



MIDDLE SCHOOL PHYSICS LAB

Mondays, September 9-December 9 (no class October 14, or November 4 and 25; 11 weeks)

11:15am-12:45pm

Ages 11-14

Throughout this course, students investigate the behavior of the universe by experimenting with matter, motion, changes through space and time, energy, and force. Students explore physics in real-life situations to better understand relationships within this field of science. Note: This is an experiential physics course, and not a math-based physics course, although there may be some limited math in this course to illustrate relationships among variables. 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 July 31

10% off sibling discount available beginning August 1

LAB SCHEDULE:

Metrics Challenges – Monday, September 9

This week, we review the use of the metrics system in science, practice metric conversions and proper use of laboratory tools, and then complete one-minute scientific challenges to reinforce these concepts in a fun way.

Physics of Racing – Monday, September 16

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.

3D Motion – Monday, September 23

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

Experimenting with Newton's Laws – Monday, September 30

We study how simple machines make work easier in lab this week. We learn how work, force and energy are related, and build simple machines with LEGO® to demonstrate the advantage of using simple machines.



Real-Life Forces – Monday, October 7

This week we learn about kinetic and potential energy, motion and momentum, and effects of mass and force to design, construct and test a roller coaster.

Mass and Collisions – Monday, October 21

We crash things this week! Students learn about linear momentum, balance and distribution of mass as they design a vehicle to protect an egg from breaking upon impact.

Gravity – Monday, October 28

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

Matter and Its Properties – Monday, November 11

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

Harmonic Motion – Monday, November 18

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

Thermodynamics – Monday, December 2

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 – Monday, December 9

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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