON NQF: **3**

CREDITS: **8**

FIELD: **Manufacturing, Engineering and Technology**

SUB FIELD:

ISSUE DATE:

REVIEW DATE:

PURPOSE:

The skills, values and knowledge reflected in this unit standard are required by people in the field of manufacturing and engineering.

The learning outcomes in this unit standard also contribute to the exit level outcomes required for various manufacturing and engineering qualifications.

Qualifying learners can perform quality procedures in their work area. They are able to demonstrate an understanding of quality assurance requirements and relate and apply these in their work.

LEARNING ASSUMED TO BE IN PLACE:

This unit standard has been designed as part of a progression. It is one of a series of unit standards for quality within the field of manufacturing and engineering.

SPECIFIC OUTCOMES

1. Explain and discuss the quality assurance system and quality objectives, standards, elements and quality specific requirements in work area

2. Apply quality procedures and standards in work area

- Perform duties in a quality conscious manner
- Sample and inspect materials and products at regular intervals
- Select and use appropriate instruments and gauges related to quality processes
- Determine non-conformances against appropriate standards
- Label and separate non-conforming materials and product

3. Handle and care for instruments and gauges related to quality processes

   Range:

   Handle and care for includes checking, cleaning, maintaining and storing

4. Recognise and report on quality problems in work area
   - Identify potential quality problems and any conditions that present a threat to quality maintenance
   - Inform appropriate parties

   Range:

   Quality problems include problems related to materials, product-in-progress, final product and equipment functioning

ASSESSMENT CRITERIA

Results achieved

1. An understanding of the quality assurance system and quality objectives, standards, elements and quality specific requirements in work area is demonstrated
2. Quality procedures and standards are adhered to in work area
3. Quality problems in work area are recognised and reported in a timely manner

Indicators

1. Explanations on quality issues are given in a clear manner using appropriate examples from learner's own work experience and work area
2. Quality assurance activities are carried out at regular and required intervals
3. Instruments and gauges related to quality processes are handled and cared for appropriately

Understanding confirmed

1. Respond to 'what if' and 'why' questions covering:

- Purpose of quality assurance
- The quality assurance system, quality objectives, standards and elements and quality requirements of work area
- Quality standards and procedures
- Types of non-conformances
- Instruments and gauges related to quality processes
- Quality problems
- Reporting procedures

ACCREDITATION AND MODERATION:

The assessment will be governed by the policies and guidelines of the MERSETA Education and Training Quality Assuror (ETQA) who has jurisdiction over this field of learning.

The assessor will (at the very least) be accredited and have a technical qualification in this learning area.

The learner can be assessed in the language of his/her choice although if s/he has to report incidents or conditions to some one else, s/he will be assessed on his/her ability to report in the language commonly used in the working environment.

The learner will be assessed in the workplace or by simulation, but can submit documents, projects, test results and assignments that are not produced in the workplace or by the RPL process.

The learner can be assessed against this unit standard to obtain credits or as part of an integrated assessment for a qualification.

RANGE STATEMENT:

The scope and level of this unit standard is determined by the ranges as indicated under the specific outcomes.

NOTES:

Essential Embedded Knowledge

1. Purpose of:
    - Assuring quality

2. Attributes, descriptions, characteristics & properties:
    - The Quality assurance system, quality objectives, elements and standards

- Quality requirements in work area

3. Cause and effect, implications of:
   - Implications of failing to detect quality problems and/or conditions that present a threat to quality maintenance

4. Procedures and techniques:
   - Quality procedures

5. Regulations, legislation, agreements, policies, standards:
   - Applicable quality standards

6. Theory: rules, principles, laws:
   - Basic principles of quality assurance

7. Relationships, systems:
   - Relationship between quality assurance and customer satisfaction
   - Relationship between quality requirements and customer requirements

Critical Cross-Field Education & Training Outcomes

1. Identify and solve problems
   - Related to quality problems in work area

2. Collect, analyse, organise and critically evaluate information
   - Related to identifying non-conformances to quality procedures and standards

3. Communicate effectively
   - Recognise and report on quality problems in work area

4. Demonstrate an understanding of the world as a set of related systems
   - Describe the relationship between quality requirements and customer requirements

15. PHARMACEUTICAL SUBSECTOR

Standard No.: PHARMA13(e)/00

Title:	**Demonstrate knowledge of suppositories**
Level:	2
Credit:	3
Field and Sub Field:	Manufacturing, Engineering and Technology Pharmaceutical Products
Issue date:	
Review date:	
Purpose:	Persons credited with this unit standard are able to: ➢ Demonstrate knowledge of suppositories ➢ Demonstrate knowledge of moulding suppositories This standard is useful to operators and supervisors in a pharmaceutical production environment.
Learning assumptions:	Basic literacy (ABET 4 reading and writing) Numeracy (ABET 3 mathematics) Basic pharmaceutical production knowledge including GMP and Safety

Specific Outcomes and Assessment Criteria

Specific Outcome 1: Demonstrate knowledge of suppositories

Assessment criteria:

1.1 The advantages and disadvantages of suppository medication are given.
1.2 The properties of an ideal suppository base are given.

Specific Outcome 2: Demonstrate knowledge of moulding suppositories

Assessment criteria:

2.1 The problems that may occur during manufacture are explained.
RANGE: overheating of base - decomposition
vigorous mixing – air bubbles
2.2 The basic principles of suppository moulding are explained.
2.3 The problems that occur during mould filling are explained.
RANGE: Content uniformity
Homogeneity
Pin-holing
2.4 The importance of careful packaging and storage are explained.
2.5 The specific suppository labelling requirements are given.
2.6 The required calculations are performed accurately.
RANGE: average suppository mass
individual suppository mass
range of average masses
yield

Specific Outcome 3: Demonstrate knowledge of the GMP and safety principles applied in suppository moulding.

Assessment criteria:

3.1 The GMP principles carried out prior to and during suppository moulding are explained.
3.2 The procedure to be taken when any deviation occurs is explained.
3.3 The safety procedures and Personal Protective Equipment (PPE) relevant to suppository moulding are explained.

Critical Crossfield Outcomes:

This unit standard addresses the following critical crossfield outcomes:

Critical crossfield outcome	
Identify and solve problems using critical and creative thinking	*solving problems and deviations occurring during manufacture*
Communicate effectively	*effective oral communication of knowledge during assessment*
Collect, analyse, organise and critically evaluate information	*performing calculations applicable to suppository moulding*

Essential embedded knowledge:

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that for the most part, the possession or lack of the knowledge can be directly inferred from the quality of the candidate's performance. Where direct assessment of knowledge is required, assessment criteria have been included in the body of the unit standard.

- GMP – *see assessment criterion 3.1*

Supplementary information:

Definition of terms:

PPE: Personal protective equipment, including gloves, masks, overshoes**,** overcoats, safety shoes

GMP: Good Manufacturing Practice means the part of quality assurance which ensures that medical products are consistently produced and controlled to the quality standards appropriate to their intended use.

Relevant Legislation:

OHS Act of 1997

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	3
Credit(s)	**:**	8
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

This unit standard is intended for people who work, or intend to work, in a Chemical Manufacturing environment. It is particularly useful for operators who work within the FMCG environment involved in the manufacture of personal products. This unit standard will contribute towards the achievement of a National Certificate in Chemical Manufacturing at NQF Level 3.

A person credited with this standard will be able to:

- Prepare to mix liquid personal products.
- Mix Liquid personal products
- Sample mixed personal products
- Shut down the mixing equipment
- Clean the mixing equipment

LEARNING ASSUMED TO BE IN PLACE :

Learners accessing this unit standard will have demonstrated competence to:

- ABET 4 in Language and communication
- ABET 3 in Mathematics
- It is also an advantage to have competence equivalent to NQF 2 in Science and Technology.

It is also recommended that the learner has demonstrated competence against the following Unit Standard:

PP/06 – *Implement Hygiene and safety practices*

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1:	**Prepare to mix liquid personal products**

Assessment Criteria:

1.1 The condition of vessels and equipment is clarified from hand-over documents. Problems with the equipment during the previous shift, or anything which could delay production are noted and investigated. Work permits are checked to see if the equipment is being worked on, or if it is safe to start mixing personal products.

Range: status is established as follows:

- Priorities are established in accordance with the production plan.
- Incomplete work is verified (eg. Work permits not signed off).

1.2 All equipment is verified to be free from faults. Any faults within the operator's scope are repaired. System faults, and faults which are not the responsibility of the operator, are reported to the designated persons, as shown in the checklists and/or fault-finding guidelines.

Range: *Integrity:*

- Air and/or
- Chilled water leaks and/or
- Poor vacuum

Verification:

- Plant start-up safety checks
- Visual inspection
- Micro switches
- Doors
- Magnetic switches
- Emergency stops
- Guards

Jursidiction

- Tighten fasteners
- Lubricate
- Replace worn parts and/or components
- Reset
- Align

1.3 The pre-programmed recipe is the correct one for the scheduled production. It is available and selected by the agreed time.

1.4 Mixing equipment is free from contamination and ready for use, before production is about to begin.

1.5 There are enough materials (ingredients) for mixing to meet planned and expected production needs. Any shortages are reported to the appropriate persons promptly so that there is no delay in production.

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

1.6 Any difference in the appearance or quality of ingredients from specification is identified. The appropriate corrective action is taken so that down time is kept to a minimum.

1.7 The preparation for mixing personal products follows the guidelines in organisational policies and procedures.

1.8 Personal Protective Equipment (PPE) is worn so that it protects the operator. It also prevents the product being spoiled. All protective equipment is worn or used as described in the maker's instructions, company policy and safety legislation.

1.9 Safety equipment is checked to make sure that it is available and in good working order.

Range: *Safety equipment:*

- Showers
- Eye baths
- Fire extinguishers
- First Aid boxes

1.10 Good housekeeping is applied throughout the shift. The work environment is clean And free from hazards in line with documented best practice and Standard Operating Procedures.

Range: *Housekeeping:*

- Product spills
- Leaks
- Proper storage

Practices:

- 5 S's Inspections
- Standardised visual controls
- Audits

Specific Outcome 2:	**Mix liquid personal products**

Assessment Criteria:

2.1 The correct ingredients are combined in the specified quantities, using computerised automated equipment.

2.2 The equipment speed is monitored against the recommended operating range of the equipment at the required intervals. The temperature of the ingredients is matched to production specifications at agreed intervals. Any adjustments made are in line with guidelines for corrective action or set procedures for product improvement.

2.3 Mixed personal products are tested to see that they meet with product specifications. Adjustments that are made follow the guidelines provided.

Range: *Specifications:*

- PH
- Viscosity
- Colour
- Perfume
- Moisture content
- Specific gravity

2.4 Mixing is carried out carefully so that product wastage is kept to a minimum. Spilled or incorrectly mixed product is recovered and reworked where possible.

2.5 The mixing of personal product meets with organisational policies, procedures and legislation.

2.6 Any differences from normal computerised automated mixing equipment performance are noted. Operators adjust the equipment if they are trained to do so. If not, they report to those who are trained to act, without delay, so that there is no wasted production time.

Range: *Best Practice:*

- Visual checks
- "Look, listen and feel" exercise

Variances:

- Pump failures
- Power surges
- Flow speed
- Motor overload

2.7 Good housekeeping is applied throughout the shift. The work environment is clean and free from hazards in line with documented best practice and Standard Operating Procedures.

Range: *Houskeeping:*

- 5 S's Inspections – product spills, leaks
- Equipment storage standards applied

2.8 Checklists or forms that report on the mixing of liquid personal product are accurate, complete and available as set out in the Standard Operating Procedures.

Range: *Documentation:*

- Manually completed batch sheets
- Response to PLC prompts
- Visual performance measurement system
- Quality management system

2.9 Ways of improving the mixing of the product are noted and reported to the persons responsible for incorporating the changes.

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

Specific Outcome 3	**Sample and test mixed products**

Assessment Criteria:

3.1 Sampling during the reaction is accurate. The correct tests are applied so that the key variables are monitored, as laid down in the standard operating procedures.

Range: *Key variable tests:*

- Specific gravity
- PH
- Perfumes, smell
- Chloride
- Non-volatile residue
- Refractive index
- Viscosity, levels
- Colour
- AD

3.2 Test results are matched with product specifications. Non-conforming product is adjusted as required by the result guidelines.

3.3 Sampling and testing equipment is available, calibrated and ready for use at the specified time.

Range: *Equipment:*

- Beaker
- AD Solution
- PH meter
- Cohesion meter
- SG CUP
- Viscometer

3.4 Non-conforming product is recovered and reworked wherever possible so that waste is kept to a minimum.

3.5 Data on sampling is accurate and complete, and captured and stored according to organisational policies.

Range: *Documentation*

- IP Lab
- Back-up book

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

Specific Outcome 4	Shut down and clean mixing equipment

Assessment Criteria:

4.1 The shut down sequence is correct according to the Standard Operating Procedures.

4.2 Automated and manual cleaning equipment is available and ready for use at the agreed time.

4.3 The computerised, automated C.I.P. (Clean-in-place) cleaning cycle selected and implemented is correct for the particular machine and type of product.

4.4 The equipment is checked after C.I.P. and remnants are removed by additional manual cleaning where necessary.

Range: *Equipment:*

- Hoses
- Sprayballs
- Water blaster
- Scrubbing brushes

4.5 Mixing equipment is clean and free from contamination by the agreed time after shut down.

4.6 Shutdown and cleaning of mixing equipment meets with organisational policies, procedures and legislation.

4.7 Effluent water from the operating and cleaning processes is treated and disposed of in a way that meets with environmental best practice, organisational policies, procedures and legislation.

4.8 Personal Protective Equipment (PPE) is worn so that it protects the operator and prevents the product from being spoiled. All protective equipment is worn or used as described in the manufacturer's instructions, company policy and safety legislation.

4.9 Good housekeeping is applied throughout the shift. The work environment is clean and free from hazards in line with documented best practice and Standard operating Procedures.

Range: *Housekeeping:*

- Product spills
- Leaks
- Proper storage

Practices:

- 5 S's Inspections
- Standardised visual controls
- Audits

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

Assessment options include:

- Short written answers to oral or written questions.
- Oral questions and answers in a structured interview.
- Direct observation in simulated or actual working conditions.
- Examination of relevant documentation.

RANGE STATEMENTS:

Equipment
Computerised - programmable logic control, keyboard, monitor.
Mechanical – heat exchangers, emulsifiers, disintegrators, dosing plant, pumps, valves, stirrers, measuring gauges, thermometers, pipework, hoses, couplings, viscometer, extractor fans, filters.

Autonomous Maintenance
This means that the operator can do 50% of "traditional artisan work".

The operator:
- *Has a working knowledge of:* filters, fans, seals, pumps, bearings, drive systems, pneumatics, hydraulics, basic electricity, alignment.

- *Can perform:*
  - lubrication,
  - basic machine maintenance and repair (replace worn parts including belts, blades, chains, seals, certain sub-assemblies);
  - advanced maintenance (resets, replaces components, align drivers);
  - fault-finding on own equipment and make running adjustments;
  - advanced fault diagnosis (to assess whether electrical or mechanical assistance is required);
  - conduct own changeovers and set-ups in accordance with Standard Operating Procedures, without requiring assistance;
  - basic condition monitoring.

- *Can recommend:*
  - equipment modification for efficiency.

- *Can assist:*
  - Artisan to modify equipment to improve efficiency.

- *Can use and maintain own set of tools*
- *Use centralised specialised tools*
- *Use and interpret built-in diagnostics* (lights, alarms, gauges, limit switches)
- *Use technical information* (Drawings, manuals, catalogues)

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

Ingredients
Personal products – water, lime, emollients, surfactants, colours, preservatives, active, potash.

Legislation
OHASA Act

Products
Toothpaste, Hair care, lotions, PJ.

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Use Science and technology effectively and critically.
- Work effectively with others and in teams.
- Organise and manage oneself and one's activities responsibly and effectively.
- Solve problems.
- Understand the inter-related parts of a system.
- Collect and critically evaluate information.
- Effectively demonstrate some oral and written communication.

EMBEDDED KNOWLEDGE:

Technical

- Working knowledge of production services
- PLC operation
- Mixer operation
- Autonomous maintenance of mixing machinery
    - Heat exchangers
    - Emulsifiers
    - Disintegrators
    - Dosing plant
    - Pumps
    - Valves
    - Stirrers
    - Pipe work
    - Hoses
    - Couplings
    - Extractor fans
    - Filters

16. Prepare and Mix Liquid Personal Products using computerised automated and manual equipment		

Quality

- Safety principles underpinning
- Quality sampling and testing procedures for mixing
- Knowledge of materials and ingredients for production
- Knowledge and application of Good Housekeeping Practices
- Documentation
    - Hand-over books
    - Lock-out procedures
    - Checklists
    - Quality log sheets
    - System

Principles

- Principles and application of World Class Manufacturing
- Knowledge and application of TPM Principles
- Knowledge and principles of visual performance measurement systems
- Knowledge and application of Value chain principles

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Demonstrate the ability to use electronic mail software to send and receive messages

SAQA US ID
UNIT STANDARD TITLE

7571
Demonstrate the ability to use electronic mail software to send and receive messages

SGB NAME
ABET BAND
PROVIDER NAME

SGB Information Systems and Technology
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Information Technology and Computer Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-ITC-0-SGB IST
Regular
Level 2
3

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2000-12-06
2003-12-06
7571
SAQA 0933/00

PURPOSE OF THE UNIT STANDARD

People credited with this unit standard are able to :

demonstrate the ability to log on to the internet and use electronic mail software to send and receive messages

attach documents or files to a message

organise and manage message folders or directories within electronic message software

LEARNING ASSUMED TO BE IN PLACE

Open.

The credit value of this unit is based on a person having the prior knowledge and skills to operate a personal computer and a modem.

