# Skills Assessment

**Assessment event 2 of 2**

# Trainer & Assessor Marking Guide

## Criteria

### Unit code, name and release number

MSL933008 - Perform calibration checks on equipment and assist with its maintenance (1)

### Qualification/Course code, name and release number

MSL30118 - Certificate III in Laboratory Skills (1)

MSL40118 - Certificate IV in Laboratory Techniques (1)

\*\*Amend the qualification box before distributing to the student. The information here should only contain the qualification the student is enrolled in\*\*

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For queries, please contact:

Innovative Manufacturing, Robotics and Science SkillsPoint

Hamilton Campus

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This assessment can be found in the: [Learning Bank](https://share.tafensw.edu.au/share/access/searching.do?doc=%3Cxml%2F%3E&in=P7ac4831b-430a-4b8d-8b56-f7b32ed5b9cf&q=&type=standard&sort=rank&dr=AFTER)

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Instructions for the trainer and assessor** | This is a skill based assessment and will be assessing the student on their ability to demonstrate skills related to instrument maintenance and calibration.  This assessment is in 3 parts:   1. Practical (Tasks A, B and C) 2. Observation Checklist 3. Assessment Feedback (student facing document)   Select two different laboratory instruments or items of equipment for this assessment. Ensure the unit performance evidence are met:   * set-up, pre-use and calibration checks for at least 2 different items, and * cleaning and maintenance tasks on two different items   Benchmark responses are provided in this documentation for a:   * balance * refractometer   Students must have been trained in and have had opportunity to practice these assessment tasks for the laboratory instruments or items of equipment you choose. Additionally, the necessary documentation must be available, including (as necessary):   * Procedures for the set-up/pre-use * Procedures for the calibration checks * Procedures for maintenance checks * SDSs as required * Result recording (LIMS or paper based) * Workplace protocols for faults, faulty equipment, out-of-calibration equipment, and quarantine and maintenance requirements.   Although observations for Instruments 1 and 2 will occur on different dates, the observable demonstrations will be the same. The observations for the cleaning/maintenance (Task C) of two instruments could occur at the same time for the pre-set/use/ calibration (Tasks A and B) observations. This should be a local arrangement and the student should be advised well in advance of the timing of the assessments.  **Note:** the student is not being asked to run or calibrate any instrument. The unit covers only the set-up, pre-use and calibration checks. For example:   * for a pH meter this could be the set-up of the meter using prepared pH 4 and 7 buffer solutions and then a check of the calibration using a buffer solution of known pH * for a balance this could be checking the balance is clean, dry, level and on zero for the set-up and then a check with a calibration mass * for a refractometer this could be the set-up of the refractometer and a check of the calibration data using a known standard such as purified water or trichloromethane.   You will need to observe the student working on two pieces of equipment/instruments for the set-up, pre-use and calibration check component and also on two pieces of equipment/instruments for cleaning and maintenance. The **same two pieces of equipment/instruments could be used** for all sections. It is also possible that in the laboratory the student will work on **different** pieces of equipment for the cleaning and maintenance areas. In this instance a different set of equipment/instruments could be used.  For Task A you will need to observe the student completing the set-up and pre-use checks on the allocated items following the appropriate procedures. The student will need to obtain the correct laboratory paperwork, follow the written procedures, identify equipment that is faulty and record all required information.  For Task B you will need to observe the student obtaining the appropriate laboratory documentation for the checking of calibration on the instruments/equipment chosen. Students will need to determine if the instrument meets the calibration specifications, report out-of-calibration and quarantine if required. All required reporting must be completed.  For Task C you will need to observe the student conducting scheduled maintenance checks on the allocated equipment/instrument. They are required to obtain all laboratory documentation, identify faulty components and replace if permitted, clean and store the equipment according to workplace requirements. Report all maintenance/servicing tasks.  Benchmark responses are provided for these two instrument  There is a reporting sheet contained within this Assessment that the student needs to complete.  Model answers, sample responses or criteria for each task or activity is provided in the checklist. You may ask questions during the observation to gain clarification. The questions and the student response should be recorded in the observation checklist  Use these to support your judgement when determining a satisfactory result.  The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct. However, if a student provides information other than indicated below, and in the professional opinion of the assessor it is appropriate and meets the intent of the question, it may be considered correct.  Complete the Observation Checklist for each task and activity and the Assessment Feedback to the student. Ensure you have taken a copy of the assessment prior to it being returned to the student.  The Assessment Feedback page must be signed by both the student and the assessor so the student displays that they have received, understood and accepted the feedback.  Ensure the students name appears on the bottom of each page of the submitted assessment. |
| **About this marking guide** | The student’s response to each task or activity must contain the criteria indicated in this marking guide in order for their response to be correct.  All tasks and activities must be completed correctly in order to satisfactorily complete this assessment event.  Assessors will need to make a judgement call as to whether each response meets the criteria based upon the:   * Rules of Evidence:   + Validity – does the answer address the skill required and does the evidence reflect the four dimensions of competency?   + Sufficiency – is the task or activity sufficient in terms of length and depth?   + Currency – has the work been done so recently as to be current?   + Authenticity – is this work the student’s own authentic work? * Principles of Assessment   + Fairness – individual student’s needs are considered in the assessment process   + Flexibility – assessment is flexible to the individual student   + Validity – any assessment decision is justified, based on the evidence of performance of the student   + Reliability – evidence presented for assessment is consistently interpreted and assessment results are comparable irrespective of the assessor conducting the assessment * Dimensions of competency   + Task skills   + Task Management Skills   + Contingency Planning Skills   + Job Role Environment Skills |
| **Student must provide** | Calculator, pens, PPE (enclosed shoes, laboratory coat, safety glasses) |
| **Assessor must provide** | A copy of this assessment document for each student for each of the two instances of the assessment.  Own Personal protective equipment (enclosed shoes, laboratory coat, safety glasses).  The hardcopy resources for the practical if they are not available in the laboratory. |
| **Due date/time allowed/venue** | Assessment will take place in routine laboratory sessions.  Dates to be arranged |

