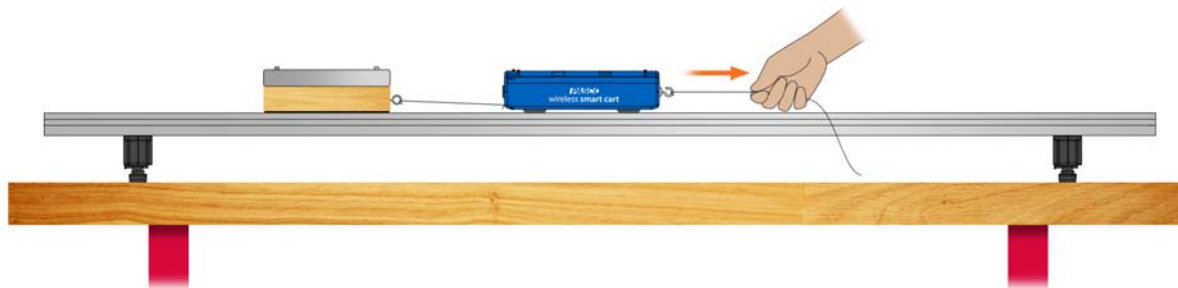


Investigation 5C: Static and kinetic friction

Essential question: What determines the force of friction?

Friction is everywhere and can be either helpful or wasteful depending on the situation. In this investigation you will test models of friction against actual measurements to get a sense of how accurate these friction models are.



Coefficient of static friction and kinetic friction

1. Open the experiment file **05C_Friction**, and then connect the Smart Cart to the software using Bluetooth.
2. Set up the equipment like the picture. Zero the Smart Cart force sensor while nothing is touching the hook.
3. Start data collection, and then very slowly pull on the string, increasing the force you exert until the block starts to slide. Once the block is sliding, keep pulling at a constant speed until you get to the edge of the table, and then stop data collection.
4. Record the mass of the block in the table.
5. Repeat this activity two more times, each time adding a 250-g mass on top of the block.
6. For each trial, use the graph tools to find the maximum force exerted just as sliding was about to start (static friction force), and the average force while the block was sliding (kinetic friction force). Record the values for each trial in the table.

Table: Coefficient of static friction and kinetic friction

Trial	Max Force	Average Force While Sliding	Mass of Block	Static Friction Coefficient μ_s	Kinetic Friction Coefficient μ_k
1					
2					
3					

Average value for μ_s : _____

Average value for μ_k : _____