UNIT STANDARD RANGE

UNIT STANDARD OUTCOME HEADER

Demonstrate ability to log on to internet and unde

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Demonstrate ability to log on to internet and understand basic uses of electronic mail software.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2998

ASSESSMENT CRITERIA

1. A connection is established with an Internet Service Provider.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2870

ASSESSMENT CRITERIA

2. The electronic mail application is opened.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61519

ASSESSMENT CRITERIA

3. A mail inbox is opened for a specified user.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61520

ASSESSMENT CRITERIA

4. A mail message is opened.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61521

ASSESSMENT CRITERIA

5. Application Help Functions are used.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61522

ASSESSMENT CRITERIA

6. The electronic mail application is closed.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61523

SPECIFIC OUTCOME 2

Adjust Basic Settings.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2999

ASSESSMENT CRITERIA

1. Viewing modes are changed.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2871

SPECIFIC OUTCOME 3

Create and send a message.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

3000

ASSESSMENT CRITERIA

1. A new message is created.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Insert address in "mail to" field, insert title in "subject" field, add automatic signature, set priority

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2872

ASSESSMENT CRITERIA

2. Spell-checking tool is used if available.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61512

ASSESSMENT CRITERIA

3. A file is attached to a message.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61513

ASSESSMENT CRITERIA

4. Copy, cut, paste and delete tools are used.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Copy text, duplicate text, cut text, move text, delete text, within message, to/from another active message, from another source into message, delete file attachment.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61514

SPECIFIC OUTCOME 4

Read and reply to a message.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

3002

ASSESSMENT CRITERIA

1. Mail is collected or opened.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2874

ASSESSMENT CRITERIA

2. A message in a mail folder is marked or highlighted in a mail folder.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61527

ASSESSMENT CRITERIA

3. A mail bin or folder is used.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61528

ASSESSMENT CRITERIA

4. A file attachment is opened and saved.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61529

ASSESSMENT CRITERIA

5. The reply function is used.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Reply to sender, reply to all, reply with original message, reply without original message, forward a message

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61530

SPECIFIC OUTCOME 5

Use addressing functions and manage messages.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

3004

ASSESSMENT CRITERIA

1. An address list is modified or a new address list is created

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Add, delete, update from incoming message, create new list

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2876

ASSESSMENT CRITERIA

2. Messages are sent to several addresses.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Reply to a message using a distribution list, copy a message to another address, use blind copy tool.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61532

ASSESSMENT CRITERIA

3. Messages are managed.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Search for a message, delete a message, create new mail folder, move messages to a new folder.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61533

ASSESSMENT CRITERIA

4. Messages are sorted.

18. Produce Powdered Detergent using automated production equipment		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	3
Credit(s)	**:**	6
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

This unit standard is for people who are currently working, or who intend to work, in an FMCG environment which involves the use of specialised automated production equipment used to produce powdered detergent, and similar substances.

People credited with this unit standard are able to prepare for powder detergent production, and operate powder detergent production equipment. They will also be able to perform changeovers for production, shut down and clean powder detergent production equipment.

LEARNING ASSUMED TO BE IN PLACE :

It is an advantage to have competence equivalent to:

- ABET 4 Language and ABET 3 Maths
- Standard No. PWM-B/03 *Implement health, hygiene and safety practices;* and
- Standard No. PWP/05 *Implement quality practices in a production environment;*

18. Produce Powdered Detergent using automated production equipment		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1: Prepare for powder detergent production

Assessment Criteria:

1.1 Equipment for production is available, operational, and fit for purpose within the agreed timeframe.

1.2 Correct materials are available in a sufficient quantity for scheduled and anticipated production within the agreed timeframe.

1.3 The production plan and product recipe is available, current, and complete.

1.4 Equipment, components and materials for production are at the correct temperature in accordance with the production plan.

1.5 Equipment is dry prior to scheduled production.

1.6 Variations in the specified technical performance of the detergent production equipment are identified, and corrective action is taken within a timeframe that optimises performance.
Range:
variations:
- qualitative
- quantitative
- safety.

1.7 Production downtime due to production preparation is minimised.

1.8 Detergent production preparation complies with organisational policies, procedures, and legislation.
Range:
policies and procedures:
- work instructions
- manuals
- standard operating procedures (SOP's)
- quality standards.

1.9 Team members agree opportunities to offer assistance are identified, and are actioned in a manner which promotes goodwill.

18. Produce Powdered Detergent using automated production equipment		

Specific Outcome 2:	Operate powder detergent production equipment

Assessment Criteria:

2.1 The correct components and materials are available in the correct condition, and in a sufficient quantity for the scheduled and planned production.

2.2 Production equipment is operational and at the correct temperature within the agreed timeframe.
Range:
production equipment:
- Detergent tower
- Blowers
- Slurry
- belts

2.3 Storage containers are available in the correct location with sufficient capacity for scheduled and anticipated production.

2.4 Equipment is operated in a manner that optimises production and protects the saftey of the operator and team members.

2.5 Powder detergent is produced, and is the correct colour, density, granulation size, and moisture content in accordance with product specifications.

2.6 Product flow through the detergent production equipment is maintained.

2.7 Variations in the specified technical performance of the powder detergent product and equipment are identified, and corrective action is taken within a timeframe that optimises performance.
Range:
variations:
- qualitative
- quantitative
- safety;

corrective action:
- repair
- replace
- notify authorised personnel

2.8 Operation of the powder detergent production equipment complies with organisational policies, procedures, and legislation.
Range:
policies and procedures:
- work instructions
- manuals
- standard operating procedures
- quality standards.

18. Produce Powdered Detergent using automated production equipment		

2.9 The work environment is clean and free from hazards.

Range: hazards:

- to personnel
- to product
- to plant
- caused by personnel
- caused by equipment
- caused by the environment

Specific Outcome 3:	**Perform changeovers for production of powdered detergent product**

Assessment Criteria:

3.1 Product changeover is planned and prepared for.

3.2 Product changeover sis performed in such a way as to minimise production downtime.

3.3 Equipment used for the scheduled product is available and operational within the agreed timeframe.

3.4 Product is free from contamination.

Range:

contamination:

- previous product residue
- equipment
- foreign objects
- microbiological

3.5 Product changeover complies with organisational policies, procedures, and legislation.

Range:

policies and procedures:

- work instructions
- manuals
- standard operating procedures
- quality standards.

3.6 Variations in the specified technical performance of the production equipment and product are identified, and corrective action is taken within a timeframe that optimises performance.

Range:

variations

- qualitative
- quantitative
- safety.

3.7 The work environment is clean and free from hazards.
Range:
Hazards:
- to personnel
- to product
- to plant
- caused by personnel
- caused by equipment
- caused by environment.

3.8 Documentation related to product changeover is accurate and complete in accordance with Standard operating procedures

Specific Outcome 4:	**Shut down and clean powder detergent production equipment**

Assessment Criteria:

4.1 Production equipment is free from powder detergent residue and materials.

4.2 Equipment is shut down within the agreed timeframe.

4.3 Equipment is clean and free from contamination within the agreed timeframe.
Range:
Contamination:
- product residue
- rust
- foreign matter.

4.4 Effluent from powder detergent production is disposed of in accordance with organisational policies, procedures, and legislation.

4.5 All operators using the equipment have agreed that the equipment is ready for use and fit for purpose within agreed timeframe.

4.6 Product wastage due to the shut down and cleaning of the powder detergent production equipment is minimised, and opportunities to rework product are maximised.

4.7 The shutting down and cleaning of automated powder detergent production equipment complies with organisational policies, procedures, and legislation.
Range:
Policies and procedures
- work instructions
- manuals
- standard operating procedures
- quality standards.

18. Produce Powdered Detergent using automated production equipment		

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Short written answers to oral or written questions.
- Oral questions and answers in a structured interview.
- Examination of an assessment portfolio and other relevant documentation.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

NOTES:

3. Unit Standard Range:

Equipment
- Production, test; control panels, programmable logic control systems (PLC), pumps, valves, motors, gear boxes, pipes, belts, elevators, hoists, jets, extraction systems, fans, ducts, burners, blowers, mixers, grinding mills.

Materials
- raw, pre-mixed; ingredients: powders, liquids, dyes, perfumes, flavours; packaging.

Powders
- detergent, concentrated, conventional, heavy, light, high density, low density, white, coloured.

4. The following Unit Standard may be considered relevant to, and /or supportive of, this unit standard, but is not a prerequisite entry unit standard:

Monitor and Maintain Powder Detergent Production

5. In this Unit Standard, the word "agreed" indicates that a course of action is:

a. Agreed between 2 or more people (including the assessee), eg. Action completed in an agreed timeframe and/or
b. Contained in stated policy and/or procedures (made known to the assessee) as being the required performance standard, eg location for filing documentation.

18. Produce Powdered Detergent using automated production equipment		

6. In this Unit Standard, the use of "and/or" to separate items in a range statement Indicates that sufficient valid evidence must be gathered for at least one of the items listed, as required by the assessee's work role.

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made.
- Collect, analyse, organise and critically evaluate information.
- Work effectively with others as a member of a team, group, organisation or community.
- Collect, analyse, organise and critically evaluate information.
- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations.
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.
- Contribute to the full personal development of each learner and the social and economic development of the society at large.

EMBEDDED KNOWLEDGE:

Embedded Knowledge:

Technical:

- working knowledge of production services
- operation of a detergent production plant – setting lines, valves, pumps
- principles and operation of heat exchange system
- principles and application of cleaning (steam, air blow)
- autonomous maintenance of a detergent production plant

Quality:

- safety principles underpinning operation
- quality sampling and testing procedures involved in detergent production
- knowledge of materials and ingredients for detergent production
- knowledge and application of good housekeeping practices
- documentation – hand over books, lock out procedures, checklists, quality log sheets and system

Principles:

- principles and application of World Class Manufacturing
- knowledge and application of TPM principles
- knowledge and principles of visual performance measurement systems
- knowledge and application of value chain principles

19. Produce extruded and packaged product in a chemical manufacturing environment		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	2
Credit(s)	**:**	6
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

A person credited with this unit standard is able to:

- Prepare to extrude, cut and package product
- Extrude, cut and package product
- Conduct post-packaging activities

This unit standard is for people who work, or intend to work, in a Chemical Manufacturing Environment. This unit standard will contribute towards the achievement of a National Certificate in Chemical Manufacturing at Level 3.

Learning assumed to be in place

- Learners accessing this unit standard will have demonstrated competence at ABET 4 language and ABET 3 Numeracy. They should also have demonstrated competence against the unit standard: Maintain health, hygiene and safety in a Chemical Environment.

19. Produce extruded and packaged product in a chemical manufacturing environment		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1: Prepare to extrude, cut and package product.

Assessment Criteria:

1.1 Packaging materials are loaded onto the machinery, and are available in sufficient quantities for the product type, colour and size requirements of the production schedule.

1.2 Hand-over documents are checked to verify the status of the equipment, and to ensure that it is safe to operate.

1.3 Personal Protective Equipment (PPE) is worn so that it protects the operator and prevents the product from being contaminated. All protective equipment is worn or used as described in the supplier's instructions., company policy and safety legislation.

1.4 Product and Equipment changeovers are completed timeously and safely, so that production is not delayed.

1.5 Extrusion, cutting and packaging machinery is aligned, verified to be free from contamination and in good working order.

1.6 Production services are ensured to be ready, available and in the right quantity and within the correct parameters to meet production needs.

Specific Outcome 2: Extrude, cut and package product

Assessment Criteria:

2.1 The equipment is started up and minor adjustments are made in order to optimise the performance , as per the manufacturer's recommendations.

2.2 The equipment is operated in such a way that the operator and team are safe, and there is minimal product wastage occurring during the process.

2.3 Wherever possible, spilled product is recovered, removed or reworked according to standard operating procedures and GMP (Good Manufacturing Practice) principles.

2.4 Flow rates and/or transfer times, are checked against the specifications, and appropriate measures are taken to rectify any non-conformances, where necessary.

2.5 Visual quality checks are carried out to ensure that the product produced meets specifications. Non-conforming product is removed and reworked, in accordance with standard operating procedures and GMP principles.

2.6 The consequences of despatching non-conforming product to the customer are explained in terms of cost to production and the implications on quality and customer satisfaction.

2.7 Any differences in equipment performance are noted and in-process adjustments are made, where appropriate and within the operator's jurisdiction. Adjustments not within the operator's jurisdiction are referred to the correct authorities without delay, to ensure that there is no production time wasted.

19. Produce extruded and packaged product in a chemical manufacturing environment		

Specific Outcome 3: Complete packaging activities

Assessment Criteria:

3.1 On completion of the production run, the machinery is shut down in accordance with the standard operating procedures.

3.2 The machinery is cleaned, inspected for wear and tear, and lubricant levels are checked.

3.3 The equipment is cleaned and prepared for the next production run, as per the requirements of the product being manufactured, the manufacturer's recommendations, as well as appropriate statutory, health, safety and environmental standards.

3.4 Any problems or difficulties that have occurred during the extrusion, cutting and packaging activities are noted, and appropriate solutions are developed to improve performance.

3.5 All relevant documentation is completed accurately and timeously, in accordance with the organisational and/or statutory requirements.

ACCREDITATION AND MODERATION :

The relevant Education and Training Quality Assurance Body (ETQA) will accredit the providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

ACCREDITATION AND MODERATION OPTIONS:

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities, Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Examination of an assessment portfolio.
- Reporting skills are demonstrated by effective communication, using verbal, (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the extrusion and packaging process.
- This unit standard can be assessed along with appropriate first-line maintenance unit standards.

19. Produce extruded and packaged product in a chemical manufacturing environment		

RANGE STATEMENT:

1.1 Packaging materials, flow and paper-wrapping.

1.2 Equipment changeover: filters, screens, plates, blades, etc. are cleaned and replaced.

1.3 Production services: electricity, chilled water, vacuum and compressed air are checked and maintained.

1.4 Guards are in place, safety switches are ensured to be operational.

NOTES:

EMBEDDED KNOWLEDGE:

- Technology applicable to extruding a product.

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES:

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made.
- Work effectively with others as a member of team or organisation.
- Organise and manage oneself and one's activities responsibley and effectively.
- Collect, analyse, organise and critically evaluate information.
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion.
- Use science and technology effectively and critically, showing responsibility towards the environment and the health of others.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- In order to contribute to the full personal development of each learner and the social and economic development of society at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of reflecting-on and exploring a variety of strategies to learn more effectively; participating as responsible citizens in the life of local, national and global communities; being culturally and aesthetically sensitive across a range of social contexts.

20

1. TITLE: Communicate effectively in teams

2. UNIT STANDARD NUMBER:

3. LEVEL ON THE NQF: 2

4. CREDITS: 5

5. FIELD: Engineering, Manufacturing and Technology
Sub Field: Manufacturing and Assembly

6. ISSUE DATE:

7. REVIEW DATE:

8. PURPOSE:

This standard is aimed at people who are currently working, or who intend to work, in formal or informal work places, where job holders are required to have good communication skills.

People credited with this unit standard are able to:

- Establish and maintain working relations with colleagues, team members, other departments
- Enhance productive working relationships with immediate supervisor
- Identify and minimize interpersonal conflict
- Establish and maintain relationships with customers and suppliers

9. LEARNING ASSUMED TO BE IN PLACE

Learners accessing this unit standard will have demonstrated competence against numeracy and literacy at ABET Level 3 or equivalent

10. SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

Specific Outcome 1: **Establish and maintain working relations with colleagues, team members, other departments**

Assessment Criteria

1.1 Communication is conducted in a manner that promotes productive working relationships

1.2 Opportunities to discuss work related matters with team members are actively utilized, and discussions initiated as required

1.3 Assistance and/or advice is offered in a helpful manner and where necessary individuals are referred to specialists

1.4 Undertakings to others are met and feedback on progress and/or constraints is given in time to allow for contingency planning

1.5 Where concern exists over the quality of work the matter is directly raised with team members and/or reported to those responsible

Specific Outcome 2: **Enhance productive working relationships with immediate supervisor**

Assessment Criteria

2.1 Immediate supervisor is kept informed at an appropriate level of detail about progress, results and achievements

2.2 Information about problems and/or opportunities to improve the process is clear, accurate and provided with an appropriate degree of urgency

2.3 Information and advice on matters within the area of responsibility are sought from immediate supervisor as necessary

2.4 Differences are dealt with in ways that reduce dysfunctional conflict and maintain productive working relationships

2.5 Requirements of job are satisfied to the agreed performance levels and activities are performed in a helpful and willing manner

Specific Outcome 3: **Identify and minimise interpersonal conflict**

Assessment Criteria

3.1 Expected standards of work and behaviour and consequences for non-compliance are described with reference to relevant documents

3.2 Problems which directly or indirectly affect work are discussed with the person/s concerned in time to prevent conflict situations

3.3 Potential and actual conflicts are identified and actions taken prevent conflict escalation

3.4 Actions to minimize conflict satisfy legal and organizational requirements and approved codes of practice

3.5 Descriptions of the problem or conflict situation are accurate and complete, and submitted in accordance with organizational requirements

3.6 Confidentiality is maintained in accordance with shared values

3.7 Conflict situations are referred to appropriate people according to organizational requirements

Specific Outcome 4: **Establish and maintain relationships with customers and suppliers**

Assessment criteria:

4.1 Communication is conducted in a manner that promotes productive working relationships

4.2 Expected standards of service and behaviour towards customers are described with reference to relevant documents

4.3 Expectations are agreed between provider and customer, and records are available to both for future reference

4.4 Good customer service practices are described and the implications explained, without reference to source materials

4.5 Potential and actual service problems are identified and actions taken enhance customer service levels

11. ACCREDITATION AND MODERATION:

The Educational Training Quality Assurance Body (ETQA), for the Chemical Industry in consultation with GEN/FETQA will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

12. RANGE STATEMENT:

1.1 Behaviours will reflect: respect for individuals, other cultures, other view points; active listening skills; frequent exchange of information; shared communication values

3.4 One-on-one discussion, team conflict resolution mechanisms, formal grievance procedures, formal disciplinary procedures

SO4 Customers in this context can mean internal or external customers

4.1 Behaviours will reflect: respect for individuals, other cultures, other view points; active listening skills; frequent exchange of information; shared communication values

4.2 Service level expectations, ordering procedures, delivery times, feedback procedures

13. NOTES:

EMBEDDED KNOWLEDGE:

- Interpersonal skills
- Conflict resolution skills
- Good communication practice and skills
- Group dynamics
- Giving and receiving feedback
- Goal setting and time management
- Conditions of employment
- Grievance and disciplinary procedures
- Customer relations and service principles

CRITICAL CROSS-FIELD AND DEVELOPMENTAL OUTCOMES

The ability to:

- Identify and solve problems in which responses display that responsible decisions using critical and creative thinking have been made
- Work effectively with others as a member of a team and organization
- Organize and manage oneself and one's activities responsibly and effectively
- Collect, analyse, organise and critically evaluate information
- Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written persuasion
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others
- Demonstrating and understanding of the world as a set or related systems by recognizing that problem solving contexts do not exist in isolation
- In order to contribute to the full personal development of each learner and the social and economic development of society at large, it must be the intention underlying any programme of learning to make an individual aware of the importance of reflecting on and exploring a variety of strategies to learn more effectively; participating as responsible citizens in the life of local, national and global communities; being culturally and aesthetically sensitive across a range of social contexts

21. Control a neat soap production process		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	3
Credit(s)	**:**	8
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

Persons credited with this Unit Standard will be able to:

- Operate and monitor the equipment and process parameters in a soap-making plant, and
- Monitor production quality

This standard is useful for persons working in an FMCG manufacturing operation.

LEARNING ASSUMED TO BE IN PLACE :

It is an advantage to have competence equivalent to:

- ABET 4 Language and ABET 3 Maths
- Standard No. PWM-B/03 *Implement health, hygiene and safety practices;* and
- Standard No. PWP/05 *Implement quality practices in a production environment;*
- Standard No. PWM/07 *Control a soap rework process.*

21. Control a neat soap production process		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA	
Specific Outcome 1:	**Operate and monitor the equipment and process parameters in a soap-making plant.**

Assessment Criteria:

1.1 The process parameters are matched to production specifications at agreed intervals. Any adjustments made agree with guidelines for corrective action, the stipulated procedures and product improvement.

