# Knowledge assessment 1

**Assessment event 1 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 biological processes of the kingdoms of life and how this applies in a working laboratory. |
| **Assessment Event number** | 1 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 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 |
| **Due date/time allowed** | 1.5 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. Taxonomy is the:

Table 2 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. classification system of all things |  |
| 1. naming system for plants |  |
| 1. classification system for all living things |  |
| 1. naming system for animals |  |

1. Gregor Mendel was responsible for:

Table 3 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. formulating the principles of inheritance |  |
| 1. creating gene expression |  |
| 1. demonstrating that evolution is real |  |
| 1. determining that gene expression is a function of environment |  |

1. Meiosis is the process of:

Table 4 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. cellular division |  |
| 1. gamete formation in animals |  |
| 1. chromosome division |  |
| 1. genotyping |  |

1. Recessive traits are those which are:

Table 5 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. always expressed |  |
| 1. require only one gene to express the trait |  |
| 1. requires both genes to express the trait |  |
| 1. never expressed |  |

1. A Punnett square assists you to determine:

Table 6 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. the probability of having a male or female offspring |  |
| 1. the probability of having a recessive or dominant gene expressed in offspring |  |
| 1. how many offspring you will produce |  |
| 1. the exact physical features of your offspring |  |

1. A pedigree chart is:

Table 7 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. a chart that shows the heritage of an individual |  |
| 1. a chart that shows the lineage of a related group of individuals |  |
| 1. a tool for genealogical or genetic research |  |
| 1. b) and c) |  |

1. A dominant trait requires:

Table 8 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. only one gene to express the trait |  |
| 1. is always hidden |  |
| 1. requires two genes to express the trait |  |
| 1. none of the above |  |

1. Genotypes are:

Table 9 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. the same as a karyotype |  |
| 1. the same as a phenotype |  |
| 1. the genetic constitution of an individual organism |  |
| 1. the physical expression of genetic material |  |

1. Mendelian genetics concludes that :

Table 10 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. each parent has a gene pair in each cell for each trait studied |  |
| 1. the hereditary determinants are genes |  |
| 1. one member of the gene pair separates into gametes, therefore, each |  |
| 1. gametes unite at random and irrespective of other gene pairs |  |
| 1. all of the above |  |

## Part 2: True or false

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

Table 11 True or false

| Question | Write *True* or *False* |
| --- | --- |
| 1. There are 5 kingdoms of life |  |
| 1. Prokaryotes include the phylum chordata |  |
| 1. Eukaryotes are multicellular organisms |  |
| 1. Prions are living organisms |  |
| 1. Classification of organisms is based upon shared characteristics |  |
| 1. Taxonomy is how things are named |  |
| 1. Karyotype means the number and appearance of chromosomes an organism has |  |
| 1. Chromosomes are the genetic material of an organism |  |
| 1. Meiosis is the process of cell division |  |
| 1. A pedigree is the knowledge of one’s ancestry |  |

## Part 3: Short answer

Read the question carefully. Please refer to each question for the word count.

1. Draw a diagram of the carbon cycle in the box below. Make sure you label each component of the carbon cycle in your diagram.
2. Draw a diagram of the energy cycle in the box below. Make sure you label each component of the energy cycle in your diagram.
3. Explain the term ‘bioaccumulation’, using mercury as an example, and draw a simple foodweb of the biomagnification of mercury in the food chain (10 to 50 words):
4. List the seven main levels in the classification hierarchy (7 words):
5. Describe the following words and give an example of each.
   1. Prokaryotes (4 to 10 words):
   2. Eukaryotes (4 to 10 words):
   3. Prions (5 to 15 words):
   4. Parasites (10 to 25 words):
6. Describe the basic characteristics of each of the kingdoms of life.
7. Bacteria (10 to 25 words):
8. Viruses (10 to 25 words):
9. Fungi (10 to 25 words):
10. Plants (10 to 25 words):
11. Animals (10 to 25 words):
12. A patient requires a blood transfusion. Using the following information, calculate the:
    1. Initial transfusion volume delivered in first 15 minutes
    2. Total length of time for the full transfusion to be completed
    3. The precision of the results, with the first two transfusions taking 130 and 132 minutes to complete

Dosage rates: 120mL/h for 15 minutes, then 240mL/h until bag is emptied

Transfusion bag is 500mL total volume

You must show your working, and use **appropriate units and precision**.

1. What are certified reference materials, and why is it important to use them in a laboratory environment (10 to 30 words)?
2. Explain the meaning of controls in a laboratory setting and give two examples of how and when they might be used (10 to 30 words).
3. Explain the concept of environmental sustainability in a laboratory setting and give one example of how you might implement a sustainable process (10 to 30 words):
4. Complete the Punnett square below and answer the following questions (2 letters per empty cell).

|  |  |  |
| --- | --- | --- |
|  | G | g |
| G |  |  |
| g |  |  |

* 1. If G is the dominant gene, what is the probability that the offspring will express that gene (1 word)?
  2. If g is a recessive gene, how many offspring will have the recessive disorder (1 word)?

1. Read the description below and using the key provided, key out this specimen to the species level.

To key out the specimen, write ‘Y’ in the correct box for each subset of information

When you have determined the species, write your answer in the space provided under the key (2 words).

***Specimen description:***

This specimen is a multicellular organism, of the kingdom Animalia. It has a tubular nerve cord, bilateral symmetry and milk glands. It has thin skull bones, grasping fingers and hair covering its body.

