Biology 1
Performance Level Descriptors
User Guide
August 2024

Introduction to the User Guide

Performance Level Descriptors (PLDs) serve as a foundational resource in the development process for the South Carolina End-of-Course Examination Program (EOCEP) tests. These descriptors help convey information about South Carolina's goals for students (i.e., level of knowledge and skills required of students at each level of performance) and give meaning and context to the total test score (scale score). This document was created to help educators and parents better understand the use of PLDs.

1. What are Performance Level Descriptors?

PLDs are descriptions that provide the knowledge, skills, and abilities expected of students in each performance level as defined by the South Carolina College- and Career-Ready Science Standards 2021 (SCCCRSSci 2021). The South Carolina Department of Education (SCDE) has two classifications of PLDs: Policy PLDs and Range PLDs.

2. What are the differences between SCDE's Policy PLDs and Range PLDs?

A. ***Policy PLDs*** summarize the state's definition for each performance level, providing information to stakeholders on the state's suggested interpretation of each level. These are typically not specific to any given grade or content area.

B. ***Range PLDs*** summarize the knowledge, skills, and abilities as informed by the state content standards, expected of students in each performance level on a specific test. These PLDs translate the policy definitions into specific expectations about student knowledge and skills in a particular content area, at each performance level, for each subject and grade.

3. What are performance levels? How many are there for EOCEP tests?

Performance levels are the broad, categorical levels used to report student performance on an assessment. There are four performance levels for the South Carolina EOCEP tests which are organized in a manner that assumes students performing in higher levels have mastered the concepts and skills within the preceding levels. The general meaning of each of the four levels is provided below.

Performance Level Descriptors

	Does not Meet Expectations	Minimally Meets Expectations	Meets Expectations	Exceeds Expectations
Policy	The student **Does Not Meet the Expectations** of the course content standards.	The student **Minimally Meets the Expectations** of the course content standards.	The student **Meets the Expectations** of the course content standards.	The student **Exceeds the Expectations** of the course content standards.

4. How do performance levels relate to scale scores for EOCEP tests?

A scale score is the total test score a student receives on the EOCEP teas and is reported as a letter grade (A, B, C, D, F). Scale scores are built using the PLDs and the Rasch model. Each letter grade corresponds to a performance level.

- *Does Not Meet* corresponds to a scale score in the range of 0—59 (F).
- *Minimally Meets* corresponds to a scale score in the range of 60-69 (D).
- *Meets* corresponds to a scale score in the range of 70-89 (B/C).
- *Exceeds* corresponds to a scale score of 90-100 (A).

5. Do the performance levels align to the classifications used for reporting categories?

No, the process used to create the Low, Middle, and High classifications for the reporting categories differs from the process used to create the performance levels for the total test score. Each reporting category classifies a student's performance as "Low," "Middle," or "High." This classification is based on the subset of items that assess the reporting category. The PLDs are intended to describe the overall student performance and should only be used in conjunction with the total test score. These classifications within the reporting categories are found on South Carolina EOCEP Individual Student Reports that districts send to students.

6. What is the purpose of the PLDs?

The purpose of content-specific, Range PLDS is to provide

- guidelines to assess the level of student performance,
- an indication of how demanding the standards should be,
- specific expectation about student knowledge and skills in a particular content area at each performance level, and
- a progression of knowledge and skills that students are expected to have mastered across the performance levels.

Both the scale score and the PLDs provide information that helps guide educators and assist parents in understanding the level of student performance required at each performance level.

7. How are PLDs used in conjunction with the EOCEP tests?

PLDs provide a link among the raw score, scale score, and performance level, while also adding insight into student knowledge and performance. These statements are the basis for test score reporting and interpretation of student scores on the EOCEP tests. PLDs are developed, revised, and expanded prior to and during the Standard Setting process for each EOCEP subject and are used by the standard-setting committee as a guide to make recommendations for "cut scores" that mark the threshold of performance from one level to the next.

