

- 1 A 2.0 kg box on a frictionless incline of angle 40° is connected by a cord that runs over a massless and frictionless pulley to a light spring of spring constant $k = 120 \text{ N m}^{-1}$, as shown in **Fig. 1.1**. The box is released from rest along the inclined plane when the spring is unstretched.

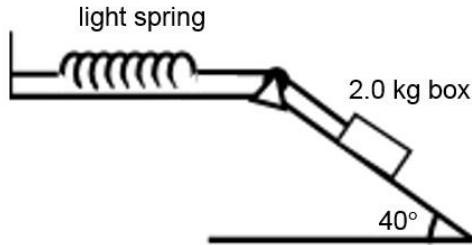


Fig. 1.1

- (a) Calculate the energy stored in the spring when the box reaches 10 cm down the incline.

$$\text{Energy stored} = \dots \text{ J} [2]$$

- (b) Determine, D , the distance along the incline moved through by the box before it comes to a stop.

$$D = \dots \text{ m} [2]$$

- (c) State what will happen to the answer calculated in (b) if the inclined angle is increased.

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- (d) The frictionless incline is now replaced by a rough incline. Assuming the average friction between the rough incline and the box is 5.0 N, determine D' , the new distance moved through by the box before it comes to a stop.

D' = m [2]

- (e) Explain qualitatively how D' might change if a spring with a bigger spring constant were used instead.

¹ See, for example, the discussion of the relationship between the U.S. and European approaches to the same problem in the following section.

¹ See also the discussion of the relationship between the two concepts in the section on "The Concept of Social Capital."

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