## Part 1: Practical

To complete this part of the assessment, the student is required to participate in a practical demonstration of how to complete a task or activity.

These practicals will be observed by you.

The student’s responses will be used as part of the overall evidence requirements of the unit.

You should refer to the list of criteria provided in the Observation Checklist to understand what skills the student is required to demonstrate in this section of the assessment. This Checklist outlines the Performance Criteria, Performance Evidence and Assessment Conditions you will be marking the student on.

Once completed the student is required to submit this assessment and the tasks and activities required to be completed to you for marking.

**Task A: Set-up, pre-use checks**

As part of your work in the laboratory you undertake the set-up, pre-use, calibration checks, cleaning and maintenance of equipment.

You will be observed doing the set-up/pre-use checks on two pieces of equipment/ instruments. You will need to:

1. Obtain the correct laboratory procedure for the set-up and pre-use of the item of equipment/instrument
2. Read the procedure, noting on the recording sheet:
3. the correct PPE
4. Note hazards already identified for the process
5. Reporting requirements
6. Follow the laboratory procedures to conduct the set-up/pre-use check
7. Identify faulty or unsafe components quarantining as required
8. Report the faults according to laboratory procedures, noting on reporting sheet
9. Complete all required paperwork for the laboratory including the reporting sheet (Task A) found within this documentation

The task assessments will be conducted at times determined with your teacher or assessor.

**Task B: Calibration checks**

You will be observed running the standard calibration check for the two pieces of equipment identified. You will need to:

1. Obtain the necessary laboratory paperwork for the calibration. This would include the SOP and any hazard identification
2. Read and note (on the reporting sheet) the information related to PPE, hazards and reporting requirements
3. Set-up and start the equipment following the SOP ensuring all specified materials are available for the calibration
4. Conduct the calibration check following laboratory procedures
5. Shut down the equipment as per procedure
6. Record all calibration data accurately and legibly on the reporting sheet
7. Identify non-compliant or out-of-specification equipment
8. Quarantine problem equipment
9. Report according to the laboratory procedures (including the reporting sheet Task B attached within this task)

The task assessments will be conducted at times determined by your teacher or assessor.

**Task C: Basic maintenance**

You will be observed completing basic maintenance tasks on two pieces of equipment/instruments. This will require you to:

1. Keep the equipment areas clean and tidy, before, during and after the process
2. Obtain the maintenance procedure for the task, read and note on the reporting sheet:
3. PPE
4. Hazards
5. Disposal requirements
6. Follow the maintenance procedure for the particular equipment/instruments
7. Identify, isolate and replace faulty equipment, reporting as required
8. Repair or dispose of damaged equipment
9. Clean and store equipment at conclusion of the maintenance, by following procedure
10. Record the maintenance conducted, as required by the laboratory and on the reporting sheet
11. Report information on unsafe or faulty equipment according to workplace procedures and also on the reporting sheet

**Reporting Sheet**

**MSL933008 Perform Calibration checks on equipment and assist with its maintenance.**

**Pre-use and Set-up checks: Task A**

Technician ……ABC……………………………………….

