

Essential Standards for Science

North Carolina Assessment Specifications Summary

Grades 5 and 8 Assessments

High School Biology Assessments

Purpose of the Assessments

- Edition 4 Grades 5 and 8 science assessments and the High School Biology assessments will measure students' proficiency on the Essential Standards for Science, adopted by the North Carolina State Board of Education in February 2009.
- Assessment results will be used for school and district accountability under the North Carolina ABCs Program and for Adequate Yearly Progress (AYP) according to the *No Child Left Behind Act* of 2001.

Curriculum Cycle	
February 2009:	North Carolina State Board of Education adoption of the Essential Standards for Science
2010–2011:	Item development for the Next Generation of Assessments, Edition 4
2011–2012:	Administration of stand-alone field tests of Edition 4 assessments
2012–2013:	Operational administration of Edition 4 aligned to the Essential Standards for Science

Standards

- The Essential Standards for Science are posted at:
<http://www.ncpublicschools.org/acre/standards/new-standards/> .
- Grades 5 and 8 and High School have a set of content standards.
- 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 (RBT)*.
- The unifying concepts within each set of essential standards provide a context for teaching both science content and scientific-process skill goals.
- The Essential Standards for Science for Grades 5 and 8 were written to include content from each of the three branches of science: Life (L), Earth (E), and Physical (P). The unifying concepts for Grades 5 and 8 include:
 - Forces and Motion;
 - Matter, Properties and Change;
 - Energy: Conservation and Transfer;
 - Earth Systems, Structures, and Processes;
 - Earth History;
 - Structures and Functions of Living Organisms;
 - Ecosystems;
 - Evolution and Genetics; and
 - Molecular Biology.

- The Essential Standards for Biology was written to provide deeper understanding of life science content learned throughout Grades K–8. The unifying concepts for Biology include:
 - Structure and Function of Living Organisms,
 - Ecosystems,
 - Evolution and Genetics, and
 - Molecular Biology.

Prioritization of Standards

- The North Carolina Department of Public Instruction invited teachers 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 a multiple-choice item format. Subsequently, curriculum and test development staff from the North Carolina Department of Public Instruction met to review the results from the teacher panels and to develop weight distributions across the domains for each grade level. See Tables 1–3.

Table 1
Weight Distributions for Grade 5

Unifying Concept	Grade 5
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

Unifying Concept	Grade 8
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%

Table 3
Weight Distributions for Biology

Unifying Concept	Biology
Structure and Function of Living Organisms	18–22%
Ecosystems	18–22%
Evolution and Genetics	43–53%
Molecular Biology	15–19%
Total	100%

Cognitive Rigor and Item Complexity

- Assessment items will 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.

Types of Items

- The Grades 5 and 8 science and High School Biology assessments will consist of four-response-option multiple-choice items and technology-enhanced items. *NCEXTEND2* assessments will consist of three-response-option multiple-choice items and technology-enhanced items.
- The *NCEXTEND1* alternate assessments for science will consist of fifteen performance-based, multiple choice items.
- The Grade 8 End-of-Grade (EOG) and Grade 8 *NCExtend2* Science assessments require access to a periodic table of the elements. It can be downloaded at <http://www.ncpublicschools.org/accountability/testing/eog/science/>

Delivery Mode

- Grades 5 and 8 science assessments will be designed for an online administration but will also be available in a paper/pencil version.
- The High School Biology assessment will be designed for an online administration but will also be available in a paper/pencil version.
- *NCEXTEND2* is an alternate assessment for students with disabilities whose IEP specifies an assessment aligned to the general content standards but based on modified academic achievement standards. The *NCEXTEND2* science assessments will closely follow the weightings of the standards on the general assessments. The Grades 5 and 8 *NCEXTEND2* and the High School *NCEXTEND2* science assessments will be designed for online administrations.
- *NCEXTEND1* is an alternate assessment designed for students with significant cognitive disabilities whose IEP specifies an assessment aligned to the North Carolina Extended Essential Standards for Science and based on alternate academic achievement standards. The *NCEXTEND1* science assessments will be designed for paper/pencil administrations with online data entry by the assessor.