Biology I 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 the National Science Education Standards (NSES) and is aligned with state standards.

Length: Two Semesters

Unit 1: Introduction to Biology

- Biology as Science
- Connections in Biology
- Doing Science: Introduction to Biology
- Introduction to Biology Wrap-Up

Unit 2: The Chemistry of Biology

- Chemistry of Life
- Carbohydrates, Lipids, and Nucleic Acids
- Proteins, Enzymes, and Water
- Doing Science: The Chemistry of Biology
- The Chemistry of Biology Wrap-Up

Unit 3: Cells

- Cell Structure
- Cell Membrane
- Cell Differentiation

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- Doing Science: Cells
- Cells Wrap-Up

Unit 4: Energy Transfer

- Photosynthesis
- Cellular Respiration
- Matter and Energy
- Doing Science: Energy Transfer
- Energy Transfer Wrap-Up

Unit 5: Earth's Resources

- Biogeochemical Cycles
- A Changing Earth
- Solutions for the Future
- Doing Science: Earth's Resources
- Earth's Resources Wrap-Up

Unit 6: Semester 1 Review and Exam

- Semester 1 Review and Exam

Unit 7: DNA and Heredity

- The Code of Life
- Passing On Traits
- Mendelian Genetics
- Doing Science: DNA and Heredity
- DNA and Heredity Wrap-Up

Unit 8: DNA to Protein

- Structure of Genetic Material
- From DNA to Protein
- Changes to DNA
- Doing Science: DNA to Protein
- DNA to Protein Wrap-Up

Unit 9: Ecosystems and Natural Selection

- Ecosystems
- Populations
- Adaptation and Natural Selection
- Doing Science: Ecosystems and Natural Selection
- Ecosystems and Natural Selection Wrap-Up

Unit 10: Evolution and Classification

- Evolution
- Classification
- Diversity of Life
- Doing Science: Evolution and Classification

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- Evolution and Classification Wrap-Up

Unit 11: Human Biology

- Structure of the Body
- Fuel, Defense, and Signaling
- Reproduction and Development
- Doing Science: Human Biology
- Human Biology Wrap-Up

Unit 12: Semester 2 Review and Exam

- Semester 2 Review and Exam

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