Student Experiment Scaffold - Physics

**Word limit – 600-800 words.** Tables, in-text referencing and reference list do not count towards the word count.

**Title:**

Use your research question as the title.

(Length: under 15 words)

**Rationale:**

The rationale should contain basic background information, including the physical theory and laws behind your experiment. It should consider all information relevant to the variables in your research question and any known relationships between them.

This should be approximately 2-3 paragraphs of information. (Length: 200-300 words)

*You are marked here on:*

* *Whether the concept of energy conservation and representation of energy transfer and transformation within systems is “a justified explanation” (A), “accurate to make informed predictions” (B), “applied to predict changes” (C), “partially applied” (D) or “statements” (E)*

**Original experiment:**

The original experiment must be summarized and described in terms of procedure, results and overall findings.

This should be approximately 1 small paragraph worth of information. (Length: 30 words)

The original method should be included as appendix 1. *The original method is attached in appendix 1.*

**Research question:**

A specific and relevant research question must be developed. It must clearly state the independent and dependent variables.

(Length: 1 sentence)

*You are marked here on:*

* *Whether your research question is “justified” (A), “informed” (B), “developed” (C), “guided in development” (D) or “statements” (E)*

**Modifications to methodology:**

This section must justify **why** you altered the methodology of the original experiment.

E.g. A motion sensor was used to improve the reliability of data collection.

The method you used should be included as appendix 2. *See appendix 2 for the modified methodology.*

(Length: 50-100 words). Can be in dot points.

*You are marked here on:*

* *Whether your modification to the methodology is “independent and justified” (A), “independent and informed” (B), “independent” (C), “partially designed” (D) or “the provided method” (E)*
* *Whether your methodology “manages reliability” (A), “considered the implications of reliability” (B), “considered reliability” (C) or “partially considers reliability” (D)*

**Management of risks:**

You need to describe the potential risks of the experiment and explain which safety measures you implemented for protection. This should be in past tense. You may refer to your risk assessment and it should be attached as appendix 3. *Risk assess is attached as appendix 3.*

This should be approximately 1 paragraph of information. (Length: 50 words)

*You are marked here on:*

* *Whether the safety issues are “managed” (A), “considered the implications of safety” (B), “considered safety” (C), “partially consider safety” or “identify safety considerations” (E)*

**Raw data:**

Results collected clearly in well laid out tables with correct units and appropriate figure titles. **ONLY** the data you collected in the experiment – not things you calculated after.

**Processed data:**

This section should include equations, tables and graphs to show how you worked with the data you collected. Values in tables should only be the values you calculated – average, velocity, force etc.   
  
 Sample calculations should be included in a table in this section.

Table

Description automatically generated

All tables and graphs should be labelled appropriately ie. Figure 1, Table 1 etc.

**Trends, patterns and relationships:**

The trends, patterns and relationships observed within the data should be clearly stated and allow for a justified conclusion to the research question.

1-2 paragraphs. (Length: 100-150 words)

*You are marked here on:*

* *Whether the explanation of findings was “justified” (A), “plausible” (B), “identified” (C), “statements and identification of patterns” (D) or “statements” (E)*
* *Whether the construction of arguments was “justified” (A), “informed” (B), “evidence based” (C), “constructed” (D) or “fragmented” (E)*

**Evaluation of Methodology:**

This section should identify the uncertainty and limitations of the evidence, while justifying the validity of the experimental process. This is used to discuss why these results were not as reliable and valid as they could be and should identify significant random and systematic errors in the experimental process.

You should be making suggestions on improvements that could be made in the future, if this experiment were to be completed again.

1-2 paragraphs. (Length: 50-100 words)

*You are marked here on:*

* *Whether the explanation of sources of uncertainty was “justified” (A), “informed” (B), “explanation” (C) or “statements” (D - E)*

**Conclusion:**

The conclusion should be supported with evidence that directly answers the research question. A summary of results should be included to justify the final decision

This section can be 1 paragraph in length.

(Length: 50-100 words)

*You are marked here on:*

* *Whether the conclusions are “justified” (A), “informed” (B), “explained” (C) or “statements” (D-E)*
* *Whether the construction of arguments was “justified” (A), “informed” (B), “evidence based” (C), “constructed” (D) or “fragmented” (E)*

**Word Count:**

How many words is your report? Does not include data tables or in-text referencing.

**Reference List:**

Must be in APA style. The following guide details how to correctly reference according to APA guidelines: <https://lor.usq.edu.au/usq/file/676e08a0-5b68-45d8-b588-a4b235920b19/1/USQ%20Library%20-%20APA%20Referencing%20Guide%20Nov%202018.pdf>

* Should:
  + Contain only the sources you have referenced in-text.
  + Begin on a new page with a centred heading.
  + Include hanging indents for all reference list entries.
  + Be arranged in alphabetical order by the surname of the first author.
  + Spell out titles that begin with numerals.
  + If the list contains more than one item published by the same author(s) in the same year, add lower case letters immediately after the year to distinguish them (e.g. 1983a).

**Appendix:**

1. Original experiment
2. Method for experiment
3. Risk Assessment completed through risk assess.