

Name _____

Exploring Pendulums

Predictions

Do heavier masses fall faster than lighter masses?

How will changing the angle, or amplitude, which is equivalent to changing the distance the bob falls, affect the number of swings, or frequency, of the pendulum?

How will changing the length of the string that supports the bob affect the frequency of the pendulum?

Materials

- Pencil
- Three lengths of string (30 cm, 45 cm, and 60 cm)
- Scissors
- Tape
- Washers of various sizes and weights
- Digital watch or stopwatch
- Balance (to weigh the bobs)
- Ruler (to measure the lengths of string)
- Protractor (to measure the angle)

Procedure

1. Construct a pendulum using the 30cm string and a washer. Attach it to a pencil and tape that pencil to the surface of the desk so that it swings freely. This controlled-falling system is a weight (bob) suspended by a string from a fixed point so that it can swing freely under the influence of gravity.

2. Pull the bob back to your desired starting point and use the protractor to measure the angle. Make sure to record the starting angle in the data table.
3. Release the bob to start the pendulum moving. Using a digital watch or stopwatch, count the number of swings of the pendulum in 15 seconds. Record the information in the data table.
4. Test different weights, starting from the same angle. Time and record the number of swings of the pendulum in 15 seconds.
5. Test several different starting points or angles using the same bob. Time and record each test.
6. Test the three different lengths of string using the same angle and bob. Time and record each test.

Data Table

Test #	Mass (weight of bob)	Amplitude (angle)	Length of String (cm)	Frequency (swings per 15 seconds)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

