PLC Activity #6
Work-Energy Theorem
Due: See website for due date

How to get credit for this activity
First, sign-in at the computer and sign-out when the activity is complete. Show your work and results to a PLC tutor so they can check your work and initial the signoff sheet. Be prepared to answer questions about the activity or your results.

Question 1 (Physlet Problem 6.2)
A 1.5-kg brick falls a given height onto a 15-gram spike as shown in the animation (position is given in meters and time is given in seconds).

a. Determine the work done on the brick by the nail.
b. Use your calculation in (a) to determine the average force exerted on the nail by the brick.

Question 2
Three situations are plotted of a box of contraband pulled by applied forces (F_A, F_B, F_C) directed along a frictionless surface. Line B is straight; the others are curved.

a. Rank the situations according to the change in kinetic energy of the box at (i) time t_1 and (ii) time t_2, greatest first, relative to the origin.
b. Rank the situations according to the net work done on the box by the applied forces during the time period t_1 to t_2, greatest first. Indicate the directions of the displacement and force along paths A, B, and C.
c. Which of the following best describes the net work done by the applied forces during the period t_1 to t_2: Energy is transferred (iii) to the box, (iv) from the box, or (v) is zero.

Question 3
Juan, standing at the edge of a cliff, sees his rotten ex-girlfriend walking by. Armed with a glob of slime, Juan decides to use her as a target by either dropping or throwing them at her as she walks by.

a. Using the work-energy theorem, draw work-energy bar diagrams for the situations of a (i) drop and (ii) thrown glob of slime.
b. Using your bar diagram and short concise sentences, which of the graphs are
- not possible?
- possible? Of the possible ones, which represent the dropped globs? Globs thrown upwards? Globs thrown downwards?