



# *NC Standard Course of Study (NCSCS) for Mathematics*

## **End-of-Grade Grades 3–8 Math Assessments**

## **End-of-Course Math I Assessment**

## **North Carolina Assessment Specifications**

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### **Purpose of the Assessments**

- Edition 4 grades 3–8 mathematics assessments and the Math I assessment will measure students' proficiency on the *NC Standard Course of Study (NCSCS) for Mathematics*, adopted by the North Carolina State Board of Education in June 2010.
- Assessment results will be used for school and district accountability under the READY Accountability Model and for Federal reporting purposes.

### **Curriculum Cycle**

- June 2010: North Carolina State Board of Education adoption of the NCSCS
- 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 assessments aligned to the NCSCS

### **Standards**

- The NCSCS may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccess.ncdpi.wikispaces.net>
- North Carolina will teach and assess a common set of standards for the first-year high school course of mathematics, Math I
- The eight Standards for Mathematical Practice help develop processes and proficiencies in students such as problem solving, reasoning, proof, communication, representations, and connections as well as conceptual understanding and procedural fluency. Test items that are developed for content standards may link to one or more of the Standards for Mathematical Practice.
- The End-of-Course Assessment of Math I is the only high school math EOC assessment available. All high school students are transitioning to Math I, II and III.

### Prioritization of Standards

- The North Carolina Department of Public Instruction invited teachers to collaborate and develop recommendations for a prioritization of standards indicating the relative importance of each standard, the anticipated instructional time, and the appropriateness of the standard for a multiple-choice or gridded-response 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 below.
- Some content standards in the NCSCS will not be directly assessed in the Edition 4 test because either (1) the standard cannot be appropriately assessed during a limited time assessment using multiple-choice and/or gridded-response items or (2) the standard is better assessed through another, more inclusive standard.

*Table 1: Weight Distributions for Grades 3–5*

| <b>Domain</b>                     | <b>Grade 3</b> | <b>Grade 4</b> | <b>Grade 5</b> |
|-----------------------------------|----------------|----------------|----------------|
| Operations and Algebraic Thinking | 30–35%         | 12–17%         | 5–10%          |
| Number and Operations in Base Ten | 5–10%          | 22–27%         | 22–27%         |
| Number and Operations—Fractions   | 20–25%         | 27–32%         | 47–52%         |
| Measurement and Data              | 22–27%         | 12–17%         | 10–15%         |
| Geometry                          | 10–15%         | 12–17%         | 2–7%           |
| <b>Total</b>                      | <b>100%</b>    | <b>100%</b>    | <b>100%</b>    |

*Table 2: Weight Distributions for Grades 6–8*

| <b>Domain</b>                         | <b>Grade 6</b> | <b>Grade 7</b> | <b>Grade 8</b> |
|---------------------------------------|----------------|----------------|----------------|
| Ratios and Proportional Relationships | 12–17%         | 22–27%         | NA             |
| The Number System                     | 27–32%         | 7–12%          | 2–7%           |
| Expressions and Equations             | 27–32%         | 22–27%         | 27–32%         |
| Functions                             | NA             | NA             | 22–27%         |
| Geometry                              | 12–17%         | 22–27%         | 20–25%         |
| Statistics and Probability            | 7–12%          | 12–17%         | 15–20%         |
| <b>Total</b>                          | <b>100%</b>    | <b>100%</b>    | <b>100%</b>    |

*Table 3: Weight Distributions for Math I*

| <b>Conceptual Category</b> | <b>Math I</b> |
|----------------------------|---------------|
| Number and Quantity        | 5–10%         |
| Algebra                    | 25–31%        |
| Functions                  | 35–40%        |
| Geometry                   | 10–15%        |
| Statistics and Probability | 15–20%        |
| <b>Total</b>               | <b>100%</b>   |

### **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 NCSCS for Mathematics. These items will require students to not only recall information, but also apply concepts and skills and make decisions.

### **Types of Items**

- Grades 3 and 4 mathematics assessments will consist of four-response-option multiple-choice items.
- The grades 5–8 mathematics assessments and the Math I assessment will consist of four-response-option multiple-choice items and about twenty percent gridded- response items requiring numerical responses.
- All NCSCS mathematics assessments will include both calculator-active and calculator-inactive sections. One-third to one-half of the grades 3–8 assessments will be comprised of calculator-inactive items; approximately one-third of the high school assessments will be calculator inactive.
- The *NCEXTENDI* mathematics alternate assessments will consist of fifteen performance-based, multiple-choice items.
- Appendices A-G show the number of operational items for each standard administered on the 2014-15 assessments. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*.

