# Knowledge Assessment

**Assessment event 2 of 3**

## Criteria

### Unit code, name and release number

MSS024016 - Process and present environmental data Release 1

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

MSS50218 - Diploma of Environmental monitoring and technology Release 1

## 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: 1 November 2018

Date modified: 13/01/2020

For queries, please contact:

Innovative Manufacturing, Robotics and Science Skills Point

TAFE Hamilton Campus

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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 of descriptive statistics as would be required in the workplace. |
| **Assessment Event number** | 2 of 3 |
| **Instructions for this assessment** | This is a written assessment and it will be assessing you on your knowledge of the unit.  This assessment has three Parts;  Part 1 – Descriptive statistics (7 questions)  Part 2 – Presenting data (10 questions)  Part 3 – Interpreting data (4 questions)  All questions are short answer and the assessment is open book.  Assessment feedback is provided at the end of this document. |
| **Submission instructions** | This assessment will be undertaken in the presence of a teacher or assessor. |
| **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?** | You should bring a pen/s, calculator, ruler/straight edge and your Student Workbook. |
| **Due date/time allowed** | You will have three hours to complete this assessment. |
| **Assessment feedback, review or appeals** | In accordance with the TAFE NSW policy *Manage Assessment Appeals,* all students have the right to appeal an assessment decision in relation to how the assessment was conducted and the outcome of the assessment. Appeals must be lodged within **14 working days** of the formal notification of the result of the assessment.  If you would like to request a review of your results or if you have any concerns about your results, contact your Teacher or Head Teacher. If they are unavailable, contact the Student Administration Officer.  Contact your Head Teacher for the assessment appeals procedures at your college/campus. |

## Part 1 – Descriptive statisitcs

1. Provide a definition of *descriptive statistics*.

Answer correct  Yes  No

1. Describe the difference between a *sample*, a *population* and a *census*.

Answer correct  Yes  No

1. a) What does the term *representative* mean? Why do samples need to be representative?

Answer correct  Yes  No

b) Why do samples need to be representative?

Answer correct  Yes  No

1. a) What is the difference between a *distribution of data* and its *central tendency*?

Answer correct  Yes  No

b) What is the difference between a *distribution of data* and its *central tendency*? Identify one key statistical measure for each term.

Answer correct  Yes  No

1. What is the difference between a *normal* and *non-normal* distribution?

Answer correct  Yes  No

1. Examine the following data set containing the temperature data from an incubating oven.

Table 2 Data set containing temperature data from an incubating oven

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 37.2 | 37.2 | 38.0 | 35.8 | 36.5 | 37.9 | 35.5 | 36.8 | 35.2 | 38.0 |
| 38.1 | 35.6 | 38.3 | 36.7 | 35.4 | 36.8 | 35.7 | 36.4 | 37.5 | 35.3 |
| 36.9 | 36.5 | 36.8 | 37.6 | 35.8 | 35.4 | 38.4 | 36.4 | 36.7 | 38.8 |

* 1. Complete the following tally chart and graph frequency histogram. You will need to decide on an appropriate bin range

