# Reporting Category Statements
# Biology

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Bureau of K–12 Student Assessment
Florida Department of Education
325 West Gaines Street
Tallahassee, Florida 32399–0400

# Introduction

Students who participate in one or more of Florida's statewide, standardized assessments in grades 3–10 and/or end-of-course (EOC) assessments in Algebra 1, Geometry, Civic, U.S. History, and Biology 1 will receive a detailed score report that is unique to computer-adaptive assessments for each assessment. Each report will contain detailed information about the student's performance, narratives regarding strengths and weaknesses, and suggestions as to steps parents/guardians can take to help students progress in their learning. The information in each report is intended primarily for students and families and is not intended to replace classroom instruction.

The most detailed narrative is provided at the *reporting category* level. Reporting categories refer to major groupings of content and skills, such as Reading Informational Text or Reading Prose and Poetry in English Language Arts (ELA); Number Sense and Operations with Whole Numbers or Algebraic Reasoning in Mathematics; Nature of Science in Science; and Roles, Rights, and Responsibilities in Social Studies; among others. For each of the reporting categories, three tiers of text have been created based on state academic standards and informed by the Achievement Level Descriptors (ALDs) that were written by Florida educators. These tiers include *Below Expectations*, *At/Near Expectations* or *On Grade Level*, and *Above Expectations*. These reports classify student performance into one of the three tiers based on student responses to items that measure the benchmarks associated with that reporting category. Individual benchmark codes can be found in a report beneath the name of the correlated reporting category. Each student's report is tailored to provide specific information based on which of the three tiers that each reporting category score falls into. This document provides the complete set of narratives so that stakeholders can see expectation progressions within a reporting category and, if appropriate, across grades.

Each description included in these reports and the accompanying next steps were drafted by panels of Florida educators and reviewed by larger Florida educator committees facilitated by EdCount, LLC, and consisting of Florida educators, specialists from the Bureau of Standards and Instructional Support and other Florida Department of Education personnel.

It is important to keep in mind that a student's overall score provides the most valid and reliable evidence of what the student knows and can do with respect to the state academic standards. Due to the relatively small size of each reporting category, neither individual nor combined reporting category performance should be used to infer overall performance.

For more information on Florida's statewide, standardized assessments, please see the Statewide Assessments Guide. Please direct questions and comments about these reports to Assessment@fldoe.org.

# Additional Resources

The following resources are available to support understanding of the test design for Florida's statewide, standardized assessments and the skills outlined in the state academic standards.

Grade 5 Science Achievement Level Descriptions

Grade 8 Science Achievement Level Descriptions

Biology 1 EOC Achievement Level Descriptions

Florida's Academic Standards for Science

Science Test Design Summary

# Biology Reporting Category Statements

| Molecular and Cellular Biology<br>See Florida State Academic Standards **SC.912.L.14.1** [SC.912.N.1.3, SC.912.N.2.1, SC.912.N.3.1, SC.912.N.3.4]; **SC.912.L.14.3** [SC.912.L.14.2]; **SC.912.L.16.3** [SC.912.L.16.4, SC.912.L.16.5, SC.912.L.16.9]; **SC.912.L.16.17** [SC.912.L.16.8, SC.912.L.16.14, SC.912.L.16.16]; **SC.912.L.18.1** [SC.912.L.18.11]; **SC.912.L.18.9** [SC.912.L.18.7, SC.912.L.18.8, SC.912.L.18.10]; **SC.912.L.18.12**; and **SC.912.N.1.1** [SC.912.N.1.4, SC.912.N.1.6, SC.912.L.14.4]. | | | |
|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| **What These Results Mean** | For example, your learner may be able to:<br>• Recognize that theories (supported by evidence from reliable sources) and laws exist in science and serve different purposes.<br>• Know that there are various cell types (e.g., prokaryotic and eukaryotic), each with unique structures and functions.<br>• Recognize that all living things share the same DNA components and that mutations (changes) can affect individuals.<br>• Recognize that genetic information is transmitted and maintained through DNA replication.<br>• Recognize that cells reproduce in different ways (e.g., mitosis and meiosis).<br>• Recognize the major macromolecules (building blocks) in cells.<br>• Recognize that enzymes speed up chemical reactions.<br>• Identify the reactants, products, and/or functions of photosynthesis and cellular respiration.<br>• Identify some properties of water (e.g., cohesive behavior, temperature | For example, your learner may be able to:<br>• Recognize the difference between theories (supported by evidence from reliable sources) and laws.<br>• Describe the similarities and differences between structures in different cell types (e.g., prokaryotic, eukaryotic, plant, animal).<br>• Differentiate DNA replication, transcription, and translation and identify that mutations (changes) in proteins can affect individuals (e.g., cancer).<br>• Describe the processes of the cell cycle, mitosis, and meiosis.<br>• Identify the structures and functions of the macromolecules in cells (proteins, carbohydrates, lipids, and nucleic acids).<br>• Explain the role of enzymes in lowering the energy needed for a chemical reaction.<br>• Identify the reactants, products, and functions of photosynthesis and cellular respiration and how they are related. | For example, your learner may be able to:<br>• Analyze the development of theories (supported by evidence from reliable sources) and laws.<br>• Compare and contrast the different structures and functions of multiple types of cells (e.g., prokaryotic, eukaryotic, plant, animal).<br>• Explain DNA replication, transcription, and translation and evaluate the effect that mutations (changes) have on the cell cycle.<br>• Differentiate between mitosis and meiosis and describe the role of each process in genetic variation and reproduction.<br>• Analyze factors that affect enzyme activity (e.g., pH and temperature) and their effects on chemical reactions.<br>• Explain the relationship between photosynthesis and cellular respiration, identifying the components and functions of each process.<br>• Analyze the properties of water and their significance in creating a life-sustaining environment on Earth. |

