

Kindergarten

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.¹

At the kindergarten level, instructional time is focused on two main areas: developing a sound sense of numbers by representing and comparing numbers, initially using sets of objects; and recognizing and describing shapes and using spatial relations. More learning time in kindergarten is devoted to number sense than any other topic.

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 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,

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<http://www.nysed.gov/common/nysed/files/programs/curriculum-instruction/nys-next-generation-mathematics-p-12-standards.pdf>

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

Kindergarten Next Generation Mathematics Standards are organized into the following domains:

- Counting and Cardinality
- Operations and Algebraic Thinking
- Number and Operations in Base Ten
- 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

FLUENCY IN THE NEXT GENERATION STANDARDS

Students are taught to use strategies based on place value, properties of operations, and the relationship between addition and subtraction; however, when solving any problem, students can choose any strategy.

Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.

The required fluency for kindergarten:

ADD and SUBTRACT WITHIN 5.