



## **HIGH SCHOOL PHYSICAL SCIENCE LABS**

Thursdays, September 17-December 17 (Fall 2020)

No class October 15 or November 26

Thursdays, January 28-April 29 (Spring 2020)

No class February 18 or April 8

9:30am-11:00am

Ages 14+

The focus of our High School Physical Science Labs is exploring fundamental principles of physics by conducting investigations of force and motion, electricity and magnetism, and properties of waves. Students learn laboratory techniques, and perform hands-on science experiments commonly required in many high school physical science curricula. Please note: labs related to chemistry are conducted during our High School Chemistry Labs course. A brief review of relevant material starts each lab, followed by a lab period which includes lab preparation, experimentation and clean-up. Labs will be based on the Glencoe Physical Science Lab Manual and is recommended for students to complete labs and lab reports (to be evaluated by the parent). We recommend students register for the full semester (ideally year), but students can also register for individual labs. All lab costs are included in registration fees. Lab enrollment is limited to 12 students.

Location: STEM Lab (suite 21)

\$275/semester OR \$25/lab

10% off sibling discount available

### **LAB SCHEDULE:**

#### **METRIC SYSTEM AND MEASUREMENT - September 17**

We review the use of the metric system in science, practice metric conversions and properly use laboratory tools as we follow a scientific procedure and draw conclusions from our results.

#### **BALANCED AND UNBALANCED FORCES - September 24**

Students study opposing forces and how unbalanced forces result in movement as we experiment with buoyant and gravitational forces.

#### **SPEED AND ACCELERATION LAB - October 1**

We explore the difference between speed and acceleration as we experiment with forces that affect how an object moves.



### **WAVES** - February 4

Students study how energy moves through waves as we experiment with periodic motion, properties of waves and oscillations of springs.

### **SOUND WAVES AND PITCH** - February 11

We study how sound is produced and transmitted by vibrations of molecules and explore the relationship between pitch and frequency of sound waves.

### **LIGHT WAVELENGTHS** - February 25

Light consists of a spectrum of wavelengths, and students explore how these wavelengths can be separated and visualized as colors.

### **REFLECTION OF LIGHT** - March 4

Students observe how light travels in straight lines but is reflected as it strikes a surface. We conduct an experiment to measure the angles of incidence and reflection.

### **MAGNIFICATION** - March 11

Kids learn how convex lenses refract light to magnify objects as they experiment with a variety of lenses to investigate magnifying power and focal length.

### **WET CELL BATTERY** - March 18

Students explore the chemical reactions that produce electricity inside batteries as we construct a wet cell battery and measure the current that is produced.

### **ELECTROPLATING** - March 25

We use electricity and chemistry to coat one metal onto the surface of another metal as we learn the science of copper-plating coins.

### **SIMPLE CIRCUITS** - April 1

Series and parallel circuits are constructed as students learn the components of a simple circuit and how they function to conduct electricity.

### **MAGNETIC FIELDS** - April 15

Students explore interactions of magnets and their magnetic fields, and compare the magnetic fields and strengths of different types of magnets.

### **ELECTROMAGNETS** - April 22

In today's lab, we experiment with electromagnet design to test the strength of the magnetic fields and the factors that affect its strength.



## SOLAR ENERGY - April 29

We study solar energy and how solar cells work to convert radiant energy into electrical energy.

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