



## Which Surface is 'Inclined' to Experience More Friction? Experiment II

### Annotation

This two- part lab incorporates food into a class demonstration and student worksheet of friction of a surface and friction of a substance, and the ways to minimize the effects of friction. Students time Experiment 1 and based on those results they test a hypothesis for Experiment 2. This lab best targets remedial classes that have trouble visualizing the effects of friction.

### Hypothesis

The fastest substance from experiment I will experience the most friction on the roughest surface.

### Primary Learning Outcome

- Students should be able to demonstrate application of the scientific method
- Students should understand the effects of friction, how to minimize and increase it, and in what kind of real life situations either might want to be done
- Students should know how to collect, average, and interpret data

### Assessed GPS

SCSh1  
SCSh3  
SCSh5  
SCSh8  
SP1  
SPS8

### Total Duration

5 minutes to set up  
15 minutes to run demonstration (longer if each group does their own)  
15-30 minutes to complete data table  
5 minutes to clean up

### Materials and Equipment

1. wax paper, sandpaper, smooth wood on incline plane (set at 35°)
2. fastest substance from experiment 1
3. 6 stopwatches
4. 3 15 mL beakers

### Procedure

1. Set three surfaces of equal distance onto 3 incline planes (set at 35°)
2. Into 3 15mL beakers pour 10mL of fastest substance from experiment 1 into a beaker
3. Align bottom front edge of beaker with start of wax paper. All beakers will be poured at the same time on respective incline planes
4. Assign two timers to each incline plane, and designate one person to pour each substance
5. Have another person say "Go." Pour all three substances
6. Time begins when the tip of the beaker reaches the surfaces. Time ends when the substance first leaves the edge of the surface
7. Calculate and record needed data in the table

### Lesson Material Attached

Title: Data Table for Which Surface is 'Inclined' to Experience More Friction? -Experiment II

Annotation: Student data table and questions based on observations and calculations of average speed

### Assessment

Students will be assessed base on accurate completion of the data table and follow up questions, but no grade will be given for accuracy of hypothesis.

## Which Surface is 'Inclined' to Experience More Friction? -Experiment II Data Table

Write here the substance from Experiment 1 that traveled the fastest\_\_\_\_\_. This substance will be tested on three surfaces. Which surface will slow the substance down the most? Write your hypothesis here\_\_\_\_\_.

Distance traveled=\_\_\_\_\_cm

Surface	Trial 1		Trial 2		Average Speed
	Average Time	Speed	Average Time	Speed	

1) Calculate the speed on each surface in Trial 1 and record in the table.

2) Calculate the speed on each surface in Trial 2 and record in the table.

3) Calculate the average speed for each surface and record in the table.

4) Do the results match your hypothesis?