End-of-Course Biology Test
North Carolina Test Specifications

Overview

The End-of-Course (EOC) biology test measures students' proficiency on the North Carolina Standard Course of Study for Biology (NCSCOS), adopted by the North Carolina State Board of Education (NCSBE) in July 2023. Test results are used for school and district accountability based on state and federal accountability models and reporting requirements.

NCSBE Policy Requirements Regarding End-of-Course Assessments (TEST-003) directs schools to use the results from all operational end-of-course (EOC) assessments as at least twenty percent (20%) of the student's final course grade.

- An exception for the first operational administration in 2024–25 school year, students' final grades for biology will not include the EOC test score [NC Admin Rule 16 06D .0309 (c)(3)] to allow time for standard setting and final adoption of cut scores by NCSBE at the end of summer 2025.

Implementation Cycle

July 2023:	North Carolina State Board of Education adoption of the North Carolina Standard Course of Study for Biology
2023–2024:	New items aligned to 2023 biology standards developed and field tested
2024–2025:	First operational administration of the EOC biology test (Edition 3)

Item Development

In June and July 2024, 118 North Carolina educators were recruited and trained to write new items for end-of-grade science and end-of-course biology tests at in-person workshops. The diversity among item writers and their knowledge of the current standards were addressed during recruitment. Trained North Carolina educators also review items and suggest improvements, if necessary. The use of North Carolina educators to write and review items strengthens content validity evidence of EOC assessments.

For an in-depth explanation of the test development process, see NCSBE Policy TEST-013: Multiple Choice Test Development or reference the Test Development Process: Item, Selection, and Form Development document.

Content Specification

In December 2023, as part of plannings for test specification meetings, the NCDPI sent out a survey to district level and charter school science educators statewide. The purpose of the survey was to collect initial recommendations for content specification and assessment design options; about relative importance of standards; and options on how best to incorporate Science and Engineering Practices (SEPs) into the assessment.

In February 2024, a representative sample of 73 science educators representing the diversity of Public School Units (PSUs) across the State participated in an in-person test specification workshop. During the workshop, participants worked individually then in small groups to provide test blueprint recommendations on the relative importance of each objective and the total ratio of items addressing Disciplinary Core Ideas (DCI) only or DCI and SEPs for each assessment.

The final test blueprints presented in the tables below were derived by summarizing results from a statewide survey and the in-person test specification workshop. Table 1 shows the proposed ranges for the weights and the number of items for the EOC biology tests at the strand level and commonly assessed SEPs. As shown in Table 1, 26% to 34% of the total items in the EOC biology test will come from the From Molecules to Organisms - Structures and Processes strand. These items will most likely be associated with a random combination of higher frequency SEPs listed for the course.

Table 1. EOC biology strand weight distributions

Domain	Strand	Objective	Science and Engineering Practices (Commonly Assessed)	Weight Distribution Range	Operational Item Count Range
Life Science	From Molecules to Organisms – Structures and Processes	Bio.1.1	Higher Frequency • Analyze and Interpret Data • Use Models • Use Mathematics and Computational Thinking • Construct an Explanation • Carry Out an Investigation Lower Frequency • Engage in Argument from Evidence	26–34%	13–17
		Bio.1.2			
		Bio.1.3			
		Bio.1.4			
		Bio.1.5			
		Bio.2.1			
		Bio.2.2			
		Bio.3.1			
		Bio.3.2			
		Bio.3.3			
	Ecosystems – Interactions, Energy, and Dynamics	Bio.4.1		14–22%	7–11
		Bio.4.2			
		Bio.5.1			
		Bio.5.2			
	Heredity – Inheritance and Variation of Traits	Bio.6.1		24–32%	12–16
		Bio.6.2			
		Bio.7.1			
		Bio.7.2			
		Bio.7.3			
		Bio.8.1			
		Bio.8.2			
	Biological Evolution – Unity and Diversity	Bio.9.1		20–28%	10–14
		Bio.9.2			
		Bio.9.3			
		Bio.9.4			
		Bio.10.1			
		Bio.10.2			
Total				**100%**	**50**

Cognitive Complexity Framework

The main DCI statements of the 2023 science standards are defined using the Revised Bloom's Taxonomy (RBT) complexity framework. The addition of SEP with the DCI introduces an additional layer of complexity when attempting to develop test items that are aligned to the full depth of content standards. To best account for both sources of cognitive complexity for item and test development, the NCDPI have adopted an iterative cognitive complexity framework based on Range Achievement Level Descriptors (RALD) combining both DCI and SEP.

