



North Carolina Department of Public Instruction

INSTRUCTIONAL SUPPORT TOOLS

FOR ACHIEVING NEW STANDARDS

3rd 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 3rd 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 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.	In third grade, mathematically proficient students know that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Third grade students may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, “Does this make sense?” Students listen to other students’ strategies and are able to make connections between various methods for a given problem.
2. Reason abstractly and quantitatively.	Mathematically proficient third grade students should recognize that a number represents a specific quantity. They connect the quantity to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities.
3. Construct viable arguments and critique the reasoning of others.	In third grade, mathematically proficient students may construct arguments using concrete referents, such as objects, pictures, and drawings. They refine their mathematical communication skills as they participate in mathematical discussions that the teacher facilitates by asking questions such as “How did you get that?” and “Why is that true?” They explain their thinking to others and respond to others’ thinking.
4. Model with mathematics.	Mathematically proficient students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart, list, or graph, creating equations, etc. Students require extensive opportunities to generate various mathematical representations and to both equations and story problems, and explain connections between representations as well as between representations and equations. Students should be able to use all of these representations as needed. They should evaluate their results in the context of the situation and reflect on whether the results make sense.
5. Use appropriate tools strategically.	Mathematically proficient third grader students consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use graph paper to find all the possible rectangles that have a given perimeter. They compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles.
6. Attend to precision.	Mathematically proficient third grader students develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the area of a rectangle they record their answers in square units.
7. Look for and make use of structure.	In third grade mathematically proficient students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to multiply and divide (commutative and distributive properties).
8. Look for and express regularity in repeated reasoning.	Mathematically proficient students in third grade should notice repetitive actions in computation and look for more shortcut methods. For example, students may use the distributive property as a strategy for using products they know to solve products that they don’t know. For example, if students are asked to find the product of 7×8 , they might decompose 7 into 5 and 2 and then multiply 5×8 and 2×8 to arrive at $40 + 16$ or 56. In addition, third graders continually evaluate their work by asking themselves, “Does this make sense?”

Return to [Standards](#)

Operations and Algebraic Thinking

<p>Solve two-step problems. NC.3.OA.8 Solve two-step word problems using addition, subtraction, and multiplication, representing problems using equations with a symbol for the unknown number.</p>	
Clarification	Checking for Understanding
<p>This standard refers to two-step word problems using the addition, subtraction, and multiplication only. The size of the numbers should be limited to related 3rd grade standards (e.g., 3.OA.7 and 3.NBT.2). Adding and subtracting numbers should include numbers within 1,000, and multiplying numbers should include single-digit factors and products less than 100.</p> <p>This standard calls for students to represent problems using equations with a letter to represent unknown quantities.</p>	<p>Mike runs 2 miles a day. His goal is to run 25 miles. After 5 days, how many miles does Mike have left to run in order to meet his goal? Write an equation and find the solution ($2 \times 5 + m = 25$).</p> <hr style="border: 1px solid black;"/> <p>Ms. Jones’s class is trying to earn \$130 to provide food for the rescue animals at the local shelter. They already earned \$90 at a penny drive. The class has two ways they could raise the rest of the money. They could sweep the lunch room for \$10 per week or pick up trash in the school yard for \$8 per week. Which job should the class do to earn the money the fastest?</p> <ul style="list-style-type: none"> Explain your solution using pictures, numbers, or words. Write an equation for how you started the problem. Be sure to include the number of weeks required for each job.

Return to [Standards](#)

Number and Operations in Base Ten

<p>Use place value to add and subtract. NC.3.NBT.2 Add and subtract whole numbers up to and including 1,000.</p> <ul style="list-style-type: none"> Use estimation strategies to assess reasonableness of answers. Model and explain how the relationship between addition and subtraction can be applied to solve addition and subtraction problems. Use expanded form to decompose numbers and then find sums and differences. 				
Clarification	Checking for Understanding			
<p>In this standard, students build on work in previous grades regarding strategies based on place value, the properties of operations, and relating addition to subtraction. Students should be able to use the expanded form of a number to calculate sums and differences. Students explain their thinking and show their work and verify that their answer is reasonable.</p> <p>Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties.</p> <p>Estimation strategies include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of</p>	<p>There are 178 fourth graders and 225 fifth graders on the playground. What is the total number of students on the playground?</p> <p><i>Possible responses:</i></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; border-right: 1px solid black; padding: 5px; vertical-align: top;"> <p>Student A $100 + 200 = 300$ $70 + 20 = 90$ $8 + 5 = 13$ $300 + 90 + 13 = 403$ students</p> </td> <td style="width: 33%; border-right: 1px solid black; padding: 5px; vertical-align: top;"> <p>Student B I added 2 to 178 to get 180. I added 220 to get 400. I added the 3 left over to get 403.</p> </td> <td style="width: 33%; padding: 5px; vertical-align: top;"> <p>Student C I know the 75 plus 25 equals 100. Then I added 1 hundred from 178 and 2 hundreds from 275. I had a total of 4 hundreds and I had 3 more left to add.</p> </td> </tr> </table>	<p>Student A $100 + 200 = 300$ $70 + 20 = 90$ $8 + 5 = 13$ $300 + 90 + 13 = 403$ students</p>	<p>Student B I added 2 to 178 to get 180. I added 220 to get 400. I added the 3 left over to get 403.</p>	<p>Student C I know the 75 plus 25 equals 100. Then I added 1 hundred from 178 and 2 hundreds from 275. I had a total of 4 hundreds and I had 3 more left to add.</p>
<p>Student A $100 + 200 = 300$ $70 + 20 = 90$ $8 + 5 = 13$ $300 + 90 + 13 = 403$ students</p>	<p>Student B I added 2 to 178 to get 180. I added 220 to get 400. I added the 3 left over to get 403.</p>	<p>Student C I know the 75 plus 25 equals 100. Then I added 1 hundred from 178 and 2 hundreds from 275. I had a total of 4 hundreds and I had 3 more left to add.</p>		

