



Technical and Vocational Education and Training (TVET) Council



## **Occupational Standards of Competence**

# **Laboratory Operations**

## **Level 1**

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**Qualification Overview**

**NVQB**

**in**

**Laboratory Operations**

**Level 1**

## **NVQB in Laboratory Operations Level 1**

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### **Qualification Overview**

Employers can use this qualification to support employees in developing their entry-level laboratory skills required to effectively assist in laboratory operations across a wide range of industry sectors.

Employees at this level must demonstrate the ability to follow established procedures, recipes and protocols and apply entry level technical skills and basic scientific knowledge. These individuals generally assist scientists or other professionals in a laboratory environment but may also operate in the field or within production plants. They may also be responsible for the simple and routine aspects of laboratory maintenance and general office administration.

Like all NVQs this qualification is competence based. This means that it is linked to the candidate's ability to competently perform a range of tasks connected with his/her work. Candidates must plan a programme of development and assessment with their assessors and compile a portfolio of evidence to prove that they are competent in their work role.

### **Who is this qualification for?**

The NVQB in Laboratory Operations Level 1 is aimed at persons who assist professionals such as laboratory technicians, instrument operators and similar personnel in conducting a limited range of laboratory operations within a scientific discipline.

### **Jobs within the occupational area**

Relevant occupations include:

- Laboratory assistants (e.g., medical, pharmaceutical, agriculture, food/beverage, scientific research, education, etc.)
- Entry level laboratory technicians
- Instrument operators

### **Where can it be used?**

The qualification can be used in medical services facilities, production plants and various types of laboratories (e.g. educational, agricultural, agro-food processing, scientific or research).

This list is not exhaustive and only serves to illustrate the breadth of the qualification.

**A012201 – APPROVED NATIONAL VOCATIONAL QUALIFICATION STRUCTURE**  
**LABORATORY OPERATIONS LEVEL 1**

To achieve the full award, candidates must complete all nine (9) mandatory units.

<b><u>Mandatory Units (All must be completed)</u></b>	<b><u>CODES</u></b>
<b>1. Participate in workplace communication</b>	<b>U53802</b>
1.1 Gather and convey workplace information	
1.2 Contribute to workplace meetings and discussions	
1.3 Complete work-related documents	
<b>2. Contribute to environmentally sustainable work practices</b>	<b>UA57201</b>
2.1 Identify current resource use	
2.2 Comply with environmental regulations	
2.3 Seek opportunities to improve environmental practices and resource efficiency	
<b>3. Prepare, standardise and use solutions</b>	<b>UA57301</b>
3.1 Set-up solutions	
3.2 Standardise and use volumetric solutions	
3.3 Calculate and record data	
3.4 Monitor the quality of laboratory solutions	
3.5 Maintain a safe work environment	
<b>4. Plan and conduct laboratory or field work</b>	<b>UA57401</b>
4.1 Organise work activities	
4.2 Identify and resolve work problems	
4.3 Work in a team environment	
4.4 Complete allocated work	
4.5 Update knowledge and required skills	
<b>5. Record and present data</b>	<b>UA57501</b>
5.1 Calculate simple scientific quantities	
5.2 Document and check data	
5.3 Present data	
5.4 Store and retrieve data	
<b>6. Contribute to the achievement of quality objectives</b>	<b>UA57601</b>
6.1 Apply quality control procedures	
6.2 Support quality improvements	
6.3 Maintain commitment to organisational quality standards in own work	
6.4 Maintain customer relationships	
6.5 Update knowledge and skills	

**Mandatory Units (All must be completed)**

**CODES**

- |           |   |                |
|-----------|---|----------------|
| <b>7.</b> | <b>Contribute to laboratory, field and workplace safety</b>             | <b>UA57701</b> |
| 7.1       | Participate in occupational health and safety in the workplace          |                |
| 7.2       | Manage and report occupational health, safety and environmental hazards |                |
| 7.3       | Work in a safe manner   |                |
| 7.4       | Follow incident and emergency response procedures                       |                |
| <b>8.</b> | <b>Receive, handle and prepare samples for testing</b>                  | <b>UA57801</b> |
| 8.1       | Maintain a safe work area and environment                               |                |
| 8.2       | Manage information  |                |
| 8.3       | Prepare samples for testing   |                |
| 8.4       | Distribute samples  |                |
| 8.5       | Log samples   |                |
| <b>9.</b> | <b>Monitor the quality of working solutions</b>                         | <b>UA57901</b> |
| 9.1       | Use laboratory chemicals, glassware and equipment                       |                |
| 9.2       | Check existing stock of solutions                                       |                |
| 9.3       | Make-up working solutions   |                |

**U53802****Participate in workplace communication**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to gather, interpret, and convey information in response to workplace requirements.

