

## Mass on spring lab

Physics (science) works on the assumption that the universe follows certain laws. Laws can be thought of as models to help us establish relationships between certain quantities in Physics. One way for us to discover these relationships is by doing experiments, making observations, and collecting data.

We will start by making performing an experiment. The experiment involves determining the relationship between the mass on a spring (also known as an oscillator), and the amount of time it takes to complete one full revolution (known as the period). Eventually, we will use this relationship to help us determine our spring constant.

1. Obtain a stopwatch (your phone will do!), a spring, 5 different masses, meter stick, and clamp stand.
2. Set up your table as shown in figure 1.
3. For each trial, pull your mass downwards by 10cm from the equilibrium position. Start the stopwatch at precisely the same time you let go of your mass. Wait for 10 oscillations and stop your stopwatch when your mass returns to the same position you released it.
4. **RECORD DATA ON A SEPARATE SHEET OF PAPER.**
  - a. Make sure you write down the mass and the amount of time this took (put your data in a nice table).
  - b. Try to make a “qualitative observation” as well as the quantitative observation.
5. Repeat with the same mass for a total of 4 times.
6. Change the mass on the spring and repeat the process (obtain at least 5 different masses – It is important to get as wide a range of different measurements as possible).

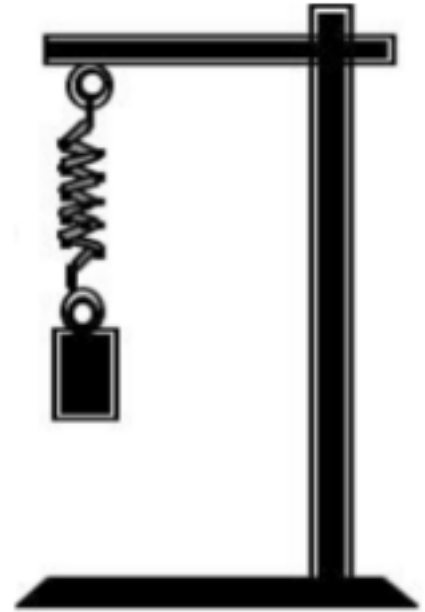


Figure 1. <https://phys150.wikispaces.com/mass+on+a+spring+2>

Put all your data in a nice clean table. Answer the following questions on a separate sheet of paper.

### Questions:

- 1) Write down the uncertainty of your timing device.
- 2) What is the dependent variable in this experiment?
- 3) What is the independent variable in this experiment?
- 4) What are the control variables in this experiment?
- 5) Why do we make repeat measurements?

**For the next class, collect all your data, complete your data tables, and answer the 5 questions above. We will need all of this work completed to start our next lesson.**