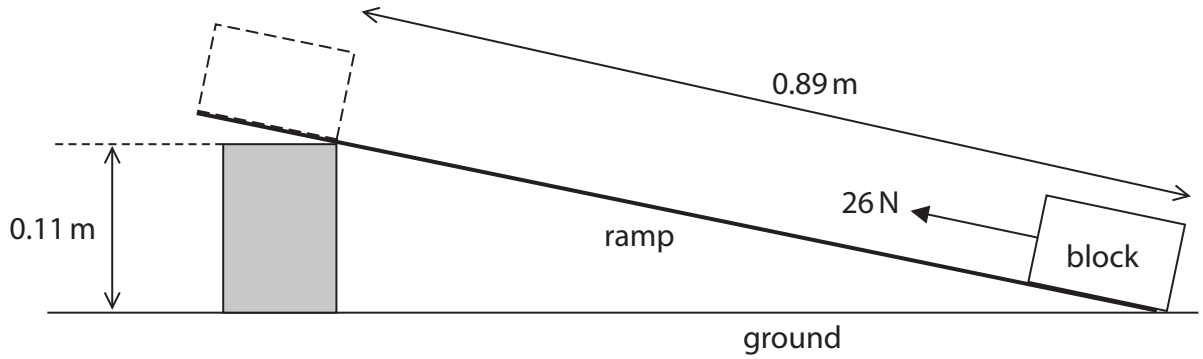
11 A student uses this apparatus to investigate the force needed to pull a block along a ramp.



(a) (i) State the formula linking work done, force and distance moved in the direction of the force.

(1)

(ii) The student pulls the block 0.89 m along the ramp with a force of 26 N.

Show that the work done on the block by the 26 N force is about 23 J.

(2)

(iii) The block has a mass of 1.3 kg and moves vertically upwards 0.11 m.

Calculate the increase in the gravitational potential energy (GPE) store of the block between the bottom and the top of the ramp.

(3)

increase in GPE = ... J

(iv) Explain why the work done to move the block along the ramp is greater than the increase in the GPE store of the block.

(2)

(b) The student suggests it is better to use a less steep ramp to raise the block through the same vertical height.

Discuss an advantage and a disadvantage of using a less steep ramp.

(4)

(Total for Question 11 = 12 marks)