During the first step of this iterative process, draft RALDs aligned to 2023 science standards were developed and reviewed by content experts at the North Carolina State University-Technical Outreach for Public Schools (NCSU-TOPS) and NCDPI Test Development. RALDs were written to align to the policy achievement levels at Not Proficient to Level 3, Level 4, and Level 5. The NCDPI then invited a small panel of experienced science educators for an in-person workshop to review and provide additional feedback on the draft RALDs during the second step. At step three of this iterative process, overall feedback from field test item level statistics was used to make additional revisions to RALDs and inform ongoing item alignment. The final step to establish RALDs will occur in summer of 2025 as part of the standard setting workshop. This will be managed and facilitated by an independent subject matter expert with panels of NC science educators.

Once adopted by the NCSBE, the RALDs will serve as the main cognitive complexity framework to evaluate the degree to which items on the EOC biology assessments represent the full depth and breadth of cognitive expectations of content standards.

Table 2 provides the current proposed range of items at each RALD for EOC biology tests. This table will be updated in August 2025 after the NCSBE's formal adoption of the RALDs and associated cut scores.

Table 2. EOC biology test items distribution by RALD

Proposed RALD	**Distribution Range**	**Number of Operational Items Range**
Not Proficient–Level 3	16–26%	8–13
Level 4	50–60%	25–30
Level 5	16–24%	8–12
Total		**50**

Testing Format and Test Administration

The survey and test specification workshop, conducted in December 2023 through February 2024, also provided recommendations for distributions of the DCI and SEPs items. Table 3 shows final recommended distribution of number of items aligned to DCI and the SEPs for each EOC biology test form.

Table 3. EOC biology test items aligned to DCI and SEPs

	DCI Only	**DCI and SEPs**
Percentage of Items	30–50%	50–70%

The EOC biology test will consist of four-response-option multiple-choice and technology-enhanced item types presented as standalone items or as part of an item set. For items presented as part of an item set, students will be provided reference material associated with all questions in the item set. Each item on the test will be worth one point.

Table 4 provides the number of operational and field test items for the EOC biology test. Included in the total item counts are embedded field test items that will not be included as part of students' final scores but will be used for purposes of developing items for future test forms.

Table 4. Item counts for EOC biology test

	Operational			**Field Test**			**Total Items**
	Stand-Alone Items	Items (Item Sets)	Total Operational Items	Stand-Alone Items	Items (Item Set)	Total Field Test Items	
Biology	38–42	8–12 (2)	50	5	5 (1)	10	60

Based on analysis of item-completion timing data, the NCDPI estimates it will take 2 hours (120 minutes) for most students to complete the EOC biology test. The NCDPI requires all students be allowed ample opportunity to complete the test. The maximum amount of time allowed is 3 hours (180 minutes) except for students with documented special needs requiring accommodations, such as *Scheduled Extended Time*. Refer to the *North Carolina Test Coordinators' Policies and Procedures Handbook* on the Testing Policy and Operations webpage for additional information.

Test Cycle and Delivery Mode

The EOC biology test must be administered during the last five days (4x4/semester courses/summer school) or the last ten days (traditional yearlong schedule) of the instructional period.

The EOC biology test is provided only in English. Translated versions in other languages are not available. North Carolina G.S.§115C-81.45(a) requires all teachers and principals to conduct all classes other than foreign language classes in English.

All standard administrations of the EOC biology test must be administered online in NCTest unless a paper format is required for students with a documented accessibility need.

Online tests are provided through NCTest, the NCDPI's online testing platform. Schools must ensure every student participating in an online test for the North Carolina Testing Program completes the online assessment tutorial for the associated test at least once at the school before test day. The tutorial provides students the opportunity to practice the mechanics of navigating through the testing platform, to become familiar with the tools, and to respond to the sample items. Refer to the *North Carolina Test Coordinators' Policies and Procedures Handbook* on the Testing Policy and Operations webpage for additional information.

Supplemental Materials and Additional Resources

Online test read aloud in English is available as a designated feature to assist with the reading load of the biology test items. The online read aloud is computer-generated modulation, not human vocalizations. Students do not need an individualized education plan (IEP) to qualify. The teacher will have to approve the read aloud designated feature for students prior to testing. It is recommended students have routine access to such technology during regular classroom instruction.

Upon request, students should be provided scratch paper and a writing utensil.

Released forms are available on the EOC webpage and through NCTest, the NCDPI's online testing platform. The released form for the EOC biology test was built using the same operational test specifications. A single released form may not reflect the full depth and breadth of course level assessed standards, but it reflects the range of difficulty found on any EOC operational test form. Released items may be used by public school units to acquaint students with items.

The NCTest tutorial page has been updated to include science item set practice and technology-enhanced question sets for grade spans (grade three, grades four and five, middle school, and high school). These practice questions are not included in the Online Assessment Tutorial requirement

and may be accessed via https://data.ncsu.edu/nctest/Tutorial.html#StudentSignIn.

These materials must not be used for personal or financial gain, are copyrighted to the NCDPI, and cannot be uploaded into third-party applications. Released items may be accessed via NCTest by clicking on the released items icon.