Table 12 Key to species

| # | Key to species | Ref # | Answer |
| --- | --- | --- | --- |
| 1a | Eukaryotic, no cell walls, reproduce sexually | 2 |  |
| 1b | Eukaryotic, decomposers, no chlorophyll, cell walls comprised of chitin | 11 |  |
| 1c | Eukaryotic, cell walls comprised of cellulose | 12 |  |
| 1d | Prokaryotes, no cell nucleus, cell walls made of peptidoglycan | 13 |  |
| 1e | Cannot self-replicate, have a capsid containing genetic material | 14 |  |
| 2a | Notochord, dorsal tubular nerve cord, pharyngeal slits | 15 |  |
| 2b | Marine animals, water vascular system, tube feet | 16 |  |
| 3a | Animals with a spinal column, bilateral symmetry | 5 |  |
| 3b | Notochord, nerve cord, no vertebra | 4 |  |
| 4a | Embryo – bilateral symmetry, adult – radial symmetry | Crinoidea |  |
| 4b | Star shaped body, central disc and multiple radiating arms | Asteroidia |  |
| 5a | Chordates with fur or hair and milk glands | 6 |  |
| 5b | Chordates with scaly water resistant skin, lay shelled eggs | 17 |  |
| 6a | Mammals with fur or hair, grasping fingers, opposable thumbs, five-digit hands | 7 |  |
| 6b | Mammals with prominent canines, walk on four legs, cannot move jaw from side to side | 18 |  |
| 7a | Large eyes, reflective layer over retina, a tail, long lower teeth directed forward, covered in fur | 9 |  |
| 7b | Primates with relatively flat faces and three-dimensional vision | 8 |  |
| 8a | Hominids with upright position and large brain, quadrupedal knuckle walking | 9 |  |
| 8b | Hominids with upright position and large brain, walk on two feet | 10 |  |
| 9a | Average lifespan 40-45 years, covered in hair, intelligent, five-fingered hands | Pan troglodytes |  |
| 9b | Long legs, pink lips and dark face, covered in hair | Pan paniscus |  |
| 10a | Members of the genus homo with a high forehead and notably thin skull bones, walk on two legs | Homo sapiens |  |
| 10b | Members of the genus homo, walk on two legs, thick skull, flat face, heavy eye ridges | Homo erectus |  |

What is the name of the species? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Read the description below and using the key provided, key out this specimen to the species level.

To key out the specimen, write ‘Y’ in the correct box for each subset of information

When you have determined the species, write your answer in the space provided under the key (2 words).

***Specimen description:***

This specimen is a multicellular organism, of the kingdom Fungi. It has a stipe that does not change colour when scratched. The stipe has rings of less than 35mm, and if the head of the fungi is larger than this, there are no warts on its lower side. The cap can be white, cream or brownish, and the stipe generally has a bulbous base, with the length of the stipe roughly equal to the diameter of the cap.

*Stipe:* Stalk of mushroom

Table 13 Key to species

|  | Key to species | Ref # | Answer |
| --- | --- | --- | --- |
| 1a | Stipe yellowing distinctly when scratched | 2 |  |
| 1b | Stipe reddening, browning or not changing colour when scratched | 4 |  |
| 2a | Cap white, cream, or occasionally pale greyish-brown, cap yellowing when scratched, at least at margin | Agaricus xanthodermus |  |
| 2b | Cap covered in dark brown to grey brown small squamules or fibrils, only lower half of stipe strongly yellowing when scratched | 3 |  |
| 3a | Fruiting bodies almost black when young, radially splitting at maturity | Agaricus rotalis |  |
| 3b | Young fruiting bodies grey brown, only occasionally splitting at maturity | Agaricus moelleri |  |
| 4a | Stipe with a broad ring, >35 mms diameter with floccules or warts below | 5 |  |
| 4b | Ring < 35mms, or if larger then without floccules or warts on its lower side | 6 |  |
| 5a | Cap covered with yellow brown to brown squamules on paler background | Agaricus augustus |  |
| 5b | Cap white discolouring yellowish brown with age or on handling, glabrous or covered with minute concolourous fibrils | Agaricus arvensis |  |
| 6a | Cap with purple, vinaceous or brown-vinaceous fibrils or squamules | 7 |  |
| 6b | Cap white, cream or brownish, fibrillose, squamulose or glabrous | 10 |  |
| 7a | Cap fibrillose at centre, but elsewhere covered in broad, adpressed red brown to brown-vinaceous squamules, spores 7-9 µm long | Agaricus langei |  |
| 7b | Cap uniform fibrillose or covered in narrow squamules, spores < 7 µm long | 8 |  |
| 8a | Cap large, 50 – 100 mms diameter, plano convex, later applanate, flesh reddening or browning on cutting | Agaricus austrovinaceus |  |
| 8b | Cap smaller, 30 – 60 mms diameter, convex, flesh yellowing slightly or unchanging on cutting | 9 |  |
| 9a | Spores 5.3 × 3.5 on average | Agaricus dulcidulus |  |
| 9b | Spores 7 × 4.4 on average | Agaricus sp.1 |  |
| 10a | Stipe with bulbous base and height generally = or > cap diameter | Agaricus impudicus |  |
| 10b | Stipe without bulbous base | 11 |  |
| 11a | Cap brownish, ring triangular, lamellar edge sterile, basidia 2-spored | Agaricus bisporus |  |
| 11b | Cap white to cream, ring thin, lamellar edge fertile, basidia 2 or 4-spored | 12 |  |
| 12a | Stipe height < cap diameter, ring thin, lamellar edge fertile, basidia 4-spored | Agaricus campestris |  |
| 12b | Stipe height > cap diameter, ring ephemeral, basidia 2 and 3 spored | Agaricus sp.5 |  |

What is the name of the species? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## 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.***