**ELEMENT****PERFORMANCE CRITERIA**

*Candidates must be able to:*

- |   |   |
|---|---|
| 1. Gather and convey workplace information          | 1.1 Access relevant and up-to-date information from appropriate sources.<br>1.2 Use effective communication strategies to gather and convey information.<br>1.3 Use appropriate medium to transfer information and ideas.<br>1.4 Identify and follow lines of communication with management and colleagues.<br>1.5 Define procedures for the location and storage of information.<br>1.6 Record information according to organisational procedures. |
| 2. Contribute to workplace meetings and discussions | 2.1 Make useful contributions in meetings and discussions.<br>2.2 Express opinions in a clear, courteous and respectful manner.<br>2.3 Confirm that discussions are appropriate to the purpose and proposed outcome of the meeting.<br>2.4 Interpret and implement meeting outcomes in accordance with established procedures.  |
| 3. Complete work-related documents                  | 3.1 Select and complete documentation according to organisational requirements.<br>3.2 Identify and correct errors on forms and documents in accordance with organisational requirements.   |



**RANGE STATEMENT**

*All range statements must be assessed:*

1. **Appropriate sources** may include but are not limited to:
  - Team members
  - Suppliers
  - Trade personnel
  - Public sector (government)
  - Industry
2. **Communication strategies** may include but are not limited to:
  - Questioning
  - Listening
  - Speaking
  - Writing
  - Non-verbal communication
3. **Medium** may include but is not limited to:
  - Memorandum
  - Circular
  - Notice
  - Information discussion
  - Follow-up or verbal instruction
  - Face-to-face communication
4. **Storage** may include but is not limited to:
  - Manual filing system
  - Electronic filing system
5. **Protocols** may include but are not limited to:
  - Organisational policies and procedures
  - Legislation
6. **Workplace interactions** may include but are not limited to:
  - Face-to-face
  - Telephone
  - ICT
  - Written (electronic, memos, instructions, forms)
  - Non-verbal (gestures, signals, signs, diagrams)

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What are the organisational policies and procedures that relate to the communication of information.
2. How to locate, interpret and provide information in response to organisational requirements or customer requests.
3. What are appropriate sources of information.
4. What is effective communication.
5. What are the different modes of communication and how to use them.
6. What are the different communication strategies and how to use them.
7. How to communicate effectively with management, colleagues and clients to provide information and feedback.
8. How to participate in workplace meetings and discussions.
9. How to identify the purpose and proposed outcomes of a meeting and make positive contributions to achieve them.
10. How to express opinions in a clear, respectful and courteous manner.
11. How to use basic ICT resources (smartphones, tablets, computer etc.).
12. What is the range of work related documentation and how it should be completed.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge on more than one occasion. This evidence must come from a real working environment.

### (2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not** be used, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57201****Contribute to environmentally sustainable work practices**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to contribute to environmentally sustainable work practices. Candidates are required to comply with environmental regulations, identify environment issues and minimise the risks of negative impact on work and carry out improvements in own work area.

**ELEMENT****PERFORMANCE CRITERIA***Candidates must be able to:*

- |  |   |
|--|---|
| 1. Identify current resource use   | 1.1 Identify resources used in assigned work roles.   |
|  | 1.2 Confirm current consumption levels of resources in assigned work roles with relevant persons.   |
|  | 1.3 Identify and confirm current environmental performance and resource efficiency issues in the workplace with relevant persons.         |
| 2. Comply with environmental regulations   | 2.1 Discuss and confirm the environmental policies and other requirements applicable to assigned work roles with relevant persons.        |
|  | 2.2 Identify and report incidents to relevant persons in accordance with organisational procedures.                                       |
|  | 2.3 Perform work tasks in a manner that ensures compliance with organisational, environmental policies and procedures.                    |
| 3. Seek opportunities to improve environmental practices and resource efficiency | 3.1 Identify workplace practices and workplans that contribute to environmental performance and resource efficiency issues.               |
|  | 3.2 Recommend changes to workplace practices and workplans that could lead to improvements in environmental performance in the workplace. |

**RANGE STATEMENT**

*All range statements must be assessed:*

**1. Environmental performance and resource efficiency issues** may include but are not limited to:

- Excess waste generation (e.g. solid/chemical waste, liquid or gas emissions, etc.)
- Overconsumption of resources (e.g. energy and water)
- Negative ecosystem/environmental impacts (e.g. pollution of air, lands and water systems)
- Overuse of non-recyclables or environmentally harmful materials

**2. Incidents** may include but are not limited to:

- Breaches or potential breaches of environmental regulations
- Occurrences outside of standard procedures which may lead to lower environmental performance

**3. Improvements** may include but are not limited to:

- The prevention and mitigation of negative environmental impacts (e.g. environmental damage from hazardous substances)
- Reduced carbon footprint (e.g. using renewable energy sources, reducing energy consumption)
- Improved energy efficiency
- Reduced waste and water usage
- Reusing/recycling waste/products

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What is “environmental sustainability” and how this can be achieved.
2. How to identify resources used in assigned work roles.
3. Why it is important to track the consumption of resources.
4. What are the methods of measuring or tracking the consumption of various types of resources in the workplace and how to confirm resource consumption levels.
5. What are the relevant organisational and legislative environmental policies and other requirements applicable to assigned work roles and how to clarify and confirm them.
6. What are the types of environmental performance incidents and resource efficiency issues that occur in the workplace and how to identify and report them.
7. Who are the relevant persons with whom to consult regarding environmental policies and issues in the workplace.
8. How to perform work tasks in a manner that ensures compliance with organisational environmental policies and procedures.
9. How to identify workplace practices and workplans that contribute to environmental performance and resource efficiency issues.
10. How to recommend changes to workplace practices and workplans that could lead to improvements in the environmental performance of the workplace.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57301****Prepare, standardise and use solutions**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to prepare, standardise and use volumetric solutions. Candidates will also be required to monitor the quality of these solutions and calculate and record associated data.

