

## Analysis and Evaluation

### Hypothesis and Variables

Derive an equation for the hypothesis

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State the independent variable

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State the dependent variable

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State all quantities in the equation above which must be deliberately held constant

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Hence state the proportionality relationship (if any)

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### Results and Calculations

If necessary, add additional column(s) to the table of results to present the two sides of the proportionality.

Plot a graph of this relationship. Include a line of best fit.

Calculate the slope of the line of best fit

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Calculate the expected slope

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Hence calculate the percentage error of the slope

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### **Precision and Random Error**

State whether there is a large or small amount of scatter in the results.

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Hence state whether the measurements were of low or high precision.

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Describe one possible source of random error.

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Explain whether the effects shown on the graph are consistent with this possible source.

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Explain one way the procedure could be modified to increase the precision of the measurements.

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Describe how the effect of random error can be reduced.

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### **Accuracy and Systematic Error**

Explain what the y-intercept of the line of best fit is expected to be.

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Hence state whether there is a large or small amount of shift in the results.

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Taking into account both shift and percentage error, state whether the measurements are of low or high accuracy.

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Describe one possible source of systematic error.

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Explain whether the effects shown on the graph are consistent with this possible source.

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Explain one way the procedure could be modified to increase the accuracy of the measurements.

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Describe how systematic error can be detected.

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State whether the hypothesis was supported or not supported.

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Describe evidence to support this conclusion.

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