

Alaska Tutorials are designed specifically for the Alaska Standards.

Biology Tutorials offer targeted instruction, practice, and review designed to help students develop fluency, deepen conceptual understanding, and apply scientific thinking skills. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing their ability to explain and analyze biological scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible through focused content, guided analysis, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

## 1. THE NATURE AND CHEMISTRY OF LIFE

- **CHARACTERISTICS OF LIFE**
- **BIOMOLECULES**
  - **SC2.1** describing the structure-function relationship (i.e., joints, lungs).

## 2. CELL STRUCTURE AND FUNCTION

- **PROKARYOTIC AND EUKARYOTIC CELLS**
  - **SC2.1** describing the structure-function relationship (i.e., joints, lungs).
  - **SC2.2** explaining that cells have specialized structures in which chemical reactions occur.
- **PLANT AND ANIMAL CELLS**
  - **SC2.1** describing the structure-function relationship (i.e., joints, lungs).
  - **SC2.2** explaining that cells have specialized structures in which chemical reactions occur.

## 3. PASSIVE TRANSPORT AND ACTIVE TRANSPORT

- **PASSIVE TRANSPORT**
  - **SC2.1** describing the structure-function relationship (i.e., joints, lungs).
  - **SC2.2** explaining that cells have specialized structures in which chemical reactions occur.
- **ACTIVE TRANSPORT**
  - **SC2.1** describing the structure-function relationship (i.e., joints, lungs).
  - **SC2.2** explaining that cells have specialized structures in which chemical reactions occur.

## 4. CELLULAR ENERGETICS, GROWTH, AND REPRODUCTION

- **PHOTOSYNTHESIS**
  - **SC3.2** exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis).

- **THE CELL CYCLE**
- **MITOSIS**

## 5. DNA STRUCTURE AND FUNCTION

- **COMPONENTS OF DNA**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.
- **THE GENETIC CODE**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.
- **DNA REPLICATION**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.

## 6. GENE EXPRESSION

- **TRANSCRIPTION**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.
  - **SC1.2** explaining how the processes of natural selection can cause speciation and extinction.
  - **SC1.3** examining issues related to genetics
- **TRANSLATION**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.

## 7. MUTATIONS

- **GENETIC CHANGES IN DNA**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.
- **GENETIC CHANGES IN CHROMOSOMES**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.

## 8. HEREDITY

- **MENDELIAN LAWS OF HEREDITY**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.
  - **SC1.2** using probabilities to recognize patterns of inheritance (e.g., Punnett Squares).
- **MULTIPLE ALLELES AND ALLELES WITHOUT DOMINANCE**
  - **SC1.1** recognizing that all organisms have chromosomes made of DNA and that DNA determines traits.
  - **SC1.2** using probabilities to recognize patterns of inheritance (e.g., Punnett Squares).

## 9. REPRODUCTION

- **MEIOSIS**
  - **SC1.1** relating the structure of DNA to characteristics of an organism.
  - **SC1.2** researching how the processes of natural selection cause changes in species over time.
- **SEXUAL AND ASEQUAL REPRODUCTION**

## 10. EVOLUTION

- **MULTIPLE LINES OF EVIDENCE**

- **SC1.3** inferring evolutionary pathways from evidence (e.g., fossils, geologic samples, recorded history).

- **THE FOSSIL RECORD**

- **SC1.3** inferring evolutionary pathways from evidence (e.g., fossils, geologic samples, recorded history).

## 11. MECHANISMS OF EVOLUTION

- **NATURAL SELECTION**

- **SC1.2** researching how the processes of natural selection cause changes in species over time.
- **SC3.3** identifying dynamic factors (e.g., carrying capacity, limiting factors, biodiversity, and productivity) that affect population size.
- **SC3.2** exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis).

- **EVOLUTION OF SPECIES**

- **SC1.3** inferring evolutionary pathways from evidence (e.g., fossils, geologic samples, recorded history).
- **SC1.2** researching how the processes of natural selection cause changes in species over time.

## 12. CLASSIFICATION

- **TAXONOMY**

- **SC2.1** describing and comparing the characteristics of phyla/divisions from each kingdom.

- **THE SIX KINGDOMS**

- **SC2.1** describing and comparing the characteristics of phyla/divisions from each kingdom.

## 13. HOMEOSTASIS AND FUNCTIONS OF ANIMAL SYSTEMS

- **HOMEOSTASIS AND DYNAMIC EQUILIBRIUM**

- **SC2.3** explaining the functions of organs of major systems (i.e., respiratory, digestive, circulatory, reproductive, nervous, musculoskeletal, and excretory).

- **THE NERVOUS SYSTEM**

- **SC2.3** explaining the functions of organs of major systems (i.e., respiratory, digestive, circulatory, reproductive, nervous, musculoskeletal, and excretory).
- **SC2.1** describing the structure-function relationship

- **THE IMMUNE AND LYMPHATIC SYSTEMS**

- **SC2.3** describing the functions and interdependencies of the organs within the immune system and within the endocrine system.

## 14. FUNCTIONS OF PLANT SYSTEMS

- **PLANT TISSUES**

- **SC2.1** describing the structure-function relationship (i.e., joints, lungs).

- **PLANT RESPONSES**

- **SC2.1** describing the structure-function relationship (i.e., joints, lungs).

## 15. MATTER AND ENERGY

- **FOOD CHAINS AND WEBS**

- **SC3.2** exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis).

- **PYRAMIDS OF ENERGY, NUMBERS, AND BIOMASS**

- **SC3.2** exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis).

## 16. CYCLES IN NATURE

- **THE CARBON CYCLE**

- **SC3.1** relating the carbon cycle to global climate change.
- **SD1.2** describing their interrelationships (i.e., water cycle, carbon cycle, oxygen cycle).
- **SC3.2** analyze the potential impacts of changes (e.g., climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem.

- **THE NITROGEN AND PHOSPHOROUS CYCLES**

- **SC3.1** describing the carbon and nitrogen cycle within an ecosystem and how the continual input of energy from sunlight keeps the process going.
- **SC3.2** analyze the potential impacts of changes (e.g., climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem.

## 17. ECOLOGY OF SUCCESSION

- **SUCCESSION IN COMMUNITIES**

- **SC3.2** analyze the potential impacts of changes (e.g., climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem.

- **NATURAL IMPACTS ON ECOSYSTEMS**

- **SC3.2** analyze the potential impacts of changes (e.g., climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem.