

Name: _____

Date Started: _____ Date Completed: _____ Score: _____

Learning Activity Sheet

Applications of the Law of Conservation of Mechanical Energy

A. Choose the letter of the correct answer and write it in the blank provided before each number.

For items 1 and 2:

A roller coaster train, with a mass of 900 kg including passengers, starts from rest at a height of 60 m above the ground. It rapidly drops down and moves along a frictionless track, completes the 360° loop, which has a height of 20 m, before it finally stops on the ground.

_____ 1. What is the velocity of the train when it reaches the top of the loop?

- A. 26 m/s
- B. 28 m/s
- C. 32 m/s
- D. 34 m/s

_____ 2. What is the velocity of the train at ground level (the bottom of the loop)?

- A. 26 m/s
- B. 28 m/s
- C. 34 m/s
- D. 36 m/s

_____ 3. A bag of chocolates with a mass of 1 kg is placed at the top of a cupboard of height 2 m. By lifting the bag of chocolates against the force of gravity, we give the bag potential energy. What is its potential energy?

- A. 16.6 J
- B. 17.6 J
- C. 18.6 J
- D. 19.6 J

_____ 4. If air resistance is negligible, what happens to the total mechanical energy of a free-falling body?

- A. remains constant
- B. increases
- C. becomes zero
- D. decreases

_____ 5. A 50 g object is shot vertically up in the air with a velocity of 200 m/s. Using the principle of conservation of mechanical energy, what is its kinetic energy?

- A. $EK = 1,000 \text{ J}$
- B. $EK = 2,000 \text{ J}$
- C. $EK = 3,000 \text{ J}$
- D. $EK = 4,000 \text{ J}$

B. Explain how the law of conservation of mechanical energy is applied to everyday situations. Cite at least five examples. Write your answers on the space provided. (5 points)