8. What process is used to develop Range PLDs?

The PLDs are written using a multi-step process. State agency content experts and the state testing contractors/subcontractors start with the policy definitions and expand the definitions in terms of specific knowledge, skills, and abilities required at each level within a content area to create an initial draft. A committee of South Carolina educators and curriculum experts are selected to review and revise the drafts to articulate the SCCCRSS 2021 expectations of the EOCEP standards. Participants are

- required to have an affiliation with a South Carolina public school,
- mostly content-specific classroom teachers and teachers serving special populations, and
- representative of the demographic characteristics of South Carolina in terms of gender, race and ethnicity, region (education districts), and community type (urban, suburban, rural).

The final version is adopted by the SCDE and released to the field.

9. How can teachers use the PLDs in the classroom?

In addition to being used in the standard setting process, PLDs may serve several purposes. By using the PLDs to better understand students total test scores, classroom teachers will have a better understanding of what their students were generally be able to do within a performance level. PLDs help to further clarify the relationship between the standards and expectations of the EOCEP tests, which can inform the development of classroom expectations to ensure these expectations meet the rigor of the standards.

Teachers may leverage this understanding of the previous year's students' performances to better inform instruction for the coming year in the same content area. Teachers can further use this information to help understand the knowledge, skills, and abilities that current students have from the previous year's instruction by

- tracking student growth along the expectation continuum as described in the PLDs,
- differentiating instruction to support achievement of all students,
- develop formative classroom assessments, and
- creating rubrics to gauge student learning against the expectations of the EOCEP tests.

10. Where is a copy of the PLDs found?

A copy of the PLDs is attached in the subsequent pages of this document. PLDs are updated as standards are revised.

EOCEP Biology 1 Performance Level Descriptors

August 2024

Columbia, SC

Performance Levels and Performance Level Descriptors

For the South Carolina End-of-Course Examination Program (EOCEP), educators have developed four performance levels to describe student mastery and command of the knowledge and skills outlined in South Carolina's College- and Career-Ready Standards (SCCCRS). Most students have at least some knowledge of the information described in the content standards; however, performance levels succinctly describe the extent to which students have demonstrated mastery of the knowledge and skills expressed in the college- and career-ready standards. Performance levels give meaning and context to scale scores by describing the knowledge and skills students must demonstrate to achieve each level.

The four performance levels on EOCEP are *Does Not Meet Expectations*, *Minimally Meets Expectations*, *Meets Expectations*, and *Exceeds Expectations*. The general meaning of each of the four levels is provided below:

The student **does not meet the expectations** of the course content standards.

The student **minimally meets the expectations** of the course content standards.

The student **meets the expectations** of the course content standards.

The student **exceeds the expectations** of the course content standards.

More-detailed descriptions of the specific concepts and skills are provided for each course in the **Performance Level Descriptors** (PLDs). PLDs are descriptions of the knowledge and skills expected at each of the four performance levels and were developed by committees of South Carolina educators in October 2023. The PLDs are based on the state-adopted content standards.

PLDs show a *progression of knowledge and skills* that students are expected to have mastered across the performance levels. It is important to understand that a student should demonstrate mastery of the knowledge and skills within the student's performance level *as well as all content and skills in any performance levels that precede the students own, if any*. For example, a student who Meets Expectations should also possess the knowledge and skills described at the Minimally Meets Expectations and Does Not Meet Expectations performance levels.

Performance Expectation	Does Not Meet Expectations	Minimally Meets Expectations	Meets Expectations	Exceeds Expectations
	The student **Does Not Meet the Expectations** of the course content standards.	The student **Minimally Meets the Expectations** of the course content standards.	The student **Meets the Expectations** of the course content standards.	The student **Exceeds the Expectations** of the course content standards.
	The student ***needs substantial academic support*** to be on track for college and career readiness.	The student ***needs additional academic support*** to be on track for college and career readiness.	The student ***is prepared*** to be on track for college and career readiness.	The student ***is well prepared*** to be on track for college and career readiness.
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.***	Can recognize the structure of DNA and identify differences between DNA and RNA.	Can describe the structure of DNA and understand how genes code for different proteins.	Can apply the base pair rule for DNA and RNA, explain the general role DNA plays in protein synthesis, and explain how proteins carry out the essential functions of life through systems of specialized cells.	Can evaluate a DNA strand to determine its mRNA codons and its corresponding amino acids. Can explain how changes in a DNA molecule could affect the function of a protein.
B-LS1-4 ***Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing, and maintaining, complex organisms.***	Can recall that cells divide by mitosis to produce identical daughter cells.	Can sequence a model and explain the purpose of cellular division such as increasing the size and complexity of an organism.	Can use a model to illustrate the events occurring during mitosis, the stages of the cell cycle, and the consequences of uncontrolled cell division (i.e., interphase, mitosis). Can explain the role of mitosis in differentiation and organism complexity.	Can develop, evaluate, or revise a model to illustrate the stages of the cell cycle. Can analyze and interpret the role of checkpoints in the cell cycle.

