



North Carolina Department of Public Instruction

# INSTRUCTIONAL SUPPORT TOOLS

FOR ACHIEVING NEW STANDARDS

## **1<sup>st</sup> Grade Mathematics • Unpacked Contents**

For the new Standard Course of Study that will be effective in all North Carolina schools in the 2018-19 School Year.

This document is designed to help North Carolina educators teach the 1<sup>st</sup> Grade Mathematics Standard Course of Study. NCDPI staff are continually updating and improving these tools to better serve teachers and districts.

### **What is the purpose of this document?**

The purpose of this document is to increase student achievement by ensuring educators understand the expectations of the new standards. This document may also be used to facilitate discussion among teachers and curriculum staff and to encourage coherence in the sequence, pacing, and units of study for grade-level curricula. This document, along with on-going professional development, is one of many resources used to understand and teach the NC SCOS.

### **What is in the document?**

This document includes a detailed clarification of each standard in the grade level along with a *sample* of questions or directions that may be used during the instructional sequence to determine whether students are meeting the learning objective outlined by the standard. These items are included to support classroom instruction and are not intended to reflect summative assessment items. The examples included may not fully address the scope of the standard. The document also includes a table of contents of the standards organized by domain with hyperlinks to assist in navigating the electronic version of this instructional support tool.

### **How do I send Feedback?**

Please send feedback to us at [feedback@dpi.state.nc.us](mailto:feedback@dpi.state.nc.us) and we will use your input to refine our unpacking of the standards. Thank You!

### **Just want the standards alone?**

You can find the standards alone at <http://www.ncpublicschools.org/curriculum/mathematics/scos/>.

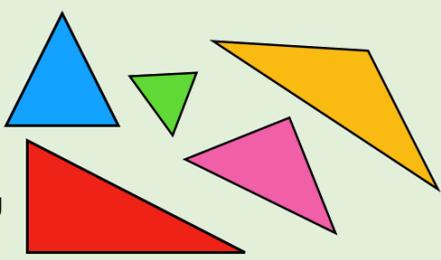
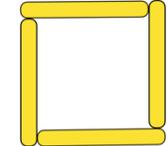
## Standards for Mathematical Practice