**ELEMENT****PERFORMANCE CRITERIA***Candidates must be able to:*

- |   |   |
|---|---|
| 1. Set-up solutions                         | <ul style="list-style-type: none"> <li>1.1 Select appropriate equipment, glassware, materials and solvents of specified purity that are fit for purpose in accordance with laboratory requirements.</li> <li>1.2 Measure appropriate quantities of reagents for solution preparation and record data in accordance with laboratory procedures.</li> <li>1.3 Assemble specified laboratory equipment and appropriate grade of glassware in accordance with laboratory requirements and manufacturer's guidelines.</li> <li>1.4 Perform dilutions in accordance with laboratory procedures and requirements.</li> <li>1.5 Homogenise solutions at the specified concentration using appropriate solution preparation procedures.</li> <li>1.6 Label and store solutions in a manner that maintains identity and stability.</li> </ul> |
| 2. Standardise and use volumetric solutions | <ul style="list-style-type: none"> <li>2.1 Assemble appropriate laboratory equipment and glassware in accordance with laboratory procedures and manufacturer's guidelines.</li> <li>2.2 Perform serial dilutions, where required, in accordance with organisational procedures.</li> <li>2.3 Homogenise the solution to the specified range and precision.</li> <li>2.4 Label and store solutions in a manner that maintains identity and stability.</li> </ul>   |



- 2.5 Use standard volumetric solutions to determine the concentration of unknown solutions.
- 3. Calculate and record data
  - 3.1 Evaluate specified concentrations in accordance with organisational methods and procedures.
  - 3.2 Modify data, where required, using authorised procedures.
  - 3.3 Record relevant details and report results in accordance with laboratory procedures and organisational requirements.
  - 3.4 Report concentration with appropriate units in accordance with organisational procedures and requirements.
- 4. Monitor the quality of laboratory solutions
  - 4.1 Inspect stored solutions for visual signs of deterioration and check expiry dates in accordance with industry best practices.
  - 4.2 Re-standardise or dispose of dated or deteriorated solutions in accordance with industry best practices and environmental regulations.
  - 4.3 Record relevant details and label solutions in accordance with laboratory procedures.
- 5. Maintain a safe work environment
  - 5.1 Follow established safety precautions and wear personal protective equipment in a manner that ensures personal safety and the safety of other laboratory personnel.
  - 5.2 Clean up spills using approved techniques to protect personnel, the work area and the environment.
  - 5.3 Minimise the generation of waste and environmental impacts in accordance with organisational environmental policies.
  - 5.4 Confirm the safe collection of laboratory and hazardous waste for subsequent disposal.
  - 5.5 Store equipment and reagents as required according to laboratory and manufacturer's requirements.

**RANGE STATEMENT**

*All range statements must be assessed:*

**1. Equipment** may include but is not limited to:

- Ph meters
- Balances
- Stirrers
- Water baths
- Heat sources (e.g., bunsen burner, hot plate)
- Measuring cylinders
- Filter papers and funnels
- Fume cupboards
- Retort stands
- Thermometers

**2. Glassware** may include but is not limited to:

- Pipettes and burettes
- Volumetric flasks
- Conical flasks
- Test tubes
- Dishes
- Beakers

**3. Solutions** may include but are not limited to:

- Acids
- Oxidising or reducing agents
- Complexometric or precipitation titrations
- Stains and tissue
- Enzymes
- Buffers and antibodies
- Diluents
- Organic (e.g. Benzenes)
- Histological fixatives
- Indicators

**4. Safe precautions** may include but are not limited to:

- Use of material safety data sheets (MSDS)
- Use of personal protective equipment
- Correct labelling of reagents and hazardous materials
- Handling and storing hazardous materials and equipment
- Regular cleaning or decontamination of equipment and work area

**5. Personal protective equipment** may include but is not limited to:

- Respirator
- Faceguard
- Goggles/face mask
- Gloves
- Face shield
- Coveralls
- Safety glasses

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What are the terminologies relating to chemicals and reactions.
2. What is the concept of metrology.
3. What are the grades of glassware, reagents and their uses.
4. What reactions are used for standardisation and desirable characteristics.
5. What are the organisation's communication and reporting procedures.
6. What are the occupational health and safety (OHS) procedures used in laboratories.
7. What are the relevant health, safety and environment requirements.
8. How to interpret and follow laboratory standard operating procedures (SOPs).
9. How to determine equivalence points using indicators and graphical methods.
10. How to calculate using methods, including appropriate units, uncertainties, balancing equations.
11. How to use apparatus and reagents to prepare standard solutions.
12. How to select and use primary and secondary standards and indicators.
13. How to perform quality assurance checks for solution performance.
14. How to perform titrations.
15. How identify control results that are not within an acceptable range.
16. How to interpret and use safety information, such as that provided by material safety data sheets (MSDS) and follow relevant safety procedures.
17. What are the appropriate techniques for cleaning up spills.
18. How to minimise waste.
19. What are the industry, organisational and environmental requirements for disposing of laboratory waste.
20. How to store equipment and chemicals.
21. What are the relevant occupational health and safety requirements.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57401****Plan and conduct laboratory or field work**

## Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to plan and conduct laboratory or field work. Candidates are required to plan and complete tasks individually or in a team context. The tasks involve established routines and procedures using allocated resources with access to readily available guidelines and advice.

