



## **HIGH SCHOOL BIOLOGY LABS – online labs**

Mondays, September 14-December 14

No class October 12, November 23

12:30pm-2:00pm

Ages 14+

In our High School Biology Labs, students investigate the fundamentals of life from cells and biological processes, to invertebrate and vertebrate anatomy. Students learn laboratory techniques and perform hands-on science experiments, including dissections, commonly required in many high school biology curricula. A brief review of relevant material starts each lab, followed by a lab period which includes lab preparation, experimentation and clean-up. Students have the option to complete reports for each investigation (to be evaluated by the parent). All lab costs are included in registration fees.

Location: Online

\$275/fall semester OR \$25/lab

50% off sibling discount available

### **LAB SCHEDULE:**

#### **SCIENTIFIC METHOD AND METRIC SYSTEM - Monday, September 14**

We review the scientific method how to properly use scientific tools to measure mass, volume, distance, and temperature using the metric system.

#### **CELL STRUCTURE AND FUNCTION - Monday, September 21**

In this lab, we review microscopy techniques and biological illustration as we examine animal and plant cells under microscope to describe their structural differences and organelle distribution and function.

#### **DIFFUSION AND OSMOSIS - Monday, September 28**

We conduct experiments with chicken eggs and plant cells to evaluate the processes of diffusion and osmosis, and the importance of passive transport to cell structure and function.

#### **BLOOD TYPING - Monday, October 5**

Students study blood types and how blood is characterized, learn how antibodies are used to determine blood antigens, and conduct a blood type analysis on synthetic blood.

#### **PHOTOSYNTHESIS - Monday, October 19**



We study chemistry and biology of photosynthesis as we examine variables that alter the rate of the photosynthetic reaction, and review where this process occurs within plants.

#### **ENZYME LAB - Monday, October 26**

Students experiment with reaction rates as we learn about the enzyme, catalase, its function within cells and its interaction with hydrogen peroxide.

#### **STRUCTURE AND FUNCTION OF DNA - Monday, November 2**

We review the basics of DNA, including its structure and function, create a model of a DNA strand and extract DNA from an octoploid organism following a scientific protocol.

#### **MITOSIS AND MEIOSIS LAB - Monday, November 9**

In lab today, we model the processes of mitosis and meiosis to study how DNA replication is incorporated into the cell cycle, and visualize each stage of mitosis in cells using microscopy.

#### **HEREDITY - Monday, November 16**

Students use a Punnett square card game to investigate how alleles are inherited and to study the behavior of dominant and recessive genes.

#### **GENOTYPES AND PHENOTYPES - Monday, November 30**

This week, students investigate genotypes and phenotypes to learn how genetics influences physical traits, and how natural selection acts on phenotypes of individuals.

#### **EVOLUTION LAB - Monday, December 7**

We investigate factors that influence the frequency of alleles in a population, and how populations evolve to become distinct species.

#### **BACTERIAL INVESTIGATIONS - Monday, December 14**

We study microbes in this lab as we classify bacteria by cell and colony characteristics, learn protocols for bacterial culturing and Gram staining, and design a proper microbial experiment.