# Knowledge assessment 2

**Assessment event 2 of 6**

## Criteria

### Unit code, name and release number

MSL974021 - Perform biological procedures (1)

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

MSL50118 - Diploma of Laboratory Technology (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\*\*

## Student details

### Student number

### Student name

## Assessment Declaration

* This assessment is my original work and no part of it has been copied from any other source except where due acknowledgement is made.
* No part of this assessment has been written for me by any other person except where such collaboration has been authorised by the assessor concerned.
* I understand that plagiarism is the presentation of the work, idea or creation of another person as though it is my own. Plagiarism occurs when the origin of the material used is not appropriately cited. No part of this assessment is plagiarised.

### Student signature and Date

Version: *1.0*

Date created: 23/09/2019

Date modified: 27/11/2019

For queries, please contact:

Innovative Manufacturing, Robotics and Science SkillsPoint

Hamilton Campus

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RTO Provider Number 90003 | CRICOS Provider Code: 00591E

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Assessment overview** | The objective of this assessment is to assess your knowledge as would be required to understand the role of cellular biology and biochemistry when working within a microbiology laboratory. |
| **Assessment Event number** | 2 of 6 |
| **Instructions for this assessment** | This is a written assessment and it will be assessing you on your knowledge of the unit. This assessment is in 6 parts:  This assessment is in 4 parts:   1. Multiple choice questions 2. True or False questions 3. Short answer questions 4. Assessment feedback |
| **Submission instructions** | On completion of this assessment, you are required to upload it or hand it to your trainer for marking.  It is important that you keep a copy of all electronic and hardcopy assessments submitted to TAFE and complete the assessment declaration when submitting the assessment. |
| **What do I need to do to achieve a satisfactory result?** | To achieve a satisfactory result for this assessment all questions must be answered correctly. |
| **What do I need to provide?** | Pens, student workbook for this unit |
| **Due date/time allowed** | 2 hours |
| **Assessment feedback, review or appeals** | Appeals are addressed in accordance with Every Student’s Guide to Assessment. |

## Part 1: Multiple choice

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

1. The phases of the cell cycle are:

Table 2 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. prophase, metaphase, anaphase, telophase, cytokinesis |  |
| 1. interphase, mitosis, cytokinesis |  |
| 1. prophase, mitosis, cytokinesis |  |
| 1. all of the above |  |

1. Interphase is the:

Table 3 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. stage between successive cell divisions |  |
| 1. the phase before mitosis commences |  |
| 1. the phase after cytokinesis completes |  |
| 1. all of the above |  |

1. The basic function of a cell is:

Table 4 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. taking nutrients from food and converting them into energy |  |
| 1. carrying out specialised functions |  |
| 1. carrying hereditary material and making copies of themselves |  |
| 1. all of the above |  |

1. What is the purpose of procedures in a microbiology laboratory?

Table 5 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. To provide a safe working environment |  |
| 1. To ensure quality control of testing procedures and documentation |  |
| 1. To show staff how to conduct their job roles safely and adequately |  |
| 1. All of the above |  |

1. Workplace procedures demonstrate:

Table 6 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. how to perform a task safely and correctly |  |
| 1. what equipment should be used to complete a task |  |
| 1. how to maintain customer confidentiality |  |
| 1. all of the above |  |

1. Organic compounds always contain:

Table 7 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. carbon and oxygen |  |
| 1. carbon and nitrogen |  |
| 1. carbon and hydrogen |  |
| 1. carbon and sulfur |  |

1. The atoms in organic compounds are held together by:

Table 8 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. covalent bonds |  |
| 1. ionic bonds |  |
| 1. metallic bonds |  |
| 1. hydrophilic bonds |  |

1. What is the principal carbohydrate storage product in plants:

Table 9 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. glycogen |  |
| 1. starch |  |
| 1. cellulose |  |
| 1. glucose |  |

1. Carbohydrates are a good source of energy because they have:

Table 10 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. carbon-hydrogen bonds |  |
| 1. glycerol |  |
| 1. phosphate groups |  |
| 1. sulfur bonds |  |

