10 Diagram 1 shows the apparatus a student uses to investigate the bending of a wooden strip.

Part of the wooden strip is clamped to a table.

A load is fixed to the free end of the wooden strip, causing it to bend.

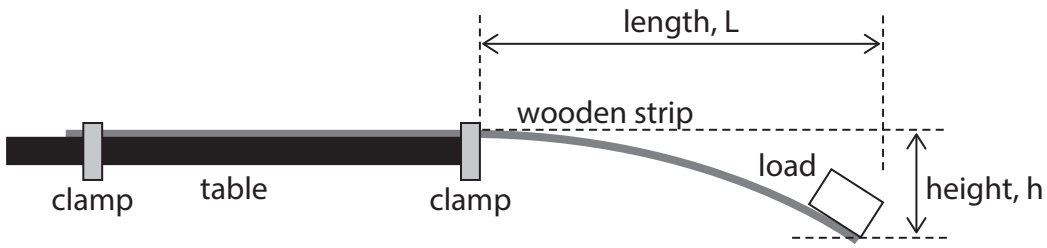

Diagram 1

The free end of the wooden strip is positioned a length, L, beyond the edge of the table, as shown in diagram 1.

The weight of the load causes the end of the wooden strip to move down through a height, h.

A student investigates how the length, L, affects the height, h.

(a) The load has a mass of 250 g.

Calculate the weight of the load.

Use the formula

weight = mass × gravitational field strength, *g*

(2)

weight = ... N

(b) This is the student's method for the investigation.

- clamp the wooden strip so that L = 20 cm
- fix the load to the end of the wooden strip, as shown in diagram 1
- measure the height, h

The student repeats this method for different values of L.

(i) Give the independent and dependent variables in the investigation.

(2)

independent variable

.....

dependent variable

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(ii) Give two control variables in the investigation.

(2)

1 .....

2 .....

(iii) Suggest how the student could accurately measure the height, h.

(2)

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(c) The table shows the results of the investigation.

Length (L) in cm	Height (h) in cm
20	2
40	8
60	18
80	
100	53
120	71

(i) Diagram 2 shows the wooden strip when L = 80 cm.

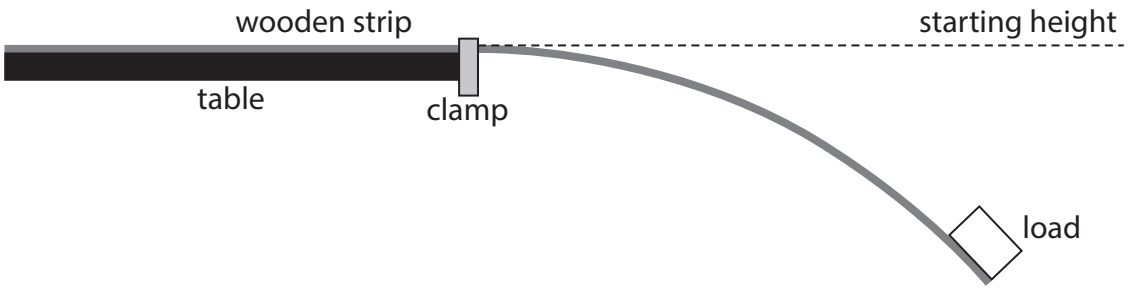


Diagram 2

Using diagram 2, determine the height, h, in the laboratory.
[1 cm on the diagram = 10 cm in the laboratory]

(2)

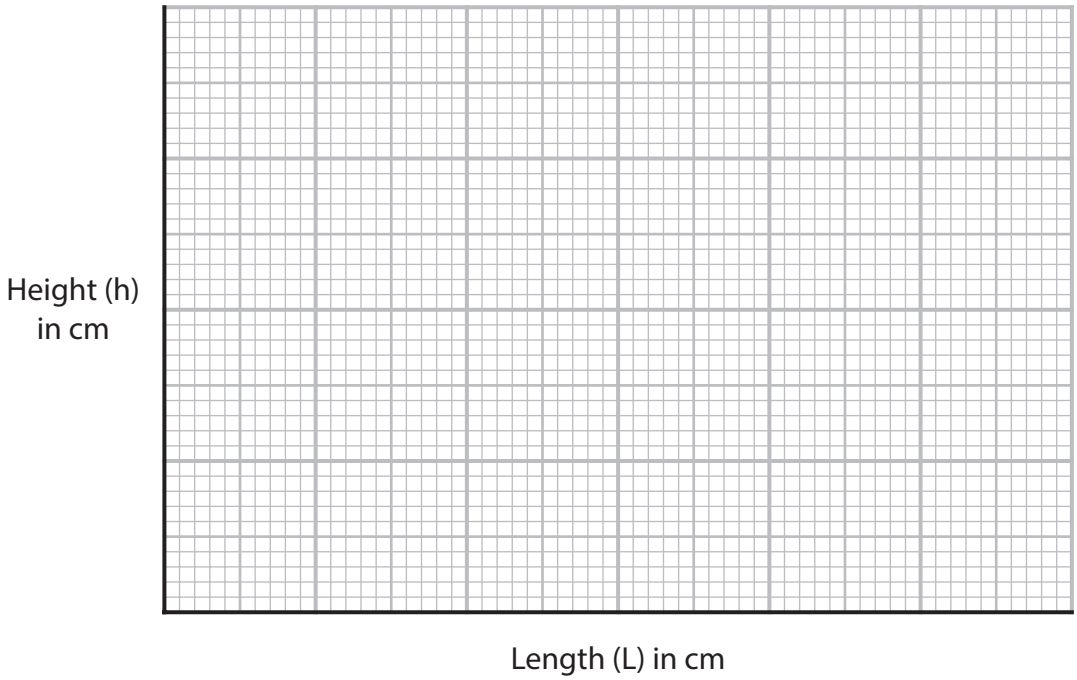
height, h = ... cm

(ii) Plot a graph of the student's results.

(2)

(iii) Draw the curve of best fit.

(1)



(iv) The student concludes that h is directly proportional to L.

Evaluate the student's conclusion.

(2)

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(Total for Question 10 = 15 marks)