

Module 09-Lesson 7

Conservation of Energy

Question 1: A 1.00 kg parcel slides down an inclined plane from a height of 1.00 m. At the bottom the parcel moves with a speed of 4.00 m/s. Is energy conserved? Explain your answer.

Question 2: A simple toy is designed to shoot small rockets of mass 60 g using a spring-loaded mechanism. If the rocket is to reach a height of 25 m after the spring is compressed a 12 cm from its equilibrium position, what should be the spring constant specified by the designer of this toy?

Problem: Suppose a box of mass 1.0 kg slides down a semi-circular track of radius 2.0 m, as shown in Fig. 1. The speed of the box at the bottom of the track is 4 m/s. Is there a friction force between the box and the surface of the track? If yes, find the work done by the friction force on the box, if no, explain why.

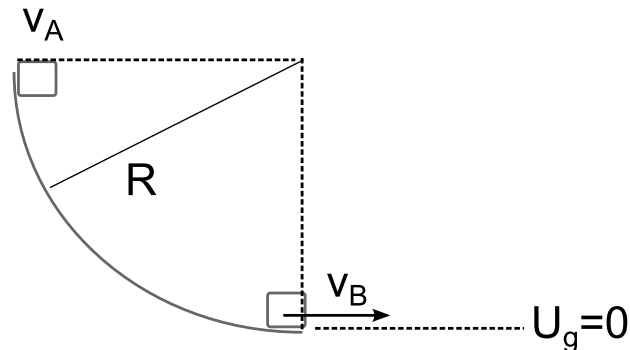


FIG. 1: : Box on a semi-circular track.