



Can you identify energy transformations?

Energy cannot be created or destroyed. However, energy can be transformed from one type into another type, and energy can be transferred from one object to another object. In this lab, you will transform gravitational potential energy into kinetic energy as well as transfer energy from one object to another object.

Learn It

Before you can draw valid conclusions from any scientific experiment, you must **analyze** the results of that experiment. That means you must look for patterns in the results.

Try It

1. Read and complete a lab safety form.
2. Use the photo in your textbook to make a pendulum. Using **string**, hang one **large washer** on the **paper clip**. Place the **small box** so it will block the swinging pendulum. Mark the position of the box with **tape**.
3. Pull the pendulum back until the bottom of the washer is 15 cm from the floor. Release the pendulum. Measure using a **ruler** and record the distance the box moves. Repeat two more times.
4. Repeat step 3 using pendulum heights of 30 cm and 45 cm.
5. Repeat steps 3 and 4 with two washers, then with three washers.

		Distance Box Moved		
		15 cm	30 cm	45 cm
1 washer	Trial 1	add		
	Trial 2	add		
	Trial 3	add /Average		
2 washers	Trial 1			
	Trial 2			
	Trial 3			
3 washers	Trial 1			
	Trial 2			
	Trial 3			

Skill Practice continued

Apply It

6. How does gravitational potential energy depend on the pendulum's weight and height?

**The gravitational potential energy increases
with the increasing HEIGHT and MASS**

7. How does the distance the box travels depend on initial gravitational potential energy?


**The distance almost doubles as the height
doubles, so does the mass**

8. Does the pendulum do work on the box? Explain your answer.

**YES! Work occurs when a force is applied
from the pendulum swing (speed & mass)**

9. What energy transformation occurred that caused the box to stop moving?

FRICTION..Kinetic----->Thermal

10.  **Key Concept** Describe the energy transformations and transfers that took place as the pendulum fell, as the pendulum hit the box, and as the box slid along the floor.

1. LIFTING the pendulum provided potential energy

2. RELEASE the pendulum provided Kinetic energy

3. Kinetic Energy transferred to the box

**4. The box moved across the floor and
stopped by friction**