**ELEMENT****PERFORMANCE CRITERIA**

*Candidates must be able to:*

- |                                       |   |
|---------------------------------------|---|
| 1. Organise work activities           | 1.1 Clarify allocated work activities and required resources in accordance with established procedures.<br>1.2 Prioritise work activities as directed.<br>1.3 Break down work activities into small achievable components and efficient sequences.<br>1.4 Review work plans in response to new information, urgent requests, changed situations or instructions from appropriate personnel. |
| 2. Identify and resolve work problems | 2.1 Identify problems or opportunities for improved work performance.<br>2.2 Apply agreed problem-solving strategies to consider possible causes and solutions.<br>2.3 Determine and access appropriate sources of assistance in accordance with established procedures.<br>2.4 Consider available alternatives and keep them open before deciding on the most appropriate action.          |
| 3. Work in a team environment         | 3.1 Cooperate with team members to negotiate and achieve agreed outcomes, timelines and priorities.<br>3.2 Identify personal abilities and limitations when undertaking team tasks.   |

- 3.3 Confirm personal roles and responsibilities within the team for particular outputs.
    - 3.4 Demonstrate sensitivity to the diversity of team members' backgrounds and beliefs.
  - 4. Complete allocated work
    - 4.1 Locate relevant workplace procedures for required tasks.
    - 4.2 Undertake tasks following prescribed and routine work-related sequences.
    - 4.3 Seek assistance from relevant personnel for difficulties which cannot be handled within the scope of your own role/authority.
    - 4.4 Record the completion of activities to confirm outputs in accordance with plan.
  - 5. Update knowledge and required skills
    - 5.1 Identify personal strengths and weaknesses that may affect the ability to carry out work activities.
    - 5.2 Participate in skill development activities in accordance with guidance from relevant persons.

**RANGE STATEMENT**

*All range statements must be assessed:*

1. **Work activities** may include but are not limited to:
  - Set-up, pre-use and calibration status checks
  - Sampling and testing
  - Maintenance and cleaning
2. **Workplace procedures** may include but are not limited to:
  - Safety and health
  - Use of materials
  - Cost control
  - Sustainable work practices
  - Standard operating procedures
  - Production schedules
  - Methods, recipes and protocols
3. **Problem solving strategies** may include but are not limited to:
  - Accessing relevant documentation
  - Identifying inputs and outputs
  - Sequencing a process
  - Identify and rectifying a problem step
  - Obtaining timely assistance.
  - Implementing preventative strategies
4. **Team members** may include but are not limited to:
  - Full and part time employees
  - Internal and external employees (contractors, laboratory and production personnel)
  - Employees working remotely on other worksites, in other laboratories

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What are the procedures and guidelines for work.
2. How to effectively plan, prioritise and complete laboratory or field work tasks.
3. What are problem solving strategies.
4. What are interpersonal, communication and conflict resolution techniques.
5. What are the strategies to maintain an efficient workflow.
6. What are the occupational safety and health requirements specific to the work task.
7. How to work independently.
8. How to work as a part of a team.



## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on at least two (2) occasions**. This evidence must come from a real work or simulated working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57501****Record and present data**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to record and store data, perform simple calculations of scientific quantities and present information in tables and graphs. It requires personnel to solve predictable problems using clear information or known solutions.

**ELEMENT****PERFORMANCE CRITERIA***Candidates must be able to:*

- |   |  |
|---|--|
| 1. Calculate simple scientific quantities | 1.1 Calculate simple scientific quantities using given formulae and data.                                |
|   | 1.2 Confirm that calculated quantities are consistent with estimations and expectations.                 |
|   | 1.3 Report calculated quantities with appropriate precision and units.                                   |
| 2. Document and check data                | 2.1 Enter data into laboratory information system or record sheets as directed.                          |
|   | 2.2 Identify transcription errors or atypical entries in data in accordance with established procedures. |
|   | 2.3 Rectify errors in data according to workplace procedures.  |
| 3. Present data                           | 3.1 Present data in tables, charts and graphs using given formats and scales.                            |
|   | 3.2 Check, confirm and report obvious features and trends in data.                                       |
| 4. Store and retrieve data                | 4.1 File and store data in accordance with organisational procedures.                                    |
|   | 4.2 Maintain workplace confidentiality standards.  |

## RANGE STATEMENT

*All range statements must be assessed:*

**1. Sources of data** may include but are

- Observations
- Tests and measurements
- Surveys
- Graphs
- Tables
- Charts

**2. Calculations** may include but are not limited to:

- Percentages
- Fractions
- Decimals
- Conversions between SI units
- Areas and volumes
- Density
- Specific gravity
- Absolute and relative humidity
- Rations
- Concentrations
- Averages
- Process variables
- Moisture content
- Food properties (e.g. calorific content)
- Standard deviation

**3. Features and trends** may include but are not limited to:

- Maximum and minimum values
- Spread of data
- Rate of change
- Outliers

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. How to calculate scientific quantities.
2. What are the procedures for maintaining and filing records and securing data.
3. How to check data for errors and irregularities according to specific data types.
4. How to make the necessary adjustments to data errors and enter data to suit the aim and purpose.
5. What are the relative protocols for workplace confidentiality.
6. How to interpret and present findings to suit the aim and purpose.
7. What are the relevant research methodologies required for the data to be recorded and presented.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57601****Contribute to the achievement of quality objectives**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to contribute to the achievement of quality objectives. Candidates will be required to develop their working knowledge of quality principles and apply this in laboratory/field work.

