SPH3U-11 PHYSICS **Formal Lab Report Format**

**The following format is to be used for all formal experimental reports unless modifications are suggested by the teacher.**

**Purpose:**

• Briefly state why the experiment was done.

• Begin your purpose with the phrase" To investigate…".

**Hypothesis:**

• You may be asked predict the outcome of the experiment BEFORE performing the experiment.

•You should try to provide a reason for your educated guess based on your prior knowledge.

**Materials:**

• List all materials and equipment **actually used** in your experiment.

**• Don't** include materials from the suggested list given in the textbook which were not used.

**Procedure:**

• Describe the procedure that was followed to complete the experiment.

• Use the **past passive tense** since you have already performed the experiment.

• Number each step for clarity. Repeated steps are listed by indicating which variables were changed.

***Example:***

*1. A simple pendulum was constructed using a split rubber stopper, string and 50 g pendulum bob as*

*shown in Figure 1. The starting length of the pendulum was set to be 10.0 cm.*

*2. The pendulum string was displaced from its rest position by a small angle of approximately 10 ° and released from rest. The time for the pendulum to complete 10 complete cycles was measured. This step was then repeated 2 more times.*

*3. Step 2 was repeated for a variety of pendulum lengths from 15.0 – 100.0 cm.*

**Diagram:**

• Draw the **experimental set-up** using a **simple line diagram** or include a **photo** of your set-up.

• Refer to your diagram in your procedure steps.

• Draw in pencil and use a ruler for straight lines and labels OR use a computer generated image.

• Where possible, show how physical quantities were measured ( e.g length, angle, etc.).

• Provide a title for the diagram at the bottom. (e.g. *Figure 1: Simple Pendulum Apparatus* )

• **Don't** include isolated diagrams of measurement tools such as rulers or stopwatches.

**Data and Observations:**

• Record all data observed in table format wherever possible. The table should have a number and

title. List any variables held constant in the table title.

• Show measurement units ONCE in the column heading

• Indicate your estimated uncertainty for measured values once before your table. The precision

of your recorded data should match your stated uncertainty.

**Sample Observation Table Format:**

**Table 1: Pendulum Period versus Pendulum Length for constant bob mass of 50 g**

Estimated uncertainty in length measurements: ± 0.1 cm

Estimated uncertainty in time measurements: ± 0.1 s

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pendulum Length  L (cm) | Time for 10 cycles  Δt (s) | | | | Period  T  (s) |
| Trial 1 | Trial 2 | Trial 3 | Average |
| 100.0 | 22.26 | 21.20 | 23.50 | 22.3 | 2.23 |
| 90.0 | 20.54 | 18.23 | 19.56 | 19.4 | 1.94 |

**Analysis**:

• Include analysis tables, graphs, and sample calculations here.

• All graphs and tables should have titles and figure captions (e.g. Figure 2: Pendulum Period versus

Pendulum Length)

**• YOU MUST REFER TO EACH ANALYSIS TABLE OR GRAPH IN YOUR DISCUSSION!!! YOUR**

**DISCUSSION SHOULD REFLECT WHAT YOU CAN DEDUCE FROM YOUR ANALYSIS BASED**

**ON YOUR OBSERVATIONS, ANALYSIS TABLES AND GRAPHS.**

• Include ONE sample calculation for each analysis step.

• Show percent difference or percent error calculations here.

**Use percent error when comparing an experimental value with an accepted value:**

% error = x 100%

**Use percent difference when comparing two experimental measurements:**

% difference = x 100%

**Discussion:**

• Discuss the trends and relationships evident in your data.

• Answer any specific discussion questions given in the lab report instructions.

**• YOU MUST REFER TO YOUR DATA, ANALYSIS TABLES AND GRAPHS IN YOUR DISCUSSION!!!**

**Conclusions and Sources of Error:**

• This is a final summary of what you learned in your investigation.

• Provide a statement of your qualitative results (relationships determined) and quantitative

( measured results).

• Discuss whether your hypothesis was supported by the results of your experiment.

• Discuss factors contributing to experimental error.

• Suggest ways to reduce sources of experimental error if the experiment could be repeated.