|  |  |  |
| --- | --- | --- |
| 1. Name/number | 1. Mettler Analytical 2 | 2. Abbe Refractometer 3 |
| 1. Date | **11/04/20XX** | **18/6/20XX** |
| 1. SOP Name/Number | M115 | M121 |
| 1. PPE required | Enclosed footwear  Laboratory coat  Safety glasses | Enclosed footwear  Laboratory coat  Safety glasses |
| 1. Identified hazards | Hands should be washed before and after the procedure.  Wastes disposed of according to laboratory protocols | Use of hazardous chemicals for cleaning and possibly actual samples.  Only small volumes (drops) |
| 1. Reporting requirements | Balance precheck form F106 to be completed | Calibration check values to be reported  Refractometer precheck F109 to be completed |
| 1. Faults/unsafe components identified | Electrical lead shows exposed lead | No faults detected |
| 1. Actions required | Balance tagged out of service | NA |
| 1. Faults reported | Balance removed from area and issue reported to supervisor | NA |
| 1. Workplace documentation completed | Maintenance request submitted | Calibration sheet and record sheet completed |
| 1. Technician signature | ABC | ABC |

**F106 Prestart checklist laboratory balance**

Balance ID Mettler Analytical 2

|  |  |  |  |
| --- | --- | --- | --- |
| # | Safety check | Fit for purpose | Not fit for purpose |
|  | Balance unplugged |  |  |
|  | Balance correctly positioned on bench (clean, level, dry) |  |  |
|  | Power cord in good condition |  |  |
|  | Electrical safety tag in date |  |  |
|  | No loose, damaged or broken moving parts |  |  |
|  | Equipment in working order |  |  |
|  | Actions required (or NA)  No actions required | | |

|  |  |
| --- | --- |
| Technician name | ABC |
| Signature | *ABC* |
| Date | **11/04/20XX** |

**F 109 Prestart checkist Abbe Refractometer**

Refractometer ID Abbe Refractometer 3

|  |  |  |  |
| --- | --- | --- | --- |
| # | Safety check | Fit for purpose | Not fit for purpose |
|  | Refractometer unplugged |  |  |
|  | Refractometer placed in clean work area |  |  |
|  | Power cord in good condition |  |  |
|  | Electrical safety tag in date |  |  |
|  | No loose, damaged or broken moving parts |  |  |
|  | Equipment in working order |  |  |
|  | Actions required (or NA)  All OK to continue | | |

There should be one form for each day

|  |  |
| --- | --- |
| Technician name | ABC |
| Signature | *ABC* |
| Date | **18/6/20XX** |

**Reporting Sheet**

**MSL933008 Perform Calibration checks on equipment and assist with its maintenance.**

**Calibration checks: Task B**

Technician ……ABC……………………………………….

|  |  |  |
| --- | --- | --- |
| 1. Instrument   Name/number | 1. Mettler Analytical 2 | 2. Abbe Refractometer 3 |
| 1. Date | **11/04/20XX** | **18/6/20XX** |
| 1. SOP Name/Number | **M115** | **M121** |
| 1. PPE required | Enclosed footwear  Laboratory coat  Safety glasses | Enclosed footwear  Laboratory coat  Safety glasses |
| 1. Hazards | Hands should be washed before and after the procedure.  Wastes disposed of according to laboratory protocols | Use of hazardous chemicals for cleaning and possibly actual samples.  Only small volumes (drops) |
| 1. Reporting requirements | Balance precheck form F106 to be completed | Calibration data reported |
| 1. Materials required for calibration check | **One calibration mass** | Distilled water/thermometer |
| 1. Procedure followed | Yes/No | Yes/No |
| 1. Equipment shutdown successful | Yes/No  Instrument left on as check was within a run of weights | Yes/No |
| 1. Calibration result recorded | Yes. 10.000g mass value obtained 10.002g | RIwater T corrected = 1.3335  Calibration correction = -0.0002 |
| 1. Comparison to past results. | Compliant/non-compliant | Compliant/non-compliant |
| 1. Non-compliant equipment identified | (if non-compliance identified this should be noted and a reason provided eg for balance the calibration mass recorded a value outside the expected as per the documentation with the instrument) | **NA** |
| 1. Equipment quarantined | If the equipment is to be quarantined it should be tagged out and removed from service. | **NA** |
| 1. Out of calibration equipment reported | Reported to Resources person (or local person identified) | **NA** |
| 1. Technician signature | ABC | ABC |

**Reporting Sheet**

**MSL933008 Perform Calibration checks on equipment and assist with its maintenance.**

**Equipment maintenance: Task C**

Technician …… ABC……………………………………….

