Biology 1B

Course Description

Biology 1B is about biological diversity, including viruses, bacteria, protists, fungi, plants, and animals. In this course, students take a close look at the characteristics, behavior, and physiology of a wide variety of organisms, ranging from the microscopic to the largest living creatures known to mankind. Students also learn basic principles of ecology, which is the study of the interactions of organisms with each other and with their environments, and the consequences of these interactions. Students experience biological principles through hands-on lab activities.

Throughout the course, students are directed to relevant websites for further information about course content. Discussion group activities in each unit enable students to communicate with their teacher and peers about course content.

Overview

Unit 1 – Viruses, Prokaryotes, and Protists
- Lesson 1: Viruses
- Lesson 2: Prokaryotes
- Lesson 3: Protists

Unit 2 – Fungi and Plants
- Lesson 1: Fungi
- Lesson 2: Plants
- Lesson 3: Seed Plants

Unit 3 – Introduction to Animals
- Lesson 1: Invertebrates
- Lesson 2: Annelids and Mollusks
- Lesson 3: Arthropods and Echinoderms

Unit 4 – Introduction to Phylum Chordata
- Lesson 1: Fishes
- Lesson 2: Amphibians
- Lesson 3: Reptiles
- Lesson 4: Birds
- Lesson 5: Mammals

Unit 5 – Introduction to Ecology
- Lesson 1: Abiotic Influences in Ecosystems
- Lesson 2: Population Dynamics
- Lesson 3: Human Impact on Biodiversity

Objectives

Students completing this course will be able to demonstrate the following skills:

- Explain how organisms are classified based on their similarities and differences, as well as their evolutionary relationships, and identify the key characteristics of the major groups of organisms, including bacteria, protists, fungi, plants, and animals.
- Describe virus structure, replication and infection cycles.
- Classify bacteria based on shape and chemical composition.
- Study the characteristics, decomposition role, and symbiotic relationships of fungi, with an emphasis on penicillin.
- Differentiate between vascular and nonvascular plants, with an emphasis on coal forests.
- Explore the characteristics of animals, including invertebrates, annelids, mollusks, arthropods, echinoderms, and chordate (which includes humans).
- Compare and contrast the three basic types of fishes.
- Describe the characteristics common to all mammals, and compare and contrast the three different mammal classes.
- Explain how an animal adapts to its environment based on its mechanism for body temperature control.
- Understand the basic principles of ecology, including ecosystems, the food pyramid and food chain, and population growth.
- Identify, compare, and contrast the major biomes.
- Describe the concepts of population stability and diversity, including the latitudinal diversity gradient, the depth diversity gradient, and geographic range.
- Describe how organisms interact with the environment, and understand the consequences of these interactions.

Activities and Assessments

- **11 Laboratory Activities** – Students apply their understanding of biological concepts by completing two laboratory activities per unit.

- **8 Online Discussion Group Activities** – Within each unit, students participate in group discussions of a topic relevant to the material covered. The teacher evaluates the students' contributions to the discussion and provides grading and feedback.

- **6 Writing Assignments** – At the end of each unit, students demonstrate their understanding of the concepts presented by completing one or two notebook assignments. The teacher grades these assignments and provides feedback.

- **1 Final Project** – Upon completion of the course, students complete a final project consisting of a research paper about the biology-related career. The teacher grades this project and provides feedback.

- **17 Quizzes, 5 Unit Evaluations, and 1 Final Exam -** Along with numerous self-check activities throughout the course, there is a quiz at the end of each of the 17 lessons in the course. There is also an evaluation at the end of each of the five units. At the conclusion of the course, students are given one opportunity to complete a comprehensive final exam. All of these assessments are computer-graded and provide students with instant feedback on their work.