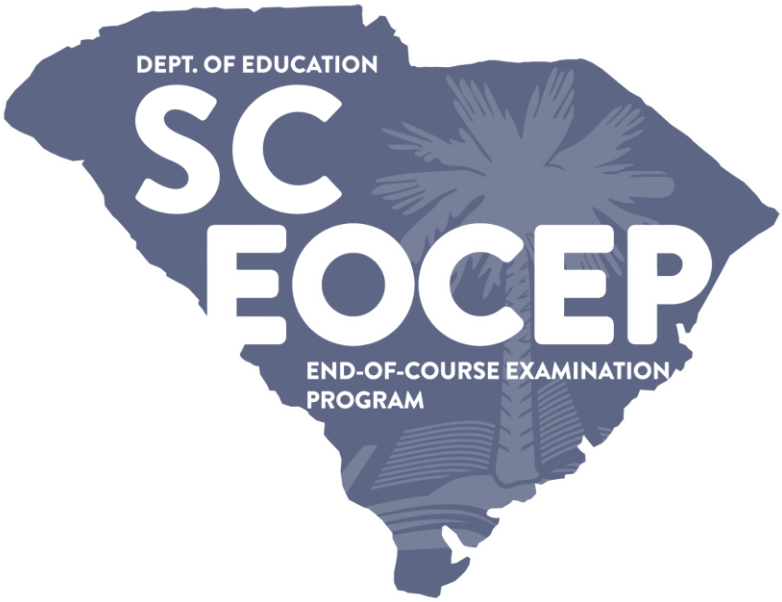
SOUTH CAROLINA DEPARTMENT OF EDUCATION



EOCEP Biology 1
2025 Data Review Report

Office of Assessment and Standards

October 2025

South Carolina Department of Education

Contents

Introduction

Data Recognition Corporation and the South Carolina Department of Education (SCDE) Office of Assessment and Standards convened a committee of content experts to review item-level data from the Spring 2025 EOCEP Biology 1 Operational Test. The committee analyzed and discussed the items and the data. The committee acknowledged the demanding work of South Carolina educators and offered these relevant and useful instructional strategies.

The Data Review committee was also mindful that the *South Carolina College- and Career-Ready Science Standards 2021* were fully implemented for the first time in the 2023–2024 school year. These strategies reflect the higher rigor of the new standards.

Assessing the Practices and Crosscutting Concepts in Science:

Science is unique among the content areas in that students are presented with a variety of graphics that communicate data and information about the natural world. This requires assessment items (test questions) to present a variety of graphics, for example, models, data tables, graphs, diagrams, etc. These types of graphics and the tools and features of the testing platform are presented for students to practice with on the Online Tools Training (OTT). Students need to have opportunities to interact with the OTT throughout the year to practice using these tools to support their performance on state science assessments.

We encourage teachers to use the resources posted on the SCDE website for guidance on instruction. Go to Instructional Resources to find the Vertical Articulations, Performance Targets, Bundling Guides, guidance on using the SEPs and CCCs and many more helpful resources.

Overarching Themes

The following main themes consistently emerged as areas of emphasis during committee discussions.

Claim-Evidence-Reasoning (CER)

The practice of CER builds critical thinking and argumentation skills, helps students use data to justify conclusions, and reinforces scientific literacy. CER weaves throughout all instruction and should become part of daily practice for students. The committee recommends the following instructional strategies using CER to deepen students' understanding of scientific concepts.

- Provide students opportunities to make claims and use evidence from data to support their claims.
- Allow students to be challenged by their peers and engage in argument using evidence from models, text, and experimental data.
- Require students to use chains of reasoning, especially with more complex observations.
- Ask students to make inferences based on text and provide evidence from the text and rationales supporting inferences.
- Require students to justify or provide reasoning for revisions of models, solutions, and designs.

Models

Every year the development and use of models is consistently identified as an area for growth by data review committees every year. Models that explain or illustrate simple to complex systems and phenomena take many different forms and should be incorporated throughout instruction.

