1 Background

A *simple* pendulum is one where we can consider the pendulum bob to be a point particle suspended from massless string which does not stretch. The parameters that may affect the period of a pendulum are amplitude, length, and mass. For small amplitude oscillations, the period of a simple pendulum is given by the expression

$$T = 2\pi\sqrt{\frac{\ell}{g}}$$

2 Tools

You will have our standard equipment of rods, clamps, metersticks, slotted masses, etc. Additionally, we have photogates, stop watches, metal balls with holes drilled in them, plum-bobs, and a variety of strings. And as always, if you think of another tool you would like to use, or another measurement you would like to make, discuss it with your professor. A suitable tool may or may not be available, but we may be able to figure out an alternative.

If you use a photogate, please take care to ensure the pendulum bob does not strike the photogate.

3 Task

You have two objectives:

1. Show whether or not the period depends on the mass of the bob. If period does depend on mass, experimentally determine a mathematical relationship between period and mass.

2. Experimentally determine a mathematical relationship between period and amplitude.