

**IDAHO ACHIEVEMENT STANDARDS  
GRADE 9-10  
BIOLOGY**

**Students are expected to know content and apply skills from previous grades.**

**Standard 1: Nature of Science**

Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations.

**Goal 1.1: Understand Systems, Order, and Organization**

**Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a)
- 9-10.B.1.1.2 Apply the concepts of order and organization to a given system. (648.01a)

**Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanation**

**Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a)
- 9-10.B.1.2.2 Develop models to explain concepts or systems. (648.02b)
- 9-10.B.1.2.3 Develop scientific explanations based on knowledge, logic and analysis. (648.02c)

**Goal 1.3: Understand Constancy, Change, and Measurement**

**Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.1.3.1 Measure changes that can occur in and among systems. (648.03b)
- 9-10.B.1.3.2 Analyze changes that can occur in and among systems. (648.03b)
- 9-10.B.1.3.3 Measure and calculate using the metric system. (648.03c)

**Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State**

Reference to 7.S.3.2.1

**Goal 1.5: Understand Concepts of Form and Function**

No objectives in Biology.

## **Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills**

### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.1.6.1 Identify questions and concepts that guide scientific investigations. (649.01a)
- 9-10.B.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)
- 9-10.B.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c)
- 9-10.B.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d)
- 9-10.B.1.6.5 Analyze alternative explanations and models. (649.01e)
- 9-10.B.1.6.6 Communicate and defend a scientific argument. (649.01f)
- 9-10.B.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g)

## **Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors**

No objectives in Biology.

## **Goal 1.8: Understand Technical Communication**

### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a)

## **Standard 2: Physical Science**

No goals or objectives in Biology.

## **Standard 3: Biology**

Students explain the importance of cells as they relate to the organization and structure of complex organisms, differentiation and specialization during development, and the chemical reactions necessary to sustain life. Students describe the functions of cell structures. Students use the theory of evolution to explain diversity of life.

## **Goal 3.1: Understand the Theory of Biological Evolution**

### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.3.1.1 Use the theory of evolution to explain how species change over time. (652.01a)
- 9-10.B.3.1.2 Explain how evolution is the consequence of interactions among the potential of a species to increase its numbers, genetic variability, a finite supply of resources, and the selection by the environment of those offspring better able to survive and reproduce. (652.01a)

### **Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems**

#### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.3.2.1 Explain how matter tends toward more disorganized states (entropy). (653.01a)
- 9-10.B.3.2.2 Explain how organisms use the continuous input of energy and matter to maintain their chemical and physical organization. (653.01b)
- 9-10.B.3.2.3 Show how the energy for life is primarily derived from the sun through photosynthesis. (653.01c)
- 9-10.B.3.2.4 Describe cellular respiration and the synthesis of macromolecules. (653.01d)
- 9-10.B.3.2.5 Show how matter cycles and energy flows through the different levels of organization of living systems (cells, organs, organisms, communities) and their environment. (653.01h)

### **Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things**

#### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.3.3.1 Identify the particular structures that underlie the cellular functions. (651.01a)
- 9-10.B.3.3.2 Explain cell functions involving chemical reactions. (651.01b)
- 9-10.B.3.3.3 Explain how cells use DNA to store and use information for cell functions. (651.01c)
- 9-10.B.3.3.4 Explain how selective expression of genes can produce specialized cells from a single cell. (651.01e)

### **Standard 4: Earth and Space Systems**

No goals or objectives in Biology.

### **Standard 5: Personal and Social Perspectives; Technology**

Students understand that science and technology interact and impact both society and the environment. Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.

### **Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced**

#### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.5.1.1 Analyze environmental issues such as water and air quality, hazardous waste, forest health, and agricultural production. (656.01a)

### **Goal 5.2: Understand the Relationship between Science and Technology**

#### **Objective(s): By the end of Biology, the student will be able to:**

- 9-10.B.5.2.1 Explain how science advances technology. (655.01a)
- 9-10.B.5.2.2 Explain how technology advances science. (655.01a)

9-10.B.5.2.3 Explain how science and technology are pursued for different purposes.  
(656.01b)

**Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them**

**Objective(s): By the end of Biology, the student will be able to:**

9-10.B.5.3.1 Describe the difference between renewable and nonrenewable resources.  
(656.03a)