General Recommendations:

- Expose students to a variety of models and scaffold the development process of modeling.
- Require students to use models to explain what is happening during cellular processes, cycles, and events, not just the identification of the components.

Modeling Processes, Cycles, and Systems

- Provide examples and opportunities for students to construct models representing biological processes, cycles, and systems in the natural world. Require students to do the following.
    - Identify the components.
    - Explain the relationship between the components.
    - Peer-evaluate and revise models.

Exploring Biological Concepts and Phenomena

Provide students opportunities to explore biological concepts before direct instruction occurs. This allows students to activate prior knowledge and apply experiences in their lives as they investigate new phenomena.

- Use text and graphics of biological processes and phenomena, or a guided experiment. Allow students to respond in their own words before providing direct instruction:
    - Ask students to construct explanations.
    - Cite evidence that supports their explanations.
    - Facilitate discussions on their observations.
    - Scaffold students' refinement of explanations, models, arguments, etc. by introducing and reinforcing the use of scientific terminology to describe data, evidence, observations, etc.
        - Use Frayer models to reinforce the use and application of terms.
- Provide opportunities for students to conduct experimental procedures and interact with results of content-related experiments.
    - Link observations to biological processes/events.
    - Facilitate discourse on validity and reliability of results.
    - Analyze data to see whether the results support or do not support a claim.
    - Connect the objective of the experiment to the real-world.

Communicating and Analyzing Data and Information

Students must use data and other information to explain the natural world by identifying patterns, trends, and cause-and-effect relationships. Science provides the opportunity for students to incorporate the skills developed in ELA and mathematics to become critical consumers of information. Science requires empirical data to support arguments and claims, which reinforces students' ability to become critical consumers of information.

Communicating Using Scientific Terminology

- Connect scientific concepts/terminology in everyday conversations.
    - Reinforce scientific terminology when discussing phenomena and expect students to communicate using it.
- Emphasize the Greek and Latin roots and affixes and their meanings in scientific terminology; apply knowledge of etymology to determine unfamiliar words in grade-level content. This connects to ELA. AOR.9.1, in 4–8 and ELA.E1.AOR.9.1in the South Carolina College- and Career-Ready English Language Arts Standards 2023.

Data

- Increase opportunities for students to interact with data.
    - Provide data sets and demonstrate how to:
        - Analyze data to recognize patterns/trends.
        - Use data sets as evidence to support arguments/claims.
    - Require students to generate their own graphs and tables and explain what the data show.
        - Provide practice in graphing using digital programs (e.g., Excel, Google sheets, Desmos, etc.).
    - Expose students to and require students to generate data with primary and secondary x- and y-axes. For example, students should be exposed to the combination of bar graph and scatterplot or line graphs.

Building Connections and Identifying Relationships

Students should understand the interrelatedness of biological concepts. This ability to make connections is foundational to science, moves beyond memorization, and helps students retain information and understand how to apply their knowledge to new contexts. The SCDE Biology 1 Bundling Guide provides examples of content connections you can use for instructional guidance.

- Provide opportunities for students to identify relationships, for example:
    - among processes,
    - cycling of matter within Earth's spheres, and
    - how the environment affects traits and the survival of species.

Classroom Assessments

- Make sure the test banks provided by your instructional materials are tightly aligned to the standards.
- Provide opportunities for groups of students to work through multi-dimensional questions. Encourage discourse and argumentation.
- Use entrance/exit tickets to measure daily understanding.
- Review test-taking strategies with your students.
    - Focus on showing how the tools in the Online Tools Training module can help students.
        - Use the cross-off tool to omit the answer options that are wrong.
        - Use the highlighter to emphasize essential information.
        - Use the magnifier tool to see parts of models more clearly.
        - Use the notepad to record thoughts and information relevant to the correct answer.
        - Use the flag to mark items to go back to before exiting the test.
    - Explain the importance of reading the stimulus and ALL answer options before answering the question.

