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

Purpose of the Tests

- The Grades 5 and 8 End-of-Grade (EOG) Science Tests measure students' proficiency on the North Carolina Essential Standards for Science, adopted by the North Carolina State Board of Education (NCSBE) in February 2010.
- Test results will be used for school and district accountability under the accountability model and for federal reporting purposes.

Curriculum Cycle

- 2010: North Carolina State Board of Education adoption the North Carolina Essential Standards for Science
- 2010–2011: Item development for the EOG Science Tests
- 2011–2012: Administration of stand-alone field tests of the EOG Science Tests
- 2012–2013: First operational administration of the EOG Science Tests (Edition 4)

Standards

- The unifying concepts within each set of essential standards provide a context for teaching both science content and scientific-process skill goals.
- Each essential standard has associated clarifying objectives. The Essential Standards and its clarifying objectives were written using the framework *A Taxonomy for Learning, Teaching, and Assessing—A Revision of Bloom's Taxonomy of Educational Objectives*.
- The Essential Standards for Science for Grades 5 and 8 include content from the three branches of science: Life Science (L), Earth Science (E), and Physical Science (P). The unifying concepts for grades 5 and 8 include:
  - Earth History
  - Earth Systems, Structures and Processes
  - Ecosystems
  - Energy: Conservation and Transfer
  - Evolution and Genetics; and Molecular Biology
  - Forces and Motion
  - Matter: Properties and Change
  - Structures and Functions of Living Organisms

Developing Tests

- North Carolina educators were recruited and trained to write new items. The diversity among the item writers and their knowledge of the current standards was addressed

during recruitment. Trained North Carolina educators also review items and suggest improvements, if necessary. The use of North Carolina educators to develop and review items strengthens the content validity of the items.

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

Prioritization of Standards

- Members of the North Carolina Department of Public Instruction (NCDPI)/Test Development Section invited North Carolina educators to collaborate and develop recommendations for a prioritization of the standards indicating the relative importance of each standard, the anticipated instructional time, and the appropriateness of the standard for test design. Subsequently, curriculum and test development staff from the NCDPI met to review the recommendations from the teacher panels and to adopt final weight distributions across the domains for each grade level. *Tables 1–2* describe the range of total items that will appear on the tests.

Table 1: Weight Distributions for Grade 5 Science

Unifying Concept	**Grade 5 Science**
Forces and Motion	13–15%
Matter: Properties and Change	12–14%
Energy: Conservation and Transfer	11–13%
Earth Systems, Structures and Processes	15–17%
Structures and Functions of Living Organisms	14–16%
Ecosystems	14–16%
Evolution and Genetics	13–15%
Total	**100%**

Table 2: Weight Distributions for Grade 8 Science

Unifying Concept	**Grade 8 Science**
Matter: Properties and Change	14–16%
Energy Conservation and Transfer	10–12%
Earth Systems, Structures and Processes	13–15%
Earth History	11–13%
Structure and Function of Living Organisms	19–23%
Ecosystems	9–11%
Evolution and Genetics	11–13%
Molecular Biology	8–10%
Total	**100%**

- Appendices A–B show the number of operational items by standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1–2*.

Cognitive Rigor and Item Complexity

- Test items are be designed, developed, and classified to ensure that the cognitive rigor of the operational test forms align to the cognitive complexity and demands of the North Carolina Essential Standards for Science. These items will require students to not only recall information, but also apply concepts and skills and make decisions.

Testing Structure and Test Administration Time

- Included in the total item counts are embedded field test items that will not be included in the score but will be used for purposes of developing items for future test forms.

Grade Level	Number of Operational Items	Number of Field Test Items	Total Number of Items
Grade 5 Science	60	5	65
Grade 8 Science	60	5	65

- The EOG Science Tests are not designed as speeded or power tests. Students should have enough time to show what they know and are able to do. Thus, test administration times are based on analysis from item completion timing data. The NCDPI has estimated it will take about 2 hours (120 minutes) for most students to complete the Grades 5 and Grades 8 EOG Science Tests. The NCDPI requires all students be allowed ample opportunity to complete the test. The maximum amount of time allowed for regular administration 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*.

