

Energy: Potential & Kinetic



Investigation Data Sheet

Observing Energy With A Marble Ramp

Gravitational potential energy is stored energy, and kinetic energy is the energy of motion. Kinetic energy is measured by how much work is done to put an object in motion. The more potential energy an object starts with, the greater its kinetic energy will be! It is possible to change the potential energy of an object by changing the height of the position of an object.

Objective

Investigate the effect of gravity on an object's potential energy and explore the effect that the height of a ramp and the mass of an object have on potential and kinetic energy.

Materials

- a ramp
- two marbles of different weights and sizes
- a small container
- a meter stick

Safety Notice: All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

Procedure

1. To test how height affects an object's potential energy, create a ramp out of meter sticks and place a small container at the end of the ramp. By rolling a marble down the ramp and measuring how far the marble pushes the container, you will be able to determine how much potential energy is transferred to kinetic energy by observing how much work was done on the container.

2. What do you think will happen as height or mass is increased?
 - As the height of a ramp increases, potential and kinetic energy will _____.
 - As mass increases, potential and kinetic energy will _____.
3. The height of the ramp for the first roll should be 15 centimeters. Roll the marble down the ramp and measure the distance the container moves once struck by the marble. Record your observations in the data table.
4. Raise the height of the ramp to 30 centimeters and roll the marble, recording how far the container moves.
5. Raise the top of the ramp to 45 centimeters and roll the marble.
6. Now use a marble with a greater mass, rolling from the 15 centimeter height, then 30 centimeters, and finally at 45 centimeters. Record your results in the data table.

Conclusions

- Is there a way the lighter marble can have more energy than the heavy marble?

Data Table: Work Performed

Height	Distance moved by Marble 1	Distance moved by Marble 2
15 cm		
30 cm		
45 cm		
60 cm		