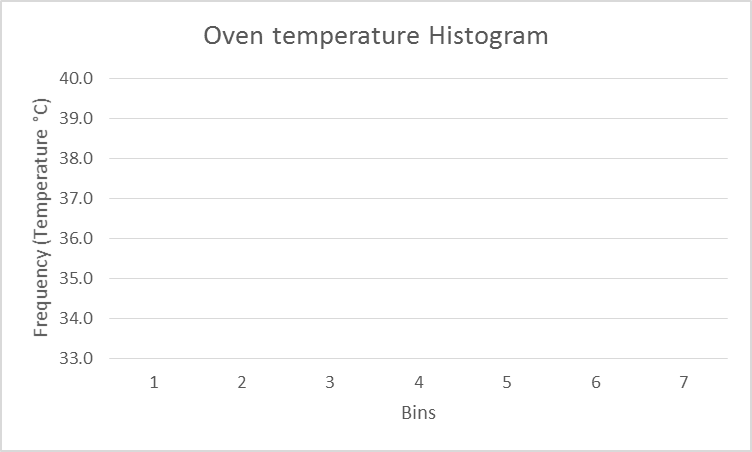
Table 3 Tally chart to be completed

|  |  |  |
| --- | --- | --- |
| **Bin** | **Tally**  **(score)** | **Frequency**  **(tally sum)** |
| **Example>>>** | ~~||||~~ ||| | 8 |
|  |  |  |
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Answer correct  Yes  No

* 1. Graph the data from the table above to create the histogram in the empty grid to follow;

Figure 1 – Blank graph for results. © TAFE NSW



Answer correct  Yes  No

1. Calculate the following attributes of the data set from Question 6. You can use a calculator (physical or online) or a spreadsheet to find the answers. You do not need to show your working.
   1. Minimum value

Answer correct  Yes  No

* 1. Maximum value

Answer correct  Yes  No

* 1. Range

Answer correct  Yes  No

* 1. Mean

Answer correct  Yes  No

* 1. Mode

Answer correct  Yes  No

* 1. Median

Answer correct  Yes  No

* 1. Standard deviation of the following sample of data from Question 6

Table 4 Sample data for question

|  |  |
| --- | --- |
| 37.2 | 37.2 |
| 38.1 | 35.6 |
| 36.9 | 36.5 |

Answer correct  Yes  No

## Part 2 – Presenting data

The instructions and the criteria in the tasks and activities below will be used by the assessor to determine whether the tasks and activities have been satisfactorily completed. Use these instructions and criteria to ensure you demonstrate the required knowledge.

1. Explain the *difference* between a *plot*, a *chart* and a *graph*.

Answer correct  Yes  No

1. Provide an *example* of the types of data that you would use the following graphs to display;
   1. Bar or column chart

Answer correct  Yes  No

* 1. Line graph

Answer correct  Yes  No

* 1. Scatter plot

Answer correct  Yes  No

* 1. Pie chart

Answer correct  Yes  No

1. Why is it essential that graphs have a title and labelled axes?

Answer correct  Yes  No

1. What must a graph have in order to be considered ‘honest’?

Answer correct  Yes  No

1. Identify and list three ways that data can be presented/reported.

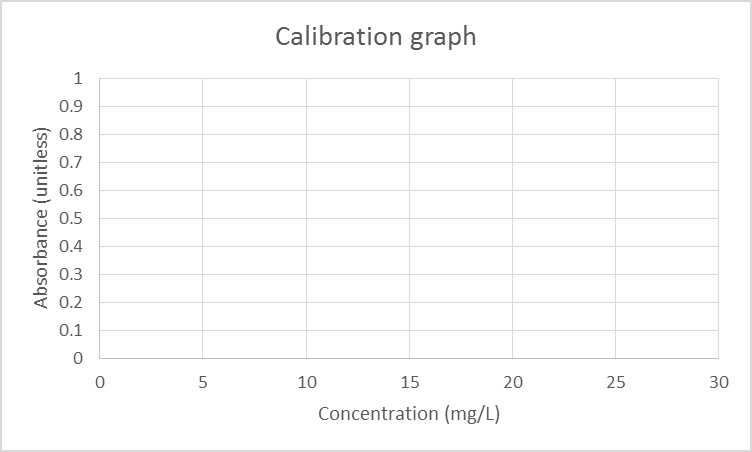
Answer correct  Yes  No

1. The following data is for a calibration graph.
   1. Plot the following data on the space below. Ensure that you include a title and label the axes including the units.

