

PHYSICS LABORATORY: Investigating a Leaky Bottle**Prompt and Purpose**

If a plastic bottle with a hole in it is filled with water, the water will drain out of the hole. Several factors could affect the rate at which water drains out of the hole.

The prompt for this design (planning) lab is:

“Investigate one factor that affects the rate at which water drains from a hole in a plastic bottle.”

You can do whatever you wish, as long as it involves investigating a draining bottle. You are encouraged to be as creative as possible. Note that you are required to work independently on this lab. I will provide you with a bottle to start with, but you may also use your own if you wish.

Refer to the Laboratory Report Guide for full details on what is expected of you. Here is a summary of the main points, to get you thinking:

Design (D)

- 1) Come up with a clearly stated research question.
- 2) Define your dependent, independent, and controlled variables.
- 3) Provide appropriate background information in your lab report; literature review is required.
- 4) Devise a methodology - completely unique to your research question, and up to you.
- 5) Prepare a detailed list of apparatus well beforehand in order for the lab assistant to procure them for you. You may use any equipment in the lab stores.

Data processing and Collection (DCP)

- 1) Collect appropriate raw data with uncertainties considered.
- 2) Process your raw data correctly, taking into account all uncertainties and a full error analysis.
- 3) Present your data in graphical format, and analyze your data through line of best fit analysis, max-min slope lines, etc.

Conclusion and Evaluation (CE)

- 1) Give a conclusion and a full explanation of your results.
- 2) Evaluate the above procedure (methodology) and apparatus used, including limitations and errors.
- 3) Identify any weaknesses and suggest ways of improving the investigation.
- 4) Propose questions for further research and discussion.
- 5) You must include a list of works cited (at least 3, in MLA format).

Remember:

1. Refer to the ‘Physics Lab Report Guide’ before submitting your report.
2. Attach the ‘Physics Lab Report Rubric’ as a cover page to your paper copy.

You will be marked on Design (D), Data Collection and Processing (DCP), and Conclusion and Evaluation (CE) for this lab.