

Lesson plan for *Pendulum Lab1*: Introduction to Pendulums

Time for activity

Learning Goals:

Students will be able to:

- Design experiments to describe how variables (*length, mass, angle and gravity field*) affect the motion of a pendulum.
- Use a photogate timer to determine quantitatively how the period of a pendulum depends on the variables (*length, mass, angle and gravity field*).

Background: This lesson was written for an emergency back-up lesson. It can easily be used with any sub if the students have done some PhET activities.

Pendulum Lab Introduction: Here are some of the Tips written by PhET; for the complete document see the “teachers guide” under [Teaching Tips for Pendulum](#). I probably won’t show these to the students, but the information might be handy to remember as I help individuals.

- If you want to do an experiment, **Pause** the sim, set up your experiment, then start it.
- If you want to compare two variables like length, check **Show 2nd Pendulum**, **Pause** the sim, set up your experiment, then start it.
- The **Photogate Timer** operates as a triggered mechanism, which starts when the pendulum crosses the vertical dotted line. The period will be displayed after one cycle.
- All the tools are draggable: the timer, stop watch, ruler and tape measure
- The initial angle is marked by a tick mark the color of the pendulum mass
- As you move the pendulum, the angles are constrained to be exactly whole numbers.
- Students may change the mass or length while the experiments are running. It is possible that they may not realize it.

Lesson: There are some questions that could be used the next day.