### **Delivery Mode**

- Grades 3- 8 mathematics assessments will be designed for paper/pencil administrations. The Grade 7 mathematics assessment will also be available for online administration during the 2014-15 spring administration.
- The Math I assessment will be available for online and paper/pencil administrations.
- *NCEXTENDI* is an alternate assessment designed for students with significant cognitive disabilities whose IEP specifies an assessment aligned to the Extended Content Standards and based on alternate academic achievement standards. The *NCEXTENDI* mathematics assessments will be designed for paper/pencil administrations with online data entry by the assessor. The Extended Content Standards may be reviewed at <http://www.ncpublicschools.org/acre/standards/extended/>.

**Appendix A**  
**Grade 3 Math**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Grade 3 Math                      | Number of Items Per Standard* |
|-----------------------------------|-------------------------------|
| Operations and Algebraic Thinking |                               |
| 3.OA.1                            | –                             |
| 3.OA.2                            | –                             |
| 3.OA.3                            | 2                             |
| 3.OA.4                            | 2                             |
| 3.OA.5                            | 3                             |
| 3.OA.6                            | –                             |
| 3.OA.7                            | –                             |
| 3.OA.8                            | 4                             |
| 3.OA.9                            | 3                             |
| Number and Operations in Base Ten |                               |
| 3.NBT.1                           | 1                             |
| 3.NBT.2                           | 2                             |
| 3.NBT.3                           | 1                             |
| Number and Operations-Fractions   |                               |
| 3.NF.1                            | 3                             |
| 3.NF.2                            | 4                             |
| 3.NF.3                            | 3                             |
| Measurement and Data              |                               |
| 3.MD.1                            | 1                             |
| 3.MD.2                            | 1                             |
| 3.MD.3                            | 2                             |
| 3.MD.4                            | 1                             |
| 3.MD.5                            | –                             |
| 3.MD.6                            | –                             |
| 3.MD.7                            | 3                             |
| 3.MD.8                            | 3                             |
| Geometry                          |                               |
| 3.G.1                             | 2                             |
| 3.G.2                             | 3                             |

\* Some standards 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.

**Appendix B**  
**Grade 4 Math**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Grade 4 Math                      | Number of Items Per Standard* |
|-----------------------------------|-------------------------------|
| Operations and Algebraic Thinking |                               |
| 4.OA.1                            | –                             |
| 4.OA.2                            | 3                             |
| 4.OA.3                            | 2                             |
| 4.OA.4                            | 1                             |
| 4.OA.5                            | 1                             |
| Number and Operations in Base Ten |                               |
| 4.NBT.1                           | –                             |
| 4.NBT.2                           | 2                             |
| 4.NBT.3                           | 3                             |
| 4.NBT.4                           | 2                             |
| 4.NBT.5                           | 2                             |
| 4.NBT.6                           | 2                             |
| Number and Operations-Fractions   |                               |
| 4.NF.1                            | 3                             |
| 4.NF.2                            | 1                             |
| 4.NF.3                            | 3                             |
| 4.NF.4                            | 3                             |
| 4.NF.5                            | 1                             |
| 4.NF.6                            | 1                             |
| 4.NF.7                            | 1                             |
| Measurement and Data              |                               |
| 4.MD.1                            | 2                             |
| 4.MD.2                            | 1                             |
| 4.MD.3                            | 1                             |
| 4.MD.4                            | 1                             |
| 4.MD.5                            | –                             |
| 4.MD.6                            | 1                             |
| 4.MD.7                            | 1                             |
| Geometry                          |                               |
| 4.G.1                             | 2                             |
| 4.G.2                             | 2                             |
| 4.G.3                             | 2                             |

\* Some standards 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.

