

Amusement Park Activity Skill Builder

If a roller coaster with a mass of 2000 kg falls from rest down a hill 40 meters above the ground to a spot 20 meters above the ground, what is the coaster's kinetic energy at the bottom of the hill?

The change in potential energy is given by:

$$\Delta P.E. = mg\Delta h = (2000kg) \left(9.8 \frac{m}{s^2}\right) (20m - 40m) = -392,000 J$$

This means the coaster will have a kinetic energy of 392,000 Joules.

1. In your own words, what is conservation of energy?

2. How is the conservation of energy related to potential and kinetic energy?

3. How can the potential energy be used to predict the kinetic energy of an object? Use an example to justify your answer.

4. A 60-kg diver is going to dive into water that is 12 meters below her. Using conservation of energy, predict her kinetic energy just as she hits the water.

5. On the back of this page, design your own amusement park ride and draw a diagram of it. Explain how potential energy and kinetic energy play a role at different points throughout the ride. How is energy conserved? Do a calculation to predict the kinetic energy at one point on your ride.