HU GK-12 Program 11-22-07

Activity:

The fellow will help demonstrate kinetic and potential energy through a lab activity.

Title:

Drop it like it's hot (REMIX)

Prepared by:

Rowland Webb and Vic Boddie

DCPS Standards:

8.5.2. 8.5.3.

Describe kinetic energy as the energy of motion (e.g., a rolling ball) and potential energy as the energy of position
or configuration (e.g., a raised object or a compressed spring).

Investigate and explain how kinetic energy
can be transformed into potential energy, and vice
versa (e.g., in a bouncing ball).

Goals

The students will demonstrate knowledge of kinetic and potential energy through a laboratory experiment.

Objectives

The students will form hypotheses, answer questions and make line graphs on data from experiment.

Background

Potential energy is the stored energy that an object has due to its position or chemical composition, which when released is converted into other forms of energy. Therefore, a ball's position above the ground gives it potential energy. It is much easier to tell if an object has kinetic energy because the object is actually moving but potential energy becomes more difficult

to evaluate because it can come from several different source, such as gravitational potential energy and elastic potential energy. Depending on an object's mass, gravity can help to increase the object's potential energy, which essentially increases kinetic energy. Of course, Gravitational potential energy is based on the fact that gravity has a major effect on all falling objects, adding to the stored energy of the physical system. Elastic potential energy is energy stored from an object that is elastic or stretches such as a rubber band or slinky. This is the same force acting on people who Bungy jump as a hobby. The rope is basically a very large and strong rubber band that acts to jolt the jumper back into the air after they are dropped.

Kinetic is a noun which has its roots in the Greek word for motion, "kinesis". This means that kinetic energy is energy of motion. This energy all depends on an object's mass and speed. Kinetic energy increases as mass increases and speed increases. For example, the car of a roller coaster reaches its maximum kinetic energy at the bottom of the ramp, whereas the roller coaster cars reach their maximum potential energy as they are going back up the incline.

Materials:

- Marbles
- Golf ball
- Sand
- Meter stick
- Tape
- Ruler
- Balance beam measure

Procedure/Evaluation and Assesment

1) Begin by measuring ½ meters, 1 meter, 1 ½ meters and lastly 2 meters against a wall. Mark each point using tape and label.
2) Place sand box directly under the tape close to wall.
3) Write an hypothesis detailing what will happened when the golf ball and marble are dropped from the same position based on them being dropped at the same heights.
4) Give a prediction of whether the golf ball or marble will cause the biggest indentation. Explain your answer.
5) Measure the mass of both the golf ball and the marble
6) Drop golf ball one time for each four different heights.
7) With a ruler, measure the indentation the golf ball makes at each different height. (Remember to smooth out sand after each drop, to keep measurements consistent.)
8) Repeat the same step for the marble as well and record the data.
9) Construct a line graph to display data recorded
10) Give an explanation about the effects of mass on potential and kinetic energy