OCR (B) Physics GCSE
PAG 03 - Investigating the acceleration of a trolley down a ramp

Flashcards

What apparatus is used to measure speeds and times more accurately?

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A light gate (or set of light gates).

How can you find the average speed of a trolley down a ramp?

How can you find the average speed of a trolley down a ramp?

Record the distance travelled (using a ruler) and the time taken (using a stopwatch) for the trolley to travel the measured distance. Then apply the formula:

Average speed = distance / time

What is the initial velocity of a trolley rolling down a ramp?

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0 m/s (provided it is released from rest, not pushed).

How can you calculate the acceleration of a trolley without a light gate?

How can you calculate the acceleration of a trolley without a light gate?

- Record the distance, s, using a ruler
- Release the trolley from rest so the initial velocity is 0 m/s
- Record the time taken, t, using a stopwatch
- Apply the equation: $s = ut + \frac{1}{2}at^2$

What is the equation used to calculate acceleration from initial velocity, time and distance, and how is it rearranged for acceleration?

What is the equation used to calculate acceleration from initial velocity, time and distance and how is it rearranged for acceleration?

$$s = ut + \tfrac{1}{2}at^2$$

This is rearranged to

$$a = \frac{2(s - ut)}{t^2}$$

How should 2 light gates be set up to investigate the motion of a trolley?

How should 2 light gates be set up to investigate the motion of a trolley?

- One just below the release point
- One at the bottom of the slope

How can 2 light gates be used to work out the acceleration of the trolley?

How can 2 light gates be used to calculate the acceleration of the trolley?

- Record the distance between them
- The light gates will record the speed of the trolley as it passes through them and the time taken to pass between them
- Use the equation a = (v-u)/t

How should 1 light gate be set up to investigate the motion of a trolley?

How should 1 light gates be set up to investigate the motion of a trolley?

Position the light gate at the bottom of the slope.

How can 1 light gate be used to work out the acceleration of the trolley?

How can 1 light gate be used to calculate the acceleration of the trolley?

- Measure the time taken from the release to the trolley passing through the light gate
- The light gate will record the final velocity, v
- u is 0 m/s
- Use the equation a = (v-u)/t