Focused Strategies

During their discussions, the committee identified specific areas that align with overarching themes. These themes are reiterated within Performance Expectations (PEs) to emphasize and support the committee's recommendations.

B-LS1-1

- Expose students to a variety of models that describe/explain the relationship between the structure of DNA and protein synthesis and its importance to living organisms.
    - Make connections between the events of protein synthesis.
    - Connect the events to the organelles in which these events occur.
- Require students to construct and use models of DNA, genes, and chromosomes.
    - Identify the components.
    - Explain the functions of the components.
    - Describe the organization of DNA, genes, and chromosomes.
- Reinforce the differences between nitrogenous bases and amino acids.

B-LS1-4

- Allow students to observe the process of mitosis in animal and plant cells using a microscope.
- Require students to sequence the events that occur during mitosis. The emphasis should be placed on understanding the events during the process rather than memorizing the names of the phases.
- Expect students to explain the purpose of mitosis and meiosis.
- Provide opportunities for students to model the cell cycle and its checkpoints, and:
    - identify the components,
    - explain the purpose of the phases, and
    - explain what occurs when a checkpoint fails.

B-LS1-5

- Connect photosynthesis to cellular respiration.
- Explain how photosynthesis relates to the carbon cycle.
- Provide opportunities for students to conduct experimental procedures and interact with the results of experiments that measure photosynthesis.

B-LS1-6

- Use manipulatives to model how these atoms can form biomacromolecules, for example, glucose and other carbohydrates, lipids, amino acids, and nucleotides.
- Connect the macromolecules produced by cells to students' favorite food.
- Reinforce the functions of lipids, amino acids, and carbohydrates in living organisms.
- Emphasize that starches are carbohydrates.

B-LS1-7

- Make connections between cellular respiration and photosynthesis. For example, students should understand the relationship between these two processes in the carbon cycle, and the relationship between the inputs and outputs of these two processes to the building of larger and more complex biomolecules
- Provide opportunities for students to conduct experimental procedures and interact with the results of experiments that measure cellular respiration.

B-LS2-1

- Provide text related to carrying capacity and require students to:
    - Identify the relationship between the variables.
    - Infer abiotic/biotic destabilizing and stabilizing factors in the ecosystem.
    - Predict how populations change when these factors change.
- Require students to graph and interpret data.

B-LS2-5

- Expose students to a variety of carbon cycle models.
    - Require students to explain the relationships and pathways between the components of the cycles.
- Reinforce the use and application of atmosphere, biosphere, geosphere, and hydrosphere.

B-LS3-2

- Emphasize the "big picture" of the outcomes of meiosis and mitosis.

B-LS3-3

- Emphasize frequency of phenotypes and explain to what this refers.
- Provide opportunities for students to use dominant and recessive alleles over successive generations.
- Allow students to explore how the environment affects the distribution of traits.

B-LS4-1

- Provide opportunities for students to evaluate information on common ancestry and biological evolution.

B-LS4-2

- Develop activities that require students to model gene flow using manipulatives and describe mechanisms of evolution.
- Allow students to develop and use models demonstrating how mutations can affect, for example, gene expression or protein function.
    - Practice graphing the distribution of trait frequency over time.
    - Interpret or generate cladograms to describe relationships among species.

B-LS4-4

- Provide text and data that describe how natural selection leads to adaptation. For example:
    - Analyze graphs showing changes in the frequency of traits over time within different ecosystems.
    - Use manipulatives to model adaptation based on given scenarios, constraints, and selective pressures.
    - Provide examples of adaptations and require students to determine whether the adaptations are beneficial or harmful. For example, bacteria develop resistance to antibiotics. This is beneficial to the bacteria but can be harmful to other organisms.

B-LS4-5

- Allow students to explore and evaluate evidence of:
    - The positive and negative impacts of invasive species native plants and animals,
    - The impact of pollution and human activity on native species, and
    - The mechanisms of extinction of species.