**ELEMENT****PERFORMANCE CRITERIA***Candidates must be able to:*

- |  |  |
|--|--|
| 1. Apply quality control procedures                                    | 1.1 Record data for quality control purposes.  |
|  | 1.2 Identify and report non-conformance in keeping with job role and quality control procedures.                                   |
| 2. Support quality improvements  | 2.1 Review own work practices for opportunities to continuously improve performance.   |
|  | 2.2 Identify and report opportunities for improvements in procedures, processes and equipment in work area to appropriate persons. |
| 3. Maintain commitment to organisational quality standards in own work | 3.1 Perform tasks in a manner that complies with the objective of 'right first time'.  |
|  | 3.2 Conduct work in accordance with sustainable work practices.  |
|  | 3.3 Minimise waste and re-work in accordance with organisational guidelines.   |
|  | 3.4 Demonstrate job ownership for whole tasks through a commitment to finish and follow-up.  |
|  | 3.5 Check and confirm that personal actions conform with the code of ethics relevant to the workplace.                             |
|  | 3.6 Maintain a journal of work tasks completed which captures relevant information.  |

- 4. Maintain customer relationships
  - 4.1 Interact with customers demonstrating an understanding of business goals and products and services of the organisation in relation to own function.
  - 4.2 Communicate with customers within the limits of own knowledge, authority and quality requirements.
  
- 5. Update knowledge and skills
  - 5.1 Identify own strengths and limitations using appropriate means.
  - 5.2 Participate in skill or knowledge development activities where available.

**RANGE STATEMENT**

*All range statements must be assessed:*

1. **Quality control procedures** may include but are not limited to:
  - Good laboratory practices
  - Customer service standards
  - Licensing and regulatory standards
  - Organisational quality procedures
  - Checklist to monitor job progress
  - Inspection and test plans
  - Journals
2. **Sustainable work practices** may include but are not limited to:
  - Reduction (e.g. energy consumption, waste emissions)
  - Reuse
  - Recycling
3. **Customers** may include but are not limited to:
  - Internal
  - External



**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. How to record and report according to organisational standards.
2. What are the organisation's quality control procedures.
3. What are sustainable work practices and how to apply them.
4. How to work independently and responsibly.
5. What are the organisation's products and services.
6. How to maintain effective customer relationships.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57701****Contribute to laboratory, field and workplace safety**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to apply occupational safety and health policies and procedures dealing with the identification and control of hazards, working safely at all times, emergency responses and contributing to the maintenance of workplace safety.

**ELEMENT****PERFORMANCE CRITERIA***Candidates must be able to:*

- |  |  |
|--|--|
| 1. Participate in occupational health and safety in the workplace          | 1.1 Raise occupational health and safety and environmental issues with designated personnel in accordance with organisational procedures legislation and obligations of employees. |
|  | 1.2 Participate in occupational health and safety activities within the scope of own responsibilities.   |
| 2. Manage and report occupational health, safety and environmental hazards | 2.1 Check the immediate work area for hazards prior to commencing and during work.   |
|  | 2.2 Address hazards within the area of own responsibility.   |
|  | 2.3 Report and record hazards and incidents to designated personnel according to organisational policies and procedures.   |
| 3. Work in a safe manner   | 3.1 Select, fit and use appropriate personal protective equipment in accordance with organisational procedures.  |
|  | 3.2 Follow organisation procedures when carrying out work tasks.   |
|  | 3.3 Keep work areas clean and free from obstacles in accordance with health and safety requirements.   |
|  | 3.4 Maintain organisational standards of personal hygiene.   |
|  | 3.5 Store, transport and dispose of hazardous materials and dangerous goods in accordance with health and safety requirements.   |

- 4. Follow incident and emergency response procedures
  - 4.1 Identify incident and emergency situations.
  - 4.2 Respond to emergencies in accordance with organisational incident and emergency response procedures
  - 4.3 Report and record incident and emergency situations according to organisational procedures.