Range:
parameters:
- levels
- soap flow
- temperatures (temperature profile in reactor; reactor back pressure; lye flow)
- vacuum
- raw material and additive dosage
- machine settings

1.2 Differences in the product from product quality specifications are identified correctly. Adjustments to the process parameters where necessary are in line with operating guidelines. Spilled and/or sub-standard product is recovered where possible for rework and/or reclassification within quality guidelines.

Range:
quality specifications include:
- colour,
- fatty acid,
- temperature,
- glycerine,
- salt,
- FFA,
- soap grain condition

rectify and/or rework:
- adjust process parameters – fitting liquor, caustic soda, brine density;
- rework - off-spec tank, waste pan

1.3 Continued sub-standard product that cannot be corrected by adjustments to process parameters is recorded in the required format and reported to appropriate personnel without delay so that production is not lost.

1.4 Raw material levels are regularly monitored and adjusted to meet specifications and desired production output. This is done in time so that production is not delayed.

1.5 Any differences from normal equipment performance are noted. Operators adjust the equipment if they are trained to do so. If not, they report to those who are trained to act, without delay, so that there is no wasted production time.

Range:
best practice:
- visual checks: look, listen and feel exercise

variances: corrections made to:
- valve operation,
- centrifuges,
- pumps
- heat exchangers,

- blending equipment,
- rotor amps,
- reactors
- relay tank
- RDC holding tank
- Scarp-pan

1.6 Production downtime due to equipment failure is kept to a minimum by applying basic mechanical fault finding and autonomous maintenance.

1.7 The production of neat soap meets product specifications and standard operating procedures.

1.8 Communication with those affected by adjustments or downtime uses agreed channels for the particular issue, as laid down in standard operating procedures. Communication is clear and in time so that production runs smoothly with no unnecessary delays.

Range:

Communication channels:

- IP LAB,
- telephone,
- direct contact,
- log sheet

1.7 Forms and/or checklists reporting on non-conforming product and process are accurate, complete and available to authorised personnel.

Range:

- log sheets,
- stock sheets,
- PAMCO,
- graphs,
- reports,
- trends,
- IP LAB

1.8 Information, which reports performance in key areas, is displayed in the agreed place and form, at the agreed time intervals.

Range:

Variables: include but is not limited to –

- output vs target;
- downtime;
- quality;
- housekeeping;
- major waste;
- problem solving effectiveness;
- product quality trends

Display:

- highly visible to line;
- simple, easy to use;
- continuously updated

1.11 Personal protective equipment (PPE) is worn so that it protects the operator and prevents the product from being contaminated. All protective equipment is worn or used as described in the maker's instructions, company policy and safety legislation.

21. Control a neat soap production process		

1.12 Good housekeeping is applied throughout the shift. The work environment is clean and free from hazards in line with documented best practice and standard operating procedures.

Range:

housekeeping:

- S's inspections
- product spills,
- leaks,
- equipment storage standards applied

Specific Outcome 2:	Monitor product quality

Assessment Criteria:

2.1 Testing equipment is available, in good working order and fit for purpose at the specified times.

Range:

equipment:

- microwave,
- inframatic dryer,
- colourimeter,
- steam bath,
- testing chemicals

2.2. Samples are collected according to the requirements of each quality test, and in a manner that satisfies standard operating procedures.

Range:

samples:

- crude soap,
- neat soap,
- washed soap,
- nigre lye,
- spent lye,
- brine

2.3 The prescribed range of quality tests is implemented at specified times. Tests are conducted accurately as laid down in standard operating procedures and documented best practice.

Range:

tests:

- brine density,
- caustic,
- salts,
- glycerol,
- fatty acid,
- colour (soap),
- free fat

2.4 Results are communicated in the agreed format and within agreed time limits so that product is not wasted and production downtime is kept to a minimum.

Range:

communication format:

- log sheet information,
- IP LAB,
- telephone / direct contact

2.5 Differences in the product from specifications are identified and corrected without delay so that product quality is maintained and waste is kept to a minimum.

2.6 Actions taken to solve problems and correct sub-standard product are correct for the identified causes of non-conformance, and the particular process.

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Short written answers to oral or written questions.
- Oral questions and answers in a structured interview.
- Examination of an assessment portfolio and other relevant documentation.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

NOTES:

Special Notes:

Definition of Terms:

- **Autonomous Maintenance:** means that an operator can do 50% of 'traditional artisan work'. The operator:

⇨ Has a working knowledge of – filters, fans, seals, pumps, bearings, drive systems, pneumatics, hydraulics, basic electricity, alignment

⇨ Can perform – lubrication; basic machine maintenance and repair (replace worn parts – belts, blades, chains, seals, some sub-assemblies); advanced maintenance (resets, replace components, align drivers); fault-finding on own equipment and make running adjustments; advanced fault diagnosis (to see whether electrical or mechanical assistance is required); conduct own changeovers and set ups to standard operating procedures without assistance; basic condition monitoring

⇨ Can recommend equipment modification for efficiency; assist artisan to modify equipment to improve efficiency

Can use and maintain own set of tools; use centralised specialised tools; use and interpret built in diagnostics (lights, alarms, gauges, limit switches); use technical information (drawings, manuals, catalogues)

21. Control a neat soap production process		

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made.
- Collect, analyse, organise and critically evaluate information.
- Work effectively with others as a member of a team, group, organisation or community.
- Collect, analyse, organise and critically evaluate information.
- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations.
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.
- Contribute to the full personal development of each learner and the social and economic development of the society at large.

EMBEDDED KNOWLEDGE:

Embedded Knowledge:

Technical:

- working knowledge of production services
- operation of soap production plant – setting lines, valves, pumps
- principles and operation of heat exchange system
- principles and application of cleaning (steam, air blow)
- autonomous maintenance of soap production plant

Quality:

- safety principles underpinning operation
- quality sampling and testing procedures soap making
- knowledge of materials and ingredients for production
- knowledge and application of good housekeeping practices
- documentation – hand over books, lock out procedures, checklists, quality log sheets and system

Principles:

- principles and application of World Class Manufacturing
- knowledge and application of TPM principles
- knowledge and principles of visual performance measurement systems
- knowledge and application of value chain principles

22. Control a soap rework process		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	3
Credit(s)	**:**	3
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

Persons credited with this Unit Standard will be able to:

- Operate and monitor a soap rework process
- Monitor production quality

This standard is useful for persons working in an FMCG manufacturing environment.

LEARNING ASSUMED TO BE IN PLACE :

It is an advantage to have competence equivalent to:

- ABET 4 Language and ABET 3 Maths
- Standard No. PWM-B/03 *Implement health, hygiene and safety practices;* and
- Standard No. PWP/05 *Implement quality practices in a production environment;*

22. Control a soap rework process		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1: Operate and monitor a soap rework process.

Assessment Criteria:

1.1 Soap for rework is gathered from a variety of sources and in sufficient quantities for the conditioning process.

Range:

sources:

- rework,
- trade returns,
- sweepings (packing hall),
- off-spec soap from production

1.2. The waste pan is prepared for the reconditioning process as laid down in the standard operating procedures.

1.3. Process parameters are checked against production specifications at agreed intervals. Any adjustments are in line with guidelines for corrective action, set procedures and product improvement.

Range:

parameters:

- levels,
- temperatures,
- raw material and additive dosage (brine, water, caustic),
- grain condition

1.4. Differences from expected product quality are identified quickly and accurately. Adjustments to process parameters where applicable, are in line with guidelines so that rework recovers as much soap as possible and/or soap can be reclassified according to quality boundaries.

Range:

specifications:

- colour,
- fatty acid,
- temperature,
- glycerine,
- salt,
- FFA,
- soap grain condition

1.5. Reworked soap of the correct quality is integrated into the mainstream production process, as per standard operating procedures.

Range:

integration: through RDC or centrifuge

1.6. The production of reworked neat soap meets product specifications and standard operating procedures.

1.7. Communication with others affected by soap rework is clear and uses the agreed channels. Communication is in time to keep production running smoothly and cut down on delays.

Range:

IP LAB, telephone, direct contact, log sheet

1.8. Forms and/or checklists reporting on sub-standard product and process are accurate, complete and available to authorised personnel.
Range:
documentation:
- log sheets,
- stock sheets,
- PAMCO,
- graphs,
- reports,
- trends,
- IP LAB

1.9. Information, which reports performance in key areas, is displayed in the agreed place and form, at the agreed time intervals.
Range:
variables: include but is not limited to –
- output vs target;
- downtime;
- quality;
- housekeeping;
- major waste;
- problem solving effectiveness;
- product quality trends

display:
- highly visible to line;
- simple,
- easy to use;
- continuously updated

1.10. Personal Protective Equipment (PPE) is worn so that it protects the operator and prevents the product being spoiled. All protective equipment is worn or used as described in the maker's instructions, company policy and safety legislation.

1.11. ood housekeeping is applied throughout the shift. The work environment is clean and free from hazards in line with documented best practice and standard operating procedures.
Range:
housekeeping:
- S's inspections
- product spills,
- leaks,
- equipment storage standards applied

22. Control a soap rework process		

Specific Outcome 2:	Monitor product quality in a rework process

Assessment Criteria:

2.1 Testing equipment is available, in good working order and fit for purpose at the specified times.

Range:

equipment:

- microwave,
- inframatic dryer,
- colourimeter,
- steam bath,
- testing chemicals
- Soap-maker's trowel

2.2. Samples are collected according to the methods and procedures in the guidelines for quality tests, and in line with standard operating procedures.

Range:

samples:

- crude soap,
- neat soap,
- washed soap,
- nigre lye,
- spent lye,
- brine

2.3 The specified range of quality tests for a soap rework are conducted at the set times laid down in the standard operating procedures. Tests are performed in such a way that they meet the standard operating procedures and documented best practice.

Range:

Tests to be conducted are:

- brine density,
- caustic,
- salts,
- glycerol,
- fatty acid,
- colour (soap),
- free fat
- soap grain condition

2.4 Results are communicated in the agreed format and within agreed time limits so that product is not wasted and production downtime is kept to a minimum.

Range:

communication media:

- log sheet information,
- IP LAB,
- telephone
- direct contact

2.5 Differences in the product from the expected quality and specifications are corrected using the accepted methods. This is done without delay so that product quality is maintained and waste is kept to a minimum.

2.6 Actions taken to correct poor quality product and to stop the problem from reccurring are correct for the identified causes of the non-conformance, and the particular process.

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Short written answers to oral or written questions.
- Oral questions and answers in a structured interview.
- Examination of an assessment portfolio and other relevant documentation.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

NOTES:

Special Notes:

Definition of Terms:

- **Autonomous Maintenance:** means that an operator can do 50% of 'traditional artisan work'. The operator:

⇨ Has a working knowledge of – filters, fans, seals, pumps, bearings, drive systems, pneumatics, hydraulics, basic electricity, alignment

⇨ Can perform – lubrication; basic machine maintenance and repair (replace worn parts – belts, blades, chains, seals, some sub-assemblies); advanced maintenance (resets, replace components, align drivers); fault-finding on own equipment and make running adjustments; advanced fault diagnosis (to see whether electrical or mechanical assistance is required); conduct own changeovers and set ups to standard operating procedures without assistance; basic condition monitoring

⇨ Can recommend equipment modification for efficiency; assist artisan to modify equipment to improve efficiency

Can use and maintain own set of tools; use centralised specialised tools; use and interpret built in diagnostics (lights, alarms, gauges, limit switches); use technical information (drawings, manuals, catalogues)

22. Control a soap rework process		

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made.
- Collect, analyse, organise and critically evaluate information.
- Work effectively with others as a member of a team, group, organisation or community.
- Collect, analyse, organise and critically evaluate information.
- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations.
- Use science and technology effectively and critically, showing responsibility towards the environment and health of others.
- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.
- Contribute to the full personal development of each learner and the social and economic development of the society at large.

EMBEDDED KNOWLEDGE:

Embedded Knowledge:

Technical:

- working knowledge of production services
- operation of soap production plant – setting lines, valves, pumps
- principles and operation of heat exchange system
- principles and application of cleaning (steam, air blow)
- autonomous maintenance of soap production plant

Quality:

- safety principles underpinning operation
- quality sampling and testing procedures soap making
- knowledge of materials and ingredients for production
- knowledge and application of good housekeeping practices
- documentation – hand over books, lock out procedures, checklists, quality log sheets and system

Principles:

- principles and application of World Class Manufacturing
- knowledge and application of TPM principles
- knowledge and principles of visual performance measurement systems

knowledge and application of value chain principles

23. Demonstrate knowledge of hard gelatin capsule technology		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	2
Credit(s)	**:**	2
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly (Pharmaceuticals and FMCG)
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

Persons credited with this Unit Standard are able to:

- Demonstrate knowledge of hard gelatin capsule characteristics
- Demonstrate knowledge of the formulation of hard gelatin capsules
- Demonstrate knowledge of the GMP principles applied in the manufacturing of hard gelatin capsules.
- Demonstrate knowledge of the general steps in the manufacture of hard gelatin capsules.
- Perform basic calculations applicable to the manufacture of hard gelatin capsules.

This Unit Standard is useful to operators and supervisors who work, or intend to work, in a Pharmaceutical production environment.

LEARNING ASSUMED TO BE IN PLACE :

Learners accessing this unit standard will have demonstrated competence in the following, or equivalent:

- Literacy - ABET 4 in Language and communication skills
- Numeracy - ABET 4 in Mathematics
- It is also an advantage to have competence equivalent to NQF 2 in Science and Technology.

It is also assumed that the learner is able to apply the principles of GMP (Good Manufacturing Practices), as well as demonstrate knowledge of the FMCG Health and Safety Unit Standard (or equivalent).

23. Demonstrate knowledge of hard gelatin capsule technology		

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1:	**Demonstrate knowledge of hard gelatin capsule characteristics**

Assessment Criteria:

1.1 The characteristics of hard gelatin capsules are explained.

Range:

- Appearance
- Colour variants are described and its use for product and/or strength
- Identification is explained
- Sizing variation (000 to 5) is explained

1.2 Hard gelatin capsules are illustrated by means of diagrams.

1.3 The different forms of medicament dispensed in hard gelatin capsules are explained.

Range:

- Powders
- Granules
- Enteric-coated granules
- Sustained-release granules

1.4 Demonstrate knowledge of the effect of density of active on the size of the gelatin capsule used.

1.5 The advantages of hard gelatin capsules over other dosage forms are explained.

Range: *Advantages include:*

- Accurate dosage
- Virtually tasteless
- Tamper-evident
- Easy to swallow
- Colour is easily identified

Specific Outcome 2:	**Demonstrate knowledge of the formulation of hard gelatin capsules.**

Assessment Criteria:

2.1 An example of a diluent is provided, and its use is explained in terms of diluting the medicament to the required concentration.

2.2 An example of a lubricant and its use is explained with regard to the prevention of adherence of the powder to the hopper and auger, resulting in improper feeding and mass variation.

2.3 An example of a disintegrant is provided and its use explained.

2.4 The ideal moisture content of the powder is explained.

23. Demonstrate knowledge of hard gelatin capsule technology		

Specific Outcome 3	**Demonstrate knowledge of the general steps in the manufacture of hard gelatin capsules.**

Assessment Criteria:

3.1 The basic principles of the filling machine operation are explained.

Range: *Principles include:*

- Separation of body and cap
- Filling of body
- Rejoining of body and cap

3.2 The purpose of sieving and slugging raw materials is explained.

3.3 The problems that may occur during filling are explained referring to machine stoppage, capsule separation, as well as dented and spilt capsules. The reasons thereof are also stated.

Range: *Reasons include:*

- Major defects in empty capsules
- Incorrect storage of empty capsules
- Mechanical equipment failure, eg. Vacuum failure

3.4 The purpose of polishing capsules is explained.

3.5 The safety procedures and PPE relevant to capsule manufacture are explained.

Specific Outcome 4	**Demonstrate knowledge of the GMP principles applied to the manufacture of hard gelatin capsules.**

Assessment Criteria:

4.1 The GMP principles carried out prior to and during capsule filling are explained.

4.2 The procedure to be taken when any unusual mass / other deviations occur is explained.

4.3 The pressure, relative humidity and temperature of the capsule filling area is specified, i.e. positive pressure, RH: 30-40%, Temperature: 21 – 25 °C.

4.4 The storage requirements and conditions of filled capsules, priotr to packaging, is explained.

23. Demonstrate knowledge of hard gelatin capsule technology		

Specific Outcome 5	Perform basic calculations applicable to the manufacture of hard gelatin capsules.

Assessment Criteria:

5.1 The required calculations are performed accurately.

Range: *Calculations include:*

- Average tare mass of empty capsule
- Average/ mean net fill mass of capsule
- Range of average net fill masses
- Yield

An example is included for assessment purposes:

The weight of 50 empty capsules = 3050mg

The target fill mass is : 299mg
The fill mass limits are: 353 – 367 mg

The weight of 10 filled capsules is: 3597mg

The shop/work order quantity is: 300 000
The quantity produced is: 296 156

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

Assessment options include:

- Short written answers to oral or written questions.
- Oral questions and answers in a structured interview.
- Direct observation in simulated or actual working conditions.
- Examination of relevant documentation.

NOTES:

Terminology:

Good Manufacturing Practice (GMP):
That part of Quality Assurance that ensures that a product is manufactured consistently and controlled to quality standards appropriate to their intended use.

Personal Protective Equipment (PPE):
This includes gloves, masks, overshoes, overcoats, safety shoes, etc.

23. Demonstrate knowledge of hard gelatin capsule technology		

CRITICAL CROSS-FIELD OUTCOMES

The following critical crossfield outcomes are addressed in this Unit Standard:

- Identifying and solving problems in which responses display that responsible decisions using critical and creative thinking have been made.
- Working effectively with others as a member of a team, group, organisation or community.
- Organising and managing oneself and one's activities responsibly and effectively.
- Collecting, analysing, organising and critically evaluating information.
- Communicating effectively using visual, mathematical and/or language skills in the modes of oral or written persuasion.
- Using science and technology effectively and critically, showing responsibility towards the environment and the health of others.
- Demonstrating an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
- Contributing to the full personal development of each learner and the social and economic development of the society at large, by making it the underlying intention of any programme of learning to make an individual aware of the importance of:
    - Reflecting on and exploring a variety of strategies to learn more effectively
    - Participating as responsible citizens in the life of local, national and global communities

Being culturally and aesthetically sensitive across a wide rang of social contexts.

EMBEDDED KNOWLEDGE:

Knowledge considered to be critical to the outcome is addressed through the assessment criteria.

ABET 4 Communication and Mathematics.

GMP and Safety knowledge considered to be critical is assessed.

Knowledge of relevant legislation, such as the OHS Act.

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Produce and use spreadsheets for business

SAQA US ID
UNIT STANDARD TITLE

7567
Produce and use spreadsheets for business

SGB NAME
ABET BAND
PROVIDER NAME

SGB Information Systems and Technology
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Information Technology and Computer Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-ITC-0-SGB IST
Regular
Level 3
5

REGISTRATION START DATE

REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2000-12-06
2003-12-06
7567
SAQA 0933/00

PURPOSE OF THE UNIT STANDARD

People credited with this unit standard are able to:

Plan and design computer spreadsheet documents to solve a busi-ness problem

Format data in a spreadsheet.