1. Which statement about fats is false?

Table 11 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Fats are part of the structural component of membranes |  |
| 1. Fats are responsible for the transport of oxygen to the tissues |  |
| 1. Fats help protect the body from shock |  |
| 1. Fats are also known as triglycerides |  |

1. How many naturally occurring amino acids are there?

Table 12 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 20 |  |
| 1. 30 |  |
| 1. 10 |  |
| 1. 15 |  |

1. In any protein, the amino acid residue with the free COOH group is called:

Table 13 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. the C-terminal |  |
| 1. the amino group |  |
| 1. the M-terminal |  |
| 1. the carboxylic group |  |

1. What molecules are the building blocks of proteins?

Table 14 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Sugars |  |
| 1. Amino acids |  |
| 1. Fatty acids |  |
| 1. Disaccharides |  |

1. The sequence of amino acids in a protein is said to be which structure of the protein?

Table 15 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Primary |  |
| 1. Secondary |  |
| 1. Tertiary |  |
| 1. Quaternary |  |

1. The legal requirements specific to biological procedures could be:

Table 16 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. maintaining client confidentiality, running all samples through a LIMS and having a QMS for business management |  |
| 1. there are no specific legal requirements |  |
| 1. having NATA accreditation and participating in round robins |  |
| 1. a) and c) above |  |

1. Ethical behaviour when working with biological materials includes, but is not limited to:

Table 17 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. tracking samples, disposing of biohazardous materials correctly and not sharing confidential information about clients or the business |  |
| 1. ethics is a personal choice, so there are no formal requirements |  |
| 1. making the most money for the company by skipping controls and blanks and just getting the work done |  |
| 1. all of the above |  |

1. Requirements for storage of confidential documents and samples are:

Table 18 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. onerous and expensive, and not compulsory |  |
| 1. 4 years for documents, 7 years for reports and 2 days after final report for samples |  |
| 1. 10 years for all samples and documents |  |
| 1. none of the above |  |

1. Security requirements for a microbiological laboratory might include:

Table 19 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. storage of confidential records behind a two-factor login |  |
| 1. only having authorised people permitted access to confidential records |  |
| 1. a securely locked and monitored records storage location |  |
| 1. all of the above |  |

## Part 2: True or false

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

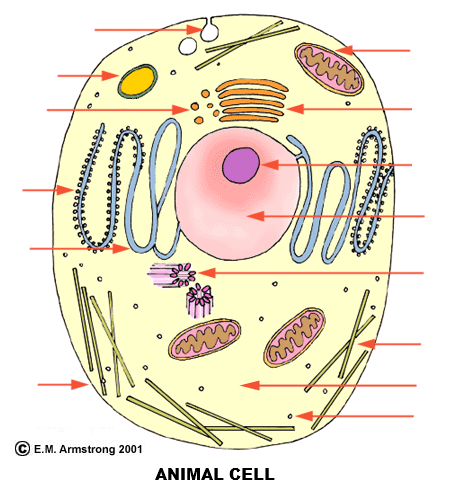
Table 20 True or false

| Question | Write *True* or *False* |
| --- | --- |
| 1. Plasmolysis is a state in which the cell membrane has detached from the cell wall during hypertonic conditions. |  |
| 1. Tonicity is the ability of a solution to make water move in or out of a cell by osmosis. |  |
| 1. Both plants and animals have vascular tissues |  |
| 1. Both plants and animals have xylem and phloem |  |
| 1. Cells are the basic building blocks of all living things |  |
| 1. Procedures are implemented to maintain workplace quality standards |  |
| 1. Organic molecules that contain two sugar units are called oligosaccharides |  |
| 1. Fats are capable of generating twice the amount of energy than proteins |  |
| 1. A chain of many amino acids is referred to as a polysaccharide |  |
| 1. Amino acids and proteins are not stored within the body and must be consumed |  |
| 1. Each chromosome is made of protein and a single molecule of DNA |  |
| 1. Alcohols are polar because of the length of the carbon chain |  |
| 1. Alkanals and Aldehydes undergo oxidation-reduction reactions |  |
| 1. Aromatics all have one or more a benzene rings within their structure |  |
| 1. All organic molecules are non-toxic |  |

