# Assessment Mapping (for streamlined units from new Training Packages)

*This document is used to demonstrate content validity of the assessment tool*

Table 1 Main details

| Details | Unique description |
| --- | --- |
| **Unit Code, name and release number** | MSL974019 - Perform chemical tests and procedures (1) |
| **Skills Team** |  |
| **Region/Campus** |  |
| **SkillsPoint (owned by)** | Innovative Manufacturing, Robotics and Science |

## Unit component mapping to assessment event/s

Table 2 Unit component mapping to assessment event/s

| Element number | Element name | Performance criteria number | Performance criteria description | Learning resources | Knowledge Assessment 1 of 3 | Project Assessment 2 of 3 | Skills Assessment3  of 3 |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Interpret and schedule test requirements | 1.1 | Review test request to identify samples to be tested, test method and equipment and instruments involved |  |  | Assignment Q1 | A1  Lab Record  4, 5 |
| 1.2 | Identify hazards and workplace control measures associated with the sample, preparation and test methods, reagents and/or equipment |  | Q24, Q25 | Research  1.6  Assignment  Q2, Q3 | A2, A3, B5  Lab Record 6 |
| 1.3 | Plan work sequences to optimise throughput of multiple samples |  |  | Assignment Q4, Q5 |  |
| 2 | Receive and prepare samples | 2.1 | Log samples using standard operating procedures (SOPs) |  |  | Assignment  Q6 | Lab record 3, 15  D18 |
| 2.2 | Record sample description, compare with specification and note and report discrepancies |  |  | Assignment  Q7, Q8 | D18  Lab Record 3 |
| 2.3 | Prepare samples and standards in accordance with chemical testing requirements |  |  | Assignment Q9 | C9, C10 |
| 3 | Check equipment before use | 3.1 | Set up equipment and instruments in accordance with test method requirements |  | Q24 | Assignment  Q10, Q13 | B 5- B8  Lab Report 7 - 8 |
| 3.2 | Perform pre-use and safety checks in accordance with relevant workplace and operating procedures |  |  | Assignment  Q11, Q12 | A2  B6 – B 7 |
| 3.3 | Check equipment calibration using specified standards and procedures |  |  | Research 1.7 | B7 |
| 3.4 | Inspect reagents required for quality issues including visual checks and expiry |  |  | Assignment  Q11 | B8 |
| 3.5 | Maintain equipment log in accordance with workplace procedures |  |  | Assignment Q13 | D18  Lab Record 18 |
| 4 | Test samples to determine chemical species or properties | 4.1 | Operate equipment and instruments in accordance with test method requirements |  |  | Assignment Q14, Q15  Research 1.5 | B5 – B7  C9 – C10, C14 |
| 4.2 | Perform tests or procedures on all samples and standards in accordance with specified methods |  |  |  | C9 – C10 |
| 4.3 | Shut down equipment and instruments in accordance with operating procedures |  |  |  | C14 |
| 5 | Process and interpret data | 5.1 | Record test data noting atypical observations and anomalies |  |  | Assignment Q17 | C13  Lab Report 12, 13 |
| 5.2 | Construct calibration graphs and compute results for all samples from these graphs |  |  |  | D16  Lab Report 10 |
| 5.3 | Check calculated values for consistency with expectations |  |  | Assignment Q16 | C13, D17 |
| 5.4 | Record and report results in accordance with workplace procedures |  |  |  | C13, D17  Lab Report 12 |
| 5.5 | Determine if obvious procedure or equipment problems have led to atypical data or results |  | Q26 | Assignment  Q17, Q18 |  |
| 6 | Maintain a safe work environment | 6.1 | Use established safe work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel |  | Q24 | Assignment Q21, Q22 | A, B, C |
| 6.2 | Minimise the generation of wastes and environmental impacts |  | Q29 | Assignment Q23, Q25 | C11  Lab Report 14 |
| 6.3 | Safely collect and dispose of laboratory and hazardous waste |  |  | Assignment Q24 | A2, C12  Lab Report |
| 6.4 | Care for and store equipment and reagents as required |  |  | Assignment Q26 | C15 |
| 7 | Maintain laboratory records | 7.1 | Record entries on report forms or into a laboratory information management system accurately calculating, recording or transcribing data as required |  |  | Assignment Q28 | D18  Lab Report |
| 7.2 | Ensure traceability of sample from receipt to reporting of results |  | Q27 | Assignment Q29 | Lab Report 3a, 11b |

## Foundation skills NOT explicit in the performance criteria

Table 3 Foundation skills NOT explicit in the performance criteria

| Foundation skills | Description | Learning resources | Knowledge Assessment  1 of 3 | Project Assessment 2 of 3 | Skills Assessment 3 of 3 |
| --- | --- | --- | --- | --- | --- |
| Numeracy skills to | Calculate the concentration of solutions. |  | Q17 |  | Lab Report 10 |
| Problem solving skills to | Problem-solving skills to trace and source obvious causes of artefacts, track obvious test malfunctions for standardised procedures, and troubleshoot basic equipment and methods. |  |  | Assignment Q17, Q18 |  |

