**Manjimup Senior High School**

**Australian Curriculum**

**Science in Practice Year 11 – Task 2**

**Identifying unknown substances as acidic, basic or neutral**

**Part D – Written Report**

Use this template to help guide your writing. Delete the instructions and sentence starters before submitting your report.

**Investigation Title:**

**Author:**

**Abstract**

Write a succinct summary of the investigation that includes the purpose of the investigation and a brief outline of the method and conclusions. 100 words.

**Introduction**

Write a succinct introduction that summarises the background information related to the investigation using correct scientific language, conventions and representations. Include citations for any definitions or preparatory research. 250 words.

> Use present tense.

> Restate the research question.

> Explicitly identify what the independent variable and dependant variable are.

> Talk about the observations /questions that led to this experiment.

> Identify the science concepts that will be explored. Give detail on how the problem /question is connected to the topic of interest.

> Say what is already known and how it is related to the investigation, including citations.

> Provide definitions if relevant.

Sentence Starters

*The purpose of this investigation is to understand \_\_\_.*

*This investigation looks at the effect of \_\_IV\_\_ on \_\_DV\_\_\_.*

*This is of interest because \_\_\_.*

*This investigation is worthwhile because \_\_\_\_\_\_.*

*I have observed that \_\_\_.*

*\_\_\_\_\_\_\_\_ occurs when \_\_\_.*

*In this case \_\_\_\_.*

*The independent variable in this experiment is \_\_\_.*

*The \_\_\_ will be changed by \_\_\_.*

*This will be done in increments of \_\_\_.*

*The dependent variable in this experiment is \_\_\_.*

*This will be measured by using a \_\_\_\_\_\_ to\_\_\_\_.*

*It will be known that there is a direct relationship between the DV and IV when \_\_\_.*

*In order to make the data more reliable, the  \_\_\_\_\_\_.*

*It is possible that \_\_\_could influence\_\_\_\_.*

*This variable will be controlled by\_\_\_.*

**Hypothesis**

Write a testable question and/or hypothesis. 100 words.

> Use present tense.

> Begin with the format ‘If there is a relationship between \_\_IV\_\_\_and\_\_DV, then when \_\_IV\_\_\_, the\_\_DV\_will (expected result) because (your scientific reasoning based on background knowledge and research).

> Describe the behaviour of molecules or the mechanics of the phenomenon when when giving reasoning. Reveal scientific understanding. Describe something that has been learnt in class. Include citations.

Sentence Starters

*It is predicted that when \_\_\_\_\_is increased/decreased, then \_\_\_\_\_will\_\_\_.*

*This is because\_\_\_.*

*Other information that supports this hypothesis is \_\_\_.*

*I know that this experiment is a valid test of the relationship between \_\_IV\_\_ and \_\_DV\_\_\_ because\_\_\_.*

**Materials**

Provide a complete list of all materials required for the investigation, with quantities.

**Methodology**

Provide clear and logical instructions on how to collect valid and reliable data.

> Use past tense, e.g.,’ Measured in 10ml of water’ or ‘10ml of water was measured’

> Passive voice (what was done rather than what you did). e.g., ‘The circuit was set up’ rather than ‘I set up the circuit’

> Give step by step instructions, like a recipe, with enough detail for another person to repeat your experiment and get the same results.

> Use dot points or numbered steps.

> Make sure that you give safety warnings and emphasize how to control variables.

> State how many times the procedures should be repeated.  For example;

1. *Set up the apparatus as shown in Figure 1.*
2. *Prepare solutions by \_\_\_\_.*
3. *Place the beaker for Solution 1 on the metal mesh, 5cms above the tip of a blue flame. When handling \_\_\_\_ be sure to \_\_\_\_\_(safety consideration).*
4. *Repeat this procedure three times to allow for three sets of data to be collected.*

> If needed, provide a diagram of the experiment design.

> Name and number the diagram, below the diagram. E.g. Figure 1: Experiment Setup

> Label or annotate the different parts in the diagram.

> The diagram must be neat and mostly just 2D lines.

**Data Table**

Copy this over from Part B. Include the data that you collected. Include any qualitative observations if relevant. Also present a correctly labelled and presented graph if this will help with the interpretation of your data.

**Data Analysis**

Describe what was observed using words. Reveal any patterns or relationships that can be seen. 100 words.

> Use past tense.

> Use words to explain what the data shows. Describe how the variables are related.

> Indicate which data points do not fit the pattern. State whether or not they are likely to be ‘outliers’ and unreliable and why.

> State whether or not the data supports your hypothesis. Try not to write ‘proves’, ‘correct’, ‘wrong’, or ‘right’.

Sentence starters

*The data shows an increase in \_\_\_ as \_\_\_.*

*This suggests that \_\_\_.*

*\_\_\_\_\_\_supports the hypothesis.*

*This data supports/does not support/partially supports \_\_\_*

**Conclusions**

Based on the patterns and relationships that were observed, make statements about what can be concluded from your experiment. Did the data support your hypothesis? Justify your statements using evidence from your data. 100 words.

> Use definitions or text from reputable sources to back up your statements (provide citations).

> Write about any other possible explanations. If your data does not, or only partially supports your hypothesis, provide alternative explanations using scientific reasoning. Provide research, including quotes, supporting your explanation of what happened.

> Write a concluding sentence that states whether or not your research question has been answered.

Sentence starters

*It was predicted that there would be a \_\_\_\_\_ relationship between \_\_\_\_\_\_.*

*This might be because \_\_\_.*

*Another source that supports this reasoning is \_\_\_.*

*\_\_\_\_ accounts for the relationship that was observed in the data.*

*It can be concluded that \_\_\_.*

**Evaluation**

Provide commentary on the accuracy, reliability and validity of your procedures and data. Was your methodology a valid (fair) test of the research question? Did your methodology produce reliable data? Were there any outliers or issues with the collection of data? What improvements could be made to the methodology? How could the experiment be extended? 100 words.

Sentence starters

*The methodology used allowed/did not allow for \_\_\_\_.*

*This is because \_\_\_.*

*Some strengths in the method were \_\_\_.*

*A weakness in the method was \_\_\_.*

*One difficulty was \_\_\_.*

*The data can be seen as being in/valid because \_\_\_.*

*The data can be seen as being un/reliable because \_\_\_.*

*The method could be improved by \_\_\_.*

*Another option would be to \_\_\_.*

*This would be an improvement because \_\_\_.*

*A logical next step from this experiment would be to \_\_\_.*

*This could be tested by \_\_\_.*

*It would be worthwhile to investigate what effect \_\_\_.*

**Bibliography**

> Use in-text citation when quoting.

> List any sources that you used for ideas or quoted in your text.

List websites and videos:

“Title of Article/Work.” URL.

For images:

Description of image. *Title of Website*, URL.