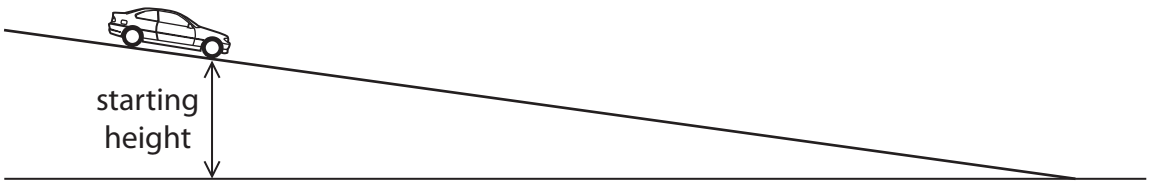
5 A student investigates the motion of a toy car as it moves freely down a slope.



The student wants to find the link between the starting height of the car and the speed of the car at the bottom of the slope.

(a) (i) State the independent variable in this investigation.

(1)

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(ii) Suggest a link between the starting height of the car and its speed at the bottom of the slope.

(1)

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(b) Describe how the student should measure the starting height of the car.

(2)

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(c) The student describes how she will find the speed of the car at the bottom of the slope.

I will start the timer when the car begins to move.
I will stop the timer when the car reaches the bottom.

I will find the speed at the bottom by dividing the distance moved by the time taken.

(i) Explain why the student will **not** be able to calculate the correct speed using this method.

(2)

(ii) Describe how the student should take the measurements needed to find the speed of the car at the bottom of the slope.

You should name any additional equipment needed.

(3)

(d) The student repeats the experiment using the same equipment and the same starting height.

She finds out that the time taken for the car to move down the slope is not exactly the same for each experiment.

Suggest three reasons why the student gets different results when she repeats the experiment.

(3)

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2 .....

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3 .....

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(Total for Question 5 = 12 marks)