



SCIENCE 8

SCI108 — 1.0 Credit

Middle School Course

Course Description

This course provides a rigorous and comprehensive foundation for the eighth-grade student about to enter high school science. It covers the relevant topics in all the major scientific disciplines, building on prior knowledge and expanding on subjects introduced earlier in middle school. Students begin with a review of the scientific process and get more into depth with the idea of critical analysis of theories and experimental research. They will move on to discuss principles of physical science and energy. In the life science portion of the course, students will cover structure and function of organisms, genetics and evolution, and tenets of ecology. This will flow into the environmental science topics including earth's cycles and environmental problems. A brief discussion of the solar system will also be covered. Students will learn about the assigned topics through interactive activities, experimentation, discussion, and engaging text and animations. Graded assignments will be stimulating and thought-provoking, hopefully paving the way for future interest in the scientific disciplines.

Course Objectives

After completing the course, students will be able to:

- Explain and use the methods and tools of scientific inquiry, applying them across scientific disciplines.
- Identify properties of an atom, element, compound, and mixture, and apply knowledge to use of formulas and equations.
- Describe the concepts of friction, gravity, waves, and kinetic and potential energy.
- Apply knowledge of structure/function of organisms to categorize them taxonomically and compare across taxonomic levels.
- Define and give examples of adaptations and explain how they apply to genetics and evolution.
- Describe energy flow in terms of food webs and trophic levels, involving biotic and abiotic components.
- Identify features of the major biomes.
- Describe the environmental cycles involving water, nitrogen, and carbon and discuss the global implications of altering them.
- Identify sources of environmental distress and discuss different measures that humans are taking, or may take in the future, to improve the health of the planet.

Course Length

Two semesters

Required Text

None

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Course Outline

The Scientific Process

- Review of the Scientific Method
- Tools and Measurement
- Critical Analysis

Chemistry

- The Atom
- Elements, Compounds, and Mixtures
- Formulas
- Basic Atomic Structure

Physics

- Force and Motion
- Gravity
- Waves

Energy

- Transfer and Conversion of Energy
- Specific Heat
- Kinetic and Potential Energy
- Energy and the Environment

Life Science

- Structure and Function of Organisms
- Interactions of Systems
- Adaptation
- Genetics and Evolution

Ecology

- Flow of energy
- Relationships

Environmental Science

- Biomes
- Earth System Cycles
- Environmental Problems

Astronomy

- Characteristics of the Solar System