

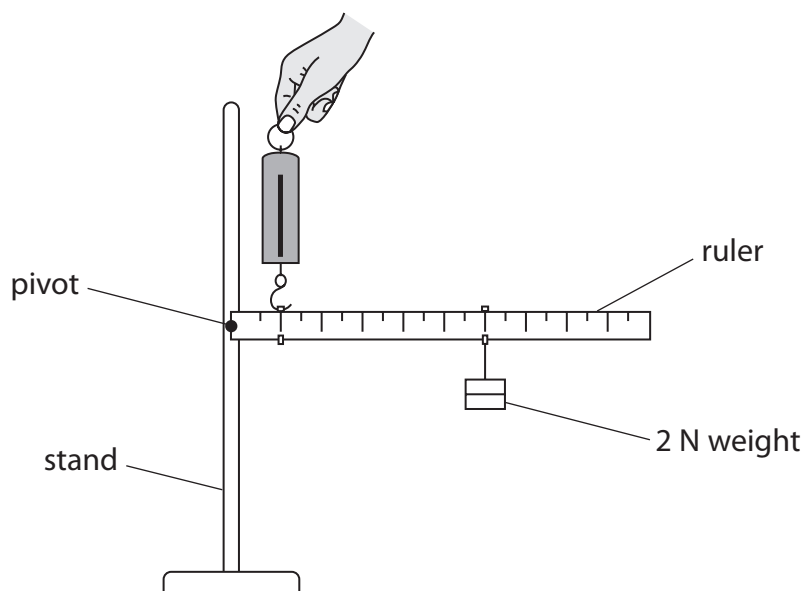
**5** A student investigates the principle of moments.

He connects a ruler to a stand with a pivot.

He hangs a 2 N weight from the 60 cm mark on the ruler.

He uses a forcemeter to hold the ruler horizontal.

The scale on the forcemeter reads from 0 N to 10 N.



(a) How could the student check that the ruler is horizontal?

(2)

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(b) (i) State the equation linking moment, force and distance from the pivot.

(1)

(ii) Calculate the moment of the 2 N weight.

State the unit.

(3)

Moment = ..... Unit .....



(c) The student holds the ruler horizontal with the forcemeter at the 10 cm mark.

He expects the reading on the forcemeter to be 12 N.

The actual reading is 10 N.

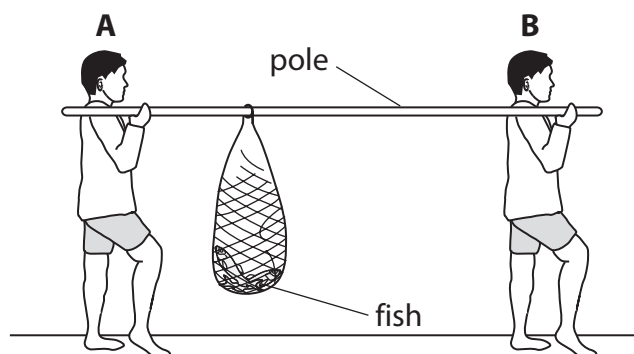
(i) Explain why the correct reading should be **larger** than 12 N.

(2)

(ii) Explain why the actual reading is only 10 N.

(1)

(d) A picture in the student's textbook shows two fishermen using a pole to carry some fish.



Fisherman **A** and fisherman **B** feel different forces on their shoulders.

Use ideas about moments to explain why fisherman **A** feels the larger force.

(3)

(Total for Question 5 = 12 marks)