Performance Expectation	Does Not Meet Expectations	Minimally Meets Expectations	Meets Expectations	Exceeds Expectations
B-LS1-5 ***Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.***	Can recognize the chemical equation (chemical formula or words) for photosynthesis. Can understand that light energy is converted into chemical energy during photosynthesis.	Can complete a model of photosynthesis by adding an input or output, including completing the chemical equation for photosynthesis.	Can use a model (i.e., diagrams, graph, table, chemical equation) to illustrate the inputs and outputs of photosynthesis, indicating how light energy is transformed to stored chemical energy.	Can evaluate, interpret, or revise a model to predict or analyze changes in the outputs of photosynthesis based on changes to the inputs.
B-LS1-6 ***Construct and revise an explanation based on evidence from how carbon dioxide, hydrogen, and sugar molecules may combine with other elements to form amino acids and other large carbon-based molecules necessary for essential life processes.***	Can recall the four major macromolecules (i.e., lipids, carbohydrates, proteins, nucleic acids) or identify the main elements (i.e., carbon, hydrogen, and oxygen) needed for each macromolecule.	Can recognize that the elements (i.e., carbon, hydrogen, and oxygen) in all four macromolecules originate from glucose.	Can construct or revise an explanation of how the elements (i.e., carbon, hydrogen, and oxygen) in sugar molecules can combine with other elements (i.e., nitrogen, phosphorus, sulfur) to build large carbon-based molecules such as amino acids.	Can provide evidence to refute an explanation for how the elements in a sugar molecule can be rearranged/used to build other biological molecules.
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.***	Can recognize the chemical equation (chemical formula or words) for cellular respiration. Can recall that the primary function of cellular respiration is to produce ATP.	Can complete a model of cellular respiration by adding an input or output, including the chemical equation for cellular respiration.	Can use a model that explains that cellular respiration: 1. requires the breaking of chemical bonds in sugars (i.e., glucose), which releases energy stored in the bonds of ATP, and 2. allows for the making of new bonds to form new compounds, resulting in a net transfer of energy. Can compare the inputs, outputs, and efficiency of aerobic and anaerobic respiration using models.	Can develop or revise a model of the various stages (i.e., glycolysis, Krebs cycle, electron-transport chain) of cellular respiration to demonstrate how ATP is synthesized.

