

Hooke's Law

Hooke's Law states:

$$\vec{F} = -k\vec{x}$$

where F is the force of the spring, k is the spring constant, and x is the distance the spring has been stretched.

1. Take your Smart Cart out of the box.
2. Turn it on and open your choice of software: SPARKvue or Capstone.
3. Wirelessly connect to the Smart Cart.
4. Make a graph of Force vs. Position.
5. Install the hook on the Smart Cart Force Sensor. Make sure the Smart Cart Force sensor is not touching anything and then zero the Force sensor in the software.
6. Put one end of a spring on the hook and hold the other end stationary with your hand. Move the cart slightly to put a little tension on the spring.

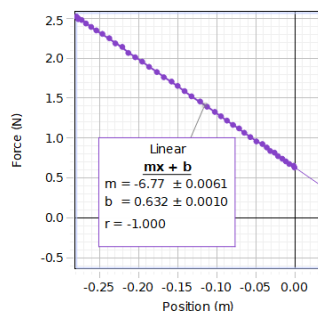


7. Start recording and pull the Smart Cart away from the fixed end of the spring until the spring is stretched out. Then stop recording.

Analysis

1. On the Force vs. Position graph, apply a linear fit to the straight-line part of the graph.
2. Determine the spring constant from the slope of the linear fit.

Sample Data



The slope of the graph indicates the spring constant is 6.77 N/m.