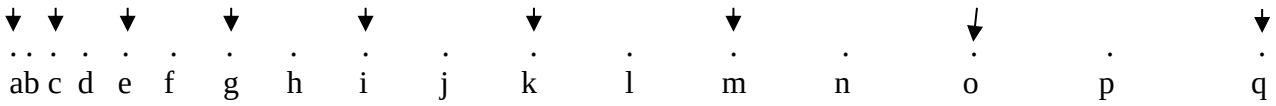
Acceleration Due To Gravity. **Name: _____**

Aim: To determine the acceleration of a falling object.
Method: Tape a 1m length of ticker tape onto a 500g weight. Drop the weight from about 1 metre. The ticker timer should be on its side overhanging the bench.

In this prac, the time interval will be 2 "ticks" (ie. 2 spaces = 2/50 of a second or 0.04 seconds).



Count from the first clear dot and fill in the table below.
Speed = length of tape section / time (duration)
Acceleration = change in speed/time taken = change in speed / 0.04 **(since each time interval is 0.04 seconds apart)**

A	B	C	D	E	F	G	H
Time Interval	**Length of tape in mm (of the 2 "ticks")**	**Length of tape in metres (of the 2 ticks) (Col B/1000)**	**Duration (of 2 ticks) (seconds)**	**Speed during each time interval (m/s) (Col C/Col D)**	**Elapsed Time**	**Change in speed (m/s) (from column E; Row 2 - Row 1, Row 3 - Row 2 etc.)**	**Acceleration (m/s/s) (during each time interval) (Col G/0.04)**
1			0.04		0	- - - - - -	- - - - - - -
2			0.04		0.04		
3			0.04		0.08		
4			0.04		0.12		
5			0.04		0.16		
6			0.04		0.20		
7			0.04		0.24		
8			0.04		0.28		
					Average acceleration = _____		

Questions:

1. Draw a **speed vs time graph** (Column E vs Column F). Speed is drawn on the y-axis.
2. Draw a line-of-best fit (which probably won't go through the origin) and then calculate its gradient. Gradient = _____m/s/s
3. What do the numbers in the Speed column (Column E) and the Acceleration column (Column H) tell you about falling objects?

_____

_____

_____

4. How do the values of the average acceleration, the gradient of the graph and the actual value of g (9.8m/s/s) compare?

_____

_____

_____

5. What is 9.8m/s/s in km/hr/s?

_____

6. Fill in the table below for an object that is allowed to free fall for the times shown. This table assumes that there is no air resistance.

Time taken to fall (seconds)	Speed on impact. (m/s)	Speed on impact. (km/hr)
1		
2		
3		
4		
5		