# 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** | MSL974017 - Prepare, standardise and use solutions (1) |
| **Skills Team** |  |
| **Region/Campus** |  |
| **SkillsPoint (owned by)** | Innovative Manufacturing, Robotics and Science |

*NOTES:*

* *Event columns can be added or deleted as required*
* *Rows for elements and performance criteria, etc. can be added or deleted as required*
* *Each component of the unit must be mapped to at least* ***one assessment criteria*** *or* ***question*** *in one or more assessment events*
* *Do NOT delete the section labelled Foundation Skills. If the Foundation skills ARE EXPLICIT in the performance criteria, they do not need to be listed. However, if the Foundation skills ARE NOT incorporated in the performance criteria they must be listed and mapped.*
* *Dimensions of Competency must be considered when selecting assessment types to ensure that the range of tasks you have chosen cover the following:*
  + *Task Skills*
  + *Task Management Skills*
  + *Contingency Planning Skills*
  + *Job Role Environment Skills*

## 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 Assessment  3 of 3 |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | Mapping refers to Observation Checklist number |
| 1 | Prepare solutions | 1.1 | Select appropriate procedure for solution preparation |  |  | Reports 1-3 Q1, 2 | Step 7  AllSci Laboratory Record 2g |
| 1.2 | Select equipment, materials and solvent of specified purity |  |  | Reports 1-3 Q4, 5 | Steps 9, 10 |
| 1.3 | Measure appropriate quantities of reagents for solution preparation and record data |  |  |  | Step 11  AllSci Laboratory Record 2j |
| 1.4 | Select and assemble specified laboratory equipment and appropriate grade of glassware |  |  |  | Step 9  Step 15 |
| 1.5 | Perform specified dilutions |  |  |  | Step 11 |
| 1.6 | Prepare solutions to achieve homogeneous mix of the specified concentration |  |  |  | Step 11, 13 |
| 1.7 | Label and store solutions to maintain identity and stability |  | Q11 |  | Step 13 |
| 2 | Standardise and use volumetric solutions | 2.1 | Assemble appropriate laboratory equipment |  |  |  | Step 15 |
| 2.2 | Perform serial dilutions as required |  |  |  | Step 15, 20 |
| 2.3 | Standardise the solution to the required specified range and precision |  | Q 24, 25 |  | Step 15-17  AllSci Laboratory Record 3o  Calculation worksheet |
| 2.4 | Label and store solutions to maintain identity and stability |  | Q 11, 42, 43 |  | Step 11, 13 |
| 2.5 | Use standard volumetric solutions to determine concentration of unknown solutions |  |  | Reports 1-3 Q9 | Step 16  AllSci Laboratory Record 4v  Calculation worksheet |
| 3 | Calculate and record data | 3.1 | Calculate specified concentrations |  | Q 41 |  | Step 12, 16, 23 |
| 3.2 | Use authorised procedure if data is to be modified |  |  | Report 4 Q4 | Step 16, 23 |
| 3.3 | Estimate and document uncertainty of measurement in accordance with workplace procedures |  |  |  | Step 17, 22 |
| 3.4 | Record all relevant details according to laboratory procedures and report results |  |  |  | AllSci Laboratory Record |
| 3.5 | Report concentration with appropriate units |  |  |  | AllSci Laboratory Record 2k, 3o, 4v  Calculation worksheet |
| 4 | Monitor the quality of laboratory solutions | 4.1 | Check solutions for visual deterioration and expiry date |  | Q 32 | Report 4 Q1 | Step 25 |
| 4.2 | Record details and label solutions according to laboratory procedures |  |  | Report 4 Q2 | AllSci Laboratory Record 5 |
| 5 | Maintain a safe work environment | 5.1 | Use established safe work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel |  |  |  | Steps 7-24 |
| 5.2 | Clean up spills using appropriate techniques to protect personnel, work area and environment |  | Q 20, 22 | Report 4 Q5 | Step 24 |
| 5.3 | Minimise generation of waste and environmental impacts |  | Q 44, 45 | Report 4 Q6 | Step 10 |
| 5.4 | Ensure the safe collection of laboratory and hazardous waste for subsequent disposal |  | Q 46 | Report 4 Q6 | Step 24 |
| 5.5 | Store equipment and reagents as required |  | Q 23 |  | Step 24, 25 |

