NCEXTEND1 Science Alternate Assessment at Grades 5 and 8 North Carolina Test Specifications

Overview

The NCEXTEND1 Science Alternate Assessments at Grades 5 and 8 measure students' proficiency on the North Carolina Extended Content Standards for Science at Grade 5 and Grade 8, adopted by the North Carolina State Board of Education (NCSBE) in July 2023. Assessment results will be 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 Extended Content Standards for Science
- 2024–25: New items aligned to 2023 extended science content standards developed and first operational administration of the NCEXTEND1 Science Alternate Assessments at Grades 5 and 8 (Edition 3)

Item Development

In July 2024, approximately 45 North Carolina educators were recruited and trained to write new items for NCEXTEND1 science and biology tests at in-person workshops. The experience 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 NCEXTEND1 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 February 2024, a representative sample of 56 science educators representing the 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 recommend test blueprint on the

relative importance of each assessable objective and the total proportion of items addressing Disciplinary Core Ideas (DCI) only or DCI and SEPs (Science and Engineering Practices) for each assessment.

The final test blueprints presented in the tables below were derived by summarizing results from the in-person test specification workshop. Table 1 shows the ranges for the weights and the number of operational items for the NCEXTEND1 Science at Grade 5 test by domain and Table 2 shows the ranges for the weights and number of operational items for the NCEXTEND1 Science at Grade 8 test by domain. As shown in Table 1, 25% to 35% of the total items in the NCEXTEND1 science test at grade 5 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

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

Lower Frequency Grade 5

- Ask Questions
- Carry Out an Investigation
- Use Mathematical and Computational Thinking

Higher Frequency Grade 8

- Analyze and Interpret Data
- Use Models

Lower Frequency Grade 8

- Construct an Explanation

Table 1. NCEXTEND1 Science at Grade 5 domain weight distributions.

Domain	Strand	Objective	Weight Distribution Range	Operational Item Count Range
Physical Science	• Matter and its Interactions • Motion and Stability – Forces and Interactions	ECS.PS.5.1.2 ECS.PS.5.1.3 ECS.PS.5.2.1	25–35%	5–7
Life Science	• From Molecules to Organisms – Structures and Processes • Ecosystems – Interactions, Energy, and Dynamics	ECS.LS.5.1.1 ECS.LS.5.1.2 ECS.LS.5.2.1 ECS.LS.5.2.2	40–50%	8–10
Earth and Space Science	Earth's Systems	ECS.EES.5.1.1 ECS.EES.5.1.2 ECS.EES.5.1.4	25–35%	5–7
Total	–	–	**100%**	**20**

Table 2. NCEXTEND1 Science at Grade 8 domain weight distributions.

Domain	Strand	Objective	Weight Distribution Range	Operational Item Count Range
Physical Science	Matter and its Interactions	ECS.PS.8.1.1 ECS.PS.8.1.2 ECS.PS.8.1.3	20–30%	5–8
Life Science	• From Molecules to Organisms – Structures and Processes • Ecosystems – Interactions, Energy, and Dynamics	ECS.LS.8.1.1 ECS.LS.8.2.1 ECS.LS.8.2.2 ECS.LS.8.2.4	35–45%	8–11
Earth and Space Science	• Earth's Place in the Universe • Earth's Systems • Earth and Human Activity	ECS.ESS.8.1.2 ECS.ESS.8.2.1 ECS.ESS.8.3.1 ECS.ESS.8.4.1	35–45%	8–11
Total	–	–	**100%**	**25**

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 Science and Engineering Practices (SEPs) with the Disciplinary Core Ideas (DCIs) introduces an additional layer of complexity when attempting to develop test items that are aligned to the full depth of NCEXTEND1 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 (RALDs) 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 science measurement

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, Level 3, and Level 4. For the second step in May 2024, the NCDPI invited a panel of approximately 25 experienced science educators from across the state for an in-person workshop to review and provide additional feedback on the draft RALDs. The final step to establish RALDs occurred in summer of 2025 as part of the standard setting workshop. This 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 NCEXTEND1 science assessments represent the full depth and breadth of cognitive expectations of content standards.

Table 3 provides the current range of items at each RALD for NCEXTEND1 science tests.

Table 3. NCEXTEND1 Science at Grades 5 and 8 test items distribution by RALD.

Grade	RALD	Distribution Range	Number of Operational Items Range
5	Not Proficient–Level 3	50–60%	10–12
5	Level 4	40–50%	8–10
5	**Total**	**100%**	**20**
8	Not Proficient–Level 3	50–60%	12–15
8	Level 4	40–50%	10–13
8	**Total**	**100%**	**25**

Testing Format and Test Administration

The NCEXTEND1 Science Alternate Assessments at Grades 5 and 8 are teacher-facilitated online assessments that are administered individually to each student. There are three administration options available. The Individualized Education Program (IEP) team determines, based on the individual needs of the student, which of the following options is most appropriate:

- Option 1: teacher-facilitated online with the student recording responses on the device,
- Option 2: teacher-facilitated online with the teacher recording the student's responses on the device, or
- Option 3: teacher-facilitated online with paper test cards and the teacher recording the student's responses on the device.

All test items are three-response-option multiple-choice items presented as standalone items or as part of an item set. For items presented as part of an item set, students will be provided with reference material associated with all questions in the item set.

For each question, a student will have up to two attempts to provide the correct response. All multiple-choice items are presented with three answer choices. If the student does not provide the correct answer on the first attempt, the incorrect answer they selected is removed from the choices and the question is presented again with the remaining two response options during the second attempt. If the question is answered correctly in the first attempt, it is worth two points. If the question is answered correctly in the second attempt, it is worth one point.

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

NCEXTEND1 percentage of items aligned to DCI and SEPs

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

Table 4 provides final test design with the number of operational and field-test items in the NCEXTEND1 Science at Grades 5 and 8 tests.

Table 4. Item counts for NCEXTEND1 science tests.

Test Design	Grade 5	Grade 8
Operational Stand-Alone Items	14	19
Operational Items (Item Sets)	6 items (2 item sets)	6 items (2 item sets)
Total Operational Items	20	25
Field Test Stand-Alone Items	0–5	0–5
Field Test Items (Item Set)	0–5 items (0–1 item set)	0–5 items (0–1 item set)
Total Field Test Items	5	5

Test Cycle and Delivery Mode

The NCEXTEND1 science tests must be administered during the last ten days (traditional yearlong schedule) of the instructional period. All students indicated as taking the alternate assessment in membership at grades 5 and 8 (according to NC Student Information System) are expected to participate with or without accommodations in the standard administration of the alternate assessment in science.

The NCEXTEND1 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 students are tested online and are expected to complete a practice activity before taking the assessment. The practice activity assists teachers with determining which administration option is most appropriate for their students. The practice activities help students become familiar with the testing platform and provide them with opportunities to practice responding to sample test questions. It is not necessary for students to complete the online practice activity if they will be administered the assessment using only the test cards with the assessor recording the responses on the device.

Supplemental Materials and Additional Resources

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

Released items for the NCEXTEND1 Science Alternate Assessments at Grades 5 and 8 are available on the NCEXTEND1 webpage. The released items for NCEXTEND1 science may not reflect the breadth and depth of standards assessed and/or the range of item difficulty on the NCEXTEND1 assessment.

Released items may be used by public school units to acquaint students with test items. These materials must not be used for personal or financial gain, are copyrighted to the NCDPI, and cannot be uploaded into third-party applications.