

# AP Physics 1

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AP Physics 1 Course [Syllabus](#)

Important Physics 1 [Dates](#)

[Grade Sheet](#) - a handy way to track your grade

Text: [College Physics - Explore and Apply \(2nd Ed\)](#)

Text: [Open Stax, College Physics](#) by Paul Peter Urone

Physics 1 [Overview](#) from the College Board

Physics 1 [Course & Exam Description](#) from the College Board

[Physics 1 Home](#) multiple resources and information

AP Exam [Info and Equation Sheet](#) for Physics 1

Astronomy and Physics [Tutorial](#)

Mr. M's favorite internet [Links](#) for physics

Need to improve your average? Check out information

[Lab Information](#) and [Homework Requirements](#)



## Web Links Physics

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Shown below are websites related to **Physics**. There is a separate listing of [Astronomy websites](#) that may also be of interest.

### Measurement Topics

[NIST](#) - Constants, Units, and Uncertainty from the National Institute of Standards and Technology

[Unit Conversions Tutorial](#) - Interactive dimensional analysis

[NIST Clock](#) - Official Time from the National Institute of Standards and Technology

[Powers of Ten](#) - Images zooming in by factor of ten; good "overtourism" simulator

### Kinematics

[The Moving Man](#) - PhET Interactive Java simulation

### Vectors & 2D Motion

[Vector Addition](#) - PhET Interactive HTML5 simulation

[Projectile Motion](#) - PhET Interactive Flash simulation

[2D Motion](#) - PhET Interactive Java simulation

[Frames of Reference](#) - A classic physics video!

### Forces

[net Force](#) - PhET Interactive

[Forces in 1 Dimension](#) - PhET Interactive Java simulation

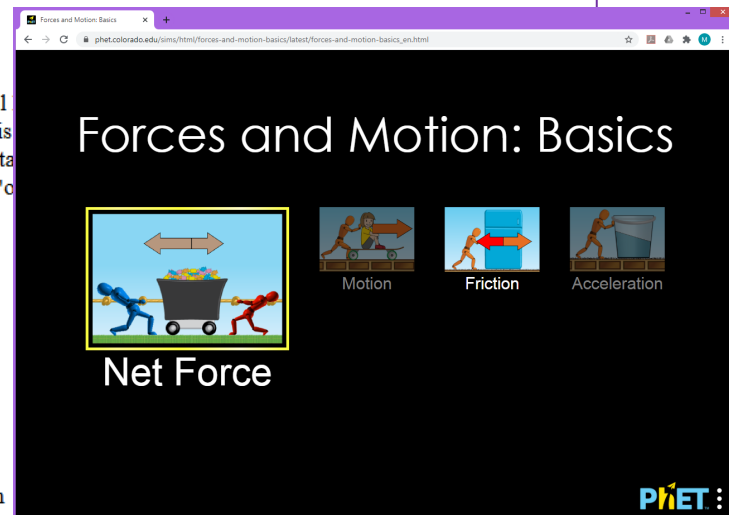
[Friction](#) - PhET Interactive simulation of atomic interaction

[Forces & Motion](#) - PhET Interactive Java simulation, includes robot game!

[Lunar Lander](#) - PhET Interactive Flash simulation

[The Ramp](#) - Phet Interactive Java simulation

[Gravity Force Lab](#) - interactive simulation of universal gravitation





1. Experiment with Net Force – is the “Sum of Forces” a vector sum?
2. Why is the sum of the forces sometimes called the ***net*** force?
3. Change the teams ***after*** the cart is in motion so that net force is **zero** – which team wins after that? Why?

The simulation shows a cart on a flat surface being pulled by two teams. The left team (blue) exerts a force of 200N to the left, and the right team (red) exerts a force of 150N to the right. The net force is 50N to the left. A speedometer on the cart shows a needle pointing to the right, indicating the cart is moving right. The control panel in the top right has three checked options: 'Sum of Forces', 'Values', and 'Speed'. A 'Go!' button is in the center, and a 'Return' button is below it. The bottom navigation bar has icons for 'Home', 'Net Force', 'Motion', 'Friction', and 'Acceleration'. The PhET logo is in the bottom right corner.

4. Start the cart moving at a moderate speed. Then try to stop it, so that its speed is zero. Why is this hard to do?
5. Reset the cart to a resting state. Apply the maximum force until the maximum speed occurs. Repeat with a force of 10 to 50 N – does it take more force to produce more speed?
6. Replace the box with the refrigerator. Again apply maximum force – what is different? Use a stopwatch to time the change in velocity zero to 40 m/s. Apply  $F=ma$  – is the simulation accurate?
7. Devise an experiment to determine the mass of the gift.

en.html

- Force 
- Values
- Masses
- Speed 



Applied Force

50 Newtons

200 kg

50 kg

40 kg

80 kg

100 kg

?

Forces and Motion: Basics

Net Force

Motion

Friction

Acceleration

PIET

- Apply a force equal to the amount of friction, so that the net is zero. Is this *also* possible with the object in *motion*?
- Under what circumstances is friction the **only** horizontal force?
- Does friction *always* oppose the applied force? See if you can apply a force in the *same* direction as friction.
- An object set into motion in this simulation always stops if the applied force ceases – an object initially in motion does not stay in motion. Does that violate the 1<sup>st</sup> Law of Motion?

asics\_en.html

Forces and Motion: Basics

Net Force Motion Friction **Acceleration**

PIET

Sum of Forces

162N

Friction Force 188N Applied Force 350N

100 kg

Applied Force

350 Newtons

200 kg 50 kg 50 kg

40 kg 80 kg

Forces  Sum of Forces  Values  Masses  Speed  Acceleration

Friction

None Lots