# Knowledge assessment 1

**Assessment event 1 of 3**

# Trainer & Assessor Marking Guide

## Criteria

### Unit code, name and release number

MSL973016 - Perform aseptic techniques (1)

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

MSL50118 - Diploma of Laboratory Technology (1)

MSL40118 - Certificate IV in Laboratory Techniques (1)

MSL30118 - Certificate III in Laboratory Skills (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 written assessment and will be assessing the student on their knowledge of the unit.  This assessment is in 5 parts:   1. Multiple choice questions 2. True or False questions 3. Short answer questions 4. Complete the table 5. Assessment feedback   Model answers, sample responses or a criteria for each question are provided below.  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.  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.  Complete the assessment feedback to the student and ensure you have taken a copy of the assessment prior to it being returned to the student.  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 question must contain the information indicated in this marking guide in order for their response to be correct.  All questions must be answered correctly in order to satisfactorily complete this assessment event.  Assessors will need to make a judgement call as to whether each answer/response meets the criteria based upon the:   * Rules of Evidence:   + Validity – does the answer address the assessment question and does the evidence reflect the four dimensions of competency?   + Sufficiency – is the answer 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** | Pens and your student workbook for this unit |
| **Assessor must provide** | A room suitable for an exam, a timer and spare pens |
| **Time allowed** | 1 hour |

## Part 1: Multiple choice

Read the question and each answer carefully. Put an X in the table next to your chosen answer.

1. Flaming the neck of a broth bottle:

Table 2 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. draws sterile air into the bottle |  |
| 1. creates an updraft, drawing airborne contaminants away from the sample |  |
| 1. sterilises the neck of the bottle |  |
| 1. both b) and c) | X |

1. Which of the following would be inappropriate for visually identifying microorganisms?

Table 3 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. broth subculture |  |
| 1. contaminated subculture |  |
| 1. lawn plate subculture |  |
| 1. all of the above | X |

1. A contaminated agar plate should be disposed of in the:

Table 4 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. stainless steel autoclave bucket |  |
| 1. contaminated waste bin | X |
| 1. biohazards sharps bin |  |
| 1. general waste bin |  |

1. Contaminated but reusable equipment, for example, broth tubes, should be place in the:

Table 5 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. stainless steel autoclave bucket | X |
| 1. contaminated waste bin |  |
| 1. biohazards sharps bin |  |
| 1. general waste bin |  |

1. Pure culture is important for microbiological investigation and interpretation of results because:

Table 6 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. the presence of two or more types of microorganisms will change further test results |  |
| 1. visual observations of single isolated colonies are used to identify microorganisms |  |
| 1. a contaminated culture may result in the identification of the incorrect microorganism |  |
| 1. all of the above | X |

1. Name **two** hygiene procedures that are followed when conducting aseptic transfers in order to obtain growth free of contamination?

Table 7 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Wash hands before transfer and disinfect bench before transfer | X |
| 1. Wash hands after transfer and disinfect bench after transfer |  |
| 1. Wash hands before transfer and disinfect bench after transfer |  |
| 1. Wash hands after transfer and disinfect bench before transfer |  |

1. Which subculture technique shows whether a culture is pure, mixed or contaminated?

Table 8 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. A lawn plate subculture |  |
| 1. Streak plate subculture | X |
| 1. Slope subculture |  |
| 1. Broth subculture |  |

1. What is the effect of the disinfectant used to wipe down benches?

Table 9 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. To completely eliminate microorganisms, present on the bench |  |
| 1. To reduce the number of microorganisms, present on the bench. | X |
| 1. To remove any dust present on the bench |  |
| 1. To remove any stains and dust marks present on the bench |  |

1. How do you minimise the generation of aerosols when flaming?

Table 10 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Rapidly draw the inoculation instrument through the flame |  |
| 1. Instead of flaming, just drop the inoculation instrument into disinfectant |  |
| 1. Slowly draw the wire through the tip of the blue cone, starting at the base of the wire, and ending with the loop | X |
| 1. Wave the inoculation instrument backwards, forwards and side to side through the flame multiple times |  |

## Part 2: True or false

Read the question and then write **True** or **False** in the space provided.

Table 12 True or false

| Question | Write *True* or *False* |
| --- | --- |
| 1. A contaminated subculture plate indicates that sterile practices were followed | F |
| 1. A pure culture is one in which proper sterilisation techniques have been applied | F |
| 1. Pure cultures are those with a single species | T |
| 1. Disinfectants and antiseptics do not reduce or kill spores | T |
| 1. An antiseptic is used to reduce the microbes on people and animal’sskin | T |
| 1. All microorganisms require atmospheric oxygen for growth | F |
| 1. Moulds grow well at 37OC | F |
| 1. Human pathogenic bacteria grows best at 37OC | T |

## Part 3: Short answer

Read the question carefully. The word count is listed at the end of each question below.

1. List two sterile practices and explain why they are important in obtaining accurate test results (15 to 30 words).

Any two of the following:

Autoclaving – to create sterile containers and equipment for cultures

Flaming the inoculation instrument/loop/wire

Flaming the neck of a broth tube/bottle

Working close to the Bunsen burner

1. List two steps for good hygiene before commencing aseptic transfer (15 to 20 words):

Any two of the following:

Wash hands

Clean workstation

Keep sample and plates/test tubes covered until ready for aseptic transfer

Tie long hair back

1. What is the purpose of sterile practices and hygiene procedures (10 to 30 words)?

To prevent contamination of the culture with external sources of microorganisms or to minimise the risk of contamination of the sample

1. What is the effect of poor sterile practices and hygiene procedures on the culture and results (10 to 30 words)?

The culture will be contaminated with microorganisms not from the original sample.

