**ACCELERATION USING A TICKER TIMER**

# YOU WILL NEED

A ticker timer, a 12V AC power supply, ticker tape, two 4mm connecting leads, a pair of scissors, a long ramp for a runway, trolley and blocks to elevate one end of the ramp.

**WHAT TO DO:**

trolley

runway

timer

Set up the apparatus as shown in the diagram with the tape fixed to the trolley. Switch on the ticker timer and let the trolley run down the slope.

Cut your tape into 5 SPACE lengths and stick it in your books just like you did for experiment one. This time make sure that you start with the shortest first and be careful to keep the pieces in order.

**PART A:** Glue in six of these 5 SPACE pieces and work out the speed of the first and sixth piece.

Length of piece 1 = cm

Your results for experiment 2 should look something like those shown in this diagram.

Length of piece 6 = cm

Speed of piece 1 = cm/s

Speed of piece 6 = cm/s

Speed of piece 1 = **m/s**

Speed of piece 6 = **m/s**

Time between piece 1 and piece 6 = 0.5 s

Acceleration of the trolley down the ramp = m/s2

You can work out the acceleration from:

Acceleration = (Speed of piece 5 – speed of piece 1)/0.5

**PART B:** Calculate the acceleration between every section of your graph by completing the following table (**practice for the EEI you are about to do)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Section of tape | Distance travelled (m) | Time to travel distance (s) | Speed of the section (m/s) | Change in speed between sections (m/s) | Time to change speeds (s) | Acceleration between sections (m/s/s) |
| 1 |  | 0.1 |  | --- |  | --- |
| 2 |  | 0.1 |  |  | 0.1 |  |
| 3 |  | 0.1 |  |  | 0.1 |  |
| 4 |  | 0.1 |  |  | 0.1 |  |
| 5 |  | 0.1 |  |  | 0.1 |  |
| 6 |  | 0.1 |  |  | 0.1 |  |

# PART C: QUESTIONS

1. How could you tell that the trolley in experiment two was accelerating steadily down the ramp?

2. If you had used five dot lengths and not five space lengths what time interval would that be?

3. The sections of ticker tape shown in the diagram above have been copied at 60% size. If what is the:

(a) speed of the tape in the first section (the shortest) of the tape?

(b) the acceleration of the tape?