

Unit 3: Newtonian Mechanics – Newton's Laws

LAB 3: Friction and Sliding Masses

Objective: Determine the coefficient of static friction of an object sliding on aluminum.

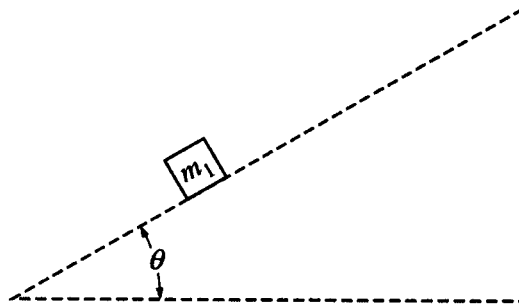
Equipment:

- A track, friction block, mass bar, motion sensor, protractor. NOTE: A triple-beam balance is *not* part of your equipment. You may not measure mass while completing this experiment. 😊

SAFETY: Take care not to drop masses onto people or the floor. If masses must fall to the floor, make sure to use padding on the floor to protect the masses and the floor from damage.

Procedure:

- Set up your system as shown with the track inclined as shown by the top dotted line. Mass m_1 is a friction block with an additional mass bar inside of it. The friction block should be on an aluminum track with a motion sensor.



- Tilt the track until the mass *just begins* to slide.
- Design an experiment to determine the coefficient of static friction of the friction block on the track. Do multiple trials and take the median value.
- Run an error analysis comparing your coefficient to the median coefficient found by the class.¹

¹ There is no known value for the coefficient of friction, because from year to year, the surfaces of the blocks change.