**Appendix C**  
**Grade 5 Math**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Grade 5 Math                                 | Number of Items Per Standard* |
|--|-------------------------------|
| Operations and Algebraic Thinking<br>5.OA.1  | 1                             |
| 5.OA.2                                       | 1                             |
| 5.OA.3                                       | 1                             |
| Number and Operations in Base Ten<br>5.NBT.1 | –                             |
| 5.NBT.2                                      | 1                             |
| 5.NBT.3                                      | 1                             |
| 5.NBT.4                                      | 1                             |
| 5.NBT.5                                      | 1                             |
| 5.NBT.6                                      | 3                             |
| 5.NBT.7                                      | 4                             |
| Number and Operations-Fractions<br>5.NF.1    | 3                             |
| 5.NF.2                                       | 4                             |
| 5.NF.3                                       | 3                             |
| 5.NF.4                                       | 5                             |
| 5.NF.5                                       | –                             |
| 5.NF.6                                       | 3                             |
| 5.NF.7                                       | 4                             |
| Measurement and Data<br>5.MD.1               | 2                             |
| 5.MD.2                                       | 1                             |
| 5.MD.3                                       | –                             |
| 5.MD.4                                       | –                             |
| 5.MD.5                                       | 3                             |
| Geometry<br>5.G.1                            | –                             |
| 5.G.2  | 1                             |
| 5.G.3  | –                             |
| 5.G.4  | 1                             |

\* Some standards 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.

**Appendix D**  
**Grade 6 Math**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Grade 6 Math                          | Number of Items Per Standard* |
|---------------------------------------|-------------------------------|
| Ratios and Proportional Relationships |                               |
| 6.RP.1                                | –                             |
| 6.RP.2                                | –                             |
| 6.RP.3                                | 7                             |
| The Number System                     |                               |
| 6.NS.1                                | 3                             |
| 6.NS.2                                | –                             |
| 6.NS.3                                | 5-6                           |
| 6.NS.4                                | 1                             |
| 6.NS.5                                | –                             |
| 6.NS.6                                | 1                             |
| 6.NS.7                                | 2-3                           |
| 6.NS.8                                | 2                             |
| Expressions and Equations             |                               |
| 6.EE.1                                | 2                             |
| 6.EE.2                                | 2                             |
| 6.EE.3                                | 4                             |
| 6.EE.4                                | –                             |
| 6.EE.5                                | –                             |
| 6.EE.6                                | 2                             |
| 6.EE.7                                | 3                             |
| 6.EE.8                                | 1                             |
| 6.EE.9                                | 1                             |
| Geometry                              |                               |
| 6.G.1                                 | 2                             |
| 6.G.2                                 | 2                             |
| 6.G.3                                 | 2                             |
| 6.G.4                                 | 2                             |
| Statistics and Probability            |                               |
| 6.SP.1                                | –                             |
| 6.SP.2                                | –                             |
| 6.SP.3                                | –                             |
| 6.SP.4                                | 2                             |
| 6.SP.5                                | 3                             |

\* Some standards 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.

**Appendix E**  
**Grade 7 Math**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Grade 7 Math                          | Number of Items Per Standard* |
|---------------------------------------|-------------------------------|
| Ratios and Proportional Relationships |                               |
| 7.RP.1                                | 3                             |
| 7.RP.2                                | 5                             |
| 7.RP.3                                | 5                             |
| The Number System                     |                               |
| 7.NS.1                                | –                             |
| 7.NS.2                                | –                             |
| 7.NS.3                                | 5                             |
| Expressions and Equations             |                               |
| 7.EE.1                                | 3                             |
| 7.EE.2                                | –                             |
| 7.EE.3                                | 4                             |
| 7.EE.4                                | 6                             |
| Geometry                              |                               |
| 7.G.1                                 | 2                             |
| 7.G.2                                 | 1                             |
| 7.G.3                                 | 1                             |
| 7.G.4                                 | 3                             |
| 7.G.5                                 | 2                             |
| 7.G.6                                 | 3                             |
| Statistics and Probability            |                               |
| 7.SP.1                                | 1                             |
| 7.SP.2                                | –                             |
| 7.SP.3                                | –                             |
| 7.SP.4                                | 3                             |
| 7.SP.5                                | –                             |
| 7.SP.6                                | –                             |
| 7.SP.7                                | 1                             |
| 7.SP.8                                | 2                             |

\* Some standards 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.



**Appendix F**  
**Grade 8 Math**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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.

