

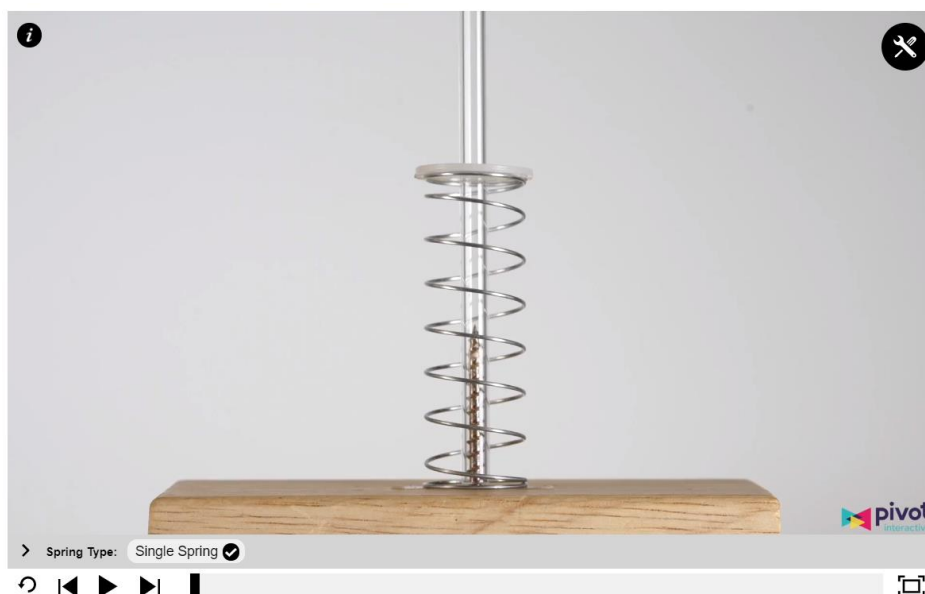
## Pivot Interactives Air Track Linear Oscillators and Multiple Springs

**Purpose:** To investigate oscillations of a mass on a spring.

Access the Pivot Interactives lab “Air Track Linear Oscillators and Multiple Springs”.

First we will determine the spring constant of one of the springs used in this lab. Then we will move on to measure oscillatory motion.

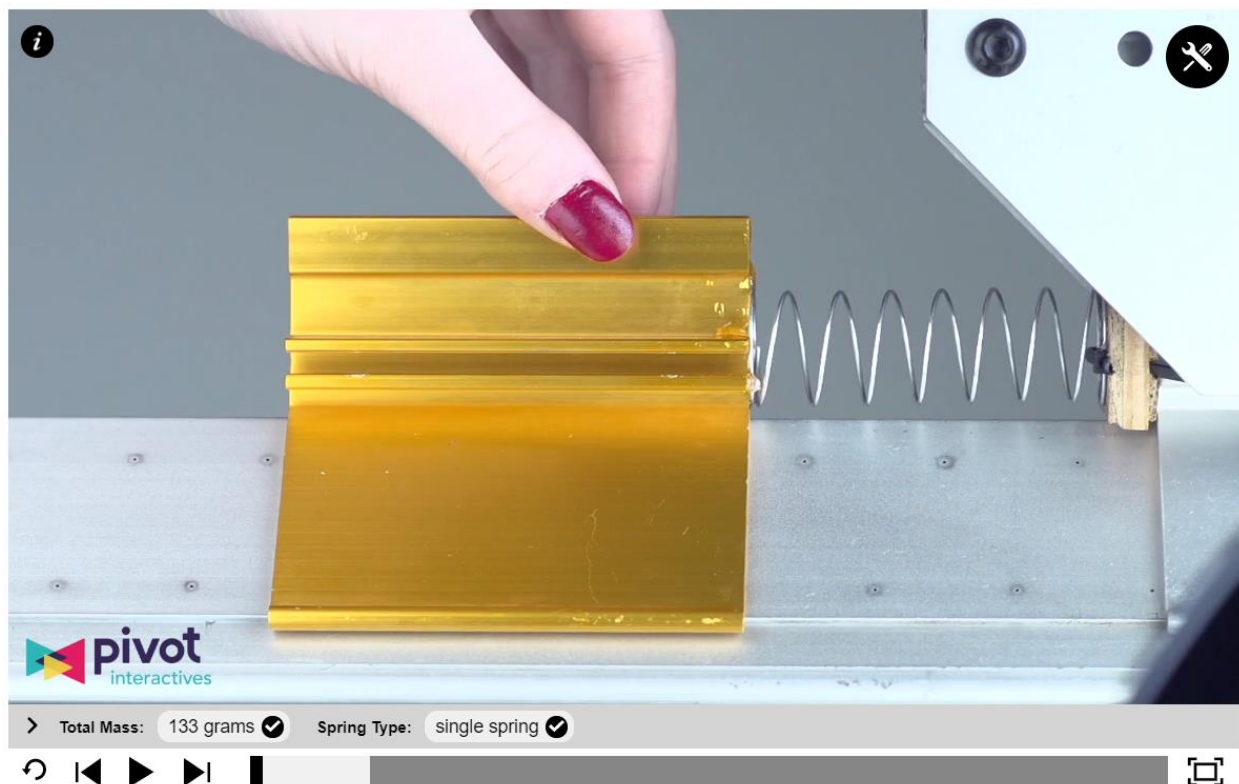
Scroll down to the section labeled “Spring Data” and expand that section. You will see this:



When you run this video, you will see that two 50 gram masses are piled on the spring and the spring is given a chance to settle. Then another pair of 50 gram masses are added...and so forth. Open the toolbox and measure how much the spring is compressed for each set of masses. Then open a spreadsheet and use it to plot the compression of the spring against the weight of the masses. Fit a trendline and add the equation to the plot. Then copy a screen shot of this plot into a Word document. What is the spring constant you find? Type the answer to that question in your Word document as well.

Now switch the setting on this video to “Double Spring” and determine the effective spring constant of two identical springs following the same procedure as you did for the single spring. Once again, make a plot of your data and fit a trendline, inserting the equation into your plot. Copy a screen shot of this plot into your Word document and type in the effective spring constant you found for the double spring.

Now scroll up to the video window for the glider on a spring:



If you expand the menu at the bottom of the video window, you will see that there are six masses available and two spring settings – single spring and double spring. You will perform six measurements of the period of the oscillations, for the 133 g, 333 g and 533 g masses, and for the single and double spring settings for each mass.

For each mass and spring setting, determine the period as accurately as possible by using the stopwatch from the toolbox to measure the time it takes to complete as many cycles as are available in the video for that mass and spring setting. For each mass and spring setting, compare the result you obtained for the period to the period you expected from the mass and the spring constant. Type all of these results into your Word file, and then submit your Word file via Canvas.