# Topic Test 5 – Presenting data

# Trainer & Assessor Marking Guide

## Criteria

### Unit code, name and release number

MSL924003 - Process and interpret data Release 1

\*\*This unit sits in all qualifications below. This assessment is not to be amended\*\*

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

MSL60118 Advanced Diploma of Laboratory Operations Release 1

MSL50118 Diploma of Laboratory Technology Release 1

MSL40118 Certificate IV in Laboratory Operations Release 1

MSL30118 Certificate III in Laboratory Skills Release 1

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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 has 6 questions. It is to be conducted as a supervised open book test. Students are able to bring the Student Workbook into the test but no other information resources.  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.  Arrange a time for each student to view their marked tests and the assessor feedback. Assessors are to retain all tests after students have viewed their results. Students to not keep a copy of their completed test.  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** | Students must provide pen/s, calculator, ruler/straight edge and their Student Workbook.. |
| **Assessor must provide** | One copy of the assessment task per student, filename MSL924003\_AE\_Kn\_5of7. Question 10 on page 11 must be printed in colour. |
| **Time allowed** | 1 hour |

## Short answer

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

Students should provide a response in line with the Topic 6 section of the Student Workbook titled *What is a plot, or a graph or even a chart?* An example of a suitable response would be:

A plot is created when points are placed on a coordinate system (x-y-z)

A graph is created when the data points display a line from an event or formula

A chart is created when shapes are used to display data

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

Students should provide an example, a general statement is not needed but is provided below for assessors’ information.

* 1. Bar or column chart

Any data that benefits from comparisons – these graphs quickly show the relative size of each point in relation to other data points. Examples: a frequency histogram, changes over time such as monthly rainfall or health data.

* 1. Line graph

Any data where there is a relationship between two variables and where it is meaningful to join the dots (such as changes over time). Examples: average house price per month or year, blood pressure measured each hour, a person’s weight measured on a regular basis such as weekly.

* 1. Scatter plot

Any data where you want to see if there is a relationship between two variables. For example, age vs rate of diabetes in that age group, temperature vs levels of dissolved oxygen in water, distance from the equator vs rainfall.

* 1. Pie chart

Any data where it is important to understand proportions or parts of a whole. Examples: percentage of blood types across a population, percentage or weight of different constituents of a sample.

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

So that there in no ambiguity/confusion about the data/information the graph is representing.

1. List 4 items that a graph must have in order to be considered ‘honest’?

Students need to include at least 4 of the following items or any item consistent with Topic 6 of the Student Workbook section *The art of being ‘honest’!*

• axes labelled clearly

• informative title

• axis scale is the same all the way along – if 0-10 covers 1 cm, then so should 90-100 etc

• the axis scales must be shown

• where multiple series are plotted on the same graph, make it clear which data belongs to which line/column by the use of legends

• not over complicating the graph by the use of too many colours/gridlines/3-D (see below)

• the measured variable should be plotted on the vertical axis

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

Students need to provide any three of the following:

Short forms

Analytical Reports OR Reports

Certificates of analysis OR Certificates

Tables

Presentations

Plots, graphs OR charts

A spreadsheet of calculations

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 2 Calibration graph data

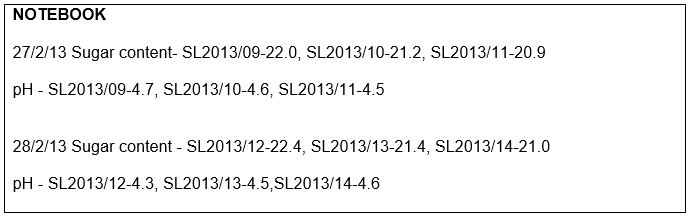
|  |  |  |
| --- | --- | --- |
| **Solution ID** | **Concentration (mg/L)** | **Absorbance (unitless)** |
| Blank | 0 | 0 |
| Std 1 | 5 | 0.186 |
| Std 2 | 10 | 0.395 |
| Std 3 | 15 | 0.601 |
| Std 4 | 20 | 0.789 |
| Std 5 | 25 | 0.893 |
| Sample | ? | 0.554 |

The graph must include: title, labelled axes including units, correctly plotted points and a line of best fit.

* 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.

Answers between 14 and 15 are acceptable and there should be some indication in the graph of how the answer was derived (usually a horizontal and vertical line).

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



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.

Table 1: Sugar content and pH

Table 2 sample student response for question 1

| Date | SL Number | Sugar content | pH |
| --- | --- | --- | --- |
| 1/2/14 | SL2013/09 | 22.0 | 4.7 |
| 1/2/14 | SL2013/10 | 21.2 | 4.6 |
| 2/2/14 | SL2013/11 | 20.9 | 4.5 |
| 2/2/14 | SL2013/12 | 22.4 | 4.3 |
| 2/2/14 | SL2013/13 | 21.4 | 4.5 |
| 2/2/14 | SL2013/14 | 21.0 | 4.6 |

A transposed table (with dates along the top) would also be acceptable.

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, 44

**Table 1: Student marks**

Table 1 Partially completed table for frequency of marks

| Group (Bins) | Frequency |
| --- | --- |
| 10-19 | I (1) |
| 20-29 | I (1) |
| 30-39 | I (1) |
| 40-49 | IIII (4) |
| 50-59 | ~~IIII~~ II (7) |
| 60-69 | ~~IIII~~ IIII (9) |
| 70-79 | IIII (4) |
| 80-89 | III (3) |
| 90-99 | II (2) |

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

**Table 3: Blood groups in Australia**

Table 3 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>

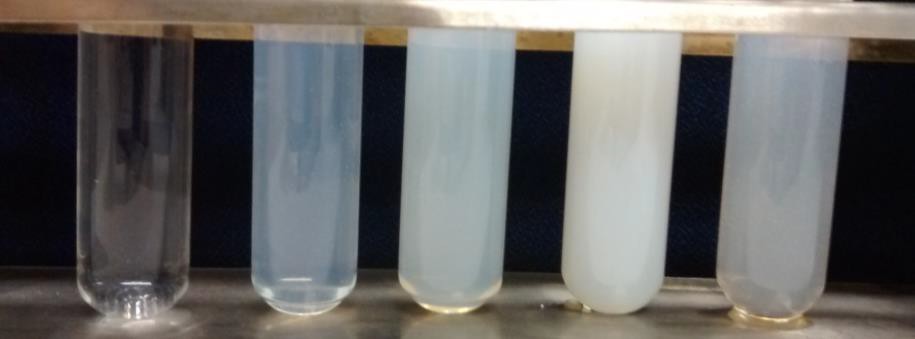
Column graph needs a title, axis labels and suitable spacing so you can read the data differences.

1. Examine the figure below. Use the information in Table 4 to rate each solution. Place the symbol that corresponds to the amount of turbidity of the liquid in the box below each tube.

**Table 4 Symbols for indicating amount of turbidity of liquids**

Table 4 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 | ++++ |



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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| - |  | + |  | +++ |  | ++++ |  | ++ |

All test tubes must be labelled correctly.