

Unit 3: Newton's Laws of motion labs

1. 2nd Law (Parts 1 and 2)
2. Friction on flat surface
3. Friction on an incline – did not do
4. Circular Motion

Lab: Newton's 2nd Law of Motion

September 6-7

- Obj: Experimentally verify the relationship between acceleration and: (1) mass (2) unbalanced (net) force:
 - Part 1: Mass is the independent variable
 - Part 2: Unbalanced (net) force is the independent variable
- Graphs: One graph for each Part.
- The discussion should include: the shape & meaning of each graph and the value & meaning of the slope of the Part 2 graph. Did your results verify Newton's 2nd Law of motion?

Lab: Friction

September 14-15

- Copy objective and diagram from the provided [lab sheet](#)
- Data: suggested data tables plus...
- Calculations: show one full calculation for a μ
- The discussion should include: In complete thoughts, answers the Analysis questions at the end of the provided [lab sheet](#).

Lab: Friction on an Incline

Did not do...

- Obj: Determine the μ_k of a wooden block dragged up an incline at various angles.
- Data: Copy from board
- Calculations: For one angle show full calculation set for F_f , F_w , F_{\parallel} , F_{\perp} , μ_k
- Graph: μ_k v. angle
- The discussion should include: Whether or not the μ_k depends on the angle based on graph.

Lab: Round and Round we Go

Oct 3

- Obj: Compare the circular motion properties of a student walking around a 2 m radius and 4 m radius circles
- Data: the time for each circle should be about 15 s; write observations as to how each walk “feels”
- Calculations: For each circle: rotational speed, linear speed, centripetal acceleration, and centripetal force. Show full calculation set for one circle and your mass.
- The discussion should include: Procedure, how each property related between circles, identify the actual force that was the centripetal force (gravity, friction, pull of Canada...)