| Practice  | Explanation and Example  |
|---|--|
| 1. Make sense of problems and persevere in solving them.            | Mathematically proficient students in First Grade continue to develop the ability to focus attention, test hypotheses, take reasonable risks, remain flexible, try alternatives, exhibit self-regulation, and persevere (Copley, 2010). As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, First Grade students become conscious of what they know and how they solve problems. They make sense of task-type problems, find an entry point or a way to begin the task, and are willing to try other approaches when solving the task. They ask themselves, “Does this make sense?” First Grade students’ conceptual understanding builds from their experiences in Kindergarten as they continue to rely on concrete manipulatives and pictorial representations to solve a problem, eventually becoming fluent and flexible with mental math as a result of these experiences.   |
| 2. Reason abstractly and quantitatively.                            | Mathematically proficient students in First Grade recognize that a number represents a specific quantity. They use numbers and symbols to represent a problem, explain thinking, and justify a response. For example, when solving the problem: “ <i>There are 60 children on the playground. Some children line up. There are 20 children still on the playground. How many children lined up?</i> ” first grade students may write $20 + 40 = 60$ to indicate a Think-Addition strategy. Other students may illustrate a counting-on by tens strategy by writing $20 + 10 + 10 + 10 + 10 = 60$ . The numbers and equations written illustrate the students’ thinking and the strategies used, rather than how to simply compute, and how the story is decontextualized as it is represented abstractly with symbols.   |
| 3. Construct viable arguments and critique the reasoning of others. | Mathematically proficient students in First Grade continue to develop their ability to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Their understanding of grade appropriate vocabulary helps them to construct viable arguments about mathematics. For example, when justifying why a particular shape isn’t a square, a first grade student may hold up a picture of a rectangle, pointing to the various parts, and reason, “It can’t be a square because, even though it has 4 sides and 4 angles, the sides aren’t all the same size.” In a classroom where risk-taking and varying perspectives are encouraged, mathematically proficient students are willing and eager to share their ideas with others, consider other ideas proposed by classmates, and question ideas that don’t seem to make sense.   |
| 4. Model with mathematics.  | Mathematically proficient students in First Grade model real-life mathematical situations with a number sentence or an equation, and check to make sure that their equation accurately matches the problem context. They also use tools, such as tables, to help collect information, analyze results, make conclusions, and review their conclusions to see if the results make sense and revising as needed.   |
| 5. Use appropriate tools strategically.                             | Mathematically proficient students in First Grade have access to a variety of concrete (e.g. 3-dimensional solids, ten frames, number balances, number lines) and technological tools (e.g., virtual manipulatives, calculators, interactive websites) and use them to investigate mathematical concepts. They select tools that help them solve and/or illustrate solutions to a problem. They recognize that multiple tools can be used for the same problem- depending on the strategy used. For example, a child who is in the counting stage may choose connecting cubes to solve a problem. While, a student who understands parts of number, may solve the same problem using ten-frames to decompose numbers rather than using individual connecting cubes. As the teacher provides numerous opportunities for students to use educational materials, first grade students’ conceptual understanding and higher-order thinking skills are developed.   |
| 6. Attend to precision.   | Mathematically proficient students in First Grade attend to precision in their communication, calculations, and measurements. They are able to describe their actions and strategies clearly, using grade-level appropriate vocabulary accurately. Their explanations and reasoning regarding their process of finding a solution becomes more precise. In varying types of mathematical tasks, first grade students pay attention to details as they work. For example, as students’ ability to attend to position and direction develops, they begin to notice reversals of numerals and self-correct when appropriate. When measuring an object, students check to make sure that there are not any gaps or overlaps as they carefully place each unit end to end to measure the object (iterating length units). Mathematically proficient first grade students understand the symbols they use ( $=$ , $>$ , $<$ ) and use clear explanations in discussions with others. For example, for the sentence $4 > 3$ , a proficient student who is able to attend to precision states, “Four is more than 3” rather than “The alligator eats the four. It’s bigger.” |

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| 7. Look for and make use of structure.                    | Mathematically proficient students in First Grade carefully look for patterns and structures in the number system and other areas of mathematics. For example, while solving addition problems using a number balance, students recognize that regardless whether you put the 7 on a peg first and then the 4, or the 4 on first and then the 7, they both equal 11 (commutative property). When decomposing two-digit numbers, students realize that the number of tens they have constructed 'happens' to coincide with the digit in the tens place. When exploring geometric properties, first graders recognize that certain attributes are critical (number of sides, angles), while other properties are not (size, color, orientation).  |
| 8. Look for and express regularity in repeated reasoning. | Mathematically proficient students in First Grade begin to look for regularity in problem structures when solving mathematical tasks. For example, when adding three one-digit numbers and by making tens or using doubles, students engage in future tasks looking for opportunities to employ those same strategies. Thus, when solving $8+7+2$ , a student may say, "I know that 8 and 2 equal 10 and then I add 7 more. That makes 17. It helps to see if I can make a 10 out of 2 numbers when I start." Further, students use repeated reasoning while solving a task with multiple correct answers. For example, in the task "There are 12 crayons in the box. Some are red and some are blue. How many of each could there be?" First Grade students realize that the 12 crayons could include 6 of each color ( $6+6 = 12$ ), 7 of one color and 5 of another ( $7+5 = 12$ ), etc. In essence, students repeatedly find numbers that add up to 12. |