|  |  |  |
| --- | --- | --- |
| 1. Instrument   Name/number | 1. Mettler Analytical 2 | 2.Abbe Refractometer 3 |
| 1. Date | **11/04/20XX** | 18/06/20XX |
| 1. SOP Name/Number | **M115** | M121 |
| 1. PPE required | Enclosed footwear  Laboratory coat  Safety glasses | Closed footwear  Laboratory coat  Safety glasses  gloves |
| 1. Hazards/disposal | Any chemical left in area treated as potentially hazardous, wrapped in paper, bagged and placed in refuse bin. | Hazardous chemicals  Good ventilation required (only one drop of chemical is dispensed at a time |
| 1. Procedure followed | Yes/No | Yes/No |
| 1. Faulty/unsafe equipment identified | Balance not levelling correctly, service agent to be called. | **NO** |
| 1. Repair/disposal of damaged equipment required | Yes/No | Yes/No |
| 1. Action required | Reported for service to Trainer and local service agent to be called | None |
| 1. Equipment storage requirements met | Yes/No | Yes/No |
| 1. Reportable actions | Service request made (for TAFE students this would be a request to the trainer or resource person) | **None** |
| 1. Technician signature | *ABC* | *ABC* |

## Part 2: Observation Checklist

The Observation Checklist will be used by you to mark the students’ performance in any of the previous three event types. Use this Checklist to understand what skills the student is required to demonstrate in this section of the assessment. This Checklist outlines the Performance Criteria, Performance Evidence and Assessment Conditions you will be marking the student on. All the criteria must be met. The student’s demonstration will be used as part of the overall evidence requirements of the unit. You may ask questions while the demonstration is taking place or if appropriate directly after the task/activity has been completed.

Table 2 Observation Checklist

| Task | Activity | Instrument 1 | | Instrument 2 | | Assessor Comments  (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- | --- |
|  | Instrument/Equipment |  | |  | |  |
|  | Date: |  | |  | | Any breach of safety protocol will result in the task being stopped |
| A. | Set-up and Pre-Use Checks | S | U/S | S | U/S |  |
|  | Student: |  |  |  |  |  |
| 1 | Obtains the procedures for the set-up and pre-use of the item of equipment/instrument |  |  |  |  | Student has completed the information in Specific Table Instructions  Student is able to locate the procedures and records information on the Reporting Sheet for the allocated instrument. (A1, A2, A3) |
| 2 | Reads the procedure noting on the record sheet:   1. PPE required 2. hazards to be aware of 3. reporting requirements |  |  |  |  | Student notes the required information on the Reporting Sheet  PPE (A4)  Hazards (A5)  Reporting requirements (A6) and by completing form F106 or F109 as per benchmark examples attached. |
| 3 | Uses correct PPE and laboratory/instrumental methods to complete the set-up or pre-use safety check of equipment/instrument |  |  |  |  | Student uses the identified PPE, recognises and considers the controls in place for any hazards (for example conducting in a fume cupboard or ensuring good ventilation) as the equipment is set-up or pre-use safety checks are run. |
| 4 | Identifies faulty or unsafe components and follows laboratory requirements for quarantining if required., noting on reporting sheet |  |  |  |  | Student is able to identify unsafe or faulty equipment (for example frayed electrical leads or out-of-date tag and test label, extraction hood not working, lamps blown). reporting sheet completed. (A7, A8). If necessary equipment should be quarantined. |
| 5 | Reports or records faults to appropriate personnel as required |  |  |  |  | Student follows established laboratory procedure to report faults, this could be tagging out of action, replacing lamp etc. (A9). ).Reporting would be the to the local resources person. The Assessor should have had this confirmed with the Trainer prior to the Assessment |
| 6 | Completes laboratory paperwork including the reporting sheet. |  |  |  |  | Completes paperwork for the set-up on the reporting sheet (A10, A11).  Forms F106 and F109 (or local equivalents) are to be submitted.  The local centre may have a requirement for an instrument log to be completed also, this should be confirmed with the Trainer. |
| Additional questions asked to clarify understanding: | | | | | | |
| Question:  Student response:  Question:  Student Response: | | | | | | |

