

## 4th Grade

In 2015, New York State (NYS) began a process of review and revision of its current mathematics standards adopted in January of 2011. The New York State Next Generation Mathematics Learning Standards (2017) reflect revisions, additions, vertical movement, and clarifications to the current mathematics standards. The New York State Next Generation Learning Standards for Mathematics (updated June 2019) will be fully implemented in September 2020. The Standards are defined as the knowledge, skills and understanding that individuals can and do habitually demonstrate over time because of instruction and learning experiences. These mathematics standards, collectively, are focused and cohesive—designed to support student access to the knowledge and understanding of the mathematical concepts that are necessary to function in a world very dependent upon the application of mathematics, while providing educators the opportunity to devise innovative programs to support this endeavor.

To prepare students for the changes in the way we live and work, and to be sure that our education system keeps pace with what it means to be mathematically literate and what it means to collaboratively problem solve, we need a different approach to daily teaching and learning. We need content-rich standards that will serve as a platform for advancing children's 21st-century mathematical skills—their abstract reasoning, their collaboration skills, their ability to learn from peers and through technology, and their flexibility as a learner in a dynamic learning environment. Students need to be engaged in dialogue and learning experiences that allow complex topics and ideas to be explored from many angles and perspectives. They also need to learn how to think and solve problems for which there is no one solution—and learn mathematical skills along the way.<sup>1</sup>

In Grade 4, instructional time is focused on three areas: (1) develop understanding and fluency with multi-digit multiplication, and develop an understanding of dividing to find quotients involving multi-digit dividends; (2) develop an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; and (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Investigations in Numbers, Data, and Space 3 (2017) developed by TERC and published by Pearson Education, Inc. consistently engages students in thinking, reasoning, problem solving, justifying, and communicating about mathematics. The yearlong math curriculum consists of 8 units of study. Each unit of study is composed of several investigations which focus on a subset of math ideas. The critical areas and mathematical practices outlined in the Next Generation Standards are integrated into each Investigation unit of study. Student tools allow children to

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engage in context-based mathematical situations that build to more abstract problem solving. Students use models, manipulatives, quick pictures and symbols to build deeper mathematical understandings. A written representation is any way of representing a strategy using words, pictures, or numbers. Instructional methods focus on the use of literature and technology as well as encourage students to talk and write about math.

## **MATHEMATICAL CONTENT**

Fourth grade Next Generation Mathematics Standards are organized into the following domains:

- Operations and Algebraic Thinking
- Number and Operations in Base Ten
- Number Sense and Operations - Fractions
- Measurement and Data
- Geometry

Pervasive throughout the domains are several key mathematical practices. These are:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

## **REQUIRED FLUENCIES IN THE COMMON CORE STATE STANDARDS FOR MATHEMATICS**

Students should be taught to use strategies based on place value, the properties of operations, and the relationship between multiplication and division; however, when solving any problem, students can choose any strategy. Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy.

The required fluency for grade four:

*MULTIPLY AND DIVIDE WITHIN 100*

*ADD AND SUBTRACT WITHIN 1,000,000 using strategies*