

AS Physics Data Analysis

Practical information for teachers

Distances measured from assumed C of G of mass (mass was a standard iron 0.5 kg, slightly tapered hexagonal section, ring on top) to the centre of light gate. A metal strip attached to mass with a little blu tack (had to straighten and refix after each drop). So total mass = 0.516 kg. Not easy to hold mass at correct height and " aim " so that strip breaks light beam. (changing % error in measuring h one of the points students need to be able to assess) It is vital that anyone trying to analyse the data has a go at collecting some specimen data. This is the only real way to appreciate practical limits on the accuracy.

Preamble given to students on the handout with the data

The results recorded below were collected by dropping a nominal 0.5kg mass from rest through a light gate.

A piece of thin metal sheet 20 mm wide attached to the mass at its centre was used to break the light beam. You will need to think clearly about the Physics behind the method (and it's limitations and difficulties).

A series of different dropping heights were used, ranging from 20 mm to 920 mm. To improve accuracy and reliability each height was repeated three times.

Your task is to make use of and analyse this data.

Think about the topics you have covered in Chapters 8 & 9, there are several relationships you could investigate and test.

Height above Light Gate mm	Velocity 1 m/s	Velocity 2 m/s	Velocity 3 m/s
20	0.61	0.62	0.51
70	1.12	1.11	1.10
120	1.52	1.62	1.50
170	1.76	1.72	1.79
220	1.93	2.03	1.99
270	2.26	2.28	2.30
320	2.45	2.50	2.46
370	2.62	2.67	2.63
420	2.84	2.80	2.89
470	2.96	2.97	2.99
520	3.18	3.13	3.20
570	3.30	3.44	3.34
620	3.53	3.53	3.40
670	3.62	3.64	3.67
720	3.84	3.62	3.83
770	3.86	3.84	3.83
820	4.03	3.97	3.99
870	4.18	4.12	4.14
920	4.36	4.41	4.20