Types of Items and Supplemental Materials

- The EOG Science Tests consist of four-response-option multiple-choice items and technology-enhanced items (online administration only). All items will be worth one point each.
- Students taking the Grade 8 EOG Science Test will receive a periodic table of the elements to reference (a sample is available on the EOG webpage). All students must be provided blank paper.
- Released forms are available on the EOG webpage and through NCTest, the NCDPI's online testing platform. The released forms are built using the same operational test specifications. A single released form may not reflect the full breadth and depth of grade level assessed standards, but it reflects the range of difficulty found on any EOG operational test form.
    - Released items may be used by Public School Units to help acquaint students with items. These materials must not be used for personal or financial gain.

Test Cycle and Delivery Mode

- The EOG tests must be administered during the last ten days of the school year. All

students in membership at grades 5 and 8 (according to PowerSchool) are expected to participate with or without accommodations in the standard administration of the EOG tests. Refer to the *North Carolina Test Coordinators' Policies and Procedures Handbook* for exceptions.

- The Grades 5 and 8 EOG Science Tests are designed for an online administration. Online test are delivered through NCTest, the NCDPI's online testing platform. Paper/pencil versions of all online tests, including required online administrations, are available for technology hardship situations and for students with disabilities who need to test in the paper mode for accessibility.
- 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* for additional information.
- The EOG tests are only provided in English. Native language translation versions are not available. North Carolina G.S.§115C-81.45(a) requires all teachers and principals to conduct classes except foreign language classes in English.

Additional Resources

- Achievement level information is available on the EOG webpage.
- Sample Individual Student Reports are available on the NCDPI Individual Student Reports (ISR) webpage.

Appendix A

Grade 5 Science Number of Operational Items by Clarifying Objective

The following table shows the approximate number of operational items for each clarifying objective. Note that future coverage of objectives could vary within the constraints of the content category weights in *Tables 1–2*. Some objectives not designated with tested items (i.e., "—") may be a prerequisite standard, may be tested within the context of another standard or may be included as an embedded field test item.

Grade 5 Science Objective	Number of Operational Items by Objective
Forces and Motion 5.P.1.1	3–4
5.P.1.2	3–4
5.P.1.3	1–2
5.P.1.4	0–1
Matter: Properties and Change 5.P.2.1	4–7
5.P.2.2	1–2
5.P.2.3	2–3
Energy: Conservation and Transfer 5.P.3.1	1–4
5.P.3.2	2–5
Earth Systems, Structures and Processes 5.E.1.1	2–3
5.E.1.2	3–5
5.E.1.3	4–6
Structures and Functions of Living Organisms 5.L.1.1	4–5
5.L.1.2	5–6
Ecosystems 5.L.2.1	1–2
5.L.2.2	3–4
5.L.2.3	4–6
Evolution and Genetics 5.L.3.1	2–4
5.L.3.2	4–6

Appendix B

Grade 8 Science Number of Operational Items by Clarifying Objective

The following table shows the approximate number of operational items for each clarifying objective. Note that future coverage of objectives could vary within the constraints of the content category weights in *Tables 1–2*. Some objectives not designated with tested items (i.e., "—") may be a prerequisite objective, may be tested within the context of another objective or may be included as an embedded field test item.

Grade 8 Science Objective	Number of Operational Items by Objective
Matter: Properties and Change 8.P.1.1	2
8.P.1.2	2–3
8.P.1.3	2
8.P.1.4	3
Energy: Conservation and Transfer 8.P.2.1	2–3
8.P.2.2	3–4
Earth Systems, Structures and Processes 8.E.1.1	2–4
8.E.1.2	2–3
8.E.1.3	1–3
8.E.1.4	0–1
Earth History 8.E.2.1	2–3
8.E.2.2	4–5
Structures and Functions of Living Organisms 8.L.1.1	3–4
8.L.1.2	1–3
8.L.2.1	4–6
Ecosystems 8.L.3.1	1
8.L.3.2	2–3
8.L.3.3	2–4
Evolution and Genetics 8.L.4.1	4
8.L.4.2	3–4
Molecular Biology 8.L.5.1	2–3
8.L.5.2	1–3