Student's Worksheet

Lesson 4

Lesson Topic: Energy measurements

Objective:

- To understand and apply the law of conservation of energy
- To explain the concept of Potential energy and its measurement
- To explain the concept of Kinetic energy and its measurements
- To explore the ways in which energies seem to 'disappear'

Work:

A. Potential Energy Measurements

- Remember the activity where you dropped a ball from 30 cm and it bounced back to 23 cm. How much potential energy is lost in this process?

  We know that

  $Energy_{initial} = m\ g\ height_{initial}$

  $Energy_{final} = m\ g\ height_{final}$

  Hence,

  Difference in energies = $m \times g \times (\text{difference in heights})$ =_____

- What is the Potential Energy of the ball when it just touches the surface?

_____

_____

_____

_____

- If you let ball keep bouncing up and down, it ultimately stops. What happens to the energy after 3-5 collisions? Where does the energy go?

_____

_____

_____

_____

B. Kinetic Energy Measurements

- Roll a ball on the table and measure the distance between any two points you choose.

  Distance = _____

- Record the time it takes.

  Time = _____

- Using these values calculate average speed:

  Average speed = distance / time _____

- What are the units of speed in your calculations above?

- If the units are not m/s, convert them to these units

  Average speed = _____ m/s

- Use the known value of mass m to calculate the Kinetic Energy of the ball:

  KE $= \frac{1}{2}mv^2 == \frac{1}{2} \times mass \times (\text{velocity})^2$ _____

- Compare the above value with the value of Kinetic Energy at the tracking speed:

  KE $= \frac{1}{2}mv^2 == \frac{1}{2} \times mass \times (\text{velocity})^2$ _____