

South Carolina Tutorials are designed specifically for the South Carolina College and Career Readiness Standards and the South Carolina Academic Standards to prepare students for the South Carolina End-of-Course Examination Program (EOCEP), ACT Aspire, and the South Carolina Palmetto Assessment of State Standards (SCPASS).

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.

### Unit 1: Chemistry of Life

- **BIOMOLECULES**

- B-LS1-6.: Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and other large carbon-based molecules necessary for essential life processes.

### Unit 2: Cellular Energetics

- **PHOTOSYNTHESIS**

- B-LS1-5.: Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

- **CELLULAR RESPIRATION**

- B-LS2-5.: Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
- B-LS1-7.: Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy.

### Unit 3: Cell Growth and Reproduction

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- **THE CELL CYCLE**

- B-LS1-4.: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

- **MITOSIS**

- B-LS1-4.: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

#### Unit 4: Gene Expression

- **TRANSCRIPTION**

- B-LS1-1.: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.

- **TRANSLATION**

- B-LS1-1.: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.

#### Unit 5: Mutations

- **GENETIC CHANGES IN DNA**

- B-LS3-2.: Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

- **GENETIC CHANGES IN CHROMOSOMES**

- B-LS3-2.: Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

#### Unit 6: Heredity

- **MENDELIAN LAWS OF HEREDITY**

- B-LS3-3.: Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

#### Unit 7: Evolution

- **MULTIPLE LINES OF EVIDENCE**

- B-LS4-1.: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

#### Unit 8: Mechanisms of Evidence

- **NATURAL SELECTION**

- B-LS2-1.: Use mathematical and/or computational representations to support explanations of biotic and abiotic factors that affect carrying capacity of ecosystems at different scales.

- B-LS4-2.: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.
- B-LS4-4.: Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

- **EVOLUTION OF SPECIES**

- B-LS4-5.: Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

### Unit 9: Matter and Energy 1

- **FOOD CHAINS AND WEBS**

- B-LS2-1.: Use mathematical and/or computational representations to support explanations of biotic and abiotic factors that affect carrying capacity of ecosystems at different scales.

### Unit 10: Matter and Energy 2

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

- B-LS2-1.: Use mathematical and/or computational representations to support explanations of biotic and abiotic factors that affect carrying capacity of ecosystems at different scales.
- B-LS4-2.: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

### Unit 11: Cycles in Nature

- **THE CARBON CYCLE**

- B-LS2-5.: Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
- B-LS2-7.: Design, evaluate, and refine a solution for reducing the impacts of human activities on biodiversity and ecosystem health.

### Unit 12: Ecology of Succession

- **NATURAL IMPACTS ON ECOSYSTEMS**

- B-LS2-1.: Use mathematical and/or computational representations to support explanations of biotic and abiotic factors that affect carrying capacity of ecosystems at different scales.

### Unit 13: Test-Taking Strategies

- **STUDY HABITS**

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- **BEING PREPARED AND GETTING STARTED**
  - **WORDING IN TEST QUESTIONS**
  - **WORDING IN ANSWER CHOICES**
  - **QUESTIONS WITH PASSAGES AND VISUAL DATA**
  - **ESSAY AND SHORT ANSWER QUESTIONS**
  - **WORD PROBLEMS**
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