

# Online Resources S8P3 Force & Motion

**S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.**

## OVERALL

### Virtual Labs

#### pHet Lab Force and Motion

<https://phet.colorado.edu/en/simulation/forces-and-motion>

#### cK-12 Interactives

[https://interactives.ck12.org/simulations/physics.html?referrer=special&\\_ga=2.226977053.1644477280.1551656592-1563963516.1537841646](https://interactives.ck12.org/simulations/physics.html?referrer=special&_ga=2.226977053.1644477280.1551656592-1563963516.1537841646)

#### Science Class.net

[http://science-class.net/archive/science-class/Physics/force\\_motion.htm](http://science-class.net/archive/science-class/Physics/force_motion.htm)

<https://quizizz.com/admin/quiz/58e7754230df97b93b550b19>

(S8P3 Review)

<https://share.nearpod.com/VNT3qknccX> (nearpod summary- students write and illustrate)

**S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.**

a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration.

### **PHENOMENA**

<https://sites.google.com/site/sciencephenomena/search> (Jumping on a Trampoline)

<https://sites.google.com/site/sciencephenomena/search> (Roller Coaster)

### **ARGUMENT-DRIVEN INQUIRY (ADI)**

Lab 9. Mass and Motion: How do changes in the mass of an object affect its motion?

Lab 12. Unbalanced Forces: How does surface area influence friction and the motion of an object?

Song: [Speed and Velocity \(2:09\)](#)

# Online Resources S8P3 Force & Motion

Videos for Speed, velocity, and acceleration

Funny Video about Speed and Velocity

[https://www.youtube.com/watch?v=\\_DtDCBHEM1k](https://www.youtube.com/watch?v=_DtDCBHEM1k)

Physics of Motion explained (speed, velocity, acceleration)

<https://www.youtube.com/watch?v=Jyiw6KkedDY>

[2 Minute Classroom: Speed, Velocity, and Acceleration \(2:45\)](#)

Speed, Velocity, and Acceleration

<https://www.youtube.com/watch?v=rZo8-ihCA9E> [Guided notes page for video](#)

Motion Graphs

<https://www.thephysicsaviary.com/Physics/Programs/Labs/GraphingOfMotionLab/index.html>

[http://www.flippedoutscience.com/uploads/\(2/7/8/2/27824091/graphing\\_motion.pdf](http://www.flippedoutscience.com/uploads/(2/7/8/2/27824091/graphing_motion.pdf)

## Georgia Virtual Learning (GaVL)

GaVL.1 [Intro to Force & Motion, EQ's, Key Terms, Expectations](#)

GaVL.2 [Motion: Explanation and Videos](#)

GaVL.3 [Speed Vs. Velocity](#)

GaVL.4 [Distance Vs. Time graphs](#)

GaVL.5 [Acceleration](#)

GaVL.6 [Motion Assignments:](#)

Motion Lab      Motion Cartoon activity

# Online Resources S8P3 Force & Motion

GaVL.7 [What is Force? Intro to Force Tug-O-War](#)

GaVL.8 [Types of Forces](#)

GaVL.9 [Free Body Diagrams](#)

GaVL.10 [Acceleration Due to Gravity](#)

GaVL.11 [Newton's Laws of Motion](#)

GaVL.12 [Newton's 1st Law](#)

GaVL.13 [Newton's 2nd Law](#)

GaVL.14 [Newton's 3rd Law](#) [Self assess: Quiz over Newton's 3 Laws \(8 questions\)](#)

[Physics Classroom: Identifying Action/Reaction force pairs and check your understanding](#)

GaVL.15 [Work: What does it mean to do work?](#)

GaVL.16 [Mechanical Advantage \(MA\) with a check your understanding self assess at the bottom of the page](#)

GaVL.17 Module Wrap Up (no link)

GaVL.18 [Review and click "Quiz Group" to self assess.](#)

**S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.**

b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.

[Science 360 Videos](#)

Balanced and Unbalanced Forces

<https://www.youtube.com/watch?v=oNgo9bbDi7Q>

# Online Resources S8P3 Force & Motion

## **Newton's 3 Laws of Motion sports videos:**

[Hockey NHL](#)

[Football NFL Newton's 1st Law of Motion](#)

[Football NFL Newton's 2nd Law of Motion](#)

[Football NFL Newton's 3rd Law of Motion](#)

**Basketball NBA:** [Newton's 1st Law](#) [Newton's 2nd Law](#) [Newton's 3rd Law](#)

## **Study Jams Interactive Science Activities**

<https://www.scholastic.com/teachers/activities/teaching-content/force-and-motion-6-studyjams-interactive-science-activities/>

## **PBS: Newton's Laws of Motion QUEST**

<https://gpb.pbslearningmedia.org/resource/kqedq11.sci.newtonslawsofmotion/newtons-laws-of-motion/#.WgHYjq3My-s>

## **Better Lessons**

Newton's 1st Law

<https://betterlesson.com/lesson/634369/newton-s-2nd-law-balloon-racers-newton-s-law-expo-6-of-9>

Newton's 2nd Law

<https://betterlesson.com/lesson/634369/newton-s-2nd-law-balloon-racers-newton-s-law-expo-6-of-9>

Newton's 3rd Law

<https://betterlesson.com/lesson/634369/newton-s-2nd-law-balloon-racers-newton-s-law-expo-6-of-9>

## **PBS & GPB: Fast Forward Authentic learning videos**

# Online Resources S8P3 Force & Motion

Zip-line: <http://www.gpb.org/fast-forward/episode/north-georgia-canopy-tours>

Motorsports: <http://www.gpb.org/fast-forward/episode/atlanta-motorsports-park>

Waterslides:

<https://gpb.pbslearningmedia.org/resource/8f6eed11-e8b7-4298-b5bc-b20dee10880e/water-slides/#.WgHIP63My-s>

Sky Diving

<https://gpb.pbslearningmedia.org/resource/physics-skydiving-mit/physics-skydiving-mit/>

## **Khan Academy: Newton's Laws of Motion**

Newton's 1st Law of Motion

<https://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-first-law-of-motion>

NEWTON'S 2ND LAW OF MOTION

<https://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-second-law-of-motion>

NEWTON'S 3RD LAW OF MOTION

<https://www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion/v/newton-s-third-law-of-motion>

## **Science Buddies**

<https://www.sciencebuddies.org/teacher-resources/lesson-plans/two-stage-balloon-rocket#lesson> (2 part balloon rocket)

## **Nearpod**

BALANCED AND UNBALANCED FORCES

<https://share.nearpod.com/iTgEaChPuL>

# Online Resources S8P3 Force & Motion

## **ARGUMENT-DRIVEN INQUIRY (ADI)**

Lab 7. Gravity and Free Fall: How does mass affect the amount of time it takes for an object to fall to the ground?

Lab 8. Pulling Force and Motion: How do changes in pulling force affect the motion of an object?

Lab 10. Electromagnets: How does the number of turns of wire affect the strength of an electromagnet?

Lab 11. Strength of Magnetic Force: Which electromagnet design is best for picking up 50 paperclips?

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c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia).

***Much of this standard element was covered with S8P3.b (Newton's 2nd Law of Motion). Students will use that as a resource for this standard element, S8P3.c.***

Rocketry Information

<https://www.sciencelearn.org.nz/resources/391-rockets-and-mass> (opening/teacher information)