Biology focuses on the mastery of basic biological concepts and models while building scientific inquiry skills and exploring the connections between living things and their environment.

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.

Scientific inquiry skills are embedded in the direct instruction, wherein students learn to ask scientific questions, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts.

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

This course is built to state standards and informed by 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

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- 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

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