The results will be inaccurate.

1. Give two examples of:
   1. Physical microbial control (5 to 15 words)

**Any 2 of the following is correct**

Heat e.g. Temperature above 65oC, boiling

Cold e.g. Freezer <18oC Fridge <8oC

Desiccation e.g. Dried fruit

Osmotic pressure. e.g. By high concentration of sugar or salt

Filtration e.g. Millipore filter

Radiation e.g. UV

Stream pressure e.g. Autoclave

* 1. Chemical microbial control (2 to 10 words)

**Any 2 of the following is correct**

Antiseptic

Disinfectant

Antibiotics

1. When finished in the laboratory, what steps should you take to disinfect your workstation and yourself (15 to 30 words)?

Workstation should be wiped down with disinfectant and the technician should remove lab coat and wash hands thoroughly.

1. What specific type of agar is used for fungi cultures (2 words)?

Sabouraud agar

1. Write one fact about each of the following types of culture media:
   1. Nutrient media (2 to 10 words)

Any one of the below (or any other correct answer):

Amino acids

Nitrogen

Feeds inoculant for growth

Agar mixed with nutrients

* 1. Minimal media (2 to 10 words)

Any one of the below (or any other correct answer):

Contains the minimum nutrients possible

Agar plate

Plain broth

* 1. Selective media (2 to 15 words)

Any one of the below (or any other correct answer):

One or more ingredients preventing growth of unwanted microorganisms

Encourages one bacteria to grow compared to another

Contains agar and an ingredient to prevent growth of unwanted microorganisms

Antibiotics

Chocolate media

* 1. Differential media (2 to 15 words)

Any one of the below (or any other correct answer):

Usually has an indicator

Used to distinguish one bacteria from another on the same culture

Contains agar and indicator

## Part 4: Complete the table

Read the question carefully and complete each table below.

1. List the uses of the following substances in culture media (5 to 30 words per cell):

Table 13 True or false

|  |  |
| --- | --- |
| Ingredient | Use |
| Water | Enhances chemical reactions; it allows fluids to readily enter and leave the cell, and is a requirement for life. |
| Sodium chloride | Sodium chloride or other salts are often added to the media to maintain the isotonicity or osmotic pressure. |
| Proteins and sugars | Provides food/energy source |
| Buffers | Buffers maintain the pH of the culture media. |
| Selective agents | Selective agents are special chemicals introduced into the media to inhibit the growth of certain microorganisms, while allowing others to grow. |
| Enrichment additives | These allow fastidious/fussy organisms to grow that would not survive on ordinary media |

1. Complete the table below for potential hazards and the controls we might use to prevent them (1 to 50 words per cell):

Table 14 True or false

|  |  |  |
| --- | --- | --- |
| Hazard | Potential hazard | Controls |
| Sharps | Cuts, infection | Work aseptically, dispose in correct containers, use carefully, keep in appropriate packaging until use |
| Burners | Burns | Training in safe usage, take care and use only when instructed, do not leave unattended flame |
| Molten agar | Burns | Use SDS, all containers labelled with risk and hazard statements, wear PPE, pour/mix etc carefully |
| Ultraviolet (UV) light | Burns, eye and skin damage, cancer | Don’t use when people are in the laboratory, only turn on UV light at night or when there is no laboratory work, safety signs warning not to enter the laboratory when UV light is on, automatic UV shut off when laboratory is not in use |
| Infectious agents | Infection | Work aseptically |
| Hazardous substances | Spills, burns, inhalation exposure etc | Use SDS, all containers labelled with risk and hazard statements, wear PPE, pour/mix etc carefully |

1. Where should the following items be safely and correctly disposed of (1 to 5 words per cell)?

Table 15 True or false

|  |  |
| --- | --- |
| Item | Disposal receptacle |
| Inoculated agar plate | Biohazard container |
| Contaminated transfer pipette | Back into plastic cover and into biohazards container |
| Contaminated swab | Back into plastic cover and into biohazards container |
| Bottle of inoculated broth | Autoclave bucket |
| Contaminated scalpel blade | Biohazard sharps container |
| Contaminated syringe needle | Biohazard sharps container |

1. Complete the table below by describing the following principles of infection control (5 to 30 words per cell):

Table 16 True or false

|  |  |
| --- | --- |
| Principle | Description |
| Hand hygiene | Hands are washed correctly and thoroughly and dried on clean dry cloth |
| PPE | Gloves, masks and laboratory coats are worn |
| Handling and disposal of sharps | Technicians are trained in usage of sharps, sharps are contained within appropriate receptacles and disposed in yellow biohazard sharps bins |
| Managing the physical environment | Work is conducted in a clean and sterilised environment, equipment and materials are cleaned and sterilised |
| Aseptic technique | Transfer of microorganisms is done in such a way that there is minimal risk of exposure to infectious agents |
| Waste management | Waste is appropriately disposed, recycled or reused |