## 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   1. of 3 |
| --- | --- | --- | --- | --- | --- |
| FS1. Numeracy skills to | * 1. Select and use primary and secondary standards and indicators |  | Q 21 | Reports 1-3  Q4 | Step 1, 7-24 |
| * 1. Determine equivalence points using indicators and graphical methods |  | Q 36, 37 | Reports 1-3  Q7 | Step 15 |
| * 1. Calculate the concentration of the solution with appropriate units and uncertainties given the chemical reaction for the titration |  | Q 31, 38, 41, 47 | Reports 1-3 Q9, 10 | Step 12, 16, 17, 22, 23  AllSci Laboratory Record 3o, 3p, 4u, 4v |
| * 1. Recognise control results that are not within acceptable range. |  | Q 1 | Reports 1-3 Q8 | Step 15-16 |

## 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 | Prepared and effectively standardised at least 3 different solutions in accordance workplace procedures and/or standard methods |  | Q 33 |  | 3 occurrences of Steps 1- 24 |
| PE2 | Selected and used primary and secondary standards and indicators |  | Q 34, 35 |  | 3 occurrences of Steps 1-24 |
| PE3 | Determined equivalence points using indicators and graphical methods. |  | Q 36, 37a, 37b, 37c | Reports 1-3 Q7 | Step 15 |

## 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 | Concepts of metrology, including: |  |  |  |  |
| KE1.1 | * all measurements are estimates |  | Q 19 |  |  |
| KE1.2 | * precision, accuracy and significant figures |  | Q 47 |  | Step 17, 22  AllSci Laboratory Record |
| KE1.3 | * sources of error, uncertainty and repeatability |  | Q 24, 26, 47 |  | AllSci Laboratory Record 3n, 3p, 4t, 4u |
| KE1.4 | * traceability |  |  | Report 4 Q3 |  |
| KE2 | Scientific terminology for different types of solutions |  | Q 3-5, 7, 12-14, 18 |  |  |
| KE3 | The chemistry of acids, bases, buffers and redox reactions |  | Q 3-5, 7, 12-14, 16, 18, 30 | Reports 1-3 Q4, 6 |  |
| KE4 | Chemical symbols and atomic mass |  | Q 39 | Reports 1-3 Q6, 9 |  |
| KE5 | Formulae for calculating concentration % w/w, % w/v, % v/v, ppm (mg/L) |  | Q 6, 28, 29 |  | Step 23 |
| KE6 | Moles and molarity |  | Q 31 | Reports 1-3 Q9 | All Sci Calculation worksheet |
| KE7 | What affects solubility |  | Q 27 |  |  |
| KE8 | Reactions used for standardisation and desirable characteristics |  | Q 2, 12, 13, 18 | Reports 1-3 Q6 |  |
| KE9 | Function and use of basic laboratory equipment |  | Q 8, 10 |  |  |
| KE10 | Grades of glassware, reagents and their use |  | Q 17, 37, 40 |  |  |
| KE11 | Established safe work practices: |  |  |  |  |
| KE11.1 | * use of PPE, such as safety glasses, gloves and coveralls |  | Q 9 | Report 4 Q7a | Step 2-26 |
| KE11.2 | * correctly labelling reagents and hazardous materials |  | Q 11 | Report 4 Q7b | Step 11 |
| KE11.3 | * handling and storing hazardous material and equipment in accordance with labels, SDS, manufacturer instructions, and workplace procedures and regulations |  | Q 9, 11 | Report 4 Q5, 7c | Step 11, 13 |
| KE11.4 | * regular cleaning and/or decontamination of equipment and work areas |  | Q 26 | Report 4 Q7e | Step 15 |
| KE11.5 | * prompt clean-up of spills in accordance workplace procedures |  | Q 20, 22 | Report 4 Q5 | Step 24 |
| KE12 | * Awareness of environmental sustainability issues as they relate to the work task |  | Q 46 | Report 4 Q5, 6 | Step 24 |
| KE13 | * Legal, ethical and work health and safety (WHS) requirements specific to the work task. |  | Q 42 | Report 4  Q3, 4, 5, 7d, 7f |  |

## 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 reagents and equipment to prepare and standardise solutions, such as pH meters; balances; magnetic stirrers, water baths and hot plates; measuring cylinders, beakers, conical flasks, volumetric flasks, pipettes and burettes; filter papers and funnels; and fume cupboards   + standard methods and workplace procedures   + containers and storage facilities.   Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors. |