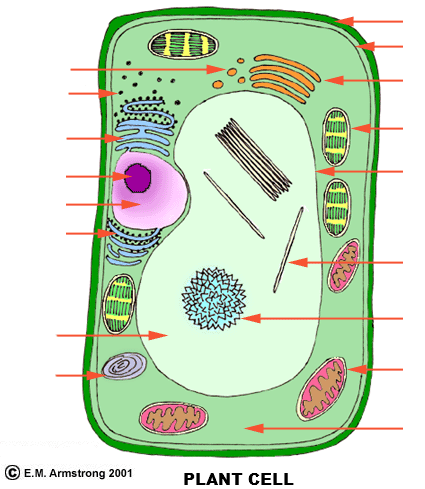
## Part 3: Short answer

Read the question carefully, then answer in the space provided. The word count is listed at the end of each question.

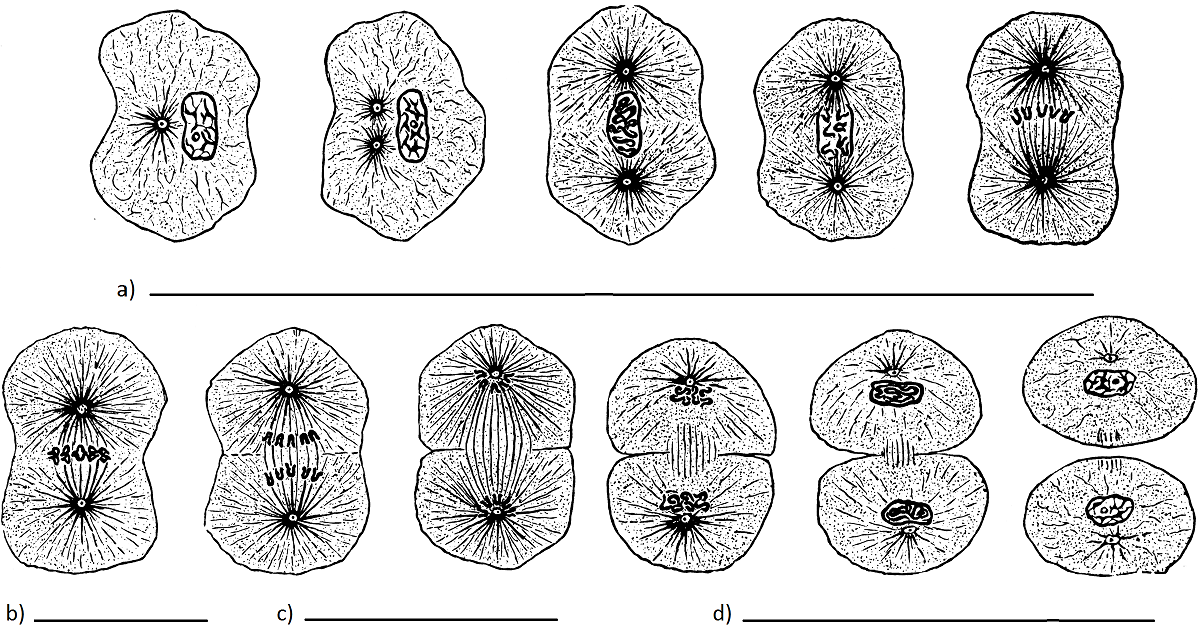
1. Explain the process of osmosis, and provide one example for plant and animal cells. (20 to 30 words)
2. Explain the meaning of the following types of diffusion, and provide an example of each:
   1. Passive (20 to 40 words)
   2. Facilitated (10 to 20 words)
   3. Active (10 to 20 words)
3. Explain the terms:
   1. Hypotonic (5 to 15 words)
   2. Isotonic (5 to 15 words)
   3. Hypertonic (5 to 15 words)
4. What are the four main tissue types in animals (4 words)?
5. What are the three main tissue types in plants (3 words)?
6. Describe the basic structure of a chromosome (3 to 15 words).
7. Describe the basic structure of a nucleic acid (4 to 15 words).
8. Describe the basic structure of a protein, and list the four types (10 to 20 words).
9. What are the functional groups for the following organic molecules (1 functional group per answer)? You can draw or write your answer.
   1. Alkanes
   2. Alkanols (Alcohols)
   3. Alkanals (Aldehydes)
   4. Carboxylic acids
   5. Alkanones (Ketones)
   6. Aromatics
   7. Amino acids
   8. Sulfhydryl
   9. Fats
   10. Carbohydrates
10. Label the animal cell diagram below. Ensure every arrow is labelled.



