

## **Biology 1**

SCIH 025 062

Credits: 0.5 units / 5 hours / NCAA

### **Course Description**

Biology 1 provides students with an introduction to biology, ecology, basic chemistry, the form and functions of cells, cell reproduction, energy conversions, genetics, gene expression, genetic engineering, the origin of life, changes in organisms, interactions among organisms, ecosystems, environmental problems and solutions, and the classification of living things

**Graded Assessments:** 4 Unit Evaluations; 2 Projects; 4 Proctored Progress Tests, 4 Teacher Connect Activities

### **Course Objectives**

When you have completed the materials in this course, you should be able to:

1. Understand the interdependence of organisms.
2. Summarize how atoms and molecules cycle among living and nonliving components of the environment.
3. Illustrate the one-way flow of energy through ecosystems.
4. Investigate and cite examples of organisms cooperating and competing in ecosystems.
5. Explain how interactions among organisms are affected by the conflict between an organism's capacity to produce infinite populations and the finite amount of resources.
6. Describe human impacts on the natural environment as a result of technology, population growth, and resource consumption.
7. Understand that living systems require a constant input of energy to maintain their chemical and physical organization and explain the nutrient and matter cycles.
8. Identify the form and function of subcellular structures that regulate cellular activities.
9. Describe cell functions (e.g., photosynthesis, respiration, cell division).
10. Investigate and disseminate how complex multicellular organisms are formed as highly organized arrangements of differentiated cells.
11. Investigate and describe how DNA carries the genetic code.
12. Investigate and understand that genetic variation occurs when genetic information is transmitted during sexual reproduction.

13. Investigate and explain how some mutations could help, harm, or have no effect on individual organisms.
14. Understand that the concept of biological evolution is a theory that explains the consequences of natural selection.
15. Use the theory of biological evolution to explain the diversity of life.
16. Investigate natural selection as an explanation for the fossil record and the molecular similarities among diverse species.
17. Illustrate the use of biological classifications based on similarities.

## **Course Outline**

### **Unit 1: Ecology**

#### **Teacher Connect 1**

Lesson 1: The Study of Life

Lesson 2: Ecology

Lesson 3: Communities, Biomes, and Ecosystems

Lesson 4: Populations

Lesson 5: Biodiversity and Conservation

#### **Unit 1 Evaluation**

#### **Project 1**

#### **Progress Test 1**

### **Unit 2: Cells**

Lesson 6: Chemistry Review

Lesson 7: Cells

Lesson 8: Cellular Energy

Lesson 9: Cellular Reproduction

#### **Unit 2 Evaluation**

#### **Teacher Connect 2**

#### **Progress Test 2**

### **Unit 3: Genetics**

Lesson 10: Sexual Reproduction and Genetics

Lesson 11: Complex Inheritance and Human Heredity

Lesson 12: Molecular Genetics

Lesson 13: Genetics and Biotechnology

#### **Unit 3 Evaluation**

#### **Teacher Connect 3**

#### **Project 2**

## Review for Progress Test 3

### Unit 4: Biological Evolution

Lesson 14: The History of Life

Lesson 15: Evolution

Lesson 16: Primate Evolution

Lesson 17: Organizing the Diversity of Life

### Unit 4 Evaluation

### Teacher Connect 4

### Progress Test 4

### Required Textbook and Materials

(available through Follett virtual bookstore at <http://highschool.nebraska.bkstr.com>)

Textbook: *Glencoe Biology*. Alton Biggs, et al., McGraw-Hill Education. 2017. (ISBN: 9780076774289)

### Lab Materials required:

1 fresh apple

75 mL (about 2.5 oz) each lemon juice and sugar solution

250 mL clear glass container (about 8 oz)

20 UV beads

1 oz sunscreen (any spf)

t-shirt (or a 3x3 in. piece of t-shirt material)

sunglasses

watch or clock with a second hand

1 deck of playing cards

2 sheets of colored paper (any color)

scissors

tape (any kind, about 1 meter in length)

### UNHS Lab Kit contents: 20 UV beads