

Writing first PHYS 1114 lab report

The requirements of PHYS 1114 lab reports are summarized in <http://langraphysics.com/11141118report.pdf>. Below are some key points:

- Write in pen, draw in pencil.
- Purpose: State the goal of the experiment.
- Apparatus: List all instruments you use. Be sure to quote any identifying numbers.
- Data: Record data in this section. If a measurement is repeated multiple times, use a data table to organize the readings and their average. Do not round off the average. The uncertainty must also be included. Briefly explain how you decide the uncertainty.
- Calculations: Calculate the result using the data, keeping track of the sig. figs. Do not round off the result to the sig. figs. yet, as you may need to use it for further calculations. In practice, keeping 5 non-zero digits is enough. If there is a reference value, calculate the percentage discrepancy by:

$$\text{percentage discrepancy} = \frac{|\text{your value} - \text{referencevalue}|}{\text{referencevalue}} \times 100\%$$

- Conclusions: Answer the “Purpose” using full sentences, keeping only the sig. figs. State the comparison with the reference value, rounding the percentage discrepancy to 1 non-zero digit.

Now, carry out the following experiment and write a lab report. Because this is your first PHYS 1114 lab report, a report template is provided on the next page.

Experiment: Measure my heart rate.

(If you have a lab partner, let your partner use a stopwatch to do the timing.) To get ready, set the stopwatch to 0, and feel your pulse on the wrist or on the neck. Once you can clearly count the pulses, say “Start!” and start the stopwatch. Then count like “1, 2, 3, ... 18, 19, stop” for 20 pulses, and quickly press the “Stop” button when you say “stop”. Record all digits on the stop watch: this is the time for 20 pulse beats. Repeat this 3 times and calculate the average. Finally, press “Start” then immediately “Stop”, and use the reading as the uncertainty. (How many digits do you have for your three readings? How many of them are significant digits?)

To calculate the heart rate, first multiply the average time by $\frac{1 \text{ min}}{60 \text{ sec}}$ to convert it to minutes. Then take 20 beats divided by the average time, which is your heart rate in beats per minute (bpm). If you have another device like a blood pressure monitor or an oximeter, use it to measure your pulse as the reference value, and calculate the percent discrepancy. If not, state if your heart rate is within the normal range of 60 to 100 bpm.

This Report Template is for reference only. Please write your lab report on a separate paper. No mark will be given if you write on the Report Template.

Name:

Partner:

1114 Section

Desk #

Date:

My Heart Rate

Purpose: Measure my heart rate in beat-per-minute.

Apparatus:

Data:

t , time for 20 pulse beats measured from (s)

Reading 1	
Reading 2	
Reading 3	
Average reading	
Uncertainty	

Note: uncertainty is the time of pressing "Start" then immediately "Stop" on the stopwatch.

Calculations:

$$t = \quad \text{sec} \times \frac{1 \text{ min}}{60 \text{ sec}} = \quad \text{min}$$

$$\text{my heart rate} = \frac{20 \text{ beats}}{t} = \frac{20 \text{ beats}}{\text{min}} = \quad \text{beats per minute}$$

Conclusion:

My heart rate is \quad bpm (beat-per-minute), which is comparison here .