

Biology is an in-depth course that furthers mastery of scientific skills, fosters a deep understanding of key concepts, and promotes the application of the scientific method to biological topics.

The course begins with an introduction to the nature of science and biology, including the major themes of structure and function, matter and energy flow, systems, and the interconnectedness of life. Students then apply those themes to the structure and function of the cell, cellular metabolism, and biogeochemical cycles. Building on this foundation, students explore the connections and interactions between living things by studying genetics, ecosystems and natural selection, and evolution. The course ends with an applied look at human biology.

Lab activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science.

Biology students are frequently asked to respond to scientific problems and issues via written assignments. Exploration activities challenge Honors students to deconstruct scientific claims, analyze scientific articles, and suggest follow-up experiments or topics for further research. Finally, Project and Checkup activities allow Honors students to use scientific process skills to delve deeper into topics.

This course is built to state standards and the National Science Education Standards (NSES).

Length: Two Semesters

### **Unit 1: Introduction to Biology**

- Core Ideas of Biology
- Structure and Function: Cells to Organisms
- Maintaining Homeostasis
- Doing Science: Introduction to Biology
- Introduction to Biology: Wrap Up

### **Unit 2: DNA and Heredity**

- DNA and Cell Reproduction
- Heredity
- Mendelian Genetics
- DNA and Heredity Wrap-Up

### **Unit 3: DNA to Proteins**

- Structure of Genetic Material
- From Nucleic Acids to Proteins
- Doing Science: DNA to Proteins

- Biotechnology
- DNA to Proteins Wrap-Up

**Unit 4: Evolution**

- Adaptation and Natural Selection
- Evolution of Species
- Doing Science: Evolution
- Diversity of Life
- Evolution Wrap-Up

**Unit 5: Semester Wrap-Up****Unit 6: The Biosphere**

- Nature of the Biosphere
- Doing Science: The Biosphere
- Matter and Energy in the Biosphere
- Earth's Ecosystems and Biomes
- The Biosphere: Wrap Up

**Unit 7: Ecology**

- Populations
- Communities
- Doing Science: Ecology
- Changes in Ecosystems
- Ecology: Wrap Up

**Unit 8: Humans and the Environment**

- Human Ecology
- Natural Resources and Land Use
- Doing Science: Humans and the Environment
- Pollution and Its Effects
- Humans and the Environment: Wrap Up

**Unit 9: Sustainability for the Future**

- Global Challenges
- Doing Science, Part I: Sustainability for the Future
- Sustainable Practices
- Doing Science, Part II: Sustainability for the Future
- Sustainability for the Future: Wrap-Up

**Unit 10: Semester Wrap-Up**