Create graphs

Write macros

Solve problems using a spreadsheet

LEARNING ASSUMED TO BE IN PLACE

Open.

The credit value of this unit is based on a person having the prior knowledge and skills to use a PC, to produce and use spread-sheets using basic functions, and an understanding of basic business principles and practises

UNIT STANDARD RANGE

UNIT STANDARD OUTCOME HEADER

Plan and design computer spreadsheet documents to

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Plan and design computer spreadsheet documents to solve a business problem.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2978

ASSESSMENT CRITERIA

1. The problem is identified as being solvable by a spreadsheet.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2851

ASSESSMENT CRITERIA

2. The spreadsheet is designed and documented in keeping with the nature of the problem.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61642

SPECIFIC OUTCOME 2

Produce a computer spreadsheet file to solve a business problem.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2980

ASSESSMENT CRITERIA

1. Data is entered into the spreadsheet using labels and values.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2853

ASSESSMENT CRITERIA

2. Data is formatted to produce the required spreadsheet in terms of cell width, alignment, number and date and time formats.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61643

ASSESSMENT CRITERIA

3. Spreadsheet formulae are applied in order to produce the required spreadsheet in terms of statistical, time and date, financial and logical functions.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61644

ASSESSMENT CRITERIA

4. Absolute cell referencing is used in order to copy formulae across and down.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61645

ASSESSMENT CRITERIA

5. Template files are created, used and documented to meet the user requirements.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61646

ASSESSMENT CRITERIA

6. Data integrity practices are demonstrated in terms of comparison with original information sources, audited formulae, check-totals and sort.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61647

ASSESSMENT CRITERIA

7. The spreadsheet contains cells, which are sorted numerically and alphabetically.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61648

SPECIFIC OUTCOME 3

Use a computer spreadsheet file to solve a business problem.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2983

ASSESSMENT CRITERIA

1. Cell ranges within the spreadsheet are charted to meet user requirements.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2856

ASSESSMENT CRITERIA

2. Cell range within a spreadsheet is graphed to user requirements.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61649

ASSESSMENT CRITERIA

3. The problem is solved by the spreadsheet created.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61650

ASSESSMENT CRITERIA

4. "What if" exercises are applied to the spreadsheet in order to accommodate changes in requirements.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61651

ASSESSMENT CRITERIA

5. Where available, the use of the onscreen help facility is demonstrated.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61652

ASSESSMENT CRITERIA

6. File management techniques are demonstrated in terms of creating, naming, saving, copying, renaming, deleting, locating directory (folder), displaying directory contents printing and relocating.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61653

ASSESSMENT CRITERIA

7. The file is previewed and printed using page setup appropriate to the layout.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Showing gridlines, setting printing range, shrinking to one page, alignment. Headers and footers.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61654

SPECIFIC OUTCOME 4

Manipulate the data in a spreadsheet.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

2984

ASSESSMENT CRITERIA

1. The appearance of spreadsheet is modified to user requirements using formatting facilities.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Alignment, cell widths, text style, font, colour, number, date and time formats.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2857

ASSESSMENT CRITERIA

2. Selected cells within an existing spreadsheet file are sorted numerically and alphabetically.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

61641

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

UNIT STANDARD DEVELOPMENTAL OUTCOME

UNIT STANDARD LINKAGES

CRITICAL CROSS-FIELD OUTCOMES (CCFO):

UNIT STANDARD CCFO IDENTIFYING

Identify and solve problems.

UNIT STANDARD CCFO WORKING

Work effectively with others as a member of a team, group, organisation and community.

UNIT STANDARD CCFO ORGANIZING

Organise and manage oneself and one's activities responsibly and effectively.

UNIT STANDARD CCFO COLLECTING

Collect, organise and critically evaluate information.

UNIT STANDARD CCFO COMMUNICATING

Communicate effectively using visual, mathematical, and language skills in modes of oral and written presentations.

UNIT STANDARD CCFO SCIENCE

Use science and technology effectively and critically (showing responsibility towards the environment and health of others).

UNIT STANDARD CCFO DEMONSTRATING

Demonstrate an understanding of the world as a set of related systems.

UNIT STANDARD CCFO CONTRIBUTING

Contribute to the full personal development of each learner and the social and economic development of society at large, by making it the underlying intention of any programme of learning to make an individual aware of the importance of:

- reflecting on exploring a variety of strategies to learn more effectively

- participating as responsible citizens in the life of local, national and global communities

- being culturally and aesthetically sensitive across a range of social contexts

- exploring education and career opportunities and

- developing entrepreneurial opportunities.

UNIT STANDARD ASSESSOR CRITERIA

UNIT STANDARD NOTES

UNIT STANDARD DOCUMENT NUMBER

UNIT STANDARD SEQUENCE NUMBER

0

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Collect and use data to establish statistical and probability models and solve related problems

SAQA US ID
UNIT STANDARD TITLE

7454
Collect and use data to establish statistical and probability models and solve related problems

SGB NAME
ABET BAND
PROVIDER NAME

SGB Math. Literacy Mathematics and Math Sciences
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Mathematical Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-MTH-0-SGB MLMMS
Regular
Level 3
5

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2000-12-06
2003-12-06
7454
SAQA 2033/00

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful to people who aim to achieve recognition at some level in Further Education

and Training or to meet the Fundamental requirement of a wide range of qualifications registered on the National Qualifications Framework.

People credited with this unit standard are able to:

Collect and work with data using various techniques to establish statistical models for specific purposes;

Use experiments and simulations to explore probability models, make predictions and study problems; and

Construct and critically interpret probability and statistical concepts in problem solving and decision making in

real-world situations.

LEARNING ASSUMED TO BE IN PLACE

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 3.

UNIT STANDARD RANGE

This unit standard includes the requirement to:

Identify issues suited to resolution by statistical methods;

Select a sample that can be representative of the population;

Collect and generate data through the use of questionnaires and suitable experiments;

Use experiments and simulations to explore situations, make predictions and study problems;

Generate appropriate statistics and probability values through the use of calculators;

Represent data in the form of tables and appropriate charts and graphs;

Use statistics and representations of data to argue a resolution to an issue;

Critically analyse and interpret statistics, the use of probabilities and representations of data;

Work with experimental and theoretical definitions of probability and sample spaces;

Work with probability values in practical situations;

Use technology to determine how well different models such as linear, quadratics fit data .

Further range statements are provided for specific outcomes and assessment criteria as needed.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Collect and work with data using various techniques.

OUTCOME NOTES

Collect and work with data using various techniques to establish statistical models for specific purposes

OUTCOME RANGE

Techniques include:

the formulation and use of questionnaires, and interviews to obtain data for specific purposes related to surveys and censuses

using databases to obtain information and data suited to the resolution of particular issues

using random number devices such as spinners, tables or calculators to select a sample

adapting simple models to simulate situations involving chance processes

working with different types of measuring instruments and scales such as dichotomous scale, discrete, and continuous variables

evaluation of data gathering techniques and of data collected so that faults and inconsistencies are identified.

calculating measures of centre and spread such as mean, median, mode, range and inter-quartile range

using scatter plots and intuitively placed lines of best fit to represent the association between two variables

Specific purposes include:

determining trends in societal issues such as crime and health

identifying relevant characteristics of target groups such as age, range, gender, socio-economic group, cultural belief, and performance

predicting the likelihood of the occurrence of events

considering the attitudes or opinions of people on issues.

SEQUENCE NUMBER

OUTCOME ID

0

2654

ASSESSMENT CRITERIA

1. Situations or issues that can be dealt with through probabilistic or statistical methods are identified correctly.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2527

ASSESSMENT CRITERIA

2. Methods for collecting, recording and organising data are identified and selections are made so as to maximise efficiency and ensure resolution of the problem or issue.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67287

ASSESSMENT CRITERIA

3. Data sources are selected to ensure representativeness of the data and validity of resolutions. Activities that could result in contamination of data are identified and explanations are provided for the effects of contaminated data.

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Use structured models to describe, represent and analyse shape and motion in 2- and 3-dimensional space

SAQA US ID
UNIT STANDARD TITLE

7460
Use structured models to describe, represent and analyse shape and motion in 2- and 3-dimensional space

SGB NAME
ABET BAND
PROVIDER NAME

SGB Math. Literacy Mathematics and Math Sciences
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Mathematical Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-MTH-0-SGB MLMMS
Regular
Level 3
4

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2002-06-12
2005-06-12
7460
SAQA 0742/02

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful to people who aim to achieve recognition at some level in Further Education and Training or to meet the Fundamental requirement of a wide range of qualifications registered on the National Qualifications Framework.

People credited with this unit standard are able to:

Describe and represent the properties of geometric shapes,

Solve real and abstract problems by constructing and interpreting geometrical and trigonometric models, and

Select and use co-ordinate or schematic systems to represent and solve problems.

LEARNING ASSUMED TO BE IN PLACE

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 2.

UNIT STANDARD RANGE

The scope of this unit standard includes perimeter, surface area, volume, ratio, proportion, symmetry, transformations, co-ordinate geometry, trigonometry and making and justifying conjectures.

More detailed range statements are provided for specific outcomes and assessment criteria as needed.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Describe and represent the properties of geometric shapes.

OUTCOME NOTES

OUTCOME RANGE

Estimate and determine the perimeter, surface area and volume of regular (pyramid and cone) and irregular objects

Apply ratio and proportion in various spatial contexts as related to area and volume with respect to reductions and enlargements

Develop and justify conjectures based on geometric properties.

SEQUENCE NUMBER

OUTCOME ID

0

2676

ASSESSMENT CRITERIA

1. Descriptions are based on a systematic analysis of the shapes and reflect the properties of the shapes accurately, clearly and completely.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2548

ASSESSMENT CRITERIA

2. Descriptions include quantitative information appropriate to the situation and need.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67924

ASSESSMENT CRITERIA

3. Estimates are appropriate and their accuracy can be justified in terms of the need.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67927

ASSESSMENT CRITERIA

4. Measurements and calculations are efficient and accurate. Symbols and units are used in accordance with SI conventions and as appropriate to the situation.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67929

ASSESSMENT CRITERIA

5. Conjectures as appropriate to the situation are based on well-planned investigations of geometrical properties and can be justified through logical arguments.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67931

ASSESSMENT CRITERIA

6. Spatial strategies with reference to the given situation are used to justify generalisations.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67933

SPECIFIC OUTCOME 2

Solve real and abstract problems.

OUTCOME NOTES

Solve real and abstract problems by constructing and interpreting geometrical and trigonometric models

OUTCOME RANGE

Problems in 2- dimensions.

Models and representations to include diagrams, congruency, transformations, co-ordinates, matrices, trigonometric functions and formulae.

SEQUENCE NUMBER

OUTCOME ID

0

19795

ASSESSMENT CRITERIA

1. Representations of the problems are consistent with and appropriate to the problem context. The problems are represented comprehensively and in mathematical terms.

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Use structured models to describe, represent and analyse shape and motion in 2- and 3-dimensional space

SAQA US ID
UNIT STANDARD TITLE

7460
Use structured models to describe, represent and analyse shape and motion in 2- and 3-dimensional space

SGB NAME
ABET BAND
PROVIDER NAME

SGB Math. Literacy Mathematics and Math Sciences
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Mathematical Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-MTH-0-SGB MLMMS
Regular
Level 3
4

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2002-06-12
2005-06-12
7460
SAQA 0742/02

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful to people who aim to achieve recognition at some level in Further Education and Training or to meet the Fundamental requirement of a wide range of qualifications registered on the National Qualifications Framework.

People credited with this unit standard are able to:

Describe and represent the properties of geometric shapes,

Solve real and abstract problems by constructing and interpreting geometrical and trigonometric models, and

Select and use co-ordinate or schematic systems to represent and solve problems.

LEARNING ASSUMED TO BE IN PLACE

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 2.

UNIT STANDARD RANGE

The scope of this unit standard includes perimeter, surface area, volume, ratio, proportion, symmetry, transformations, co-ordinate geometry, trigonometry and making and justifying conjectures.

More detailed range statements are provided for specific outcomes and assessment criteria as needed.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Describe and represent the properties of geometric shapes.

OUTCOME NOTES

OUTCOME RANGE

Estimate and determine the perimeter, surface area and volume of regular (pyramid and cone) and irregular objects

Apply ratio and proportion in various spatial contexts as related to area and volume with respect to reductions and enlargements

Develop and justify conjectures based on geometric properties.

SEQUENCE NUMBER

OUTCOME ID

0

2676

ASSESSMENT CRITERIA

1. Descriptions are based on a systematic analysis of the shapes and reflect the properties of the shapes accurately, clearly and completely.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2548

ASSESSMENT CRITERIA

2. Descriptions include quantitative information appropriate to the situation and need.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67924

ASSESSMENT CRITERIA

3. Estimates are appropriate and their accuracy can be justified in terms of the need.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67927

ASSESSMENT CRITERIA

4. Measurements and calculations are efficient and accurate. Symbols and units are used in accordance with SI conventions and as appropriate to the situation.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67929

ASSESSMENT CRITERIA

5. Conjectures as appropriate to the situation are based on well-planned investigations of geometrical properties and can be justified through logical arguments.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67931

ASSESSMENT CRITERIA

6. Spatial strategies with reference to the given situation are used to justify generalisations.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67933

SPECIFIC OUTCOME 2

Solve real and abstract problems.

OUTCOME NOTES

Solve real and abstract problems by constructing and interpreting geometrical and trigonometric models

OUTCOME RANGE

Problems in 2- dimensions.

Models and representations to include diagrams, congruency, transformations, co-ordinates, matrices, trigonometric functions and formulae.

SEQUENCE NUMBER

OUTCOME ID

0

19795

ASSESSMENT CRITERIA

1. Representations of the problems are consistent with and appropriate to the problem context. The problems are represented comprehensively and in mathematical terms.

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Accommodate audience and context needs in oral communication

SAQA US ID
UNIT STANDARD TITLE

8968
Accommodate audience and context needs in oral communication

SGB NAME
ABET BAND
PROVIDER NAME

SGB GET/FET Language and Communication
Undefined

FIELD
SUBFIELD

Communication Studies and Language
Language

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

COM-LAN-0-SGB LCS
Regular
Level 3
5

REGISTRATION START DATE

REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2001-08-15
2004-08-15
8968
SAQA 1137/01

PURPOSE OF THE UNIT STANDARD

Learners at this level are aware of their audiences and purposes for communication. They adapt their style and language register to the requirements of different situations. They are able to speak confidently in both formal and familiar settings. They can articulate their purposes and reasons for the adoption of a particular register and style in any situation. They can usually identify the assumptions and inferences implicit in what people say and how they say it.

Learners credited with this unit standard are able to:

-interact successfully with audience in oral communication

-use strategies that capture and retain the interest of an audience

-identify and respond to manipulative use of language

LEARNING ASSUMED TO BE IN PLACE

The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard: the NQF Level 2 unit standard.

US: FET-C/01 - Maintain and adapt oral communication

UNIT STANDARD RANGE

The learner can engage in oral interactions in a variety of formal and informal contexts in socio-cultural, learning and workplace situations.

Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Interact successfully with audience in oral communication.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

17590

ASSESSMENT CRITERIA

1. Contributions to group work are appropriate to the task and nature of the group, and promote effective communication and teamwork.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Contributions include: Identifying purposes, agendas, procedures and schedules; monitoring developments and retaining focus; drawing conclusions; preparing and delivering feedback and ensuring group ownership of conclusions.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55982

ASSESSMENT CRITERIA

2. Interviews successfully establish a relationship appropriate to the context, and provide a non-threatening opportunity for participants to share information.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Formal and informal; plans, background research; ordering of questions; flexibility in the situation when sequence or focus is disrupted; organisation of data elicited; and conclusions drawn.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55985

ASSESSMENT CRITERIA

3. Participation in formal meetings is appropriate to the purpose and context of the meeting. Participation is consistent with meeting procedures and contributes to the achievement of meeting objectives.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Spectrum of formal meeting procedures.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55987

ASSESSMENT CRITERIA

4. Participation in debates or negotiations is appropriate to the purpose and topic. Participation is consistent with formal procedures and contributes to meaningful interaction between participants.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Spectrum of informal and formal debating procedures and procedures for negotiations and meetings.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55989

ASSESSMENT CRITERIA

5. Responses to the ways others express themselves are sensitive to differing socio-cultural contexts.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55992

SPECIFIC OUTCOME 2

Use strategies that capture and retain the interest of an audience.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

17591

ASSESSMENT CRITERIA

1. Key words, pace and pause, stress, volume and intonation are used in appropriate ways to reinforce the message.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55998

ASSESSMENT CRITERIA

2. Body language is appropriate to context and topic, and reinforces main ideas and attitudes.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55999

ASSESSMENT CRITERIA

3. Formal communications are planned in writing, and plans are detailed, complete, and realistic with respect to time allocation and content.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

56001

***SAQA* US: FET - 09**
Title: Write texts for a range of communicative contexts.
Range: Controls language patterns and structures and engages with context, purpose and audience.
Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.
Level: 3
Credit: 5
Field: Communication Studies and Language.
Sub-Field: Language and communications; Information (Writing and Presenting).
Issue Date: May 2001
Review Date: November 2003.
Learning Assumptions:
The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard: NQF Level 2 Unit Standard.
US: FET-03 Write for a defined context.
Purpose:
Learners at this level write texts with complex subject matter and a need for various levels of formality
in language and construction. They select text type, subject matter and language to suit specific audiences and purposes. Writers can use linguistic structures and features to influence readers. They edit own writing to meet the demands of a range of text-types. They use language appropriate to the socio-cultural, learning or workplace/technical environment as required.
Learners credited with this unit standard are able to:
- Write for a specified audience and purpose.
- Use language structures and features to produce coherent and cohesive texts for a wide range of contexts.
- Draft own writing and edit to improve clarity and correctness.

Specific Outcomes and Assessment Criteria
Specific outcome 1:
Write for a specified audience and purpose.
*Rang*e:
Narrative, discursive, reflective, argumentative, descriptive, expository, transactional, business correspondence, electronic texts, multi-media presentations.
Assessment criteria
1.1 The purpose for writing, the target audience and the context is clear, in relation to the learning task or activity.
1.2 The text-type, style, and register selected are appropriate to audience, purpose and context.
1.3 Language appropriate to socio-cultural sensitivities is selected and used in an appropriate manner without compromising own values or arguments.
1.4 Writing is well-structured and conveys its message clearly.
1.5 Critical thinking skills are used as strategies for planning.
Range:
Brainstorming, mind-mapping, spider diagram, highlighting.
1.6 Arguments are supported with sound reasons and facts, and writing reflects a clear point of view, and shows logical development of a clearly articulated premise.
1.7 Research skills are evident in the way data and information relevant to the context is identified, located and selected for inclusion in the final text.
Range:
Accessing information from different sources; sorting; categorising; classifying; sifting for relevance, validity and reliability; recording; reporting; formulating conclusions.
Specific outcome 2:
Use language structures and features to produce coherent and cohesive texts for a wide range of contexts.
Assessment criteria:
2.1 Meaning is clearly expressed through the use of a range of sentence lengths, types, and complexities.
2.2 The use of paragraph conventions, including links between paragraphs in texts, promotes coherence and cohesion in writing. Their use is explained with reference to logical progression, cause and effect, and contrast.

