

Finding the Coefficient of Friction Using Atwood's Machine

Purpose: To use your fine tuned lab technique and graphing skills to calculate the coefficient of friction for three different surface combinations.

Materials:

Pulley (Could use the Smart Pulley to determine if there is acceleration)

Set of slotted masses

String

Block of wood

Wax paper

Sand paper

Procedure:

Find the mass of your block. Record this.

Set up block of wood in a horizontal type Atwood's machine on a lab table.

Place enough mass on the other end of the string so that the block moves at constant velocity after it has been tapped. You can check for constant velocity by using your Data Studio Set up. What should be the shape of your graph? Record this mass on the string.

Repeat this procedure after adding masses of 100 g, 200 g, 300 g, 400 g, and 500, g to the block. So you will have six trials of the wood to lab table surface combination.

Repeat the entire procedure for the sand paper to lab table and wax paper to lab table combinations.

Questions for you to contemplate:

1. What is the purpose of constant velocity?

2. What force is obtained from the mass of the block and its added masses?
3. What force is obtained from the mass on the string?
4. If you graph the force from #3 vs the force from #2, what does the slope of the line represent?
5. Do the graph discussed in #4. Put all three sets of data on the same set of axes.