**RANGE STATEMENT**

*All range statements must be assessed:*

**1. Hazards** may include but are not limited to:

- Physical (e.g. slip/trip hazards, falling objects, noise, heights, dust, solar radiation)
- Biological (e.g. stings, bites, allergens, infectious agents)
- Chemical (e.g. aerosols, corrosive agents, fumes, spills, mists, etc.)
- Ergonomic (e.g. manual handling, poor posture, improper lifting techniques)

**3. Emergencies** may include but are not limited to:

- Fire
- Natural disasters (e.g. adverse weather events, earthquakes, etc.)
- Medical incidents (e.g. accidents, injuries etc.)
- Security breaches
- Leakage or spillage of hazardous substances

**2. Personal protective equipment (PPE)** may include but is not limited to:

- Goggles/face mask/shield
- Gloves
- Lab coat
- Safety shoes
- Ear plugs/muffs
- Hard hat/cap

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What are the occupational health and safety requirements in the workplace.
2. How to apply occupational health and safety requirements in the workplace.
3. How to locate advice and information on occupational safety and health issues, including Material Safety Data Sheets (MSDSs).
4. What are the hazards commonly found in own job and work area.
5. What is the process for raising a health and safety issue or concern.
6. What are the standard operating procedures for equipment use.
7. How to conduct work safely.
8. How to organise and maintain work areas.
9. What are the organisation's standards for personal hygiene.
10. How to handle, store and dispose of hazardous materials and dangerous goods.
11. What are the procedures for reporting incidents and emergencies.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57801****Receive, handle and prepare samples for testing**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to log samples, check sample documentation, schedule and prepare a range of samples for testing.

**ELEMENT****PERFORMANCE CRITERIA**

*To be competent you must achieve the following:*

- |    |   |     |  |
|----|---|-----|--|
| 1. | Maintain a safe work area and environment | 1.1 | Apply safe work practices to ensure personal safety and that of other laboratory personnel.  |
|    |   | 1.2 | Use appropriate personal protective equipment to ensure personal safety when sampling, processing, transferring or disposing of samples. |
|    |   | 1.3 | Report accidents and spillages to supervisor.  |
|    |   | 1.4 | Clean up splashes and spillages on lab/equipment surfaces immediately using appropriate techniques and precautions.                      |
|    |   | 1.5 | Minimise the generation of wastes and environmental impacts.   |
|    |   | 1.6 | Confirm that hazardous materials and other laboratory waste are disposed of in a safe manner.  |
| 2. | Manage information                        | 2.1 | Report to referring client when samples and request forms do not comply with organisation's requirements.                                |
|    |   | 2.2 | Refer to supervisor for instructions where 'return to source' is inappropriate or not possible.  |
|    |   | 2.3 | Maintain confidentiality of client and organisation data and information.  |
|    |   | 2.4 | Confirm that information provided to customers is accurate, relevant and authorised for release.   |



- 2.5 Communicate and interact with customers politely and efficiently, in accordance with organisational procedures.
3. Prepare samples for testing
  - 3.1 Perform physical separation of the samples according to standard operating procedures.
  - 3.2 Organise the required number of sub-samples according to standard operating procedures.
  - 3.3 Perform chemical separation of the samples according to standard operating procedures.
  - 3.4 Place samples in appropriate container/carriers for transportation according to organisational standards.
  - 3.5 Label sample containers in accordance with organisational policies and procedures.
  - 3.6 Monitor and control sample conditions before, during and after processing.
4. Distribute samples
  - 4.1 Group samples that require similar testing requirements.
  - 4.2 Disseminate samples to workstations in a manner that maintains sample integrity.
  - 4.3 Share request forms for data entry or filing in accordance with organisational procedures.
  - 4.4 Check that samples and relevant request forms have been received by laboratory personnel.
5. Log samples
  - 5.1 Record date and time of arrival of samples according to organisational requirements.
  - 5.2 Check and match samples with request forms before they are accepted and apply corrective actions, where required, in accordance with organisational policies and procedures.

- 5.3 Enter **samples** into the laboratory information management system (LIMS).
- 5.4 Apply required document tracking mechanisms.
- 5.5 Process 'urgent' test requests according to organisational requirements.

**RANGE STATEMENT**

*All range statements must be assessed:*

**1. Safe work practices** may include but are not limited to:

- Use of material safety data sheets (MSDSS)
- Use of personal protective equipment
- Use of biohazard containers
- Use of laminar flow cabinets
- Use of fume hood
- Correct labelling of reagents and hazardous materials
- Handling and storage of hazardous materials and equipment
- Cleaning, organising and decontamination of equipment and work areas

**3. Samples** may include but are not limited to:

- Gases
- Liquids
- Solids
- Raw materials
- Waste materials

**2. Personal protective equipment** may include but is not limited to:

- Goggles/face mask/shield
- Respirator
- Gloves
- Lab coat
- Safety shoes
- Ear plugs/muffs
- Dosimeter and radiation monitoring badges
- Hard hat/cap
- Hazardous materials (HAZMAT) suits

**4. Appropriate techniques for cleaning splashes/spillages** may include but are not limited to:

- Manual
- Mechanical

**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What are safe work practices and how to apply them.
2. What are the required forms of personal protective equipment used in the laboratory and how to correctly fit, use, store and maintain each.
3. What are the organisation's procedures for receiving, documenting, distributing and storing samples.
4. How to manage spillages and hazardous wastes.
5. How to maintain effective customer relations.
6. What are the various types of physical and chemical separations that can be performed on samples and how to select the appropriate one.
7. How to perform physical and chemical separations of samples relevant to industry and purpose.
8. How to prepare samples for testing.
9. How to log samples.
10. How to store and transport samples.