| Task | Activity | Instrument 1 | | Instrument 2 | | Assessor Comments  (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- | --- |
|  | Instrument/Equipment |  | |  | |  |
|  | Date: |  | |  | | Any breach of safety protocol will result in the task being stopped |
| B. | Calibration checks | S | U/S | S | U/S |  |
|  | Student: |  |  |  |  |  |
| **1** | Obtains the SOP for the laboratory item of equipment and reads the SOP, noting in particular the Calibration procedure. |  |  |  |  | Student locates the SOP for the identified item.  Fills in Result sheet (B1, B2, B3) |
| **2** | Reads the procedure noting:   1. PPE required 2. hazards to be aware of 3. reporting requirements |  |  |  |  | Student notes the required information on the Reporting Sheet  PPE (B4)  Hazards (B5)  Reporting requirements (B6) and by completing form F106 or F109 as per benchmark examples attached. (Local arrangements may be in place and the Assessor should check) |
| **3** | Sets up and starts the equipment using the SOP including obtaining all specified materials required for the calibration check |  |  |  |  | Student obtains all equipment and sets up according to SOP (B8)  The equipment is started following standard operating procedures |
| **4** | Conducts the calibration following laboratory procedure using the specified standard |  |  |  |  | Student follows SOP to conduct calibration.  Student would have selected the specified standard for checking |
| **5** | Shuts down the equipment as per procedure. |  |  |  |  | Student shuts down following SOP (B9) |
| **6** | Records all calibration data accurately and legibly on the reporting sheet. |  |  |  |  | Data recorded as per laboratory procedures (B10).  Student records calibration data on Reporting Sheet for Calibration checks Task B. (B10-11) |
| **7** | Identifies non-compliant equipment by comparing data with specifications and/or previous records. |  |  |  |  | Student makes decision on compliance/non-compliance by comparing with specifications or previous data. (B11, B12).  Student checks historical data that would be with each piece of equipment or filed in the LIMS. |
| **8** | Quarantines out-of-calibration equipment. |  |  |  |  | Student notes actions required noted (B13).  Equipment should be tagged out of operation and removed from service. |
| **9** | Reports out of calibration and quarantining to appropriate personnel. (recording on the reporting sheet) |  |  |  |  | Student notes at B14 other reportable action required.  Student should report equipment issues to Laboratory personnel. |
| Additional questions asked to clarify understanding: | | | | | | |
| Question:  Student response:  Question:  Student Response: | | | | | | |

| Task | Activity | Instrument 1 | | Instrument 2 | | Assessor Comments  (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- | --- |
|  | Instrument/Equipment |  | |  | |
|  | Date: |  | |  | | Any breach of safety protocol will result in the task being stopped |
| C. | Maintenance | S | U/S | S | U/S |  |
|  | Student: |  |  |  |  |  |
| 1 | Keeps equipment areas clean and tidy before during and after the process. |  |  |  |  | Student maintains area clear of obstacles and clean, before during and after the process.  Student should keep area free of clutter, clean up any spills, all wastes disposed of according to workplace procedures. All equipment/resource returned at the end of the process. |
| 2 | Obtains the maintenance procedure for the individual item of equipment/instrument, noting on the reporting sheet:   1. PPE 2. Hazards 3. Disposal requirements |  |  |  |  | Student obtains maintenance schedule and procedures (C1, C2, C3)  Records PPE required, safety issues including hazards and disposal of waste materials. (C4, C5) |
| 3 | Follows the instructions for the maintenance of the equipment |  |  |  |  | Student follows SOP obtained (C6) |
| 4 | Identifies, isolates and replaces faulty or unsafe equipment and reports as required |  |  |  |  | Note: student must stop if a safety issue arises  Student is able to identify, and replace faulty or unsafe equipment according to their level of training in the laboratory. Any faulty or unsafe equipment should be isolated and reported (C9) |
| 5 | Repairs or disposes of damaged equipment (according to laboratory authorisation) |  |  |  |  | According to particular authority to work student my repair or call for authorised servicing (C8- 9).  Laboratory trainer notified and local service agent called. |
| 6 | Cleans and stores the equipment at the conclusion of the maintenance. |  |  |  |  | Student cleans and stores equipment according to laboratory procedure. (C10)  Student should be seen to:   * Wipe down benches and equipment * Return equipment as required. (most equipment requiring calibration would be in its place before, during and after calibration) |
| 7 | Records the maintenance conducted on the maintenance schedule (or equivalent) and competes the Reporting Sheet |  |  |  |  | All reporting requirements are completed. This could be maintenance, service logs etc and on the reporting sheet. (C11) |
| 8 | Reports information on unsafe or faulty equipment and completes the Reporting Sheet. |  |  |  |  | Student should advise Trainer/Resource person as soon as process is made safe to leave. This information would be recorded on the Reporting sheet (C11, C12) and also in any instrument logs that accompany the equipment. |
| Additional questions asked to clarify understanding:  Question:  Student response:  Question:  Student Response: | | | | | | |