## Performance evidence

Table 4 Performance evidence

| Performance evidence | Description | Learning resources | Knowledge Assessment 1 of 3 | Project Assessment 2 of 3 | Skills Assessment 3 of 3 |
| --- | --- | --- | --- | --- | --- |
|  | There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and: |  |  |  |  |
| PE1 | Safely performed at least 3 different chemical tests involving several measurement steps including at least 1 of the following: |  |  |  |  |
| PE1.1 | * colorimetric techniques |  |  | Marking guide provided for PE1.3 | At least 1, possibly 3 from the list undertaken.  Final list is a local decision. Marking guide provided for PE1.3 |
| PE1.2 | * infrared and ultraviolet-visible (UV-VIS) spectrophotometry |  |  |
| PE1.3 | * other spectrometric techniques |  |  |
| PE1.4 | * chromatographic techniques |  |  |
| PE1.5 | * electrochemical techniques |  |  |
| PE1.6 | * electrophoretic techniques |  |  |
| PE1.7 | * soil testing techniques |  |  |
| PE1.8 | * gravimetric analysis |  |  |
| PE1.9 | * titrimetric analysis |  |  |
| PE1.10 | * filtration, separation and solvent extraction techniques |  |  |
| PE1.11 | * corrosion testing, cement content and accelerated weathering. |  |  |

## Knowledge evidence

Table 5 Knowledge evidence

| Knowledge evidence | Description | Learning resources | Knowledge Assessment 1 of 3 | Project Assessment 2 of 3 | Skills Assessment  3 of 3 |
| --- | --- | --- | --- | --- | --- |
|  | There must be evidence the candidate has knowledge of: |  |  |  |  |
| KE1 | Why chemical tests are performed |  | Q2 |  |  |
| KE2 | Relevant chemical principles and concepts, including: |  | Q1-Q22 |  |  |
| KE2.1 | * elements, compounds, ions, atoms, molecules, bonding and links to chemical properties |  | Q1, 5, 6, 7, 9, 19, 20, 22 |  |  |
| KE2.2 | * periodic table and symbols of elements |  | Q3, 8, 20 |  |  |
| KE2.3 | * atomic mass and molecular weight |  | Q13, 16 |  |  |
| KE2.4 | * moles and molarity |  | Q4, 13 |  |  |
| KE2.5 | * chemical formulae and balancing equations |  | Q18, 21, 22 |  |  |
| KE2.6 | * chemical reactions |  | Q5, 9, 12, 22 |  |  |
| KE2.7 | * energy levels and absorption/emission spectra |  | Q10, 11 |  |  |
| KE3 | Purpose of the tests and/or procedures conducted |  |  | Research  1.2 |  |
| KE4 | International system of units (SI) |  | Q14 |  |  |
| KE5 | Principles and concepts related to equipment and instrument operation, tests and/or procedures |  |  | Research  1.3 |  |
| KE6 | Requirements for cleaning up spills and reporting faulty or unsafe equipment, hazards and incidents. |  |  | Assignment Q26  Research  1.8 | Lab Report 6b |
| KE7 | Concepts of metrology, including: |  |  |  |  |
| KE7.1 | * all measurements are estimates |  | Q 23 g |  |  |
| KE7.2 | * precision, accuracy and significant figures |  | Q 23 c, 23 e, 23 f |  |  |
| KE7.3 | * sources of error, uncertainty and repeatability |  | Q23 a, 23 b 23 d | Assignment Q17, 18 |  |
| KE7.4 | * traceability |  | Q27 |  | Lab Report 3b, 11b |
| KE8 | Function of key components of the equipment and instrument and reagents and effects of modifying equipment and instrument variables |  |  | Research  1.5, 1.7 |  |
| KE9 | Common causes of analytical errors |  | Q23 | Research  1.9 |  |
| KE10 | Calibration requirements and basic equipment and method troubleshooting procedures |  | Q13, 26 | Assignment Q12, 13, 14  Research 1.4 |  |
| KE11 | Sample preparation procedures for the tests and/or procedures conducted |  | Q15  Q25 | Research 1.2 | C10 |
| KE12 | Traceability requirements |  | Q27 |  | Lab Report 3b, 11b |
| KE13 | Awareness of environmental sustainability issues as they relate to the work task |  | Q24, 29 | Assignment Q23 | Lab Report 14 |
| KE14 | Legal, ethical and work health and safety (WHS) requirements specific to the work task. |  | Q28 | Assignment Q27, Q28, |  |

## Assessment conditions

Table 6 Assessment conditions

| Assessment conditions | Description |
| --- | --- |
|  | Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:   * use of suitable facilities, equipment and resources, including: * a standard laboratory equipped with appropriate sample preparation and test equipment, instruments, standards and reagents * workplace procedures and standard methods * records, including test and calibration results; equipment use, maintenance and servicing history, and faulty or unsafe equipment.   Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors. |