2.3 The overall structure of a piece of writing is controlled and the conclusion is clearly formulated.

Specific outcome 3:
Draft own writing and edit to improve clarity and correctness.
Assessment criteria
3.1 Writing produced is appropriate to audience, purpose and context. Corrections are an improvement on the original.
3.2 Control of grammar, diction, sentence and paragraph structure is checked and adapted for consistency.
3.3 Logical sequencing of ideas and overall unity is achieved through redrafting.
3.4 There is clear evidence that major grammatical and linguistic errors are edited out in redrafts.
3.5 Inappropriate or potentially offensive language is identified and adapted/removed.
Range:
Obfuscation, excessive use of jargon, jargon used to exclude, insensitive choice of words, (gender, rank, hierarchies in familiar settings or organisations, family, sports, wealth) offensive or incorrect register.
3.6 Experimentation with different layout and options for presentation are appropriate to the nature and purpose of the task.
Accreditation Options: Providers of learning towards this unit standard will need to meet the accreditation requirements of the ETQA.
Moderation Option: The moderation requirements of the ETQA must be met in order to award credit to learners for this unit standard.
Notes:
1. *Notes to assessors:*
Assessors should keep the following general principles in mind when designing and conducting assessments against this unit standard:
- Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes.
- Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
- Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.
- The assessment criteria provide the specifications against which assessment judgements should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.
- The task of the assessor is to *gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the candidate can achieve the outcomes again and again and again.* This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.

All assessments should be conducted in line with the following well documented principles of assessment: *appropriateness, fairness, manageability, integration into work or learning, validity, directness, authenticity, sufficiency, systematic, openness and consistency.*
The following particular issues should be taken into consideration when assessing against this unit standard. If it is at all possible, learners should develop multimedia presentations that require the following:
- the combination of text, images, sound and information from multiple sources like TV, videos, Cd-roms, newspapers and magazines, web sites, and digital images;
- the selection of an appropriate medium for each element of the presentation;
- the editing of the presentation in monitoring quality;
- the testing of the audience's response;
- and, the undertaking of any revisions that may be necessary to improve it.

2. *Critical Cross-field Outcomes:*

This unit standard promotes, in particular, the following critical cross-field outcomes:

- Identify and solve problems: using context to decode and make meaning individually and in groups in oral, reading and written activities.
- Work effectively with others and in teams: using interactive speech in activities, discussion and research projects.
- Organise and manage oneself and one's activities responsibly and effectively through using language.
- Collect, analyse, organise and critically evaluate information: fundamental to the process of growing language capability across language applications and fields of study.
- Communicate effectively using visual, mathematical and/or language skills in formal and informal communications.
- Use science and technology effectively and critically using technology to access and present texts.
- Understand the world as a set of inter-related parts of a system through using language to explore and express links, and exploring a global range of contexts and texts.
- Contribute to the full development of oneself by engaging with texts that stimulate awareness and development of life skills and the learning process.

3. *Embedded Knowledge:*

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that for the most part, the possession or lack of the knowledge can be directly inferred from the quality of the candidate's performance. Where direct assessment of knowledge is required, assessment criteria have been included in the body of the unit standard.

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Use language and communication in occupational learning programmes

SAQA US ID
UNIT STANDARD TITLE

8979
Use language and communication in occupational learning programmes

SGB NAME
ABET BAND
PROVIDER NAME

SGB GET/FET Language and Communication
Undefined

FIELD
SUBFIELD

Communication Studies and Language
Language

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

COM-LAN-0-SGB LCS
Regular
Level 4
5

REGISTRATION START DATE

REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2001-08-15
2004-08-15
8979
SAQA 1137/01

PURPOSE OF THE UNIT STANDARD

The purpose of this unit standard is to facilitate learning and to ensure that learners are able to cope with learning in the context of learnerships, skills programmes and other learning programmes. Many adult learners in the FET band have not been in a learning situation for a long time, and need learning and study strategies and skills to enable successful progression.

Learners competent at this level will be able to deal with learning materials, to access and use useful resources, to seek clarification and help when necessary, and apply a range of learning strategies. They do this with an understanding of the features and processes of the workplaces of the workplaces and occupations to which their learning programmes refer.

Learners credited with this standard are able to:

-access, use and manage suitable learning resources

-formulate and use learning strategies

-manage occupational learning materials

-conduct basic research and analyse and present findings

-lead and function in a team

-reflect on how characteristics of the workplace and occupational context affect learning

LEARNING ASSUMED TO BE IN PLACE

The credit calculation is based on the assumption that learners are already competent in terms of the full spectrum of language knowledge and communication skills laid down in the national curriculum statements up to NQF level 3.

UNIT STANDARD RANGE

Learning materials appropriate to the learners in a given context.

Specific range statements are provided in the body of the unit standard where they apply to particular outcomes or assessment criteria.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Access, use and manage suitable learning resources.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

17577

ASSESSMENT CRITERIA

1. Relevant learning resources are identified.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Resource centres, literature, internet, other people.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55888

ASSESSMENT CRITERIA

2. Learning resources are used effectively and managed through appropriate selection and cross-referencing of information, and acknowledgement of sources.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55889

SPECIFIC OUTCOME 2

Formulate and use learning strategies.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

17578

ASSESSMENT CRITERIA

1. Learning strategies are formulated by selection of specific tried techniques.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Group activities such as brainstorming, group analysis, peer and self-assessment, probing, mind maps, note taking, memorising, key words, underlining, skimming and scanning.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55890

ASSESSMENT CRITERIA

2. Information is summarised and used in the learning process.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55891

ASSESSMENT CRITERIA

3. Answers pertaining to relevant questions are synthesised and contextualised.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Checking understanding, clarifying meaning, getting information, confirming accuracy of information, using of appropriate information.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55895

ASSESSMENT CRITERIA

4. Texts are read for detail, interpreted, analysed and synthesised for a given context.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55896

ASSESSMENT CRITERIA

5. Verbal interaction is interpreted, analysed and synthesised for a given context.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55897

ASSESSMENT CRITERIA

6. Learning takes place through communicating with others in groups or as individuals.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Facilitators, other learners, colleagues.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55898

SPECIFIC OUTCOME 3

Manage occupational learning materials.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

17579

ASSESSMENT CRITERIA

1. Occupational learning materials are organised and used for optimum learning.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Videos, internet, texts, handouts, text books, charts, maps, plans, diagrams, electronic texts (menus, screens, links etc).

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55899

ASSESSMENT CRITERIA

2. Layout, presentation and organisational features of learning materials are understood and used effectively.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55900

ASSESSMENT CRITERIA

3. Technical language/terminology is engaged with, and clarification sought if needed.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

55903

SPECIFIC OUTCOME 4

Conduct basic research, and analyse and present findings.

OUTCOME NOTES

OUTCOME RANGE

SEQUENCE NUMBER

OUTCOME ID

0

17581

ASSESSMENT CRITERIA

1. Appropriate or relevant topic and scope is identified and defined.

Quals & Stds Home Page | Search for a Qualification

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations

SAQA US ID
UNIT STANDARD TITLE

9010
Demonstrate an understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations

SGB NAME
ABET BAND
PROVIDER NAME

SGB for Math Literacy, Math, Math Sciences L 2 -4
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Mathematical Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-MTH-0-MLMMS 2-4
Regular
Level 3
2

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2001-10-10
2004-10-10
9010
SAQA 0838/01

PURPOSE OF THE UNIT STANDARD

This unit standard is designed to provide credits towards the mathematical literacy requirements of the NQF at level 2. The essential purposes of the mathematical literacy requirements are that, as the learner progresses with confidence through the levels, the learner will grow in:

. An insightful use of mathematics in the management of the needs of everyday living to become a self-managing person

. An understanding of mathematical applications that provides insight into the learner 's present and future occupational experiences and so develop into a contributing worker

. The ability to voice a critical sensitivity to the role of mathematics in a democratic society and so become a participating citizen.

People credited with this unit standard are able to:

Convert numbers between the decimal number system and binary number system

Work with numbers in different ways to express size/magnitude.

Demonstrate the effect of error in calculations.

LEARNING ASSUMED TO BE IN PLACE

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematical Literacy and Communications at NQF level 2.

UNIT STANDARD RANGE

This unit standard covers:

Approximation in relation to the use of computing technologies, the distinction between exact and approximate answers in a variety of problem settings. More detailed range statements are provided for specific outcomes and assessment criteria as needed.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Convert numbers between the decimal number system and the binary number system.

OUTCOME NOTES

OUTCOME RANGE

This outcome includes the need to:

Perform addition and subtraction of positive whole numbers in binary up to 100002 (16 in decimal).

Demonstrate understanding of the mathematical relationships and principles involved in the computations.

SEQUENCE NUMBER

OUTCOME ID

0

19260

ASSESSMENT CRITERIA

1. Conversion between binary and decimal numbers is done correctly.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64632

ASSESSMENT CRITERIA

2. Basic addition and subtraction calculations in the binary number system are done correctly.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

Using positive whole numbers up to the 16 in decimal.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64633

ASSESSMENT CRITERIA

3. Practical applications of the decimal and binary system are explained correctly.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64634

SPECIFIC OUTCOME 2

Work with numbers in different ways to express size and magnitude.

OUTCOME NOTES

OUTCOME RANGE

This outcome includes the need to:

Use scientific notation for small and large numbers.

SEQUENCE NUMBER

OUTCOME ID

0

19261

ASSESSMENT CRITERIA

1. The prefixes indicating magnitude in measurements are correctly related to the decimal system.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

From Giga to Pica (1012 to 10 -12)

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64635

ASSESSMENT CRITERIA

2. Conversions between related units in different measurement systems are correctly applied in real-life contexts.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

SI to Imperial; Degrees F to degrees C.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64636

SPECIFIC OUTCOME 3

Demonstrate the effect of error in calculations.

OUTCOME NOTES

OUTCOME RANGE

This outcome includes the need to:

Work with rational and irrational numbers.

Explore repeating decimals and convert them to common fraction form

Use scientific notation for small and large numbers.

SEQUENCE NUMBER

OUTCOME ID

0

19262

ASSESSMENT CRITERIA

1. Symbols for irrational numbers such as 7c and 42 are left in formulae or steps to calculations except where approximations are required.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64637

ASSESSMENT CRITERIA

2. Descriptions are provided of the effect of rounding prematurely in calculations.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64638

ASSESSMENT CRITERIA

3. The desired degree of accuracy is determined in relation to the practical context.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64639

ASSESSMENT CRITERIA

4. The final value of a calculation is expressed in terms of the required unit.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

64640

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

Providers of learning towards this unit standard will need to meet the accreditation requirements of the GENFETQA.

Moderation Option:

The moderation requirements of the GENFETQA must be met in order to award credit to learners for this unit standard.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that the possession or lack of the knowledge can be inferred directly from the quality of the candidate's performance against the standards.

Number systems and rational and irrational numbers

Estimation and approximation

Scientific notation

UNIT STANDARD DEVELOPMENTAL OUTCOME

UNIT STANDARD LINKAGES

CRITICAL CROSS-FIELD OUTCOMES (CCFO):

UNIT STANDARD CCFO IDENTIFYING

UNIT STANDARD CCFO WORKING

UNIT STANDARD CCFO ORGANIZING

UNIT STANDARD CCFO COLLECTING

Collect, analyse, organise and critically evaluate information:

Gather, organise, and interpret numerical information.

UNIT STANDARD CCFO COMMUNICATING

Communicate effectively:

Use everyday language and mathematical language to describe relationships, processes and problem solving methods.

UNIT STANDARD CCFO SCIENCE

UNIT STANDARD CCFO DEMONSTRATING

UNIT STANDARD CCFO CONTRIBUTING

Use mathematics:

Use mathematics to describe and represent realistic situations and to solve problems relevant to the learner.

UNIT STANDARD ASSESSOR CRITERIA

Assessors should keep the following general principles in mind when designing and conducting assessments against this unit standard:

Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes.

Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.

Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.

The assessment criteria provide the specifications against which assessment judgments should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.

The task of the assessor is to gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the candidate can achieve the outcomes again and again and again. This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.

All assessments should be conducted in line with the following well documented principles of assessment: appropriateness, fairness, manageability, integration into work or learning, validity, direct, authentic, sufficient, systematic, open and consistent.

UNIT STANDARD NOTES

UNIT STANDARD DOCUMENT NUMBER

UNIT STANDARD SEQUENCE NUMBER

0

Quals & Stds Home Page | Search for a Qualification

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Identify and work with simple forms of complex numbers

SAQA US ID
UNIT STANDARD TITLE

7455
Identify and work with simple forms of complex numbers

SGB NAME
ABET BAND
PROVIDER NAME

SGB Math. Literacy Mathematics and Math Sciences
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Mathematical Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-MTH-0-SGB MLMMS
Regular
Level 3
1

REGISTRATION START DATE

REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2000-12-06
2003-12-06
7455
SAQA 2033/00

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful to people who aim to achieve recognition at some level in Further Education and

Training or to meet the Fundamental requirement of a wide range of qualifications registered on the National

Qualifications Framework.

People credited with this unit standard are able to:

Carry out simple operations on complex numbers.

Use complex numbers and systems to make sense of and solve straightforward problems.

LEARNING ASSUMED TO BE IN PLACE

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 3.

UNIT STANDARD RANGE

Range statements are provided for specific outcomes and assessment criteria as needed.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Carry out basic operations on complex numbers in straightforward cases.

OUTCOME NOTES

OUTCOME RANGE

Arithmetic operations on complex numbers

SEQUENCE NUMBER

OUTCOME ID

0

2658

ASSESSMENT CRITERIA

1. Computational tools are used efficiently and correctly and solutions obtained are verified to be correct in terms of the context or problem.

ASSESSMENT CRITERIA NOTES

2.1 Notation for expressing numbers and symbols is consistent with mathematical conventions.

2.2 Methods of calculation are appropriate to the problem types.

2.3 Complex numbers are represented in a form appropriate to the context.

2.4 Operations on various representations of complex numbers are consistent.

2.5 Methods used to make sense of and solve problems are efficient and solutions obtained are verified to be correct in terms of the context or problem.

ASSESSMENT CRITERIA RANGE

Range: Indicate non-real number solutions to equations.

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

2531

ASSESSMENT CRITERIA

2. Algorithms are executed appropriately in calculations.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67641

ASSESSMENT CRITERIA

3. Operations on various representations of complex numbers are consistent.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67642

ASSESSMENT CRITERIA

4. Notation for expressing numbers and symbols is consistent with mathematical conventions.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67643

SPECIFIC OUTCOME 2

Use complex numbers and systems to make sense of and solve straightforward problems

OUTCOME NOTES

OUTCOME RANGE

Indicate non-real number solutions to equations.

SEQUENCE NUMBER

OUTCOME ID

0

19735

ASSESSMENT CRITERIA

1. Notation for expressing numbers and symbols is consistent with mathematical conventions.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67649

ASSESSMENT CRITERIA

2. Methods of calculation are appropriate to the problem types.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67650

ASSESSMENT CRITERIA

3. Complex numbers are represented in a form appropriate to the context.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67651

ASSESSMENT CRITERIA

4. Operations on various representations of complex numbers are consistent.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67652

ASSESSMENT CRITERIA

5. Methods used to make sense of and solve problems are efficient and solutions obtained are verified to be correct in terms of the context or problem.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

UNIT STANDARD ACCREDITATION AND MODERATION OPTIONS

Providers of learning towards this unit standard will need to meet the accreditation requirements of the GENFETQA.

Moderation Option:

The moderation requirements of the GENFETQA must be met in order to award credit to learners for this unit standard.

UNIT STANDARD ESSENTIAL EMBEDDED KNOWLEDGE

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that the possession or lack of the knowledge can be inferred directly from the quality of the candidate's performance against the standards.

Number systems and real and complex numbers

UNIT STANDARD DEVELOPMENTAL OUTCOME

NATIONAL QUALIFICATIONS FRAMEWORK

UNIT STANDARD:

Work with a wide range of patterns and transformations of functions and solve related problems

SAQA US ID
UNIT STANDARD TITLE

7457
Work with a wide range of patterns and transformations of functions and solve related problems

SGB NAME
ABET BAND
PROVIDER NAME

SGB Math. Literacy Mathematics and Math Sciences
Undefined

FIELD
SUBFIELD

Physical, Mathematical, Computer and Life Sciences
Mathematical Sciences

UNIT STANDARD CODE
UNIT STANDARD TYPE
NQF LEVEL
CREDITS

PHY-MTH-0-SGB MLMMS
Regular
Level 3
8

REGISTRATION START DATE
REGISTRATION END DATE
REGISTRATION NUMBER
SAQA DECISION NUMBER

2002-06-12
2005-06-12
7457
SAQA 0742/02

PURPOSE OF THE UNIT STANDARD

This unit standard will be useful to people who aim to achieve recognition at some level in Further Education and Training or to meet the Fundamental requirement of a wide range of qualifications registered on the National Qualifications Framework.

People credited with this unit standard are able to:

Express and justify mathematical generalisations of situations

Express mathematical functions and relationships between variables in terms of numerical, graphical, verbal and symbolic approaches

Analyse and represent mathematical situations and structures using symbolic forms

Use mathematical models to represent and deal with problems that arise in real and abstract contexts.

LEARNING ASSUMED TO BE IN PLACE

The credit value is based on the assumption that people starting to learn towards this unit standard are competent in Mathematics and Communications at NQF level 2.

UNIT STANDARD RANGE

This unit standard includes the requirement to:

Use algebraic notions to express generality

Make conjectures, demonstrate and explain their validity

Recognise equivalence among expressions and situations in which we need to manipulate and rearrange for a specific purpose

Work with transformations (vertical and horizontal shifts, reflections) of the basic functions dealt with in Math 2002 with the addition of y = a|x|. These would include transformations implicit in, for example, the following formulations

y q

y q

y q

y

y a

x p q

y a q

x p

= + +

= + +

= + +

= +

= + +

= +

+

a(x p)

a(x p)

p)

a|x p|+q

2

3

atrig(q

Convert flexibly among various representations of these functions

Work with the laws and definitions that relate to the above functions. For trigonometric functions using any angle and including:

y a

y a

y a

=

=

=

cosecq

secq

cotq

Work with reduction formulae, reciprocal identities and identities dependent on:

1 cos sin

2 2

= + q q

Represent, interpret and solve problems mathematically using the above functions

More detailed range statements are provided for specific outcomes and assessment criteria as needed.

UNIT STANDARD OUTCOME HEADER

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA:

SPECIFIC OUTCOME 1

Express and justify mathematical generalisations of situations.

