

Phet Lab

Instructions:

1. Goto <https://phet.colorado.edu/en/simulations/category/html>
2. Select the HTML category, then the Forces and Motion Basics
3. Play with all aspects of the simulation to become familiar with the processes. (5 Minutes or so)

Part A: Net Force (Qualitative Answers: No numbers)

- i. Add a small (50.0 N) Red Force : What Happens to speed: _____
What happens to net force: _____
- ii. Add a second small (50.0 N) Red Force : What Happens to speed: _____
What happens to net force: _____
- iii. Add a small (50.0 N) Blue Force : What Happens to speed: _____
What happens to net force: _____

Part B: Net Force (Quantitative Answers: numbers)

Push Pause Button Before Each Trial: Use a stopwatch: Turn on all values

Trial 1: Add a 50.0 N force [Right] on the 50.0 Kg mass. Time how long to reach 40.0 m/s. Time = _____

Determine acceleration using $F_{net} = ma$: _____

Determine acceleration using Kinematics. $V_2 = V_1 + at$: _____

Trial 2: Add a 100.0 N force [Right] on the 50.0 Kg mass. Time how long to reach 40.0 m/s. Time = _____

Determine acceleration using $F_{net} = ma$: _____

Determine acceleration using Kinematics. $V_2 = V_1 + at$: _____

Trial 3: Add a 150.0 N force [Right] on the 50.0 Kg mass. Time how long to reach 40.0 m/s. Time = _____

Determine acceleration using $F_{net} = ma$: _____

Determine acceleration using Kinematics. $V_2 = V_1 + at$: _____

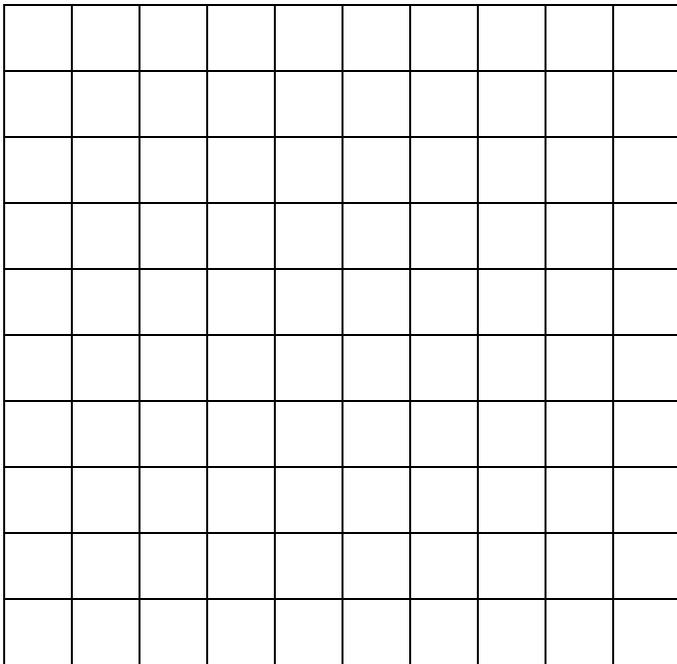
Trial 4: Add a 200.0 N force [Right] on the 50.0 Kg mass. Time how long to reach 40.0 m/s. Time = _____

Determine acceleration using $F_{net} = ma$: _____

Determine acceleration using Kinematics. $V_2 = V_1 + at$: _____

(*By now I hope you can see that we only need to calculate acceleration once, Maybe stop timing **for now.**)

Question #1: Sketch a graph of your data with FNet On the X axis, and acceleration on the Y axis My preference here is for you to use Google sheets.



Question #2: Repeat the activity with the same forces with 3 differing mass combinations of your choice. Place results in table below and sketch graphs on your existing graph.

Trial #	Mass = _____	Mass = _____	Mass = _____
1	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____
2	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____
3	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____
4	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____	a = _____, F _{Net} = _____

Question #3: Analyze your graphical results (Psst: find slopes if you can) What are you noticing?

Question #4: Determine the mass of the unknown.

Other Commentary: (Hint: Newton's Second Law)