Performance Expectation	Does Not Meet Expectations	Minimally Meets Expectations	Meets Expectations	Exceeds Expectations
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.***	Can define carrying capacity and recognize possible biotic and abiotic factors that can affect carrying capacity.	Can describe whether populations are positively or negatively affected by changes in biotic or abiotic factors within an ecosystem.	Can use quantitative representations to support and explain how biotic/abiotic factors affect the carrying capacities of populations in an ecosystem.	Can use evidence to predict and describe how changes in biotic/abiotic factors will affect populations of organisms.
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.***	Can recognize that carbon is being cycled among the biosphere, atmosphere, hydrosphere, and geosphere.	Can identify the roles that the biosphere, atmosphere, hydrosphere, and geosphere play in the cycling of carbon.	Can develop a model to show the cycling of carbon through the biosphere, atmosphere, hydrosphere, and geosphere based on the inputs and outputs of photosynthesis and cellular respiration.	Can evaluate or revise a model that shows the conversion of carbon compounds during photosynthesis and cellular respiration to explain how changes to the biosphere, atmosphere, hydrosphere, and geosphere can affect the global cycling of carbon.
B-LS2-7 ***Design, evaluate, and refine a solution for reducing the impacts of human activities on biodiversity and ecosystem health.***	Can identify that specific actions by humans can affect the environment.	Can identify the best solution from a given list of solutions to reduce human impacts on the environment.	Can design, evaluate, or refine possible solutions for reducing human impacts on a specific environmental problem and explain how those solutions could affect biodiversity.	Can generate new solutions to reduce human impacts that affect biodiversity and evaluate the constraints associated with those solutions.
B-LS3-2 ***Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combination through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.***	Can recognize that changes in chromosomes or genetic code can result in changes in physical traits (appearance).	Can identify that changes to a genome can occur during meiosis, from errors in DNA replication, and from environmental factors.	Can use evidence to make a claim about inheritable genetic variations and explain how these variations can result from either: 1. changes that occurred during specific steps of meiosis (using a model of meiosis); 2. errors in the process of DNA replication; and/or 3. mutations due to environmental factors.	Can use evidence to support or refute a claim that predicts how future generations will be impacted by genetic variations due to meiosis, DNA replication errors, or mutations due to environmental factors.

Performance Expectation	Does Not Meet Expectations	Minimally Meets Expectations	Meets Expectations	Exceeds Expectations
B-LS3-3 ***Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.***	Can recognize that a Punnett square or pedigree shows the possible distribution of genetic traits in a population.	Can complete a simple Mendelian monohybrid cross and identify the genotypes and phenotypes of the P and F_1 generations.	Can calculate the ratios and/or probabilities of an F_1 or F_2 generation possessing a specific genotype by completing a monohybrid cross (including non-Mendelian) based on specified genetic or environmental factors. Can evaluate pedigree to determine possible genotypes.	Can analyze/interpret data from completed dihybrid crosses and/or completed pedigree charts to predict the distribution of expressed traits based on genetic and environmental changes.
B-LS4-1 ***Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of evidence.***	Can recognize common ancestry based on similar structures among organisms.	Can describe the relatedness of organisms supported by a single line of evidence (e.g., DNA sequences, anatomical structures, order of appearance of structures in embryological development, or other types of traits).	Can analyze and explain that common ancestry and biological evolution of organisms are supported by multiple lines of evidence.	Can construct an evolutionary hypothesis (e.g., cladogram, phylogenetic tree) based on multiple lines of evidence.
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.***	Can recognize that populations can respond to changes in environmental conditions by evolving or becoming extinct.	Can identify examples of evolution that result from the ability of a population to survive and reproduce in a specific environment.	Can use evidence to explain that evolution results from: 1. changes in a population in a specific environment 2. changes in trait(s) resulting from mutations and sexual reproduction 3. competition for limited resources 4. differential survival and reproduction.	Can predict the evolutionary trajectory of a population in response to genetic or environmental changes.

Performance Expectation	Does Not Meet Expectations	Minimally Meets Expectations	Meets Expectations	Exceeds Expectations
B-LS4-4 ***Construct an explanation based on evidence for how natural selection leads to adaptation of populations.***	Can identify differences between biotic and abiotic factors in ecosystems.	Can describe how biotic and abiotic differences in ecosystems affect populations within those ecosystems.	Can use data to explain how specific biotic and abiotic differences in ecosystems contribute to changes in gene frequency over time, resulting in adaptations of populations.	Can compare population trends and ecosystem data to predict genetic changes that would likely be advantageous for specified populations over time.
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.***	Can identify factors that can lead to extinction.	Can describe how environmental changes can lead to the emergence or extinction of a species.	Can evaluate and use evidence to explain how environmental conditions (human induced or naturally occurring) affect: 1. current populations existing in an ecosystem, 2. the emergence of new species within that same ecosystem, 3. the extinction of those species least able to adapt to environmental changes.	Can predict how changes to the environment will impact: 1. specific organisms, 2. the population as a whole, and 3. the success of species over time.