OUTCOME NOTES

OUTCOME RANGE

This outcome includes the requirement to:

deal with situations involving the functions listed in the main range statement

distinguish between patterns, which apply to limited sets of data and generalisations which, can apply to extended sets of data

develop generalisations from sets of data, which relate to a wide range of contexts, both concrete, such as performing experiments, and abstract, such as investigating open ended mathematical situations.

SEQUENCE NUMBER

OUTCOME ID

0

2665

ASSESSMENT CRITERIA

1. Generalisations are based on systematic investigations and adequate evidence.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67841

ASSESSMENT CRITERIA

2. Generalisations are expressed in symbolic form using functions appropriate to the situation.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67843

ASSESSMENT CRITERIA

3. Conjectures are supported by acceptable arguments and claims that generalisations are not possible, are supported by coherent reasons.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67846

SPECIFIC OUTCOME 2

Express mathematical functions and relationships.

OUTCOME NOTES

Express mathematical functions and relationships between variables in terms of numerical, graphical, verbal and symbolic approaches.

OUTCOME RANGE

This outcome includes the requirement to:

Translate from one representation to another

Identify, contrast and compare the features of the functions listed in the main range statement.

SEQUENCE NUMBER

OUTCOME ID

0

19777

ASSESSMENT CRITERIA

1. The interchange of functions from one representation to another is fluent.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67855

ASSESSMENT CRITERIA

2. Symbolic computations in dealing with functions are accurate.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67857

ASSESSMENT CRITERIA

3. The key features of the graphs of functions and the effects of transformations on them are described and interpreted correctly.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67859

ASSESSMENT CRITERIA

4. Representations are expressed in an appropriate and integrated way and assist in the formulation and explanation of relationships as functions and relations embedded in contexts.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67861

SPECIFIC OUTCOME 3

Analyse and represent mathematical situations and structures using symbolic forms.

OUTCOME NOTES

OUTCOME RANGE

: This outcome includes the requirement to:

Use expressions, functions, equations, inequalities and systems of equations to represent situations that involve variable quantities

Use the properties of exponential functions

Develop strategies for deciding whether symbolic representations are reasonable and interpret such representations

Analyse the effect of transformations on symbolic representations

Develop and recognise equivalent forms of an expression, equation, function or relation

Solve systems involving 3 linear equations and 3 variables and other systems involving linear and quadratic equations.

SEQUENCE NUMBER

OUTCOME ID

0

19779

ASSESSMENT CRITERIA

1. Situations are represented correctly and comprehensively.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67864

ASSESSMENT CRITERIA

2. Representations are analysed and manipulated efficiently in arriving at results.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67867

ASSESSMENT CRITERIA

3. Results are interpreted correctly in terms of the situation.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67868

SPECIFIC OUTCOME 4

Use mathematical models to represent and deal with problems that arise in real and abstract contexts

OUTCOME NOTES

OUTCOME RANGE

This outcome includes the requirement to:

Represent the problem mathematically using functions, systems of equations and/or inequalities. This could include dealing with motion of objects in a straight line by regarding velocity and acceleration as rates of change.

Investigate a variety of repetitive processes, which can be modelled in terms of periodic functions.

SEQUENCE NUMBER

OUTCOME ID

0

19786

ASSESSMENT CRITERIA

1. Contextual problems are represented correctly and comprehensively.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67893

ASSESSMENT CRITERIA

2. Representations are analysed and manipulated efficiently in arriving at results.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67894

ASSESSMENT CRITERIA

3. Solutions are obtained through careful analysis and interpretation of the mathematical representation and solutions are reinterpreted correctly in terms of the problem context.

ASSESSMENT CRITERIA NOTES

ASSESSMENT CRITERIA RANGE

ASSESSMENT CRITERIA SEQUENCE NUMBER

ASSESSMENT CRITERION ID

0

67895

ASSESSMENT CRITERIA

4. A variety of different situations that can be modelled by a particular type of function are identified.

***33. SAQA* US: FET-08**
Title: Interpret and use information from texts.
Range: A variety of written and visual texts used in socio-cultural, learning and workplace contexts.
Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.
Level: 3.
Credit: 5
Field: Communication Studies and Language
Sub-Field: Language and Communications; Information (Reading and Viewing)
Issue Date: May 2001
Review Date: November 2003
Learning Assumptions:
The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard: Level 2 unit standards.
US: FET-02 Access and use information from texts.
Purpose:
Learners at this level read and view a range of texts. People credited with this unit standard are able to read a variety of text types with understanding and to justify their views and responses by reference to detailed evidence from text. They are also able to evaluate the effectiveness of different texts for different audiences and purposes, by using a set of criteria for analysis.
Learners credited with this unit standard are able to:
- use a range of reading and viewing strategies to understand the literal meaning of specific texts
- use strategies for extracting implicit messages in texts
- respond to selected texts in a manner appropriate to the context
- explore and explain how language structures and features may influence a reader.

Specific Outcomes and Assessment Criteria
Specific outcome 1:
Use a range of reading and viewing strategies to understand the literal meaning of specific texts
Assessment criteria
1.1 Unfamiliar words are identified. Their meanings are correctly determined by using knowledge of syntax, word-attack skills, and contextual clues.
Range:
Borrowed words, complex terms, acronyms, neologisms, colloquialisms, slang, jargon, dialect.
1.2 Different options for the meanings of ambiguous words are tested, and selected meanings are correct in relation to the context.
1.3 Main ideas are separated from supporting evidence and paraphrased or summarised.
1.4 The purpose of visual and/or graphic representations in texts are recognised and explained.
Specific outcome 2:
Use strategies for extracting implicit messages in texts.
Assessment criteria
2.1 Source of text is identified and discussed in terms of reliability and possible bias.
2.2 Author's attitude, beliefs and intentions are explored in order to determine the point of view expressed either directly or indirectly.
2.3 Authors' techniques are explored and explained in terms of purpose and audience.
Range:
Length of sentence, punctuation, diction/choice of words, use of figurative language/jargon/technical terms/slang/dialect/irony/humour/satire/sarcasm/legalisms, choice of visuals, choice of camera angle, type of shot, cinematographic techniques.
2.4 Promotion of, or support for, a particular line of thought/cause is identified and explained with reference to selection or omission of materials.
Specific outcome 3:
Respond to selected texts in a manner appropriate to the context.
Assessment criteria:
3.1 Instructions and requests are acted upon.
3.2 Text-type, format and register used are on the correct level of formality.

Specific outcome 4
Explore and explain how language structures and features may influence a reader.
4.2 The choice of words, language usage, symbols, pictures and tone is described in terms of

how a point of view is shaped or supported.
Range:
Bias (cultural, religious or peer preferences, misrepresentation, discrimination, racist, sexist, ageist), humour, irony, sarcasm, use of omission and silence, figurative expressions, repetition, hyperbole, generalisations, stereotyping, pictures and captions, typography and grammar.
Accreditation Options: Providers of learning towards this unit standard will need to meet the accreditation requirements of the accredited ETQA.
Moderation Option: The moderation requirements of the accredited ETQA must be met in order to award credit to learners for this unit standard.
Notes:
1. *Notes to assessors:*
Assessors should keep the following general principles in mind when designing and conducting assessments against this unit standard:
- Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes.
- Make sure evidence is gathered across the range as expressed under the title. Specific range statements under individual outcomes or assessment criteria are illustrations, from which Learning Programme developers can select. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
- Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.
- The assessment criteria provide the specifications against which assessment judgements should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.
- The task of the assessor is to *gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the candidate can achieve the outcomes again and again and again.* This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.
- All assessments should be conducted in line with the following well documented principles of assessment: *appropriateness, fairness, manageability, integration into work or learning, validity, directness, authenticity, sufficiency, systematic, openness and consistency.*

Critical Cross-field Outcomes:
This unit standard promotes, in particular, the following critical cross-field outcomes:
- Identify and solve problems: using context to decode and make meaning individually and in groups in oral, reading and written activities.
- Work effectively with others and in teams: using interactive speech in activities, discussion and research projects.
- Organise and manage oneself and one's activities responsibly and effectively through using language.
- Collect, analyse, organise and critically evaluate information: fundamental to the process of growing language capability across language applications and fields of study.
- Communicate effectively using visual, mathematical and/or language skills: in formal and informal communications.
- Use science and technology effectively and critically: using technology to access and present texts.
- Understand the world as a set of inter-related parts of a system: through using language to explore and express links, and exploring a global range of contexts and texts.
- Contribute to the full development of oneself: by engaging with texts that stimulate awareness and development of life skills and the learning process.
3. *Embedded Knowledge:*

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that for the most part, the possession or lack of the knowledge can be directly

APPENDIX 4

TABLE OF CONTENTS
FINAL NATIONAL CERTIFICATE – CHEMICAL MANUFACTURING
LEVEL 4

1. Title

MAINTAIN PRODUCTION EFFICIENCIES

No.		Level:	**5**
Credit:	**12**		
Field:	**Manufacturing, Engineering and Technology**	Sub-field:	**Manufacturing and Assembly**
Issued:		Review:	

Purpose

I am capable of:

Maintaining production efficiencies in a process to achieve quality and output

Learning assumed to be in place

This unit standard has been designed as part of a progression. It is one of a series of unit standards for activities below, at and above this level. The credits assigned to it are based on the assumption that I am learning what is needed for this unit standard as part of my learning for a range of related unit standards at this level or below it.

If I have experience in these related activities but do not have credits for them, I can obtain credits by being assessed through a process that recognises prior learning.

If I do not have such experience of related activities, then my learning time will be increased. I can choose to be assessed and obtain credits against those other unit standards as I make progress towards the outcomes of this unit standard.

Specific Outcomes

I have learned to

1. Observe production process
   - Check activities, safety, product quality and housekeeping
2. Share and discuss information and resolve issues which impact on quality and output
3. Identify and report performance and training issues affecting quality
4. Record process output and trends
   - Summarise information and generate reports
   - Map trends

   Range: Process output includes data on materials, process equipment, tooling, the work group, administration and reporting
5. Suggest or perform corrective actions to maintain quality and output
   - Check implementation of corrective action through spot checks

Assessment criteria

How will I be able to judge if I am capable? How will I be assessed? Evidence which will show that I have mastered the skill

Results achieved

1. Production meets specifications
2. Production targets are met
3. Machine efficiencies are maintained
4. Reports are accurate
5. Corrective actions are implemented, reviewed and recorded

Indicators

1. Scrap and downtime are minimised
2. Changeover times meet required standard
3. Problems are attended to in a timely way
4. Safe working practices are maintained
5. Corrective actions are cost effective and safe.

Understanding confirmed

1. Explain and discuss the relationship between specifications and test results
2. Explain and discuss issues related to maintenance, morale, tooling design, machine capacities and choice of materials and additives as they relate to maintaining production efficiencies.

Range statements

A general guide to the scope, context conditions, and level at which I am expected to perform.

1. This unit standard focuses on the technical aspects of the production process. It is not meant to be a replacement for management or supervisory standards. Issues of work organisation, discipline, grievances, relationships between management and workers are not assessed as part of this standard.

Accreditation process (including moderation)

My assessment will be governed by the policies and guidelines of the MERSETA Education and Training Quality Assurer who has jurisdiction over this field of learning. My assessor will (at the very least) be accredited and have a technical qualification in this learning area.

I can be assessed in the language of my choice although if I have to report incidents or conditions to someone else, I will be assessed on my ability to report in the language commonly used in my working environment.

I will be assessed in the workplace but I can submit documents, projects, test results and assignments that were not produced in the workplace.

I can be assessed against this unit standard to obtain credits or as part of an integrated assessment for a qualification.

Notes

1. This unit standard deals with the change from working with physical processes to working with information
2. It would apply to a technological expert who would link with others, taking a lead role in an activity while still being very much part of the team in the sense of feeding others with information needed to do their jobs (e.g. standing next to a person and helping to solve problems).

Essential Embedded Knowledge

Things I know and can explain

1. Names & functions of:
   - Sources and types of information
2. Attributes, descriptions, characteristics & properties:
   - Materials
   - Additives
   - Machinery and equipment (capacity)
3. Sensory cues:
   - To identify potential problems (sight, sound, smell, feel)
4. Purpose of:
   - Tests, test results, specifications, records, reports
5. Processes, events, causes and effects, implications:
   - Typical and unusual causes of problems
   - Implications of inefficiencies, poor working practices, lack of controls, lack of information and skills
6. Procedures and techniques:
   - Methods of collecting, analysing, organising, summarising and presenting data
   - Methods of determining and calculating efficiencies
   - Methods of plotting trends
   - Using equipment and determining faults
   - Quality related procedures
7. Regulations, legislation, agreements, policies, standards
   - Safety, health and environmental legislation and regulations
   - Quality policies, standards and agreements
8. Theory: rules, principles, laws

- Interrelationship of physical and chemical properties and factors which impact on them
- Statistical knowledge to make accurate decisions about data

9. Relationships, systems:
    - Relationships between output, maintenance, properties of finished product and cost

---

Critical Cross-Field Education & Training Outcomes

Generic abilities I have developed in order to develop my new skill

1. Identify and solve problems
    - In complex environments and systems
    - Based on analysing data sets
2. Work effectively with others
    - Maintain focus on achieving production efficiencies
    - Maintain flow of helpful information and feedback
    - Build relationships to improve efficiencies
3. Organise and manage myself and my activities
    - Maintain a consistent and regular approach to achieve efficient production
4. Collect, analyse, organise and critically evaluate information
    - Determine trends which will lead to inefficiencies
    - Identify potential problems based on information not from the senses
    - Identify potential problems based on information from the senses
5. Communicate effectively
    - Feedback is appropriate
    - Coach people to improve their understanding and performance
    - Provide relevant information and feedback to help people make decisions or implement actions
6. Use science and technology effectively and critically
    - Use a methodical, scientific approach to monitoring information and identifying problems and solutions
    - Interpret sensory and other information in terms of basic physical, chemical and mechanical properties
7. Demonstrate an understanding of the world as a set of related systems
    - Develop solutions which will not impact negatively on other aspects of the process, costs or end-user needs
    - Predict the behaviour of complex manufacturing systems

2. FOOD AND RELATED PRODUCT PRODUCTION LINE OPERATION
Oversee operations on food production line

level:	**4**
credit:	**7**
final date for comment:	March 2006
expiry date:	December 2007
sub-field:	
purpose:	People credited with this unit standard are able to: use safe work practices and procedures while packaging food; interpret production instructions; coach and guide staff on production line; deal with a range of problems; and evaluate and improve procedures on production line. This unit standard is developed for the employee who works without supervision
entry information:	Open.
accreditation option:	
moderation option:	
special notes:	Definitions *company requirements* may include but are not limited to - work instructions, manuals, operating procedures, quality standards, manufacturer's specifications; *legislative requirements* refer to legislation, regulations and standards that include but are not limited to -

2. FOOD AND RELATED PRODUCT PRODUCTION LINE OPERATION
Oversee operations on food production line

Elements and Performance Criteria

element 1

Use safe work practices and procedures while packaging food.

performance criteria

1.1 Correct clothing protects personnel and product and conforms to company and legislative requirements.

1.2 Work environment is clean and free from hazards in accordance with company and legislative requirements.

Range: hazards - to personnel, product, plant; caused by personnel, equipment, environment.

1.3 Documentation is completed in accordance with company and legislative requirements.

element 2

Interpret production instructions.

performance criteria

2.1 Schedule is interpreted in accordance with company and legislative requirements.

Range: deadlines, specifications, quality, health and safety, staffing.

2.2 Production schedule is explained clearly to team members in accordance with company and legislative requirements.

2. FOOD AND RELATED PRODUCT PRODUCTION LINE OPERATION
Oversee operations on food production line

element 3

Coach and guide staff on production line.

performance criteria

3.1 Work priorities are established in accordance with company and legislative requirements.

3.2 Production schedules are implemented in accordance with company and legislative requirements.

3.3 Staff observance of company policy and terms of employment are reviewed and outcomes communicated to staff and agreed to in accordance with company and legislative requirements.

3.4 Staff follow company quality processes in accordance with company and legislative requirements.

element 4

Solve food production line problems.

Range: non-routine operational/technical problems, non-routine reporting and personnel related problems.

performance criteria

4.1 Problems are solved in accordance with company and legislative requirements.

2. FOOD AND RELATED PRODUCT PRODUCTION LINE OPERATION
Oversee operations on food production line

4.2 Problem solving methods are systematic and minimise disruption to food production line.

Range: includes but is not limited to – problem clarification, recommendations, resource requirements, action plan, communication, review.

element 5

Evaluate and improve procedures on food production line.

Range: cost-effectiveness, health and safety, output, quality, ease of operation.

performance criteria

5.1 Existing procedures are evaluated and recommendations for improvements are presented to management in accordance with company and legislative requirements.

5.2 New industry developments are investigated and recommendations made to management for their use in the company.

5.3 Work teams/line staff suggestions for production/work flow improvements are used in accordance with company and legislative requirements.

2. FOOD AND RELATED PRODUCT PRODUCTION LINE OPERATION
Oversee operations on food production line

Comments to:

Competenz (Food and Beverage)
Unit Standard Revision
PO Box 160
WELLINGTON

by March 2006.

Please Note: Providers must be accredited by the Qualifications Authority before they can offer programmes of education and training assessed against unit standards.

Accredited providers assessing against unit standards must engage with the moderation system that applies to those unit standards. [Please refer to relevant Plan ref: 0111]

3. Analyse Production and Record Data to improve Equipment Performance		

SAQA Logo	**:**	
Registration No.	**:**	
NQF Level	**:**	3
Credit(s)	**:**	5
Field	**:**	NSB 06: Manufacturing, Engineering and Technology
Sub-Field	**:**	Manufacturing and Assembly
Issue Date	**:**	
Review Date	**:**	

PURPOSE STATEMENT:

This unit standard is intended for people who work, or intend to work, in a Chemical Manufacturing Environment. This unit standard will contribute towards the achievement of a National Certificate in Chemical Manufacturing Supervision at NQF Level 4.

People credited with this Unit Standard are able to:

- Identify the potential improvement in equipment performance.
- Gather and analyse data and information from the OEE (Overall Equipment Effectiveness) to drive manufacturing and production improvement.
- Improve equipment performance using TPM principles.

LEARNING ASSUMED TO BE IN PLACE :

Learners accessing this unit standard will have demonstrated competence at the equivalent of ABET 4 in Mathematics and language and communication. It is also an advantage to have competence equivalent to NQF 2 in Science and Technology.

The learner will also have demonstrated competence against the following Unit Standards, or equivalent:

- Contribute to the maintenance of a system
- Conform to and apply legislation and operational instructions in Chemical processing
- Respond to Hazardous conditions or emergencies

3. Analyse Production and Record Data to improve Equipment Performance		

Learners working towards the full qualification will have demonstrated competence against the Unit Standards in the National Certificate in Chemical Manufacturing – NQF Level 3 or Equivalent.

