

End-of-Grade Science Test at Grades 5 and 8 North Carolina Test Specifications

Overview

The Grades 5 and 8 End-of-Grade (EOG) Science Tests measure students' proficiency on the [North Carolina Standard Course of Study for Science \(NCSCOS\)](#), 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.

Implementation Cycle

| | |
|------------|---|
| July 2023: | North Carolina State Board of Education adoption of the North Carolina Standard Course of Study for Science |
| 2023–2024: | New items aligned to 2023 science standards developed and field tested |
| 2024–2025: | First operational administration of new multistage EOG Science Tests (Edition 3) |

Test Design

The EOG science grades 5 and 8 have been redesigned based on the [North Carolina Personalized Assessment Tool \(NCPAT\)](#) pilot. The EOGs are now multistage fixed adaptive assessments with three levels to enhance measurement precision across the full grade level performance scale. For students with NC Check-Ins 2.0 data, a summary of their performance will be used to assign them to one of the three multistage forms. All other students with no NC Check-Ins 2.0 data will be assigned an equivalent base form. All forms in the multistage EOG are based on content specifications presented in Tables 1–4 and cover the full achievement level performance range from Not Proficient to Level 5.

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 EOG 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 planning 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 and Table 2 show the ranges for the weights and the number of items for the EOG science tests at the domain level and commonly assessed SEPs. As shown in Table 1, 30% to 37% of the total items in the grade 5 EOG science test will come from the Physical Science domain. These items will most likely be associated with a random combination of higher frequency SEPs listed for that grade.

Science and Engineering Practices (Commonly Assessed)

Higher Frequency Grade 5

- Construct an Explanation
- Analyze and Interpret Data
- Use Models
- Use Mathematical and Computational Thinking

Lower Frequency Grade 5

- Ask Questions
- Carry Out an Investigation
- Engage in Argument from Evidence

Higher Frequency Grade 8

- Analyze and Interpret Data
- Use Models
- Construct an Explanation

Lower Frequency Grade 8

- Engage in Argument from Evidence
- Carry Out an Investigation

Table 1. EOG science grade 5 strand weight distributions

| Domain | Strand | Objective | Weight Distribution Range | Operational Item Count Range |
|-------------------------|---|--|----------------------------------|-------------------------------------|
| Physical Science | <ul style="list-style-type: none"> • Matter and its Interactions • Motion and Stability – Forces and Interactions | <ul style="list-style-type: none"> • PS.5.1.1 • PS.5.1.2 • PS.5.1.3 • PS.5.2.1 • PS.5.2.2 | 30–37% | 13–16 |
| Life Science | <ul style="list-style-type: none"> • From Molecules to Organisms – Structures and Processes • Ecosystems – Interactions, Energy, and Dynamics • Heredity – Inheritance and Variation of Traits | <ul style="list-style-type: none"> • LS.5.1.1 • LS.5.1.2 • LS.5.2.1 • LS.5.2.2 • LS.5.2.3 • LS.5.3.1 • LS.5.3.2 | 44–52% | 19–23 |
| Earth and Space Science | Earth’s Systems | <ul style="list-style-type: none"> • ESS.5.1.1 • ESS.5.1.2 • ESS.5.1.3 • ESS.5.1.4 | 18–25% | 8–11 |
| Total | | | 100% | 44 |

Table 2. EOG science grade 8 strand weight distributions

| Domain | Strand | Objective | Weight Distribution Range | Operational Item Count Range |
|-------------------------|--|--|----------------------------------|-------------------------------------|
| Physical Science | Matter and its Interactions | <ul style="list-style-type: none"> • PS.8.1.1 • PS.8.1.2 • PS.8.1.3 • PS.8.1.4 • PS.8.1.5 | 16–22% | 7-10 |
| Life Science | <ul style="list-style-type: none"> • From Molecules to Organisms – Structures and Processes • Ecosystems – Interactions, Energy, and Dynamics • Heredity – Biological Evolution – Unity and Diversity | <ul style="list-style-type: none"> • LS.8.1.1 • LS.8.1.2 • LS.8.2.1 • LS.8.2.2 • LS.8.2.3 • LS.8.2.4 • LS.8.3.1 • LS.8.3.2 | 33–41% | 15-18 |
| Earth and Space Science | <ul style="list-style-type: none"> • Earth’s Place in the Universe • Earth’s Systems • Earth and Human Activity | <ul style="list-style-type: none"> • ESS.8.1.1 • ESS.8.1.2 • ESS.8.2.1 • ESS.8.2.2 • ESS.8.3.1 • ESS.8.3.2 • ESS.8.4.1 • ESS.8.4.2 • ESS.8.4.3 • ESS.8.4.4 | 42–50% | 18–22 |
| Total | | | 100% | 44 |

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 occurred in summer of 2025 as part of the standard setting workshop. This step was managed and facilitated by an independent subject matter expert with panels of NC science educators.

Adopted by the NCSBE, the RALDs serve as the main cognitive complexity framework to evaluate the degree to which items on the science EOG assessments represent the full depth and breadth of cognitive expectations of grade-level content standards.

Table 3 provides the range of items at each RALD for EOG science tests.

Table 3. EOG science grades 5 and 8 items distribution by RALD

| RALD | Weight Distribution Range | Operational Item Count Range |
|------------------------|----------------------------------|-------------------------------------|
| Not Proficient–Level 3 | 11–34% | 5–15 |
| Level 4 | 40–60% | 18–27 |
| Level 5 | 11–34% | 5–15 |
| Total | 100% | 44 |

Test Format and Administration

The survey and test specification workshop, conducted from December 2023 through February 2024, also provided recommendations for distributions of the DCI and SEP items.

EOG percentage of items aligned to DCI and SEPs

- aligned to DCI only 35-50%
- aligned to DCI and SEPs 50-65%

The EOG science tests 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 EOG science tests. 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 future test forms.

Table 4. Item counts for EOG science tests

| Test Design | Grades 5 and 8 |
|-------------------------------|---------------------------|
| Operational Stand-Alone Items | 34 |
| Operational Items (Item Sets) | 10 items (2 item sets) |
| Total Operational Items | 44 |
| Field Test Stand-Alone Items | 3-8 |
| Field Test Items (Item Set) | 0-5 items (0-1 item sets) |
| Total Field Test Items | 8 |
| Total Items | 52 |

Based on analysis of item-completion timing data, the NCDPI estimates it will take 2 hours (120 minutes) for most students to complete the EOG science tests. 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 EOG science tests must be administered during the last ten days of the instructional year (traditional yearlong schedule).

The EOG science tests are 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 EOG science tests 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 science 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.

For the grade 8 EOG science test, an online version of the periodic table will be available in NCTest. Students can also request to have an optional paper version. A sample is available on the [EOG webpage](#).

Released forms are available on the [EOG webpage](#) and through [NCTest](#), the NCDPI's online testing platform. The released forms for the EOG science tests are built using the same operational test specifications. A single released form may not reflect the full depth and breadth of grade level assessed standards, but it reflects the range of difficulty found on a typical EOG 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://go.ncdpi.gov/NCTest>.

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.