Imagine we have taken position-time data for a running rabbit.

- Start Logger Pro on your computer and type the data into Logger Pro.
- Graph the points and then fit a curve to the data (Analyze >> curve fit). Try successively higher polynomials until the data are well fit, but no higher.
- From the fit, determine the velocity and acceleration as a function of time. Graph and discuss. Does the rabbit hop?

Hint: If you select create calculate column in the Curve Fit box, you will get a new data column with the computed Y-values, and you will have access to the coefficients of the polynomial fit. Use these you to calculate v and a.

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• Sketch the velocity graph associated with this acceleration graph:

• Assuming that the initial velocity is zero, how far does the object travel?
• Write an equation for the position as a function of time:
  • Between \( t = 0 \) and 1 s
  • Between \( t = 1 \) and 2 s
  • Between \( t = 2 \) and 3 s

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• The graphs below are plots of position and velocity vs. time. With your partners, move your hands to simulate the data in the graphs.
• For each graph, there should be a handwaver, a skeptic, and a scribe (to describe the motion). Label each description with the graph number and a sketch of the graph. Rotate roles after each graph. How well can you do this?
• Film yourself for graphs on the bottom row to analyze the videos with loggerpro.

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