Conservation of energy - Worksheet

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In lesson questions

The following pages are the questions from the video

Independent practice

1. What is the definition of a closed system?

   A closed system is an _____ or _____ of _____s that _____ cannot leave or _____.

2. State the law of conservation of energy

Key words: transfer, destroyed, created

Independent practice

1. An apple in a tree has a gravitational store of 10 J. As it falls, it accelerates constantly until it hits the ground. What is the apple's maximum kinetic store?

   The maximum kinetic energy is _____

2. Explain your answer.

   (Hint: think about the law of conservation of energy)

Independent practice

1. A golf ball has 50 J of energy in the kinetic store as it leaves the ground. What is its maximum gravitational store when it reaches its highest point?
2. Explain your answer.

Independent practice

1. A golf ball with a mass of 200 g leaves the ground with an initial velocity of 50 m/s. What is the maximum gravitational store of the ball when it reaches its highest point?
2. Question 1 is on Earth where g = 9.8 N/kg. What is the maximum height the golf ball can reach?
3. A cannonball with a mass of 25 kg is fired straight up with initial velocity of 10 m/s. The gravitational field strength is 9.8 N/kg. What is the maximum height it can reach?
4. An alien with a mass of 180 kg jumps straight up with an initial velocity of 2.4 m/s. If the gravitational field strength is 8.7 N/kg, what is the maximum height reached?

Answers

Review

1. What is the definition of a closed system? **A closed system is an object or group of objects that energy cannot leave or enter.**
2. State the law of conservation of energy **Energy cannot be created or destroyed, only transferred from one store to another.**

Review

1. An apple in a tree has a gravitational store of 10 J. As it falls, it accelerates constantly until it hits the ground. What is the apple's maximum kinetic store?

   The maximum kinetic energy is **10 J**

2. Explain your answer.

   (Hint: think about the law of conservation of energy)

   Conservation of energy tells us that energy cannot be created or destroyed but only transferred from one store to another. Here it is transferred from the gravitational store to the kinetic store.

Review

1. A golf ball has 50 J of energy in the kinetic store as it leaves the ground. What is its maximum gravitational store when it reaches its highest point?
   50 J
2. Explain your answer. **At the maximum height all the energy has been transferred from the kinetic store to the gravitational store so they have equal values according to the law of conservation of energy.**

Review

1. A golf ball with a mass of 200 g leaves the ground with an initial velocity of 50 m/s. What is the maximum gravitational store of the ball when it reaches its highest point? **250 J**
2. Question 1 is on Earth where g = 9.8 N/kg. What is the maximum height the golf ball can reach? **130 m (128 m)**
3. A cannonball with a mass of 25 kg is fired straight up with initial velocity of 10 m/s. The gravitational field strength is 9.8 N/kg. What is the maximum height it can reach? **5.1 m**
4. An alien with a mass of 180 kg jumps straight up with an initial velocity of 2.4 m/s. If the gravitational field strength is 8.7 N/kg, what is the maximum height reached? **0.33 m**