Table 5 Calibration graph data

|  |  |  |
| --- | --- | --- |
| **Solution ID** | **Concentration (mg/L)** | **Absorbance (unitless)** |
| Blank | 0 | 0 |
| Std 1 | 5 | 0.186 |
| Std 2 | 10 | 0.395 |
| Std 3 | 15 | 0.601 |
| Std 4 | 20 | 0.789 |
| Std 5 | 25 | 0.893 |
| Sample | ? | 0.554 |

Figure 2 – Blank graph for results

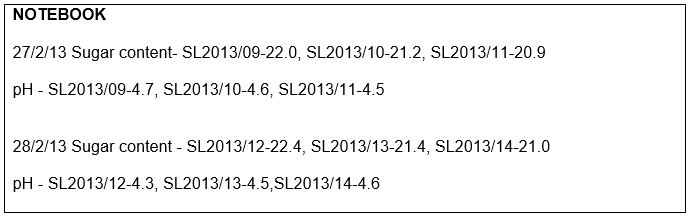
Answer correct  Yes  No

* 1. Use the graph to determine the concentration of the sample. Use a horizontal and a vertical line on the graph to show how you got your answer.

Answer correct  Yes  No

1. Test details, that is, date of test, sample number (SL2013-#) and result for sugar content and pH, were recorded in a notebook.

Figure 3 – Notebook data. © TAFE NSW



**Task:** You need to examine the data from the notebook above and design a table to record the data. Your table must have a title, column headers and row headers. Use the space below to create your table.

Answer correct ☐ Yes ☐ No

1. A histogram is a plot of the frequency of an occurrence. It is useful when dealing with large amounts of data or when data has been collected in groups or classes.

**Task:** Complete the frequency table and draw a histogram of these marks for 32 students on the grid provided. Make sure you label your graph appropriately with a title and axis labels.

**Student marks:** 52, 64, 16, 48, 25, 52, 85, 96, 90, 87, 77, 78, 37, 68, 62, 60, 51, 55, 57, 64, 54, 51, 62, 43, 68, 71, 76, 68, 65, 83, 47 and 44.

Table 6 - partially completed table for frequency of marks

| Group (Bins) | Frequency |
| --- | --- |
| 10-19 | I (1) |
| 20-29 | I (1) |
| 30-39 |  |
| 40-49 |  |
| 50-59 |  |
| 60-69 |  |
| 70-79 |  |
| 80-89 |  |
| 90-99 |  |

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Answer correct ☐ Yes ☐ No

1. Prepare a column graph showing the following data. Ensure that you include a title and label the axes.

Table 7 Source data for bar chart: Blood groups in Australia

| Blood group | O+ | A+ | B+ | AB+ | O- | A- | B- | AB- |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Blood group % in 2012\*** | 40.0 | 31.0 | 8.0 | 2.0 | 9.0 | 7.0 | 2.0 | 1.0 |

* \*Source: <https://en.wikipedia.org/wiki/Blood_type_distribution_by_country>

Table 5 Grid lines for use in creating a bar chart using blood group data

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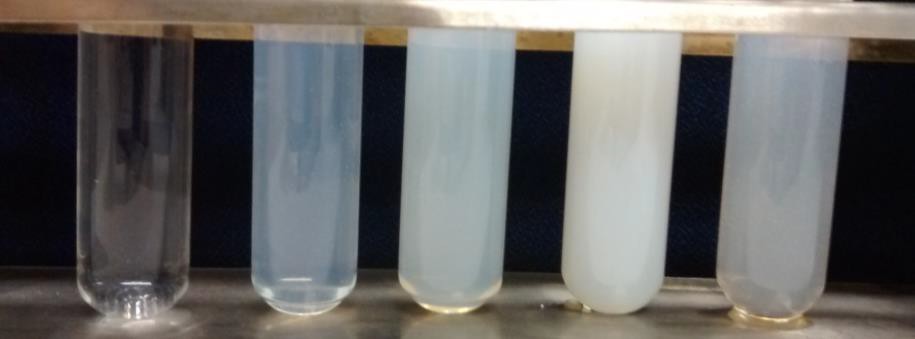
Answer correct ☐ Yes ☐ No

1. Examine the figure below. Use the information in Table 7 to rate each solution. Place the symbol that corresponds to the amount of turbidity of the liquid in the box below each tube.