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| **Molecular and Cellular Biology**<br>See Florida State Academic Standards **SC.912.L.14.1** [SC.912.N.1.3, SC.912.N.2.1, SC.912.N.3.1, SC.912.N.3.4]; **SC.912.L.14.3** [SC.912.L.14.2]; **SC.912.L.16.3** [SC.912.L.16.4, SC.912.L.16.5, SC.912.L.16.9]; **SC.912.L.16.17** [SC.912.L.16.8, SC.912.L.16.14, SC.912.L.16.16]; **SC.912.L.18.1** [SC.912.L.18.11]; **SC.912.L.18.9** [SC.912.L.18.7, SC.912.L.18.8, SC.912.L.18.10]; **SC.912.L.18.12**; and **SC.912.N.1.1** [SC.912.N.1.4, SC.912.N.1.6, SC.912.L.14.4]. | | | |
|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| | moderation, expansion upon freezing, versatility as a solvent). | • Explain the properties of water and summarize their significance in creating a life-sustaining environment on Earth. | |
| **Next Steps** | For example, have your learner:<br>• Explore different examples of scientific theories (e.g., cell theory) and laws.<br>• Practice matching cell structures (e.g., cell wall, cell membrane, nucleus, mitochondria) with cell functions.<br>• Create a visual representation to describe the similarities and differences between various cell types (e.g., prokaryotic versus eukaryotic cells; plant versus animal cells).<br>• Practice the base pairing rules and apply them to the concepts of DNA replication (copying DNA), transcription, and translation (the process of creating proteins).<br>• Describe the cell cycle, mitosis, and meiosis.<br>• Recognize that there are molecules that speed up chemical reactions (enzymes).<br>• Practice matching the structure of the major macromolecules (proteins, carbohydrates, lipids, nucleic acids) to their functions. | For example, have your learner:<br>• Explore the development of scientific theories (e.g., cell theory) and laws (e.g., Mendel's laws) in various branches of science.<br>• Explain relationships between cellular structures and their functions.<br>• Explain how DNA is responsible for the characteristics of all living things.<br>• Describe the cell cycle, mitosis, and meiosis and explain how mutations (changes) can lead to cancer.<br>• Demonstrate the role of enzymes as catalysts, with consideration of the effects of pH and temperature on enzyme activity.<br>• Perform investigations that show the relationships between photosynthesis and cellular respiration. | For example, have your learner:<br>• Explore scientific journals, online databases, and reputable sources to describe how ongoing investigations and new information can influence or shape existing theories and laws.<br>• Evaluate what could happen to a cell if specific cellular structures were damaged or missing.<br>• Investigate errors in cellular processes that may result in a disease or disorder.<br>• Predict enzyme activity using graphs and/or experimental results. |

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|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| | • Explain the interrelated nature of photosynthesis and cellular respiration.<br>• Review examples of the connection between the properties of water and life on Earth. | | |