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**UA57901****Monitor the quality of working solutions**

Unit Descriptor:

This unit describes the knowledge, skills and attitudes required to monitor the quality of working solutions. It assumes that calculations of quantities, choice of reagent grades and required dilutions will be specified by the supervisor.

**ELEMENT****PERFORMANCE CRITERIA***Candidates must be able to:*

- |  |  |
|--|--|
| 1. Use laboratory chemicals, glassware and equipment | <ul style="list-style-type: none"> <li>1.1 Apply appropriate safety precautions for the use of laboratory equipment and hazardous chemicals and materials.</li> <li>1.2 Organise appropriate laboratory glassware and measuring equipment in accordance with the required task.</li> <li>1.3 Clean and store glassware and equipment in accordance with organisational procedures.</li> </ul>  |
| 2. Check existing stock of solutions                 | <ul style="list-style-type: none"> <li>2.1 Monitor the shelf-life of working solutions in accordance with laboratory procedures.</li> <li>2.2 Dispose of, replace out-of-date or reject solutions in accordance with laboratory procedures and environmental regulations.</li> <li>2.3 Conduct routine titrimetric analyses, if appropriate, to determine if solutions are fit for purpose.</li> </ul>   |
| 3. Make-up working solutions                         | <ul style="list-style-type: none"> <li>3.1 Identify the relevant standard methods for solution preparation.</li> <li>3.2 Assemble specified laboratory equipment in accordance with industry requirements.</li> <li>3.3 Select and prepare materials and solvent of specified purity.</li> <li>3.4 Measure appropriate quantities of reagents for solution preparation and record data according to organisational procedures.</li> <li>3.5 Prepare labels and log solution details in laboratory register.</li> </ul> |

- 3.6 Transfer solutions to labelled containers as instructed.

**RANGE STATEMENT**

*All range statements must be assessed:*

**1. Equipment** may include but is not limited to:

- Ph meters
- Balances
- Stirrers
- Water baths
- Heat source (e.g. Bunsen burner, hot plates)
- Measuring cylinders
- Filter papers and funnels
- Fume cupboards
- Retort stands
- Thermometers

**2. Glassware** may include but is not limited to:

- Pipettes and burettes
- Volumetric flasks
- Conical flasks
- Test tubes
- Dishes
- Beakers

**3. Solutions** may include but are not limited to:

- Acids
- Oxidising or reducing agents
- Complexometric or precipitation titrations
- Stains and tissue
- Enzymes
- Buffers and antibodies
- Diluents
- Organic (e.g. Benzenes)
- Histological fixatives
- Indicators

**4. Safety precautions** may include but are not limited to:

- Use of material safety data sheets (MSDSS)
- Use of personal protective equipment
- Correct labelling of reagents and hazardous materials
- Handling and storing hazardous materials and equipment
- Regular cleaning or decontaminating of equipment and work area

**5. Monitor** may include but is not limited to:

- Turbidity
- Deposits
- Crystallisation
- Colour changes
- Expiring dates



**UNDERPINNING KNOWLEDGE AND SKILLS**

*Candidates must know and understand:*

1. What is the relevant biological, chemical, food and laboratory terminology.
2. How to select and use laboratory equipment safely.
3. What are the procedures and processes to follow when monitoring the shelf-life of solutions.
4. What is the basic theory of acids, bases, salts, buffers and neutralisation.
5. What are the standard methods for preparing solutions.
6. What are the organisation's procedures for preparing solutions.
7. How to perform calculations when preparing solutions of specified concentration.
8. What are the appropriate procedures for preparing, handling and disposing solutions.
9. How to use material safety data sheets (MSDSs).
10. What are the relevant safety and environmental requirements pertaining to preparing solutions.
11. How to locate advice and information on occupational safety and health issues, including Material Safety Data Sheets (MSDS).

## EVIDENCE GUIDE

*For assessment purposes:*

### (1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

### (2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

### (3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

**Assessment methods**

The methods which can be used to determine competence in performance and underpinning knowledge.

**Assessors**

The Assessor guides and assesses the candidate. His/her role is to determine whether evidence presented by a candidate for assessment within the programme meets the required standard of competence in the relevant unit or element. The Assessor needs to be competent to assess to national standards in the area under assessment.

**Approved Centre**

Organisation/Centre approved by the TVET Council to offer full National Vocational Qualifications.

**Case Studies**

In situations where it is difficult for workplace assessment to take place, case studies can offer the candidate an opportunity to demonstrate potential competence.

A case study is a description of an actual or imaginary situation presented in some detail. The way the case study is presented will vary depending upon the qualification, but the most usual methods are written, taped or filmed.

The main advantage of a case study is the amount of evidence of underpinning knowledge they can generate and the specific nature of the evidence produced.

**Competence**

In the context of vocational qualifications, competence means: the ability to carry out prescribed activities to nationally pre-determined standards in an occupation. The definition embraces cognitive, practical and behavioural skills, underpinning knowledge and understanding and the ability to react appropriately in contingency situations.

**Element**

An element is a description of an activity which a person should be able to do. It is a description of an action, behaviour or outcome which a person should be able to demonstrate.

**Explanation of NVQ Levels**

NVQs cover five (5) levels of competence, from entry level staff at Level 1 through to senior management at Level 5.

