PHYSICS IN MOTION
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Unit 6A
Nature of Waves
Exploring Pendulums Lab

Name:

Date:

In this activity, you will determine what variables affect the period of oscillation of a pendulum.

Materials:

- pendulum
- meter stick
- timer
- masses
- protractor

You will investigate three variables: the mass of the pendulum bob, the length of the pendulum, and the amplitude of the pendulum. The objective of the lab exercise is to determine which of these variables, if any, affect the period of oscillation of the pendulum.

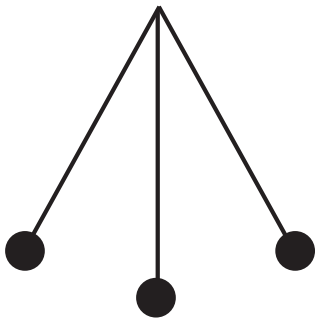
The period of oscillation of the pendulum is the amount of time it takes for the pendulum bob to make one full round trip — going from one maximum to the other and then back to the first.

Be sure to keep the other two factors constant as you test each variable.

Pre-Lab Questions:

Label the diagram below by filling in the blanks with "maximum" or "zero" for the energy and velocity of the pendulum as it oscillates:

v = _____
KE = _____
PE_G = _____



v = _____
KE = _____
PE_G = _____

v = _____
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PE_G = _____

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Data Table: Independent Variable = Mass

Length: _____ **m**

Amplitude: _____ **degrees**

Mass (g)	Period (s)

Data Table: Independent Variable = Length

Mass: _____ **g**

Amplitude: _____ **degrees**

Length (m)	Period (s)

questions continued on next page

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Name:

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Data Table: Independent Variable = Amplitude

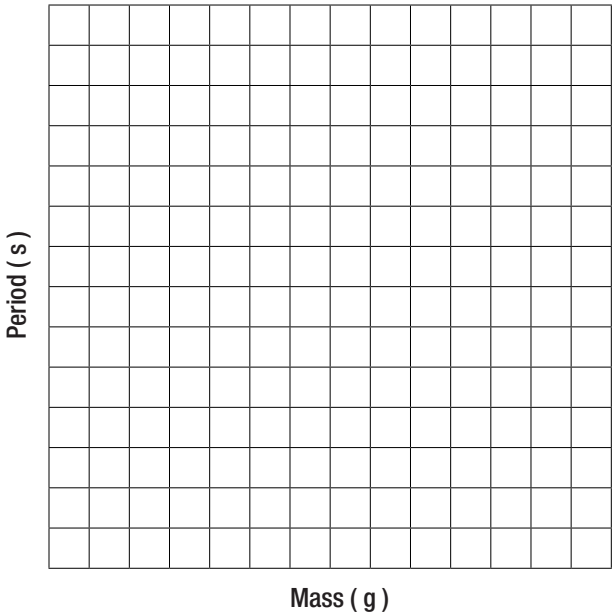
Mass: _____ g

Length: _____ m

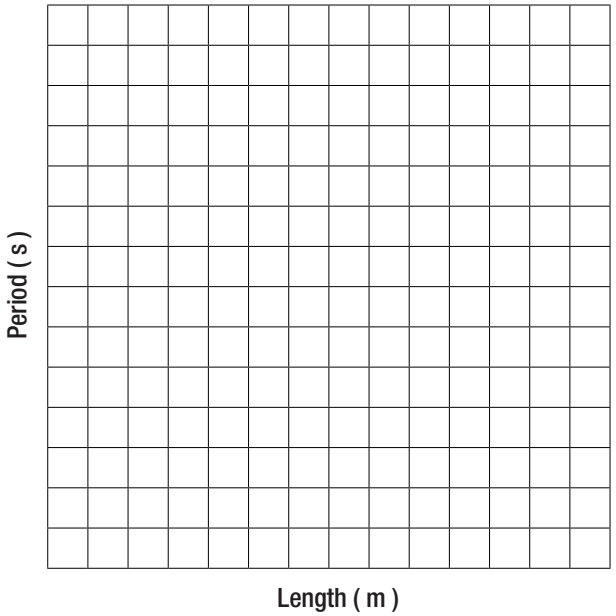
Amplitude (degrees)	Period (s)

Graphs:

Period vs. Mass



Period vs. Length



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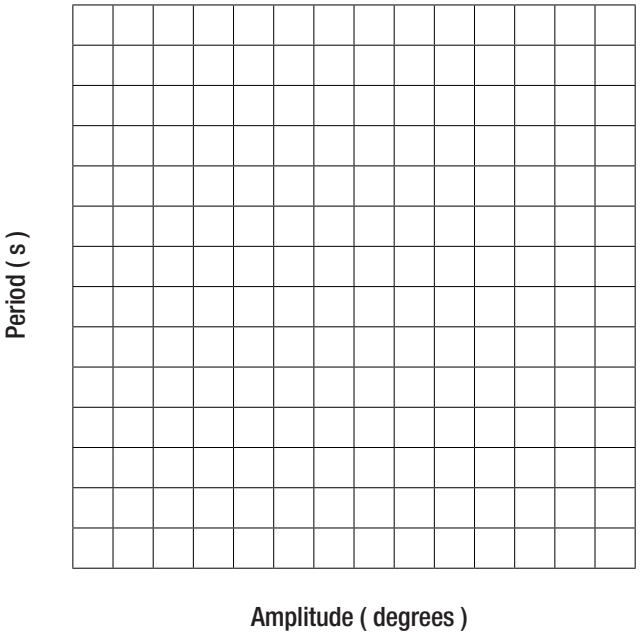
Graphs:

Period vs. Amplitude



Questions to consider:

1. **Which of the three variables had the greatest impact on the period of oscillation of the pendulum?**

2. **Does the variable from the answer above have a linear relationship with the period of oscillation? Explain using information from your graph.**