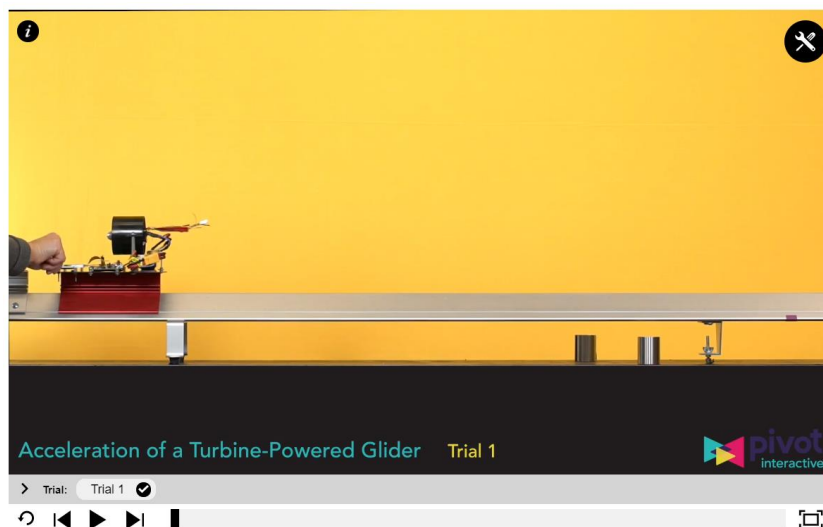


## Pivot Interactives Motion Graphs of Positive and Negative Acceleration

**Purpose:** To understand a variety of acceleration behaviors.

Access the Pivot Interactives lab “Motion Graphs of Positive and Negative Acceleration”. 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 the video. You will see this:



First, run the video for Trial 1 all the way through to see what is happening.

Then open the toolbox in the upper right hand corner of the video. Open the stopwatch and the ruler.

Go to the beginning of the video, and step the video forward frame by frame until the hand releases the glider. Drag the ruler so that the cart is at 0 cm at that moment, and reset the stopwatch to zero.

Start a table in a spreadsheet with two columns – one for time and one for position. Enter zero seconds and zero meters for the first entry.

Then step forward five frames, and enter the time and position. Continue entering data for every fifth frame until the motion is complete.

On your spreadsheet, make a scatter plot of the position vs. time, and fit a polynomial trendline to the plot. Display the fitted equation on your plot.

Copy your plot into a Word document, and in the same document, answer these questions:

- 1) Immediately after the glider is pushed, what is the direction of its velocity? Right or left? What is the direction of its acceleration?
- 2) At the moment that the glider reaches its farthest point to the right, what is the velocity (magnitude and direction)? What is the direction of the acceleration (left or right)?
- 3) When the glider is returning to the hand, what is the direction of the velocity? What is the direction of the acceleration?
- 4) What is the magnitude of the acceleration?

Now, repeat for Trial 2 – the measurement, the analysis and the questions. And put the plot and the answers to the questions in the Word document.

Then submit the document via Canvas.