



## Experiment 3

Date:

**Aim:** To determine the magnitude of the velocity of an object that falls freely.

**Investigative question:**

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**Hypothesis:**

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**Variables:**

Independent variable (Which is changed.)	Dependent variable (Which is measured.)	Controlled variable(s) (Which remain(s) the same.)

**Apparatus:**

- Ticker timer
- A measuring tape
- A stopwatch
- A mass piece



**Method:**

1. Clamp the ticker timer to the laboratory bench.
2. Hold on to the mass piece and the tape, and switch on the ticker timer.
3. Drop the weight (take care not to throw it).
4. Process and interpret the ticker timer tape (ignore the first few centimetres of the tape) as shown in the table below.

**Results:**

Spaces between consecutive dots	Distance between dots: $\Delta D$ (m)	Time = (period) $\times$ number of consecutive spaces $\Delta t$ (s) $T = \frac{1}{f} = \frac{1}{50} = 0,02 \text{ s}$	Velocity ( $\text{m}\cdot\text{s}^{-1}$ ) $v_{\text{interval}} = \frac{\Delta D}{\Delta t}$
1			at 0,1 s
2			at 0,2 s
3			at 0,3 s
4			at 0,4 s
5			at 0,5 s
6			at 0,6 s



**Answer the following questions:**

1. Does the distance ( $\Delta D$ ) between dots increase by the same amount each time?

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2. What does this suggest about the acceleration of the object?

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Use your results and draw a displacement-time and velocity-time graph.



3 How can you:

3.1 use the position-time graph to calculate the acceleration due to gravity? Explain the process in words only.

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\_\_\_\_\_  
\_\_\_\_\_

3.2 use the velocity-time graph to calculate the acceleration due to gravitation?

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4. Use the answer in Question 3.2 and compare it to the value of  $9,8 \text{ m}\cdot\text{s}^{-2}$ . Give an explanation if your value differs.

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