

GENETICS

Thursdays, January 27-May 5 (no class Feb 17, Mar 17, or Apr 7; 12 weeks)

12:30pm-2:00pm

Ages 11+

Students learn the basics of genetics and inheritance, including DNA structure and function, cellular processes involving DNA, how DNA influences physical traits of individuals and why genetic diversity is important in populations. Hands-on activities are integrated into each lab. All lab costs are included in registration fee.

Instructor: Tina Oresteen, BSc

Location: Discover Science Center – Peachtree City

Course fee: \$225 OR \$25/lab

10% off sibling discount

LAB SCHEDULE:

Intro to Genetics and DNA– Thursday, January 27

We start the semester with an introduction to DNA, examine its structure and function and create models of DNA strands.

DNA Analysis– Thursday, February 3

We discover the steps and challenges of DNA analysis, extract DNA from an octoploid organism, and extract DNA from our own cells.

Directionality and Replication– Thursday, February 10

This week we create a DNA map to investigate the importance of directionality, study the process of DNA replication, model DNA synthesis of leading and lagging strands, and learn how mutations can be incorporated into new DNA.

Mutation– Thursday, February 24

Today's lab focuses on mutations, how and why mutations happen, different types of mutations, and the effects of mutations on organisms and populations.

Codons and Translation – Thursday, March 3

We study the translation of the genetic code into amino acid sequences and how sequence differences result in different alleles.

Mitosis – Thursday, March 10

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

Meiosis – Thursday, March 24

In lab today, we differentiate Meiosis from Mitosis, model the processes of meiosis, and explore how this affects heredity while using dog breeding to understand the differences.

Genotypes and Phenotypes – Thursday, March 31

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

Laws of Inheritance – Thursday, April 14

Students learn about Mendel's Laws of Inheritance, work with monohybrid and dihybrid crosses and analyze phenotypic data to learn how alleles are passed from generation to generation.

Genetic Modification – Thursday, April 21

In this lab, we focus on gene-editing techniques, including CRISPR, and discuss the ethics of modifying genes.

Population Genetics – Thursday, April 28

We investigate factors that influence the frequency of alleles in a population, and why new populations have low genetic diversity.

Conservation Genetics – Thursday, May 5

Students learn the importance of genetic diversity in species, and how scientists work to increase the genetic variation within endangered species.