H2 Physics
(Practical)

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Contents

1 Prerequisite Knowledge

1.1 General format and procedure

1.2 Decimal places and significant figures

Decimal places are henceforth known as "d.p.", significant figures as "s.f.".

- For addition and subtraction, follow least d.p.

- For multiplication and division, follow least s.f.

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2 Quantitative Aspects

2.1 Measure and record

1. Explicitly state what you are measuring and/or number of measurements.

2. Show evidence of repeated measurements

2.2 Estimate percentage uncertainty

Use minimum $2 \times \Delta R$ for actual uncertainty

2.3 Table for recording readings

Presentation:

- Solidus notation (symbol + notation) to denote physical quantities.

- Header in the order of experiment, record raw data followed by calculated values.

- Follow d.p. for raw data, s.f. for calculated values.

- Correct number of data sets: minimum 6 for straight line, 8 for curve.

Format of table:

n	t_1/s	t_2/s	t_avg/s	T/s	$\sqrt{n}$
6	20.0	20.2	20.1	1.05	2.45
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$

2.4 Graph

2.4.1 Linearising

1. Manipulate the given equation such that the independent variable is on one side, the dependent variable on the other side.

2. The "golden" statement:

   Plot T against $\sqrt{n}$. If the relationship is valid, a straight line graph with gradient P, y-intercept Q will be obtained.

2.4.2 Graph plotting

1. **Scale**

   No odd scale; the acceptable ratios of big squares to small squares are only **1:1, 1:2, 1:5**. Label all bold lines (do not skip any). Plotted points must take up at least half of the space.

2. **Line**

   Line of best fit, equal number of points on both sides.

3. **Points**

   Points plotted to half the smallest square. Circle and label any anomalies.

2.4.3 Gradient and y-intercept

3 Qualitative Aspects

3.1 Support suggested relationship

1. My measurements do / do not support the relationship because . . .

2. % difference is smaller/larger than % uncertainty.

$$\% \text{ difference} = \left| \frac{\text{difference}}{\text{average}} \right| \times 100\%$$

$$\% \text{ uncertainty} = \frac{2\Delta R}{R} \times 100\%$$

(Percentage uncertainty would have already been calculated in an earlier question.)

3.2 Source of error and improvement

3.3 Comment on the value

1. The value is correct / wrong.

2. (How it affects graph)

4 Planning

A Common experiments