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| **Classification, Heredity, and Evolution**<br>See Florida State Academic Standards **SC.912.L.15.1** [SC.912.L.15.10, SC.912.N.1.3, SC.912.N.1.4, SC.912.N.1.6, SC.912.N.2.1, SC.912.N.3.1, SC.912.N.3.4]; **SC.912.L.15.6** [SC.912.L.15.4, SC.912.L.15.5, SC.912.N.1.3, SC.912.N.1.6]; **SC.912.L.15.8** [SC.912.N.1.3, SC.912.N.1.4, SC.912.N.2.1]; **SC.912.L.15.13** [SC.912.L.15.14, SC.912.L.15.15, SC.912.N.1.3]; **SC.912.L.16.1** [SC.912.L.16.2]; and **SC.912.N.1.1** [SC.912.N.1.4, SC.912.N.1.6]. | | | |
|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| **What These Results Mean** | For example, your learner may be able to:<br>• Use reliable resources to recognize evidence that supports the scientific theory of evolution.<br>• Recognize that living organisms are categorized based on characteristics they have in common.<br>• Recognize explanations of the origin of life on Earth.<br>• Recognize the conditions required for natural selection.<br>• Recognize that genetic variation exists within organisms of the same species.<br>• Recognize that traits are passed from parent to offspring (genetic inheritance). | For example, your learner may be able to:<br>• Use reliable resources to explain evidence that supports the scientific theory of evolution.<br>• Explain how and why organisms are classified (domains and kingdoms) based on evolutionary relationships.<br>• Describe the scientific explanations for the origin of life on Earth.<br>• Describe the conditions necessary for natural selection.<br>• Recognize that mutations and genetic recombination increase genetic variation.<br>• Predict patterns of genetic inheritance (ways that traits can be passed from parent to offspring). | For example, your learner may be able to:<br>• Use reliable resources to evaluate evidence that supports the scientific theory of evolution.<br>• Determine and analyze how and why organisms are classified based on evolutionary relationships.<br>• Analyze the conditions required for natural selection that result in differences in reproductive success.<br>• Explain how mutation and genetic recombination increase genetic variation.<br>• Analyze patterns of genetic inheritance using Mendel's laws (law of segregation, law of independent assortment). |
| **Next Steps** | For example, have your learner:<br>• Explore and explain the different bodies of evidence that support the scientific theory of evolution (fossil records, comparative anatomy and embryology, biogeography, molecular biology, and observed evolutionary change).<br>• Explore the distinguishing characteristics of the kingdoms and domains. | For example, have your learner:<br>• Evaluate examples of the different bodies of evidence that support the scientific theory of evolution (fossil records, comparative anatomy and embryology, biogeography, molecular biology, and observed evolutionary change).<br>• Practice using cladograms and phylogenetic trees to investigate different organisms based on their evolutionary relationships. | For example, have your learner:<br>• Create cladograms and/or phylogenetic trees to demonstrate evolutionary relationships.<br>• Study experiments related to the origin of life (e.g., Miller-Urey's) as well as the chemical processes that can influence the emergence of living organisms.<br>• Relate the concepts of DNA and cell division to patterns of inheritance. |

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| **Classification, Heredity, and Evolution**<br>See Florida State Academic Standards **SC.912.L.15.1** [SC.912.L.15.10, SC.912.N.1.3, SC.912.N.1.4, SC.912.N.1.6, SC.912.N.2.1, SC.912.N.3.1, SC.912.N.3.4]; **SC.912.L.15.6** [SC.912.L.15.4, SC.912.L.15.5, SC.912.N.1.3, SC.912.N.1.6]; **SC.912.L.15.8** [SC.912.N.1.3, SC.912.N.1.4, SC.912.N.2.1]; **SC.912.L.15.13** [SC.912.L.15.14, SC.912.L.15.15, SC.912.N.1.3]; **SC.912.L.16.1** [SC.912.L.16.2]; and **SC.912.N.1.1** [SC.912.N.1.4, SC.912.N.1.6]. | | | |
|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| | • Research various scientific theories and hypotheses regarding the origin of life on Earth.<br>• Explore different conditions (natural selection, genetic drift, and gene flow) that influence changes in organisms over time.<br>• Use Punnett squares and pedigrees to predict complex patterns of inheritance (e.g., dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles). | • Discuss various scientific viewpoints regarding the origin of life on Earth.<br>• Research how and why evolutionary changes occur (e.g., genetic drift, gene flow, nonrandom mating, natural selection).<br>• Research how mutation and genetic recombination increase genetic variation.<br>• Use Mendel's laws of segregation and independent assortment to predict complex patterns of inheritance. | |



