To measure the acceleration of an object using a double mask you will need:

A trolley with card attached.

The card is a double mask.

A ramp is used for the trolley to roll down.

A light gate.

This is attached by wire to a timer and you need a ruler or a metre stick to measure the length of the card.

It's best to carry out the experiment a number of times, so draw up a table to record your results.

The table should have the headings of : trial number and calculated acceleration.

The unit of acceleration is metres per second per second.

Let's start the experiment.

Select the acceleration function on the timer so that it will record the time for each part of the mask and also the time between the mask parts so that acceleration can be calculated.

Measure (d) the length of each part of the mask using a ruler.

Remember to always change centimetres to metres so that the units are consistent.

Input these two lengths into the computer.

The trolley must be released from the same point for each run.

Release the trolley and this will roll down the ramp passing through the light gate.

When the trolley passes through the light gate the time for the first mask to pass through is recorded.

When the second part of the mask passes through the gate, the time is recorded.

The time between the two parts of the mask passing is also recorded.

The computer calculates the acceleration using the equation acceleration, (a) equals final velocity, (v), minus initial velocity, (u), all divided by time, (t).

Repeat the experiment two more times.

So that you end up with three sets of results.

Put the results in the table.

To calculate the average acceleration add the three results and divide by three.

Let's re-cap the main stages of this experiment.

A trolley is set up with the double mask attached.

The length of the two parts of the mask are measured using a ruler.

This information is input into the computer.

The trolley is sent down the ramp from rest.

Initial velocity (u), of the object, is calculated when the first part of the mask passes through the light gate.

Final velocity (v), of the object, is calculated when the second part of the mask passes through the light gate.

Time between the two parts of the mask is recorded.

The computer calculates the acceleration of the trolley using the equation, acceleration (a) equals final velocity (v), minus initial velocity (u), all divided by (t).

Time between the two parts of the mask passing through the light gate.

The unit of acceleration is metres per second per second.

Key points.

Remember, always look at the units before you put values into the equation.

Make sure centimetres are converted into metres.

Sources of errors in this experiment are due to human error in measuring the distances.