

Assignmentment

[Science](#), [Physics](#)



Assignment Question Explore the Pendulum Lab simulation. For this simulation set the friction slider to none. Use the photogate timer to measure the period of the pendulum. Now figure out how to measure g the gravitational acceleration. First practice getting the right values for Earth and Jupiter. What is the gravitational acceleration on planet X? Explain how you found it.

The experiment was set as described above. The following table shows the summary of the results.

Earth

Jupiter

Planet X

Length of the pendulum l (m)

1.5

1.5

1.5

The angle of displacement (degrees)

5

5

5

Periodic time T (s)

2.4579

1.5121

2.0426

Gravity (ms^{-2})

9.8047

25. 9061

14. 1970

..... 1

Rearranging equation 1

..... 2

Using equation 2, gravitational acceleration for Earth can be evaluated to be

Gravity for Jupiter can also be evaluated to be

In a similar way, the gravity of the planet x can be evaluated to be

Question 2 Click to show the energy bar graph of the pendulum. Now set the friction slider to some value other than none. Explain what happens.

For planet Earth, when the friction slider is set to none, the thermal energy bar is not available because the friction which is a means of energy dissipation is zero. When the friction slider is set to some value, the thermal energy bar graph shows up and the total energy at any particular position is a sum of potential energy, kinetic energy and the thermal energy due to friction. In planet Jupiter, energy exchange between potential and kinetic energy occurs faster than in planet earth due to an elevated level of gravitational pull. When the friction slider is set at some value, thermal energy bar builds up, and the oscillators are continuously damped the amplitude of oscillation, therefore, reduces continuously. Lastly for the Planet X there is a slower rate of thermal energy builds up due to lower value of gravitational acceleration compared to planet Jupiter.