Table 8 Symbols for indicating amount of turbidity of liquids

| Amount of turbidity of liquid in test tube | Symbol |
| --- | --- |
| Clear, not turbid, | - |
| Slight turbidity or cloudiness | + |
| Moderate turbidity or cloudiness | ++ |
| Heavy turbidity or cloudiness | +++ |
| Extremely heavy turbidity or cloudiness | ++++ |

Figure 4 – Turbidity solutions in test tubes. © TAFE NSW



|  |  |  |  |  |  |  |  |  |
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Answer correct ☐ Yes ☐ No

## Part 3 – Interpreting data

1. Results of tests are often presented in tables and then the interpretation of the results given in words. Comments may describe trends or make comparisons between samples.

Table 9 Potassium bromide dissolved at various temperatures

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Temp (°C) | 0 | 10 | 20 | 30 | 40 | 50 |
| **KBr (g)** | 52 | 60 | 64 | 73 | 76 | 81 |

**Task:** Describe the trend shown in table 1 above.

Answer correct  Yes  No

1. A collaborative study is a study to determine the performance characteristics of a method of analysis, rather than the performance of laboratories or analysts. The results of one such analysis are presented in Table 2.

Table 10 - A collaborative study of the analysis of lead in dried cabbage

|  |  |
| --- | --- |
| **Result (mg/kg)** | **Number of laboratories** |
| 0.10 | 1 |
| 0.14 | 1 |
| 0.18 | 2 |
| 0.22 | 2 |
| 0.26 | 2 |
| 0.34 | 3 |
| 0.46 | 1 |
| 0.50 | 2 |
| 0.54 | 2 |

How many laboratories’ results were within the acceptable range of 0.23 - 0.41 mg/kg?

Answer correct  Yes  No

1. Refer to Figure 1 below which shows causes of injury due to drug reaction over the course of a year.

Figure 5 – Causes of injury due to drug reaction

**Task:** Examine Figure 1 to identify the appropriate answers to the following questions

* 1. Which was the greatest cause of injury?

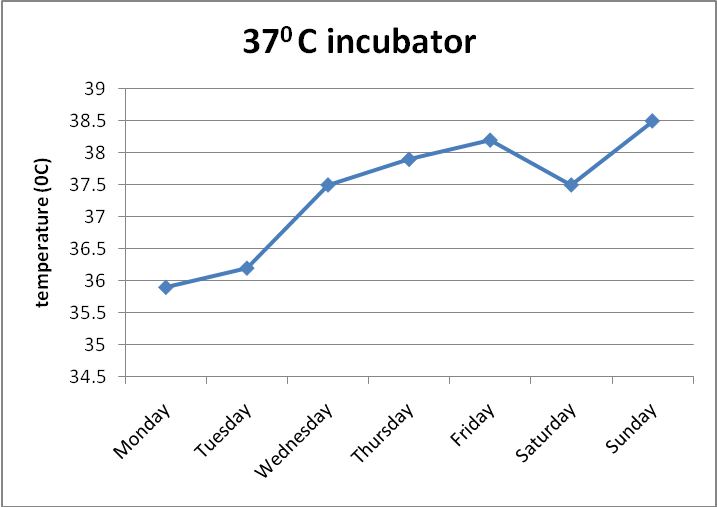
Answer correct  Yes  No

* 1. How many injuries were due to an inappropriate drug being given to the patient?

Answer correct  Yes  No

1. Refer to the graph for the temperature changes in the 37°C incubator and answer the following questions.

Figure 6 – Temperature changes in incubator



1. On what day was the temperature 37.5°C?

Answer correct  Yes  No

1. What is the trend of the temperature?

Answer correct  Yes  No

## 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.***