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| **Organisms, Populations, and Ecosystems**<br>See Florida State Academic Standards **SC.912.L.14.7**; **SC.912.L.14.26**; **SC.912.L.14.36**; **SC.912.L.14.52** [SC.912.L.14.6]; **SC.912.L.16.10**; **SC.912.L.16.13**; **SC.912.L.17.5** [SC.912.L.17.2, SC.912.L.17.4, SC.912.L.17.8, SC.912.N.1.4]; **SC.912.L.17.9** [SC.912.E.7.1]; **SC.912.L.17.20** [SC.912.L.17.11, SC.912.L.17.13, SC.912.N.1.3]; and **SC.912.N.1.1** [SC.912.N.1.4, SC.912.N.1.6, SC.912.L.14.4]. | | | |
|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| **What These Results Mean** | For example, your learner may be able to:<br>• Identify the basic structures of plant tissues and organs.<br>• Identify basic functions of the immune system and recognize that factors and/or pathogenic agents can affect individual and community health.<br>• Identify the basic anatomy of the human reproductive system and recognize some major changes that occur from fertilization to birth.<br>• Recognize that populations can be positively and/or negatively impacted by seasonal variations, changes in climate, succession, and the amount of biodiversity in an ecosystem.<br>• Recognize that matter and energy move through an ecosystem and that the actions of humans can impact the environment. | For example, your learner may be able to:<br>• Explain how the structures of plant tissues and organs are related to their functions.<br>• Explain the basic physiology of the immune system and the significant factors that may affect individual and community health.<br>• Identify the basic anatomy and physiology of the human reproductive system and describe the major changes that occur from fertilization to birth.<br>• Identify that populations can be positively and/or negatively impacted by seasonal variations, changes in climate, succession, and the amount of biodiversity in an ecosystem.<br>• Trace the movement of matter and energy through an ecosystem and predict how the actions of humans impact the environment. | For example, your learner may be able to:<br>• Relate plant structures to their physiological processes.<br>• Relate how the specific and nonspecific immune responses impact individual health.<br>• Relate human reproductive structures to their functions.<br>• Predict how populations can be positively and/or negatively impacted by seasonal variations, changes in climate, and the amount of biodiversity within an ecosystem.<br>• Analyze the movement of matter and energy through an ecosystem<br>• Analyze how the actions of humans can impact the environment and affect sustainability. |
| **Next Steps** | For example, have your learner:<br>• Practice matching the anatomy (structures) of a plant to their physiology (functions).<br>• Explore factors that affect blood flow through the cardiovascular system (e.g., diet, exercise, and stress).<br>• Explore the basic functions of the immune system (e.g., recovery from a | For example, have your learner:<br>• Determine how the anatomy of plant tissues and organs relate to their physiological processes.<br>• Evaluate case studies or scenarios to determine how specific factors affect blood flow (e.g., diet, exercise, and stress). | For example, have your learner:<br>• Relate plant cellular processes to their physiological processes.<br>• Research topics such as immunological memory and the role of antibodies to explore immune system responses and functions. |

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|---|---|---|---|
| **Indicator** | **Below Expectations** | **On Grade Level** | **Above Expectations** |
| | cold, vaccination response, wound healing).<br>• Practice matching the anatomy of the human reproductive system to its physiology and the major changes that occur from fertilization to birth.<br>• Analyze factors affecting population size, ecosystem changes, and biodiversity (seasonal variations, climate changes, and succession).<br>• Use diagrams to trace matter through biogeochemical cycles (water cycle, carbon cycle).<br>• Describe energy pathways through different trophic levels of a food web or energy pyramid (e.g., producers, primary, secondary, and tertiary consumers). | • Explain non-specific responses (e.g., fever, inflammation) and specific responses (e.g., memory cells, antibodies) to disease.<br>• Relate the anatomy of the human reproductive system to its physiology.<br>• Analyze population data to determine how carrying capacity, changes in population size, or species distribution affect an ecosystem.<br>• Analyze the movement of matter through different biogeochemical cycles and how humans can impact the environment and sustainability.<br>• Use energy pyramids and food webs to determine the amount of energy that moves from one trophic level to the next. | • Research complications that can impact the reproductive system and human development.<br>• Use case studies or real-world examples to relate multiple factors (e.g., seasonal variations, climate changes, and succession) to ecological events. |



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