1. Label the plant cell organelles in the diagram below. Ensure every arrow is labelled.



1. Label the phases of mitosis on the diagram below:



1. Complete the following table by describing the structure of each of the organelles listed and indicating plant or animal, or writing the correct name of the organelle in the space next to its description.
   1. Organelle column (1 word per cell)
   2. Structure column (4 to 15 words per cell)
   3. Plant or animal column (1 to 2 letters per cell)

Table 21 Complete the table

| Organelle | Structure | Plant (P) or Animal (A)? |
| --- | --- | --- |
| Nucleus |  |  |
| Nucleolus |  |  |
| Mitochondria |  |  |
|  | Membranous sacs | P |
|  | Granules composed of RNA and protein | A/P |
|  | Membranous sacs | A |
| Golgi complex |  |  |
| Plasma membrane |  |  |
| Cell wall |  |  |
| Endoplasmic reticulum |  |  |
| Chloroplast |  |  |
|  | Pair of hollow cylinders located near centre of cell, each centriole consists of nine microtubule triplets |  |

1. Complete the following table by describing the function of each of the organelles listed, or writing the correct name of the organelle in the space next to its description.
   1. Organelle column (1 word per cell)
   2. Function column (2 to 15 words per cell)

Table 22 Complete the table

| Organelle | Function |
| --- | --- |
| Nucleus |  |
| Nucleolus |  |
|  | Perform cellular respiration |
| Vacuoles |  |
| Ribosomes |  |
| Lysosomes |  |
| Golgi complex |  |
|  | Protect and contain cell |
| Cell wall |  |
|  | Manufacturing and packaging system |
|  | Convert light energy into sugars |
| Centrioles |  |

1. Complete the following table by describing three functions of each of the chemical compounds listed below (6 to 15 words per cell).

Table 23 Complete the table

| Chemical compound | Function |
| --- | --- |
| Carbohydrates |  |
| Fats |  |
| Amino acids |  |

1. Complete the following table by describing the significant functions of each of the biological molecules listed below (5 to 15 words per cell).

Table 24 Complete the table

| Biological molecule | Function |
| --- | --- |
| Chromosomes |  |
| Nucleic acids |  |
| Proteins |  |

1. Complete the following table by describing the significant roles of each of the biological listed below (10 to 25 words per cell)

Table 25 Complete the table

| Biologically significant ion | Role |
| --- | --- |
| Calcium |  |
| Sodium |  |
| Potassium |  |
| Iron |  |
| Magnesium |  |
| Phosphate |  |
| Chloride |  |

## Part 4: Assessment Feedback

*NOTE: This section* ***must*** *have the assessor signature and student signature to complete the feedback.*

### Assessment outcome

Satisfactory

Unsatisfactory

### Assessor Feedback

Was the assessment event successfully completed?

If no, was the resubmission/re-assessment successfully completed?

Was reasonable adjustment in place for this assessment event?  
*If yes, ensure it is detailed on the assessment document.*

Comments:

### Assessor name, signature and date:

### Student acknowledgement of assessment outcome

Would you like to make any comments about this assessment?

### Student name, signature and date

***NOTE: Make sure you have written your name at the bottom of each page of your submission before attaching the cover sheet and submitting to your assessor for marking.***