SPECIFIC OUTCOMES AND ASSESSMENT CRITERIA

Specific Outcome 1:	**Identify the principles of Overall Equipment Effectiveness (OEE) as a measure and a driver for improvement activities.**

Assessment Criteria:

1.1 Components are identified and used in calculations to produce a measure consistent with OEE outcomes.

Range: *Components include:*

- Availability
- Performance Rate
- Quality

1.2 Losses are identified that impact on TPM outcomes.

Range: *Losses include:*

- Rejects
- Reworks
- Start-up losses
- Breakdowns
- Setup losses
- Adjustment losses
- Minor stoppages
- Reduced Speed

1.3 Counter-measures commonly used in manufacturing industries are identified and described.

Range: *Counter-measures may include, but are not limited to:*

- Individual's lost work time due to injury
- Yield
- Recovery
- Cost
- Delivery
- Morale of employees
- Customer complaints
- Performance against targets

3. Analyse Production and Record Data to improve Equipment Performance		

Specific Outcome 2:	Gather and analyse data and information to calculate OEE and to drive manufacturing and production improvement.

Assessment Criteria:

2.1 Procedures to accurately record machine operations are described and are consistent with manufacturing and production requirements.

2.2 Equipment and production data is gathered according to the procedures outlined.

2.3 Analysis of data identifies potential areas for improvement using TPM techniques.

2.4 A system is described to locate all production and manufacturing losses, focus on losses, analyse losses, and resolve problems and causes of losses

Range:

- Identify root causes
- Use problem-solving tools
- Initiate action plans

.

Specific Outcome 3	Improve Equipment Performance using TPM Principles

Assessment Criteria:

3.1 Root causes of losses are identified through data gathering and analysis.

3.2 Possible solutions to address losses are identified, tested and refined.

3.3 Action plans to improve equipment performance are developed and agreed on in conjunction with the relevant stakeholders.

3.4 Action plans are implemented and results monitored to ensure that improvements are effective and sustained.

3. Analyse Production and Record Data to improve Equipment Performance		

ACCREDITATION AND MODERATION OPTIONS:

The relevant Educational Training Quality Assurance Body (ETQA) will accredit providers offering learning towards this standard and will register assessors. They will also appoint the internal and external moderators.

- Internal moderation.
- External moderation.
- An assessor, accredited by the relevant ETQA, will assess the learner's competency.
- Assessment procedures will be supplied by the ETQA in alignment with NSB requirements.
- All assessment activities must be fair, so that all candidates have equal opportunities. Activities must be free of gender, ethnic or other bias.
- Assessment and moderation procedures, activities and tools must be transparent, affordable and support development within the field, sub-field and NQF.
- Questions and answers to determine theoretical knowledge are expected.
- Examination of an assessment portfolio.
- Reporting skills are demonstrated by effective communication, using verbal (language) and/or writing skills.
- Direct observation in simulated or actual working conditions.
- Practical demonstration of the operation of the appropriate system of production in order to produce a Chemical product.

NOTES:

Definitions:

TPM (Total Productive Manufacturing)

This is as a term used to describe the philosophy of management, total employee involvement and equipment operation that encompasses continuous improvement, workplace ownership and holistic measurement.
The outcome of this is improved manufacturing results with a shift in the number of machine breakdowns, quality problems and accident levels decreasing.

OEE (Overall Equipment Effectiveness)

This is a term used to describe a holistic measurement for equipment performance in terms of availability, performance rate and quality.

Stakeholders
These are identified as operators, managers, maintenance personnel and other key personnel who play an integral role in the production process.

3. Analyse Production and Record Data to improve Equipment Performance		

CRITICAL CROSS-FIELD OUTCOMES

Qualifying learners can:

- Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made by:
  - Solving common problems associated with the operation of a complex opearting system .

- Collect, analyse, organise and critically evaluate information by:
  - Evaluating if the operation of the system meets the requirements provided in the SOP's. Monitoring and controlling the operation of the system.

- Work effectively with others as a member of a team, group, organisation or community by:
  - Preparing to start up the system
  - Operating the system to produce a chemical product
  - Shutting down the system
  - Cleaning of the system
  - Problem solving
  - Optimizing system operation
  - Improving quality and productivity
  - Co-ordinating and controlling all of the above functions

- Collect, analyse, organise and critically evaluate information by:
  - Evaluating if the operation of the system meets the requirements provided.

- Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations by:
  - Interpreting Documents
  - Completing documents pertaining to the operation of the systems

- Use science and technology effectively and critically, showing responsibility towards the environment and health of others by:
  - Explaining the technology appropriate to the operation of the system and its significance on the overall operation and the nature of the product/s being manufactured.

- Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation by:
  - Relating safety, health, environmental and quality best practice to the automated production process.

- Contribute to the full personal development of each learner and the social and economic development of the society at large.

EMBEDDED KNOWLEDGE:

Process Chemistry and related technology. Health, safety, environmental, productivity and quality principles relevant to each specific outcome.

4.

TITLE	:	**Communicate with clients and discuss work.**
UNIT STANDARD No.	:	5.L.03
LEVEL	:	5
CREDITS	:	3
FIELD	:	Manufacturing, Engineering and Technology (NSB 06)
SUB-FIELD	:	Manufacturing and assembly
ISSUE DATE	:	13.06.2001
REVIEW DATE	:	

PURPOSE:
Communicate effectively through oral and written communication with internal and external clients. He/she will be able to apply a holistic approach and explain work-related matters in context.

LEARNING ASSUMPTIONS:
A NQF level 4 Communications credit or good communication skills.

SPECIFIC OUTCOME 1:
Listen attentively and respond to a communication.

ASSESSMENT CRITERIA:

1.1 Methods to improve listening skills are practiced.
1.2 Listening skills are used to identify the actual meaning of messages.
1.3 Feedback is given to react to the content of messages.
1.4 Handling of stressful situations to decrease unnecessary stress is described.

SPECIFIC OUTCOME 2:
Be assertive and convey communication in a positive way.

ASSESSMENT CRITERIA:
2.1 Passive, aggressive and assertive behaviour should be explained and understood.
2.2 Assertive behaviour should be identified and practiced.
2.3 Techniques of assertive behaviour should be mastered in order to convey a message in a positive way.
2.4 Techniques of assertive behaviour are mastered I order to convey technical issues to non-technical people.
2.5 Communication represents the interests of the company.

SPECIFIC OUTCOME 3:
Use written communication to convey a message.

ASSESSMENT CRITERIA:
3.1 Different types of written communication are identified.
3.2 Different types of letters are written
3.3 Different types of relevant reports are compiled.

SPECIFIC OUTCOME 4:
Explain work-related matters to internal and external customers.

ASSESSMENT CRITERIA:
4.1 Work-related matters should be explained to the internal customer through effective two-way communication.
4.2 Relevant information should be communicated effectively to the external customer.
4.3 Diversity of customers is understood.

ACCREDITATION PROCESS:
Any person wishing to be assessed against this unit standard may apply to an assessment agency, assessor or provider institution accredited by the relevant ETQA, who may appoint a moderator to be present at the assessment.

RANGE STATEMENT:
Clients in the air-conditioning, refrigeration and ventilation Industry

NOTES:

Critical cross-field outcomes:
The unit standard promotes the following critical cross-field outcomes

Work effectively with others

- By communicating with clients

Communicate effectively

- By using language skills in modes of oral and written persuasion

Essential embedded knowledge:
Learners should be good listeners and able to communicate effectively-orally and in writing.

Supplementary information:

5.

TITLE	**:**	**Supervise workers at levels 2 and 3.**
UNIT STANDARD No.	**:**	4.16
LEVEL	**:**	4
CREDIT	**:**	6
FIELD	**:**	Manufacturing, Engineering and Technology (NSB 06)
SUB-FIELD	**:**	Manufacturing and Assembly
ISSUE DATE	**:**	13.06.2001
REVIEW DATE	**:**	

PURPOSE:
Ensure that personnel carry out their work safely, efficiently and cost effectively in accordance with relevant schedules or project plans. They are able to explain key factors underlying the effective use of resources, manage work place productivity and report on workplace operations.

LEARNING ASSUMPTIONS:
- Fundamental refrigeration and air-conditioning principles
- Basic managerial skills
- Basic electrical principles as applicable to refrigeration and air-conditioning
- Basic understanding of the operation of air-conditioning and refrigeration systems, their components and controls
- Carry out normal problem solving of refrigeration and air-conditioning plant.

SPECIFIC OUTCOME 1:
Plan the work methods and organize resources with individuals and teams

ASSESSMENT CRITERIA:
1.1 Project plans and schedules for the execution of the work are drawn up and are in accordance with the project specification.
1.2 The resources to meet the project plan are identified and scheduled.
Range: Resources include people, tools, finance, consumables, material, spares, outside expertise, equipment, information, time and use of technology.
1.3 Knowledge of and compliance with applicable statutory requirements is demonstrated.
Range: Basic conditions of employment. Machinery regulations. Occupational Health and Safety Act.
1.4 Objectives are clearly spelt out and contain details of performance measurement, timeframes and responsibilities.
1.5 Work methods are designed in consultation with individuals or team.
1.6 Decision-making processes are agreed with individuals or team.

SPECIFIC OUTCOME 2:
Update and achieve work objectives, delegate, control and organize individuals and teams

ASSESSMENT CRITERIA:
2.1 Work priorities are established and allocated to achieve targets and controlled to meet project plan.
Range: Allocation of tasks, resources, spares and components.
2.2 Scheduling of work is implemented and delegated as agreed with individual or team.
2.3 Systems are established to manage inputs, controls outputs and minimize wastage and delays.

SPECIFIC OUTCOME 3:
Supervise and manage production, work and services of individuals and teams.

ASSESSMENT CRITERIA:
3.1 Transport and use of material and equipment on site is monitored.
3.2 Site and facilities are established in accordance with project plan.
3.3 Accurate and complete records are kept in accordance with company policies and requirements.
3.4 Knowledge of project management administration is demonstrated.
Range: Minutes of meetings, variation orders, site instructions, resource control.
3.5 Details of deviations are assessed and corrective action taken.
3.6 Adherence of workforce to safety regulations is complied with.
Range: Mechanical, electrical, personal, OHS Act.

SPECIFIC OUTCOME 4: Evaluate performance of individuals and teams

ASSESSMENT CRITERIA:
4.1 Productivity is measured according to agreed performance standards.
4.2 Evaluation results are communicated in accordance with agreed company regulations.
4.3 Reports on work activities are accurate, timely, clear and relevant and line with company's requirements.
4.4 At completion, work place is left neat, waste material disposed off and equipment returned to stores.
4.5 Opportunities for worker improvement are identified and assessed in consultation with individual workers.
4.6 Good housekeeping in line with accepted standards is monitored.

ACCREDITATION PROCESS:
Any person wishing to be assessed against this unit standard may apply to an assessment agency, assessor or provider institution accredited by the relevant ETQA, who may appoint a moderator to be present at the assessment.

RANGE STATEMENT:
Organizing resources and materials, delegating work, planning, controlling and organising, time keeping, report writing, legal requirements.

NOTES:

Critical cross-field outcomes:
The unit standard promotes the following critical cross-field outcomes

Identify and solve problems

- Planning work. Identifying and solving problems with workforce

Work effectively with others

- Working with subordinates, superiors and clients

Organize and manage myself and my activities responsibly and effectively

- Supervising and managing subordinates

Communicate effectively

- Presenting oral or written reports to superiors

Use science and technology effectively and critically

- Work scheduling techniques

Demonstrate an understanding of the world as a set of related systems

- Understanding the impact of organizational and communication skills on work performance of workforce

Learner and societal development

- Learning how to organize and manage work force

Essential embedded knowledge:

- Skills necessary for effective supervision.
- Managing work of individuals and teams to achieve objectives.
- Setting and agreeing work objectives. Organize and allocate resources.
- Implement and evaluate work plans. Monitor and evaluate performance.
- Safety regulations. Conditions of employment.

Supplementary information:
Specific requirements are contained in one or more of the following documents:

- Company procedures and guidelines.
- Company procedures and guidelines
- The assessment of this unit standard will take place on the basis of evidence of demonstrated performance in the workplace or simulated work conditions.
- Relevant legislation refers to specific by-laws, acts and statutes that may apply to specific work activities.

6.

TITLE	**:**	**Manage work time effectively.**
UNIT STANDARD No.	**:**	3.L.05
LEVEL	**:**	3
CREDIT	**:**	3
FIELD	**:**	Manufacturing, Engineering and Technology (NSB 06)
SUB-FIELD	**:**	Manufacturing and assembly
ISSUE DATE	**:**	13.06.2001
REVIEW DATE	**:**	

PURPOSE:
To create a general understanding of time-management, and be able to prioritize activities in the environment. They will also be able to manage their work-time effectively.

LEARNING ASSUMPTIONS:
ABET Level 4

SPECIFIC OUTCOME 1:
Demonstrate understanding of the concept “time management in a 24-hour day world”.

ASSESSMENT CRITERIA:
1.1 The different concepts used in the external environment to measure time are listed.
1.2 The concept time-management is explained in the learner’s own words.
1.3 The importance of time-management in the work environment is debated.

SPECIFIC OUTCOME 2:
Describe the difference between urgent and important and prioritize daily activities.

ASSESSMENT CRITERIA:
2.1 Typical daily activities in the workplace are listed and ranked according to urgency and importance.
2.2 The listed activities are used to plan a typical day in industry.

SPECIFIC OUTCOME 3:
Estimate time spent on a task and draw up a general day, week and month planner to manage time effectively.

ASSESSMENT CRITERIA:
3.1 Estimated time spent on each task is allocated to the different activities.
3.2 A general day, week and month planner is drawn up.
3.3 Provision is made for unexpected incidents and crises management.

ACCREDITATION PROCESS:
Any person wishing to be assessed against this unit standard may apply to an assessment agency, assessor or provider institution accredited by the relevant ETQA, who may appoint a moderator to be present at the assessment.

RANGE STATEMENT:
Time management on a day-to-day basis

NOTES:

Critical cross-field outcomes:
The unit standard promotes the following critical cross-field outcomes

Collect, analyse, organise and critically evaluate information

- By prioritizing one's activities

Demonstrate an understanding of the world as set of related systems

- By understanding the bigger picture of time management

Essential embedded knowledge:
An understanding of the importance of time in the working environment, and respect for their own employer and customer's time.

Supplementary information:
A holistic view on years, months, weeks and days

7.

TITLE	**:**	**Lead a team, plan, allocate and assess their work.**
UNIT STANDARD No.	**:**	3.L.02
LEVEL	**:**	3
CREDIT	**:**	4
FIELD	**:**	Manufacturing, Engineering and Technology (NSB 06)
SUB-FIELD	**:**	Manufacturing and assembly
ISSUE DATE	**:**	13.06.2001
REVIEW DATE	**:**	

PURPOSE:
Lead the team, plan and allocate work and assess team members within context.

LEARNING ASSUMPTIONS:
An understanding of teamwork and knowledge of the role and functions of a team leader

SPECIFIC OUTCOME 1:
Plan the work activities of a team.

ASSESSMENT CRITERIA:
1.1 The strengths and weaknesses of the team are identified against current and anticipated work requirements.
1.2 All team members are encouraged and assisted to evaluate the teams' overall development needs and possible solutions to meet these needs are suggested.
1.3 Instructions are received, incorporated with planned activities and agreed with relevant parties after consultation.
1.4 Team building and development plans to set development objectives for the team are listed and explained.

SPECIFIC OUTCOME 2:
Assess and report on team member performance and issues within the team.

ASSESSMENT CRITERIA:
2.1 Selection methods to assess team member performance are identified and reported.
2.2 Selection methods to assess issues within the team are identified, explained and reported.
2.3 The role of team members in the successful growth of a company is explained.

SPECIFIC OUTCOME 3:
Allocate work to team members.

ASSESSMENT CRITERIA:
3.1 The tasks that need to be executed are listed.
3.2 The tasks that need to be executed are prioritized and an estimated time for completion is indicated.
3.3 A work allocation schedule is compiled and communicated to team members.

ACCREDITATION PROCESS:
Any person wishing to be assessed against this unit standard may apply to an assessment agency, assessor or provider institution accredited by the relevant ETQA, who may appoint a moderator to be present at the assessment.

RANGE STATEMENT:
Teams of up to 6 members

NOTES:

Critical cross-field outcomes:
The unit standard promotes the following critical cross-field outcomes

Work effectively with others

- Identify and solve problems and guide team members to find possible solutions
- Work effectively in a team by giving and receiving feedback on progress

Organise and manage myself and my activities

- Organize one's activities to work methodologically and give feedback in a logical way

Collect, analyse, organise and critically evaluate information

- To give relevant feedback to subordinates

Communicate effectively

- Communicate effectively with team members

Learner and societal development

- Contribute to the full development of each learner by understanding important role of a supervisor in context

Essential embedded knowledge:
The importance of good teamwork within the air-conditioning, refrigeration and ventilation industry will be understood.
Learners will be able to lead a team and plan, allocate and assess work.
Importance of fairness
The applicable legislation and regulations

Supplementary information:

8. TITLE: **Develop the skills of a work team**

UNIT STANDARD NUMBER: **Generic027**

LEVEL ON NQF: **5**

CREDITS: **10**

FIELD: **Manufacturing, Engineering and Technology**

SUB FIELD:

ISSUE DATE:

REVIEW DATE:

PURPOSE:

The skills, values and knowledge reflected in this unit standard are required by people in the field of manufacturing and engineering.

The learning outcomes in this unit standard also contribute to the exit level outcomes required for various manufacturing and engineering qualifications.

Qualifying learners can demonstrate an understanding of the process of skills development and enhancement. They are able to use this to identify skills gaps and develop the skills of their work team.

LEARNING ASSUMED TO BE IN PLACE:

This unit standard has been designed as part of a progression. It is one of a series of unit standards for team work.

The credits allocated to this unit standard assume that a learner has already learned to

- Develop a learning plan and a portfolio for assessment
- Develop learning strategies and techniques
- Lead a team, plan, allocate and assess their work

SPECIFIC OUTCOMES

1. Discuss and explain the concept of skills development and associated individual and team skills development plans

2. Determine areas for improvement in performance and assess team members for skills gaps

3. Arrange individual and team skills development plans and programmes

4. Request training or other interventions

5. Support team members in implementing new learning

6. Assess and evaluate the impact of new learning on individuals and the team

ASSESSMENT CRITERIA

Results achieved

1. An understanding of the concept of skills development and associated personal and team skills development plans is demonstrated
2. Personal and team skills development plans are generated
3. Team members are trained where required
4. The impact of new learning on individuals and the team is reported

Indicators

1. Explanations are given in a clear manner using appropriate examples from learner's own experience
2. Skills gaps are accurately assessed
3. Training recommended is appropriate to the needs of individuals and the team
4. Alternative solutions to training are sought where a skills deficiency is not the cause of a performance problem
5. Team members are supported in the application of their new learning in the work situation
6. The impact of new learning is accurately assessed and evaluated

Understanding confirmed

1. Respond to 'what if' and 'why' questions covering:
    - Purpose of developing the skills of the workgroup
    - Individual and team skills development plans
    - Techniques for assessing performance problems to determine skills gaps
    - Techniques for recommending training to close skills gaps
    - Alternative solutions to training
    - Techniques for supporting team members in implementing new learning back in the workplace
    - Techniques for assessing the impact of new learning

ACCREDITATION AND MODERATION:

The assessment will be governed by the policies and guidelines of the MERSETA Education and Training Quality Assuror (ETQA) who has jurisdiction over this field of learning.
The assessor will (at the very least) be accredited and have a technical qualification in this learning area.
The learner can be assessed in the language of his/her choice although if s/he has to report incidents or conditions to some one else, s/he will be assessed on his/her ability to report in the language commonly used in the working environment.
The learner will be assessed in the workplace or by simulation, but can submit documents, projects, test results and assignments that are not produced in the workplace or by the RPL process.
The learner can be assessed against this unit standard to obtain credits or as part of an integrated assessment for a qualification.

