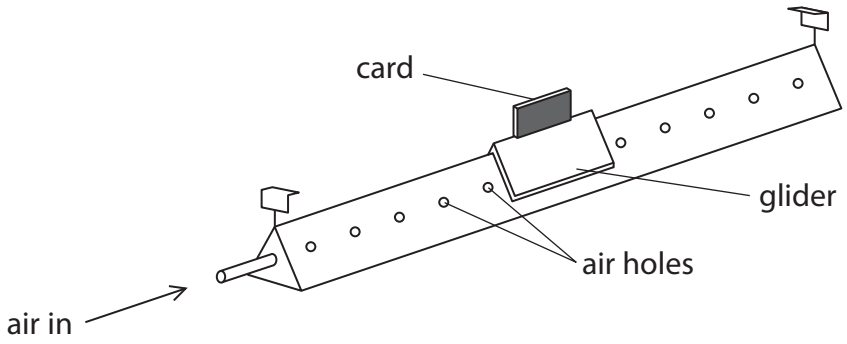
4 The diagram shows an air track that can be used to investigate motion.

Air comes out through a series of small holes in the air track.

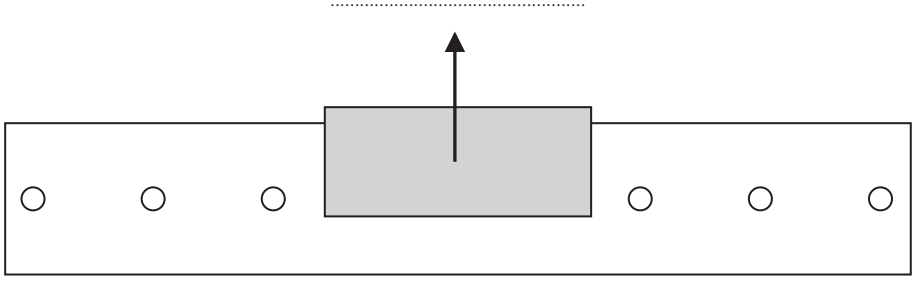
A small glider floats on a cushion of air.



(a) (i) The diagram below shows the glider at rest on the air track.

Complete the diagram to show the forces acting on the glider.
Label the forces.
One force arrow has been drawn for you.

(3)



(ii) Explain what effect the cushion of air has on the movement of the glider.

(2)

.....

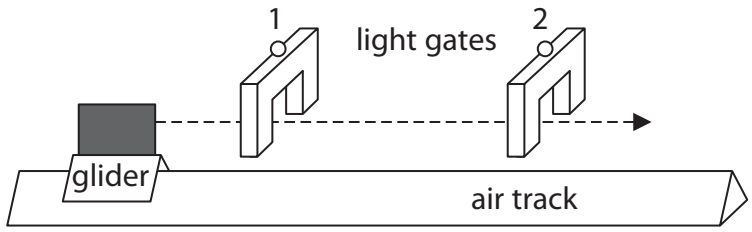
.....

.....

.....

(b) Two light gates connected to a data logger are placed above the air track so that the card will pass through them.

The glider moves at a constant speed to the right.



The length of the card is 8.3 cm.

The card takes 314 ms to pass through the first light gate.

(i) State the relationship between average speed, distance moved and time taken.

(1)

(ii) Calculate the average speed of the card as it passes through the first light gate.

(2)

average speed = ... cm/s

(iii) State the time taken for the card to pass through the second light gate.

(1)

time taken = ...ms

(Total for Question 4 = 9 marks)