**Level 1 - Entry Level**

Recognises competence in a range of varied work activities performed in a variety of contexts. Most work activities are simple and routine. Collaboration with others through work groups or teams may often be a requirement. Substantial supervision is required especially during the early months evolving into more autonomy with time.

**Level 2 - Skilled Occupations**

Recognises competence in a broad range of diverse work activities performed in a variety of contexts. Some of these may be complex and non-routine and involve some responsibility and autonomy. Collaboration with others through work groups or teams and guidance of others may be required.

**Level 3 - Technician and Supervisory Occupations**

Recognises competence in a broad range of complex, technical or professional work activities performed in a wide variety of contexts, with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and the allocation of resources are often a requirement. The individual is capable of self-directed application, exhibits problem solving, planning, designing and supervisory capabilities.

**Level 4 - Technical Specialist and Middle Management Occupations**

Recognises competence involving the application of a range of fundamental principles and complex techniques across a wide and unpredictable variety of contexts. Requires very substantial personal autonomy and often significant responsibility for the work of others, the allocation of resources, as well as personal accountability for analysis, diagnosis, design, planning, execution and evaluation.

**Level 5 - Chartered, Professional and Senior Management Occupations**

Recognises the ability to exercise personal professional responsibility for the design, development or improvement of a product, process, system or service. Recognises technical and management competencies at the highest level and includes those who have occupied positions of the highest responsibility and made outstanding contribution to the promotion and practice of their occupation.

**External Verifier**

The External Verifier is trained and appointed by the TVET Council and is competent to approve and ensure an approved Centre's quality of provision.

**Internal Verifier**

The Internal Verifier acts in a supporting role for Assessors to ensure consistent quality of assessment and competence. They need to be competent to assess to national standards in the area under assessment.

**NVQ**

National Vocational Qualifications (NVQs) are work-based qualifications that assess an individual's competence in a work situation and certify that the individual can perform the work role to the standards expected in employment.

NVQs are based on national occupational standards of competence drawn up by standards-setting bodies known as Industry Lead Bodies. The standards describe the level and breadth of performance that is expected of persons working in the industry or sector which the NVQ covers.

**NVQ Coordinator**

The NVQ Coordinator is the centre contact within each approved Centre offering NVQs. He/she has overall responsibility for the operation and administration of the NVQ system.

**Observation**

Observation of the candidate carrying out his/her job in the workplace is the assessment method recommended in the vast majority of units and elements. Observation of staff carrying out their duties is something that most supervisors and managers do every day.

**Performance Criteria**

Performance criteria indicate what is required for the successful achievement of an element. They are descriptions of what you would expect to see in competent performance.

**Product of Work**

This could be items produced during the normal course of work, which can be used for evidence purposes such as reports, menus, promotional literature, training plans, etc.

### Questioning

Questioning is one of the most appropriate ways to collect evidence to assess a candidate's underpinning knowledge and understanding.

Questioning can also be used to assess a candidate in those areas of work listed in the range which cannot be assessed by observation. Guidance on when this assessment method can be used is given in the assessment guidance of each individual element.

As an assessment method, questioning ensures you have all of the evidence about a candidate's performance. It also allows you to clarify situations.

### Range statements

The range puts the element of competence into context. A range statement is a description of the range of situations to which an element and its performance criteria is intended to apply.

Range statements are prescriptive therefore each category must be assessed.

### Role-plays

Role-plays are simulations where the candidate is asked to act out a situation in the way he/she considers "real" people would behave. By using role-play situations to assess a candidate you are able to collect evidence and make a judgment about how the candidate is most likely to perform. This may be necessary if the range specified includes a situation in which the candidate is unlikely to find himself/herself in the normal course of their work, or where the candidate needs to develop competence, before being judged competently, for example, in a disciplinary situation,

### Simulations

Where possible, assessment should always be carried out by observing **natural performance** in the workplace. **Simulated performance**, however, can be used where specified to collect evidence about an aspect of the candidate's work which occurs infrequently or is potentially hazardous, for example, dealing with fires.

By designing the simulated situation, briefing the candidate and observing his/her performance, you will be able to elicit evidence which will help you judge how a candidate is **most likely** to perform in real life.

### Supplementary evidence

Supplementary evidence can be used to confirm and support performance evidence. Types of supplementary evidence include witness testimonies, reports, journals or diaries, records of activities, personal statements, simulation (see note in glossary).

### Underpinning knowledge

Underpinning knowledge indicates what knowledge is essential for a person to possess in order to successfully achieve an element and prove total competence.

### Units

A unit of competence describes one or more activities which form a significant part of an individual's work. Units are accredited separately but in combination can make up a vocational qualification. There are two categories of units:

**Mandatory units** - are core to a qualification and must be completed.

**Optional units** - candidates must choose the required number of individual units, specified in the qualification structure, to achieve the qualification.

### Work-based projects

Work-based projects are a useful way for you to collect evidence to support any decision you make about a candidate's performance. They are particularly appropriate in determining the level of a candidate's underpinning knowledge and understanding where it may be insufficient to rely only on questioning observation.

A project often involves the identification of a solution to a specific problem identified by you and/or the candidate (such as looking at ways to redress a recent drop in sales), or may be a structured programme of work built around a central situation or idea (such as the introduction of a new job rostering process).