RANGE STATEMENT:

The specific outcomes reflected above are to be performed in collaboration with the human resources/training departments and skills development facilitator.

NOTES:

Essential Embedded Knowledge

1. Purpose of:
    - Developing the skills of a work team

2. Attributes, descriptions, characteristics & properties:
    - Individual and team skills development plans
    - Alternative solutions to training

3. Processes and events:
    - Implications of failing to detect a skills gap
    - Implications of recommending training to remedy a performance problem unrelated to a skills deficiency

4. Procedures and techniques:
    - Techniques for assessing performance problems to determine skills gaps
    - Techniques for recommending training to close skills gaps
    - Techniques for assessing the impact of new learning

5. Regulations, legislation, agreements, policies, standards:
    - Applicable skills development legislation
    - Applicable company training policies and procedures

6. Theory: rules, principles, laws:
    - Applicable theory related to identifying performance problems and training needs

7. Relationships, systems:
    - Relationship between training interventions and increased performance of the team
    - Relationship between a supportive working atmosphere and improved performance after training

Critical Cross-Field Education & Training Outcomes

1. Identify and solve problems
    - Related to performance deficiencies of work team and their causes

2. Work effectively with others
    - With team members to determine skills gaps and training needs

3. Organise and manage myself and my activities

- To assess and evaluate the impact of training on the performance of the team

4. Collect, analyse, organise and critically evaluate information
   - To generate individual and team skills development plans

5. Communicate effectively
   - With team members to determine nature of a performance deficiency

6. Use science and technology effectively and critically
   - Apply theory related to identifying performance problems and training needs

7. Demonstrate an understanding of the world as a set of related systems
   - Explain the relationship between training interventions and increased performance of the team
   - Explain the relationship between a supportive working atmosphere and improved performance after training

***9. SAQA* US: FET-13**
Title: Engage in sustained oral communication and evaluate spoken texts.
Range statement: The learner can engage in extended oral interactions in a wide range of socio-cultural, learning and/or workplace contexts.
Specific range statements are provided in the body of the unit standard
where they apply to particular specific outcomes or assessment criteria.
Level: 4
Credit: 5
Field: Communication Studies and Language
Sub-Field: Language and Communications; Information (speaking and listening)
Issue Date: May 2001
Review Date: November 2003
Learning Assumptions:
The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard: NQF Level 3 unit standard.
US: FET-07 *Accommodate audience and context needs in oral communication.*
Purpose:
Competence at this level will enable learners to participate effectively in oral communication in most situations.
Learners at this level are aware of their audiences and purposes for communication. They are able to adopt the style and language register required in different situations. They can usually identify the assumptions and inferences in what people say. They speak fluently and confidently in both formal and familiar settings and can articulate their purpose and meaning clearly. They can use language to convey detailed information, and to express their ideas and feelings. They control complex sentence structures and the use of tenses in their spoken communications.
People credited with this unit standard are able to:
- respond critically yet sensitively as a listener;
- analyse own responses to spoken texts and adjust as required;
- use strategies to be an effective speaker in sustained oral interactions;
- evaluate spoken discourse.

Specific Outcomes and Assessment Criteria
Specific outcome 1:
Respond critically yet sensitively as a listener
Assessment criteria
1.1 Responses show a clearly developed understanding of complex issues under discussion in one-on-one or group situations. Own understanding is clarified and further developed during discussions and opportunity is provided during interactions for the clarification of one another's understanding.
1.2 Discussions and/or conflicts are managed sensitively and in a manner that supports the goal of group or one-on-one interaction.
Range:
Disagreements in groups; personality clashes; conflict management, resolving deadlocks, positively summarising conclusions.
1.3 The underlying assumptions, points of view and subtexts in spoken texts are identified and challenged when appropriate to clarify understanding, remove bias and/or sustain interaction.
Specific outcome 2:
Analyse own responses to spoken texts and adjust as required.
Assessment criteria
2.1 Own responses to spoken texts are analysed in relation to audience, purpose and context. Inappropriate responses are identified and adjusted accordingly.
2.2 When confronted by opposing views, own position is put forward with confidence in a manner appropriate to the interaction.
2.3 Tone, approach or style is appropriate to context, and is adapted so as to maintain oral interaction when it breaks down or is difficult to initiate or maintain. Pedantic, illogical or aggressive language is identified and modified to sustain interaction.
Specific outcome 3:
Use strategies to be an effective speaker in sustained oral interactions.
Assessment criteria
3.1 Characteristics of a speaker's style and tone that attract or alienate an audience are identified with reference to the particular effect of each feature in creating audience response.

3.2 The impact of non-verbal cues/body language and signals on audiences is analysed and used appropriately.
3.3 The influence of rhetorical devices is analysed and used for effect on an audience.
Range:
Pause, rhetorical question, exclamation, analogy, emphasis, repetition, rhythm, use of inclusive/ exclusive pronouns, stress, intonation, volume.

Specific outcome 4:
Evaluate spoken discourse.
Range:
Formal and informal texts.
Assessment criteria:
4.1 Point of view in spoken texts is identified and meaning described in relation to context and purpose of the interaction.
4.2 Values, attitudes and assumptions in discourse are identified and their influence on the interaction described.
4.3 Techniques used by speakers to evade or dissipate responsibility for an issue are identified and interpretations of the text reflect this insight.
4.4 The impact (e.g. clarity of purpose, speaker's capability) is described, explained and judged.
Accreditation Options: Providers of learning towards this unit standard will need to meet the accreditation requirements of the accredited ETQA.
Moderation Option: The moderation requirements of the accredited ETQA must be met in order to award credit to learners for this unit standard.
Notes:
1. *Notes to assessors:*
Assessors should keep the following general principles in mind when designing and conducting assessments against this unit standard:
- Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes.
- Make sure evidence is gathered across the range as expressed under the title. Specific range statements under individual outcomes or assessment criteria are illustrations, from which Learning Programme developers can select. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
- Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.
- The assessment criteria provide the specifications against which assessment judgements should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.
- The task of the assessor is to *gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the candidate can achieve the outcomes again and again.* This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.
- All assessments should be conducted in line with the following well documented principles of assessment: *appropriateness, fairness, manageability, integration into work or learning, validity, directness, authenticity, sufficiency, systematic, openness and consistency*

Critical Cross-field Outcomes:
This unit standard promotes, in particular, the following critical cross-field outcomes:
- Identify and solve problems: using context to decode and make meaning individually and in groups in oral, reading and written activities.
- Work effectively with others and in teams: using interactive speech in activities, discussion and research projects.
- Organise and manage oneself and one's activities responsibly and effectively through using

language.

- Collect, analyse, organise and critically evaluate information: fundamental to the process of growing language capability across language applications and fields of study.
- Communicate effectively using visual, mathematical and/or language skills, in formal and informal communications.
- Understand the world as a set of inter-related parts of a system, through using language to explore and express links, and exploring a global range of contexts and texts.
- Contribute to the full development of oneself by engaging with texts that stimulate awareness and development of life skills and the learning process.

4. *Embedded Knowledge:*

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that for the most part, the possession or lack of the knowledge can be directly inferred from the quality of the candidate's performance. Where direct assessment of knowledge is required, assessment criteria have been included in the body of the unit standard.

***10. SAQA* US: FET-14**

Title: Read, analyse and respond to a variety of texts.

Range: A wide variety of complex and extended written and visual texts from socio-cultural, learning and workplace contexts.
Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.

Level: 4

Credit: 5

Field: Communication Studies and Language

Sub-Field: Language Communications; Information (Reading and Viewing)

Issue Date: May 2001

Review Date: November 2003

Learning Assumptions:

The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard: NQF Level 3 unit standards 05.

US: FET-05 Interpret and use information from text*s.*

Purpose:

Competence at this level will enable learners to use analytical skills to make sophisticated judgements about complex human and social issues. They are aware of both the functions of language and of its drama and power.

Learners are critical, reflective readers and viewers of written and visual text. They are able to draw comparisons between texts, and to compare and contrast themes and issues in texts with those in the contexts in which they live and work. They identify and analyse style and tone and account for their effectiveness in different texts. They are willing to challenge the assumptions and values expressed in texts. They are especially critical readers of both the written and visual mass media.

Learners credited with this unit standard are able t**o:**

- analyse and criticise texts produced for a range of purposes, audiences and contexts;
- identify and explain the values, attitudes and assumptions in texts;
- evaluate the effects of content, language and style on readers' responses in specific texts.

Specific Outcomes and Assessment Criteria

Specific outcome 1:

Analyse and criticise texts produced for a range of purposes, audiences and contexts.

Assessment criteria

1.1 Reading strategies appropriate to the purposes for reading are adopted.

Range:

Skim, scan, prediction, knowledge of form of text types and different genre.

1.2 Organisational features of texts are identified. The role of each of the features is explained in relation to usefulness in making meaning of readings and viewing.

Range:

Role of titles, headings, introductions, paragraphs, conclusions, outcome statements, chapters, summaries, contents, diagrams, appendices or addenda, foreword, index, content lists glossary, hyper-links, layout, icons, tables, graphics, font size and/or type, photographs, captions, visuals.

1.3 Synthesis of information from texts, and generalisation of patterns and trends, result in appropriate conclusions about purpose and audience.

Specific outcome 2:

Identify and explain the values, attitudes and assumptions in texts

Range:

Socio-cultural, learning and/or workplace contexts.

Assessment criteria

2.1 An understanding of surface and embedded meaning in the text is reflected in presentations of viewpoints.

2.2 The effect of an author's values and views on selected texts is identified and explained in terms of the impact on meaning and target audience.

2.3 Evidence cited from texts in defence of a position is relevant.

Specific outcome 3:

Evaluate the effects of content, language and style on readers' responses in specific texts.

Assessment criteria

3.1 Content is outlined and its possible effects on different readers are explored.

3.2 The impact of different writing techniques on reader perspective are identified and explained in terms of the particular effect produced by each.
Range:
Length of sentence, punctuation, diction/choice of words, use of figurative language/ jargon/ technical terms/ slang/ dialect/ irony/ humour/ satire/ sarcasm/ legalisms.
3.3 The influence of specific language structures and features is analysed.
Range:
Bias (cultural, religious or peer preferences, misrepresentation, discrimination, racist, sexist, ageist); humour; irony; sarcasm, use of omission and silence, figurative expressions. repetition; hyperbole; generalisations; stereotyping; pictures and captions; typography and grammar.
3.4 The effect of selected production techniques in visuals is explained.
Range of visuals:
Photographs, transparencies, slides, posters, graphics, videos, films
Range of techniques:
Use of colour/black and white, borders, layout features, cinematographic devices, foregrounding, backgrounding, overlays, selection and/or omission, scale, size.
Accreditation Options: Providers of learning towards this unit standard will need to meet the accreditation requirements of the accredited ETQA.
Moderation Option: The moderation requirements of accredited ETQA must be met in order to award credit to learners for this unit standard.
Notes:
1. *Notes to assessors:*
Assessors should keep the following general principles in mind when designing and conducting assessments against this unit standard:
• Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes.
• Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
• Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.
• The assessment criteria provide the specifications against which assessment judgements should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.

The task of the assessor is to *gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the candidate can achieve the outcomes again and again and again.* This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.
- All assessments should be conducted in line with the following well documented principles of assessment: *appropriateness, fairness, manageability, integration into work or learning, validity, directness, authenticity, sufficiency, systematic, openness and consistency.*
2. *Critical Cross-field Outcomes:*
This unit standard promotes, in particular, the following critical cross-field outcomes:
• Identify and solve problems: using context to decode and make meaning individually and in groups in oral, reading and written activities.
• Work effectively with others and in teams: using interactive speech in activities, discussion and research projects.
• Organise and manage oneself and one's activities responsibly and effectively through using language.
• Collect, analyse, organise and critically evaluate information: fundamental to the process of growing language capability across language applications and fields of study.

• Communicate effectively using visual, mathematical and/or language skills: in formal and informal communications.
• Use science and technology effectively and critically: using technology to access and present texts.
• Understand the world as a set of inter-related parts of a system: through using language to explore and express links, and exploring a global range of contexts and texts.
• Contribute to the full development of oneself: by engaging with texts that stimulate awareness and development of life skills and the learning process.

3. *Embedded Knowledge:*

The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without knowledge of the listed embedded knowledge. This means that for the most part, the possession or lack of the knowledge can be directly inferred from the quality of the candidate's performance. Where direct assessment of knowledge is required, assessment criteria have been included in the body of the unit standard.

11. SAQA US: FET-15

Title: Write for a wide range of contexts.
Range: Write on/present specialised and complex topics in a wide range of written and visual forms.
Specific range statements are provided in the body of the unit standard where they apply to particular specific outcomes or assessment criteria.
Level: 4
Credit: 5
Field: Communication Studies and Language
Sub-Field: Language Communications; Information (Writing and Presenting)
Issue Date: May 2001
Review Date: November 2003
Learning Assumptions:
The credit calculation is based on the assumption that learners are already competent in terms of the following outcomes or areas of learning when starting to learn towards this unit standard: NQF level 3 unit standard.
US: FET-09 Write texts for a range of communicative contexts.
Purpose:
This unit standard will be useful to learners who communicate confidently and fluently in writing in almost any formal and informal situation. Competence at this level will help people to analyse and make mature judgements about complex, human, personal, social and environmental issues.
Learners at this level write expressively and with conviction on topics of interest. They cope well with the exploration of complex themes and issues in a variety of writing styles that stimulate and maintain the interest of their readers. Through a drafting and editing process their writing shows significant improvement.
They carefully scrutinise their own and others' writing in terms of its impact on different audiences and contexts.
Learners credited with this unit standard are able to:

- write effectively and creatively on a range of topics;
- choose language structures and features to suit communicative purposes;
- edit writing for fluency and unity.

Specific Outcomes and Assessment Criteria
Specific outcome 1:
Write effectively and creatively on a range of topics.
Assessment criteria
1.1 Imaginative texts are convincing, and appropriate to the topic and purpose.
1.2 Expository/factual texts are convincing and well developed with respect to clearly articulated purposes, using fully developed paragraphs and resulting in a unified text.
1.3 Writing on personal interests is convincing in terms of issues and concerns addressed.
1.4 Choose the narrative voice appropriate to context, purpose and audience.
Range:
Passive for scientific writing, adopting a persona for narrative, first person/third person voice selection, authorial comment within narrative voice, subjective or objective options.
Specific outcome 2:
Choose language structures and features to suit communicative purposes.
Assessment criteria
2.1 Points in argument are logically and deliberately sequenced to build up to a convincing conclusion.
2.2 Devices are employed to create particular rhythmic or tonal effects.
Range:
Punctuation (ellipsis marks, semi-colons and dashes), rhetorical devices (repetition, questioning, emphasis).
2.3 Stylistic devices that enhance meaning are used effectively.
Range:
Symbol, imagery, irony, understatement, index and icon, logos, hyperbole, visuals, graphics
Specific outcome 3:
Edit writing for fluency and unity.
Assessment criteria:
3.1. Text is checked for coherence, logical sequence and structure. Weaknesses and/or errors are identified and adjustments improve coherence and flow.
3.2 Information is rearranged in ways that promote interest in, and impact of, the text for a defined

target audience.
3.3 Layout, spelling, punctuation and syntax are checked for accuracy and readability. Major grammatical and linguistic errors are identified and changes made as required.
3.4 The whole, completed text is checked against the purposes for writing to verify that these purposes have been satisfied.

Accreditation Options: Providers of learning towards this unit standard will need to meet the accreditation requirements of the accredited ETQA.
Moderation Option: The moderation requirements of the accredited ETQA must be met in order to award credit to learners for this unit standard.
Notes:
1. *Notes to assessors:*
• Assessors should keep the following general principles in mind when designing and conducting assessments against this unit standard:
• Focus the assessment activities on gathering evidence in terms of the main outcome expressed in the title to ensure assessment is integrated rather than fragmented. Remember we want to declare the person competent in terms of the title. Where assessment at title level is unmanageable, then focus assessment around each specific outcome, or groups of specific outcomes.
• Make sure evidence is gathered across the entire range, wherever it applies. Assessment activities should be as close to the real performance as possible, and where simulations or role-plays are used, there should be supporting evidence to show the candidate is able to perform in the real situation.
• Do not focus the assessment activities on each assessment criterion. Rather make sure the assessment activities focus on outcomes and are sufficient to enable evidence to be gathered around all the assessment criteria.
• The assessment criteria provide the specifications against which assessment judgements should be made. In most cases, knowledge can be inferred from the quality of the performances, but in other cases, knowledge and understanding will have to be tested through questioning techniques. Where this is required, there will be assessment criteria to specify the standard required.
• The task of the assessor is to *gather sufficient evidence, of the prescribed type and quality, as specified in this unit standard, that the candidate can achieve the outcomes again and again and again.* This means assessors will have to judge how many repeat performances are required before they believe the performance is reproducible.
• All assessments should be conducted in line with the following well documented principles of assessment: *appropriateness, fairness, manageability, integration into work or learning, validity, directness, authenticity, sufficiency, systematic, openness and consistency.*

Critical Cross-Field Outcomes:
This unit standard promotes, in particular, the following critical cross-field outcomes:
• Identify and solve problems: using context to decode and make meaning individually and in groups in oral, reading and written activities.
• Work effectively with others and in teams: using interactive speech in activities, discussion and research projects.
• Organise and manage oneself and one's activities responsibly and effectively through using language.
• Collect, analyse, organise and critically evaluate information: fundamental to the process of growing language capability across language applications and fields of study.
• Communicate effectively using visual, mathematical and/or language skills: in formal and informal communications.
• Use science and technology effectively and critically: using technology to access and present texts.
• Understand the world as a set of inter-related parts of a system: through using language to explore and express links, and exploring a global range of contexts and texts.
• Contribute to the full development of oneself: by engaging with texts that stimulate awareness and development of life skills and the learning process.
3. *Embedded Knowledge:*
The following essential embedded knowledge will be assessed through assessment of the specific outcomes in terms of the stipulated assessment criteria. Candidates are unlikely to achieve all the specific outcomes, to the standards described in the assessment criteria, without

knowledge of the listed embedded knowledge. This means that for the most part, the possession or lack of the knowledge can be directly inferred from the quality of the candidate's performance. Where direct assessment of knowledge is required, assessment criteria have been included in the body of the unit standard.