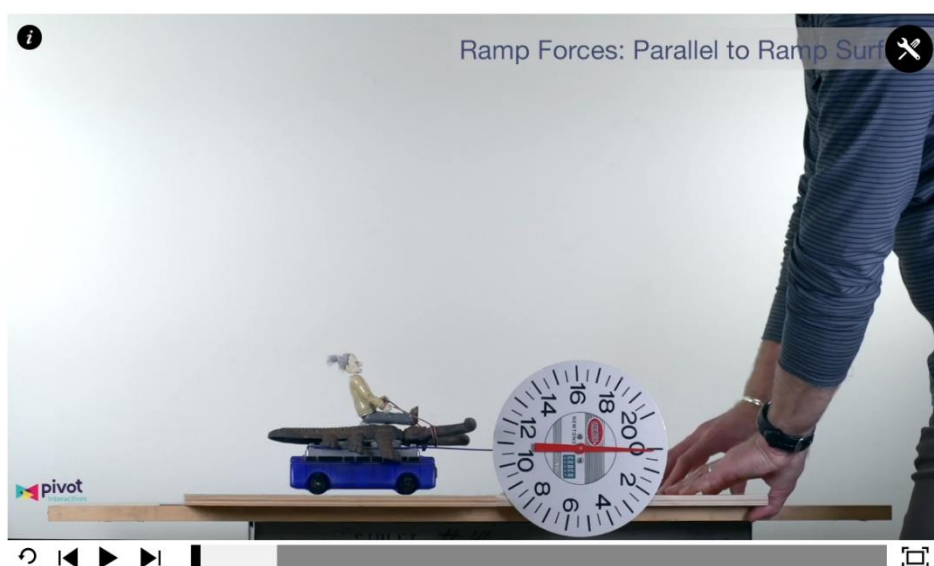


Pivot Interactives Forces on Objects on a Ramp

Purpose: To determine the component of the gravitational force pushing an object down a ramp.

Access the Pivot Interactives lab “Forces on Objects on a Ramp”. For this lesson we will be using the video and measurement tools, but we will be using an Excel spreadsheet for the analysis.

Scroll down to “Part 2: Collect Data and Create a Model” and then expand that section. You will see this:



Before you begin, click on the toolbox in the upper right hand part of the screen. Then click on the protractor. Now run the video through to see what is happening. Once you’ve done that, drag the protractor to a position where it can be used to measure the angle at which the ramp is raised.

Reset the video. Then run the video forward until the angle reaches 5 degrees. Read the force (in Newtons) from the dial on the spring scale. Repeat every 5 degrees until you reach 90 degrees.

Open a spreadsheet. Enter your data in two columns so that you can make a scatter plot of force vs. angle. Copy the plot into a Word document, and then answer the following questions:

- 1) List all the forces on the cart in the video. Draw a free body diagram and insert a picture of your free body diagram into the Word document.

- 2) What is the force of gravity on the cart in the video? Does that force change from angle to angle?
- 3) What is the force exerted on the cart by the spring scale when the angle is 0 degrees? Why?
- 4) What mathematical function describes the variation with angle of the force exerted on the cart by the spring scale? Why?

Convert your document to pdf and then submit the pdf document via Canvas.