

Work to Kinetic Energy Lab

<https://www.thephysicsaviary.com/Physics/Programs/Labs/WorkToKELab/index.html>

Purpose: 5.B.5.1 Design an experiment and analyze data to determine how a force exerted on an object or system does work on the object or system as it moves through a distance. [SP 4.2, 5.1]

Instructions: For each trial, you are to determine Wally's speed as he passes between the two photogates that are 10 meters apart. You can control the mass of Wally, the strength of the force from the fire extinguisher, and the distance over which the force of the extinguisher is applied.

- 1) Create a procedure in which you will observe the impacts of each variable on work. Then, you will need to calculate the kinetic energy for each scenario. You will need to observe the impact of changing:
 - a) The mass of Wally.
 - b) The strength of the force from the fire extinguisher.
 - c) The distance over which the force of the extinguisher is applied.

For each variable, write a separate procedure. Identify which data will be collected and how the data will be collected. Make sure your steps include an object, action, instrument, and measurement.

- 2) Create a relevant data table for based on your procedure. You should include at least 10 trials for each variable shift.
- 3) Create a relevant graph that shows the impact of work on kinetic energy for each variable shift. Then, explain how each variable impacts kinetic energy and work. Your graph should include relevant scales, x- and y-axis titles, and an overhead title.

You must turn off the extinguisher before he reaches the first photogate. When you are ready to start the experiment, click on the begin button.