

# Physics Workshop

## Displacement/Time graph for freely falling object

1. Follow the instructions in the Technical Notes and set up TSA for measuring 'g'
2. Release the ball from different heights and note the corresponding time to fall.
3. Draw a graph of displacement against time<sup>2</sup>
4. Measure the gradient of the graph – this should be  $g/2$

### Additional Experiment

1. In this experiment you will drop a mask through two Light Bridges and calculate the acceleration due to gravity.
2. Set TSA to the Acceleration Data mode.
3. Connect a light Bridge to each input and align them so that they are one above the other and at least 10cm apart.
4. The length of the mask is 10cm. Drop it so that it cuts both IR beams.
5. From the data displayed calculate 'g'
6. Once you have done step 3 a few times set TSA to the Acceleration mode and repeat the experiment to show the difference between the two modes.
7. Since microcontrollers are very good at timing why do we not get really accurate answers every time? List five sources of error.

### Apparatus Supplied

TSA & plugtop power supply

Release Mechanism with ball bearing

Timing Plate

Leads

Mask

Metre stick (S)

2 Retort stands and boss heads (S)