Reflect and Apply

1. What model did we choose for the bounce of a ball and why?

2. Use what you know about transformations to discuss the following:

   ### Vertex Form of the Equation of a Parabola

   $$y = a(x - h)^2 + k \qquad \text{vertex } (h, k)$$

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3. Do a ball bounce data collection. Fit at least four bounces with a quadratic. Choose one and write the procedure you used to transform the parent function to fit the data. Sketch a graph of each transformation.

4. Using the graph of the bouncing ball, sketch a graph of just the vertices of the parabolas. Find a model to fit this data. Justify your choice.

5. Refer to the parametric graph of $h(x) = 96x - 16x^2$ in the student activity. Change the T-step several times and investigate the effect T has on the graph. Explain using sketches of graphs with different T-steps.