

HIGH SCHOOL PHYSICS LABS

Thursdays, January 30-April 30 (no class Feb 20, Mar 12 Apr 9; 11 weeks)

12:00pm-1:30pm

Ages 14+

Students conduct labs related to matter, motion, changes through space and time, energy, and force to investigate fundamental concepts in physics. Students explore physics in theoretical and real-life situations to better understand relationships within this field of science. Note: Math equations will be used to illustrate relationships among variables in these labs. All lab costs are included in registration fee. Course enrollment is limited to 12 students.

Instructor: Candra Umunna, BSc

Location: STEM Lab (suite 21)

Course fee: \$250 OR \$25/lab

10% off early registration discount through December 15

10% off sibling discount available beginning December 16

LAB SCHEDULE:

Velocity and Acceleration – Thursday, January 30

Students use physics principles to design and build aerodynamic LEGO® cars, and determine which features of the vehicle are important in maximizing speed, velocity and acceleration.

Motion in Dimensions – Thursday, February 6

We study motion through space this week as we conduct experiments with 3-dimensional projectile trajectories.

Laws of Motion Lab – Thursday, February 13

Students learn how work, force and energy are related using force diagrams, and build simple machines with LEGO® to demonstrate the advantage of using simple machines.

Calculating Force – Thursday, February 27

This week, we apply Newton's Laws to calculate force and study the effects of friction and drag with airplanes.

Collisions – Thursday, March 5

Students study linear momentum, balance and distribution of mass as they design a vehicle to protect an egg from breaking upon impact.

Kinetic and Potential Energy – Thursday, March 19

We experiment with kinetic and potential energy, motion and momentum, and effects of mass and force to design, construct and test a roller coaster.

Mass and Gravity Lab – Thursday, March 26

Students explore the relationship between the forces gravity and friction as we conduct experiments and complete balance challenges designed to resist these forces.

Properties of Matter – Thursday, April 2

We investigate the properties of different states of matter, observe unexpected state changes, and experiment with different elements to observe their characteristics.

Oscillations – Thursday, April 16

This week, students study periodic motion, including properties of waves and oscillations of springs.

Thermodynamics – Thursday, April 23

Students investigate thermal properties of matter as they conduct experiments to study heat and temperature, and how these are related to energy and work.

Electric and Magnetic Fields – Thursday, April 30

Investigate the science of circuits and currents, explore permanent and temporary magnets, and create electromagnets to study electric and magnetic fields.

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