The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Grade 8 Math               | Number of Items Per Standard* |
|----------------------------|-------------------------------|
| The Number System          |                               |
| 8.NS.1                     | 1                             |
| 8.NS.2                     | 2                             |
| Expressions and Equations  |                               |
| 8.EE.1                     | 1                             |
| 8.EE.2                     | 1                             |
| 8.EE.3                     | 1                             |
| 8.EE.4                     | 1                             |
| 8.EE.5                     | 4                             |
| 8.EE.6                     | 2                             |
| 8.EE.7                     | 3                             |
| 8.EE.8                     | 3                             |
| Functions                  |                               |
| 8.F.1                      | 1                             |
| 8.F.2                      | 3                             |
| 8.F.3                      | 2                             |
| 8.F.4                      | 4                             |
| 8.F.5                      | 2                             |
| Geometry                   |                               |
| 8.G.1                      | –                             |
| 8.G.2                      | –                             |
| 8.G.3                      | 2                             |
| 8.G.4                      | –                             |
| 8.G.5                      | 2                             |
| 8.G.6                      | –                             |
| 8.G.7                      | 3                             |
| 8.G.8                      | 2                             |
| 8.G.9                      | 2                             |
| Statistics and Probability |                               |
| 8.SP.1                     | 2                             |
| 8.SP.2                     | 3                             |
| 8.SP.3                     | 2                             |
| 8.SP.4                     | 1                             |

\* Some standards 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.

**Appendix G**  
**Math I**  
**Number of Items by Standard**

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards 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. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at <http://maccss.ncdpi.wikispaces.net>.

| Math I  | Number of Items Per Standard* |
|---|-------------------------------|
| The Real Number System<br>N-RN.1                              | –                             |
| N-RN.2  | 2                             |
| Quantities<br>N-Q.1   | 1                             |
| N-Q.2   | –                             |
| N-Q.3   | –                             |
| Seeing Structure in Expressions<br>A-SEE.1                    | –                             |
| A-SEE.2   | 1                             |
| A-SEE.3   | 0-1                           |
| Arithmetic with Polynomials & Rational Expressions<br>A-APR.1 | 1                             |
| Creating Equations<br>A-CED.1                                 | 4                             |
| A-CED.2   | 2                             |
| A-CED.3   | 2                             |
| A-CED.4   | 1-2                           |
| Reasoning with Equations & Inequalities<br>A-REI.1            | –                             |
| A-REI.3   | –                             |
| A-REI.5   | –                             |
| A-REI.6   | 1                             |
| A-REI.10  | –                             |
| A-REI.11  | 1                             |
| A-REI.12  | 1                             |

\* Some standards 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.

**Appendix G (continued)**  
**Math I**  
**Number of Items by Standard**

| Math I   | Number of Items Per Standard* |
|--|-------------------------------|
| Interpreting Functions                         |                               |
| F-IF.1   | –                             |
| F-IF.2   | 1-2                           |
| F-IF.3   | –                             |
| F-IF.4   | 1-2                           |
| F-IF.5   | 0-1                           |
| F-IF.6   | 1-2                           |
| F-IF.7   | 1                             |
| F-IF.8   | 2-3                           |
| F-IF.9   | 1                             |
| Building Functions                             |                               |
| F-BF.1   | 2-3                           |
| F-BF.2   | 0-1                           |
| F-BF.3   | 1                             |
| Linear, Quadratic, & Exponential Models        |                               |
| F-LE.1   | 1-2                           |
| F-LE.2   | 1                             |
| F-LE.3   | 1                             |
| F-LE.5   | 1                             |
| Congruence                                     |                               |
| G-CO.1   | –                             |
| Expressing Geometric Properties with Equations |                               |
| G-GPE.4  | 1                             |
| G-GPE.5  | 1                             |
| G-GPE.6  | 1                             |
| G-GPE.7  | 1                             |
| Geometric Measurement & Dimension              |                               |
| G-GMD.1  | –                             |
| G-GMD.3  | 1                             |
| Interpreting Categorical & Quantitative Data   |                               |
| S-ID.1   | –                             |
| S-ID.2   | 1                             |
| S-ID.3   | 1-2                           |
| S-ID.5   | 2                             |
| S-ID.6   | 1                             |
| S-ID.7   | 1                             |
| S-ID.8   | 1-2                           |
| S-ID.9   | –                             |

\* Some standards 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.