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## Geometry

| <b>Reason with shapes and their attributes</b>   |   |
|--|---|
| <b>NC.1.G.1</b> Distinguish between defining and non-defining attributes and create shapes with defining attributes by: <ul style="list-style-type: none"> <li>Building and drawing triangles, rectangles, squares, trapezoids, hexagons, circles.</li> <li>Building cubes, rectangular prisms, cones, spheres, and cylinders.</li> </ul>  |   |
| Clarification  | Checking for Understanding  |
| <p>In this standard, students use defining and non-defining attributes of shapes to identify, name, build and draw shapes. Students understand that defining attributes are always present features that classify a particular object such as number of sides, lengths of sides, and number of angles. They also understand that non-defining attributes are features that may be present, but do not identify what the shape is called (e.g., color, size, orientation, etc.).</p> <div style="background-color: #e2efda; padding: 10px; margin: 10px 0;"> <p><b>For Example:</b><br/>All triangles must be closed figures and have 3 straight sides. These are defining attributes.</p> <p>Triangles can be different colors, sizes and be turned in different directions. These are non-defining attributes.</p> </div>  <p>In this standard, students apply their understanding of defining attributes of shapes in order to create, by building or drawing, given shapes.</p> <p>Note: North Carolina has adopted the exclusive definition for a trapezoid. A trapezoid is a quadrilateral with <i>exactly</i> one pair of parallel sides.</p> | <p>Build a shape from these popsicle sticks. What shape did you make? How do you know?</p> <div style="display: flex; align-items: center; margin: 10px 0;">  <p>I used popsicle sticks to build a square. I know it's a square because it has 4 sides and all 4 sides are the same size.</p> </div> |

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| <b>Reason with shapes and their attributes</b>   |   |
|--|---|
| <b>NC.1.G.2</b> Create composite shapes by: <ul style="list-style-type: none"> <li>Making a two-dimensional composite shape using rectangles, squares, trapezoids, triangles, and half-circles naming the components of the new shape.</li> <li>Making a three-dimensional composite shape using cubes, rectangular prisms, cones, and cylinders, naming the components of the new shape.</li> </ul> |   |
| Clarification  | Checking for Understanding  |
| <p>In this standard, students create composite two- and three-dimensional shapes, and are able to identify the name of the composite shape as well as the identify the shapes that form it. As first graders create composite two- and</p>   | <p>What shapes can you create with triangles?</p> <p><i>Possible responses:</i></p> |

**Reason with shapes and their attributes**

**NC.1.G.2** Create composite shapes by:

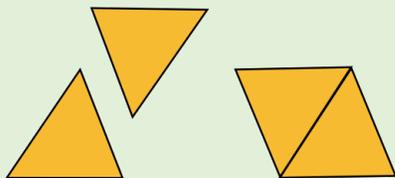
- Making a two-dimensional composite shape using rectangles, squares, trapezoids, triangles, and half-circles naming the components of the new shape.
- Making a three-dimensional composite shape using cubes, rectangular prisms, cones, and cylinders, naming the components of the new shape.

**Clarification**

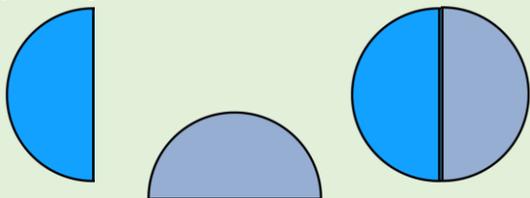
three-dimensional shapes they should begin to see how shapes fit together to create a new shape, and notice shapes within an already existing shape.

**For example:**

Recognizing that two isosceles triangles can be combined to make a rhombus, and simultaneously seeing the rhombus and the two triangles



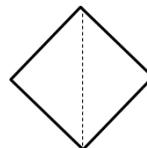
Recognizing that two half-circles can be combined to make a circle, and simultaneously seeing the circle and the two half circles)



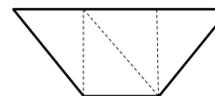
This standard calls for students to solve shape puzzles, construct designs with shapes, and create and maintain a shape as a unit. Students also continue to describe attributes and properties of shapes.

**Checking for Understanding**

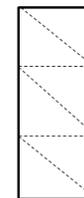
Student A: *I made a square. I used 2 triangles.*



Student B: *I made a trapezoid. I used 4 triangles.*



Student C: *I made a tall skinny rectangle. I used 6 triangles.*



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