

II-1 LOOK OUT ! NO BRAKES !

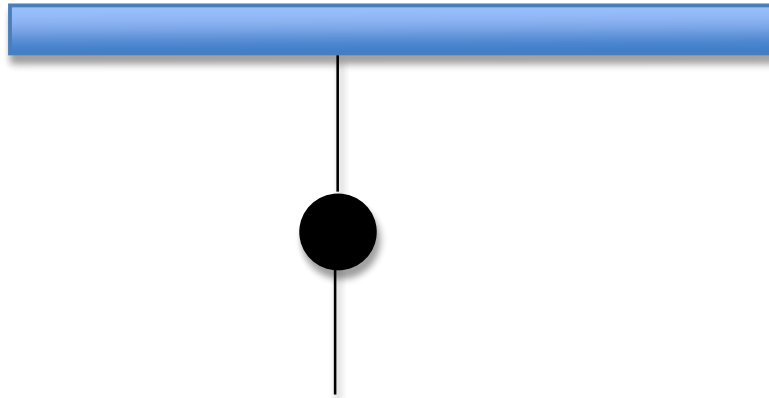
Exploration

Purpose

Where do you predict the string will break in the following situations?

Materials

Several feet of "grocers" string; a cast iron ball (such as a 1 kg mass, with hooks on each end); a wall support (hook, C clamp), or a table support capable of withstanding 20 lbs. of force.



Procedure:

Attach a piece of string about 20 cm long to a well supported hook (like from a large C clamp on the table). Then attach a 2 kg ball to the string. Attach a second string to the bottom of the ball. The length of this string should be a convenient length such as 20 cm or 30 cm. Predict which string will break, when you pull the bottom string.

Pull with a steady force on the lower string until one of the strings breaks. Now replace the broken string with a new one. Predict which string will break when you apply the force with a quick downward jerk. If nothing happens, do the same thing again only jerk harder and quicker. Repeat until a string breaks. Repeat the process until you have a consistent pattern of which string breaks for each condition.

Summary:

1. Why do you think the string breaks where it does in each situation?
2. How would you explain how a magician, using the ideas in this lab, can pull the table cloth out from under a set of dishes on a set table?