

PHYSICS LABORATORY: Water and Mass

QUESTION Are the mass and height of water in a bottle related, and if so, how?

DATA COLLECTION AND PROCESSING (DCP)

1. Start by taping a ruler on the side of a water bottle. Try to make sure that the ruler is as vertical as possible.
2. Filling the bottle to successively higher marks, record the mass of the water for at least 5 different heights. The 5 different heights do not need to have the same intervals between them. Try to span the entire height of the bottle when taking your measurements, and make sure you include uncertainties in your measurements when preparing your data table. Remember to take 3 trials of each value.
3. Make a graph of your data (include error bars).
4. Determine the best fit line and max-min lines. Report the slope of the best fit line (if linear) with the proper uncertainties obtained from the max-min lines.

CONCLUSION AND EVALUATION (CE)

1. Address the question and your hypothesis by referring specifically to your results.
2. Discuss various aspects of your results. Some questions you could answer:
 - *Does your graph go through the point (0,0)? Why or why not? If this is this an error, what kind is it?*
 - *If mass is directly proportional to height, then $m = kh$, where k is a constant. From your data, determine k . What are the units of k , and what does the value of k mean?*
 - *Does the shape of your bottle affect your results? How?*
3. Come up with two interesting related research questions (if you could do a similar activity to answer a question). Discuss what data you would take, and what your independent and dependent variables would be.

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 Data Collection and Processing (DCP) and Conclusion and Evaluation (CE) for this lab.