<p>Use place value to add and subtract. NC.3.NBT.2 Add and subtract whole numbers up to and including 1,000.</p> <ul style="list-style-type: none"> • Use estimation strategies to assess reasonableness of answers. • Model and explain how the relationship between addition and subtraction can be applied to solve addition and subtraction problems. • Use expanded form to decompose numbers and then find sums and differences. 	
<p>Clarification</p>	<p>Checking for Understanding</p>
<p>situations. For this standard, estimation strategies include, but are not limited to:</p> <ul style="list-style-type: none"> • front-end estimation with adjusting (using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts), • rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values), • using friendly or compatible numbers such as factors <p>The standard algorithm of carrying or borrowing is neither an expectation nor a focus in Third Grade. Students develop and use strategies for addition and subtraction in Grades K-3.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>So, I have 4 hundreds plus 3 more which is 403.</p> </div> <p>Student D</p> $178 + 225 = ?$ $178 + 200 = 378$ $378 + 20 = 398$ $398 + 5 = 403$ <p>The diagram shows a horizontal number line with arrows at both ends. A box labeled '178' is on the left. A large blue curved arrow starts at 178 and points to a box labeled '378'. Above this arrow is a box labeled '200'. From 378, a smaller blue arrow points to a box labeled '398', with a box labeled '20' above it. From 398, another small blue arrow points to a box labeled '403', with a box labeled '5' above it.</p>

Return to [Standards](#)

Measurement and Data

<p>Represent and interpret data. NC.3.MD.3 Represent and interpret scaled picture and bar graphs:</p> <ul style="list-style-type: none"> • Collect data by asking a question that yields data in up to four categories. • Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided. • Solve one and two-step “how many more” and “how many less” problems using information from these-graphs 	
<p>Clarification</p>	<p>Checking for Understanding</p>
<p>In this standard, students will interact with data through data collection, creation of a scaled picture or bar graph, and interpretation of data. Students should understand how to formulate a question that provides them with categorical data, which is data that can be grouped into categories. Students should be able to choose an appropriate representation of the categorical data and create the representation. Students will create scaled picture graphs and scaled bar graphs. Graphs should include a title, categories, category label,</p>	<p>Maria wanted to know what flavor of juice the people in her class like the most. She asked each person in her class, “Which of these four flavors is your favorite type of juice?” She kept track of the votes on a frequency table.</p>

Represent and interpret data.

NC.3.MD.3 Represent and interpret scaled picture and bar graphs:

- Collect data by asking a question that yields data in up to four categories.
- Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided.
- Solve one and two-step “how many more” and “how many less” problems using information from these-graphs

Clarification

key, and data. Once graphs are created, students should be able to solve simple one and two-step problems using the information in the graphs.

Scaled picture graphs have pictures that represent more than 1 data point. Scaled bar graphs have a scale on the y-axis in which the labels do not include every number. Both of these scaled types of graphs could include data that includes half of an object on picture graphs or bar graphs in which a bar is in between labels.

Checking for Understanding

Flavor	People	Flavor	People
Grape	III	Grape	5
Cherry	III III I	Cherry	11
Apple	III II	Apple	7
Orange	II	Orange	2

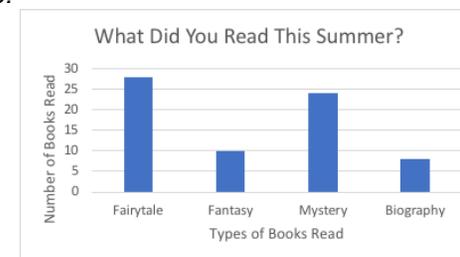
Nancy and Juan read the following amount of books during the summer.

- How many books did they read together?
- How many more books did Juan read compared to Nancy?
- Sarah read more books than Nancy but less books than Juan. How many books could Sarah have read?

Number of Books Read	
Nancy	★ ★ ★ ★ ★
Juan	★ ★ ★ ★ ★ ★ ★ ★ ★
★ = 5 Books	

As a class we are going to design a survey to collect data from all of the third grade students in the school about the types of books they read this summer. You will take the data from a table and make it into a scaled bar graph. Then write and solve two math problems that compare the values in your graph.

Possible response:



Return to [Standards](#)