Potential and Kinetic Energy
Problems

Potential energy is stored energy due to position. Kinetic energy is energy that depends on mass and velocity (movement).

G.P. E. = m x a x h or G. P. E. = w x h
K.E.= ½ m x v^2
The units used are: Energy = Joules (J)
Weight = newtons (N)
Height = meters (m)
Mass = kilograms (kg)
Velocity = meters/second (m/s)

1. What is the potential energy of a rock that weighs 100 newtons that is sitting on top of a hill 300 meters high?

2. What is the kinetic energy of a bicycle with a mass of 14 kg traveling at a velocity of 3 m/s?

3. A flower pot weighing 3 newtons is sitting on a windowsill 30 meters from the ground. Is the energy of the flower pot potential or kinetic? How many joules is this?

4. When the flower pot is only 10 meters from the ground and weighs 3 newtons, what is its potential energy?

5. How much of the total energy in problems 3 and 4 has been transformed to kinetic energy? (subtract the answers you got for problems 3 and 4).

6. A 1200 kg automobile is traveling at a velocity of 100 m/s. Is its energy potential or kinetic? How much energy does it possess?

7. If you throw a 0.4 kg ball at a speed of 20 m/s, what is the ball's kinetic energy?

8. What is the kinetic energy of a 5 kg object moving at 7 m/s?

9. If you have a mass of 240 kg and you are standing on a platform 3 m above the ground, what is your gravitational potential energy?

10. A 2 kg book is moved from a shelf of 1.5 m off the ground to a shelf 2.0 m off the ground. What is the change in GPE? (hint: find the GPE of the book at both heights first).

Energy Practice Problems

1) A scooter is driving at a speed of 15 km/hr. The mass of the driver and the scooter is 96 kg. What is the KE of the scooter as it drives?

2) A 20 kg bicycle carrying a 50 kg girl is traveling at a speed of 8 m/s. What is the Kinetic Energy of the girl and the bike?

3) Roxy hits a softball to a speed of 72 km/hr. The softball has a mass of .9 kg. What is the Kinetic Energy of the softball?

4) What is the gravitational potential energy of an apple that has a mass of .6 kg and sits 18.9 m up on a limb of an apple tree.

5) While on the Brooklyn Bridge, Chris decided to drop a penny (.008 kg) into the water below. The Brooklyn Bridge towers 4,825 m above the river. What is was the Gravitational Potential Energy before he dropped the penny?

6) A 80 kg diver jumps off a 10 m platform. Calculate how much gravitational potential energy the diver has at the top of the platform and half way down.

Answer in Complete Sentences!

1. An elephant, cheetah, & mouse are walking at the same velocity. Compare their kinetic energies.

2. Explain the changes in energy when a child slides down a sliding board.

3. Which body processes are fueled by chemical potential energy? (List 5)

4. While coasting on a skateboard, you eventually stop. Why?

5. A 70 kg light is hanging 4 m above the floor. What is its gravitational potential energy?

6. Explain to me the law of Conservation of Energy.

7. On page. 111 tell me about plants and what type of energy they store. (Environmental Science)