

Biology- Part A

COURSE DESCRIPTION: In this course, students focus on the chemistry of living things: the cell, genetics, evolution, the structure and function of living things, and ecology. Students follow a program of online study days alternating with review-and-assessment days. Lessons include extensive animations, hands-on laboratory activities, reference book study, and collaborative activities with virtual classmates.

PREREQUISITES: Middle school Life Science, or equivalent

COURSE LENGTH: One Semester

REQUIRED TEXT: Biology: A Reference Guide

MATERIALS LIST: Materials for laboratory experiments, including a compound microscope

COURSE OUTLINE:

Unit 1: The Science of Biology

- Semester Introduction
- Biology and Scientific Methods
- Scientific Processes 1
- Scientific Processes 2
- Review: Scientific Processes
- The Characteristics of Life 1
- The Characteristics of Life 2
- The Characteristics of Life 3
- Review: Characteristics of Life
- Laboratory: Using a Microscope
- Energy and Life
- Review: Microscopes and Energy
- Structure and Function
- Review: structure and Function
- Your Choice

Unit 2: The Chemistry of Life

- Chemistry Review
- Chemical Bonds
- Review: Chemical Bonds
- Carbon and Life
- Review: Carbon and Life
- Water
- Review: Water
- Laboratory: Investigating Biological Compounds 1
- Laboratory: Investigating Biological Compounds 2
- Simple Carbohydrates
- Complex Carbohydrates
- Review: Carbohydrates
- Lipids
- Review: Lipids
- Amino Acids and Proteins
- Proteins as Enzymes
- Review: Proteins
- Nucleic Acids
- Review: Nucleic Acids
- ATP
- Review: ATP

Unit 3: Cell Biology

- The Cell and Life
- Cell Structure
- Cell Organelles
- Review: Cell Life, Structure, and Organelles
- Two Types of Cells
- Review: Two Types of Cells
- Cell Membrane Structure
- Movement Across Membranes
- Review: Cell Structure and Movement
- Laboratory: Determining the Rate of Diffusion 1

- Laboratory: Determining the Rate of Diffusion 2
- Chemical Energy and Life
- Review: Chemical Energy
- Respiration and Photosynthesis
- Review: Respiration and Photosynthesis
- Laboratory: The Rate of Photosynthesis 1
- Laboratory: The Rate of Photosynthesis 2
- Reproduction and Development
- Mitosis
- Review: Reproduction, Development and Mitosis
- Laboratory: Observing Mitosis
- Cell Differentiation
- Review: Cell Differentiation
- Cell Specialization
- Review: Cell Specialization
- Sexual Reproduction
- Meiosis I
- Meiosis II
- Review: Sexual Reproduction and Meiosis

Unit 4: Mendelian Genetics

- The Work of Gregor Mendel
- Mendelian Inheritance
- Review: Mendel and Mendelian Inheritance
- Laboratory: Genetic Crosses 1
- Laboratory: Genetic Crosses 2
- Chromosomes and Genes
- Genes and Alleles
- Review: Chromosomes, Genes, and Alleles
- Proteins Express DNA
- Review: Proteins Express DNA

Unit 5: Semester Review and Test

- Semester Review

- Semester Test