

Potential vs Kinetic Pendulum Lab

Energy is the ability to do work or cause change. Energy can be in one of two states, potential energy or kinetic energy. An interesting thing about energy is that energy can be transferred from potential to kinetic due to it connecting to objects. Potential energy is stored energy, which results from position or structure of the object. Depending on the position of an object, it can have a certain amount of stored energy. Kinetic energy is when an object is in motion and, as a result, kinetic energy can do work on anything it hits. Mechanical energy of an object is the sum of its kinetic energy and potential energy, which is associated with the motion and position of an object.

Purpose: The purpose of this lab is to create a simple pendulum that demonstrates potential and kinetic energy in a mechanical system. You will be demonstrating how mass affects the potential and kinetic energy of your pendulum.

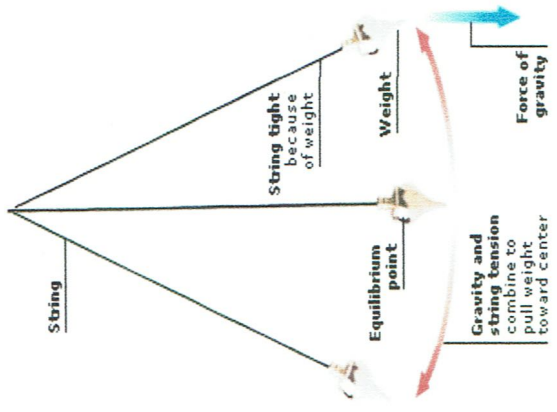
Materials:

- 3 metal washers
- 12" length of string
- Unsharpened pencil
- Masking tape
- Jumbo paper clip
- Stopwatch

Procedure:

1. Tape the pencil to a lab station, so that a quarter of it extends off the counter. This will be the rotation point of your pendulum. Measure the drop height of your pendulum in meters. (You are measuring from the end of the pencil to the floor).
2. Tie one end of the string to the extended end of the pencil. Tie the other end to the paper clip.
3. Separately weigh one washer and record the weight in Data Table section.
4. Slip one **small washer** onto the paper clip. Lift the paper clip/washer so that the string is parallel with the desktop, and then release it. Partner 1 keeps time while partner 2 counts the number of swings until it stops. (Forward and back = one swing.) Record the data in the provided chart.
5. Add a second washer to the paper clip. Repeat step 3.
6. Continue until you have completed two trials each with one, two, and three small washers.
7. Calculate the mean (average) number of swings for each amount of washers and also the mean time.
8. Answers the lab question with supportive evidence.

The diagram to the right displays how your pendulum should look.



Data Table:

Mass of One Washer = _____ grams (g)

Drop Height of Pendulum = _____ meters (m)

Washers	Number of Swings and Time Before the Pendulum Stopped		
	Trial 1	Trial 2	Trial 3
	# of Swings	# of Swings	# of Swings
	Time	Time	Time
1			
2			
3			
Mean (Average) Add all 3 scores and divide by 3			

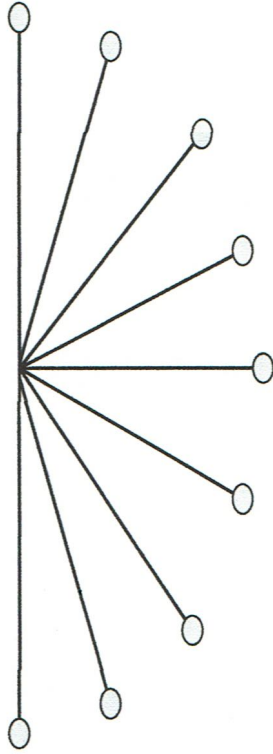
After completing the lab,
Label the diagram to show where the following areas are located:

* High kinetic energy = **HK**

* High potential energy = **HP**

* Low kinetic energy = **LK**

* Low potential energy = **LP**



4. Explain how the potential energy change as you increased the number of washers.

5. Explain how the kinetic energy changed as you increased the number of washers.

6. Did the change in mass have an impact on the potential and kinetic energy in your pendulum?
EXPLAIN your answer.

7. Did the time it took for your pendulum to stop swinging change as the mass changed?
EXPLAIN your answer.

8. Thinking back to the Law of Conservation of Mass, does the lab you just completed demonstrate this? EXPLAIN your answer.

1. Define Potential Energy:

2. Define Kinetic Energy:

3. Explain whether or not the size of the washer made a difference in the number of swings?