



Next Generation Mathematics Learning Standards Resources Review Webinar

Math Leaders and Teachers - New York State Big 5

NYSED Office of Standards and Instruction – May 2022





New York State
EDUCATION DEPARTMENT

Knowledge > Skill > Opportunity

Agenda

Next Generation Math Learning Standards:

- Implementation timeline, awareness of the changes, standards document, NGMLS resources
- Resources from Office of Standards and Instruction
- Awards and Scholarships



NYS Next Generation ELA & Mathematics Learning Standards Implementation Timeline (2017-2022)

THE ROADMAP AND IMPLEMENTATION TIMELINE

September 2017:
Adoption of Next Generation Learning Standards

Phase I Raise Awareness (Winter 2018 - Winter/Spring 2019)

- Professional development on NYS Next Generation Learning Standards
- Two-day assessments measuring the 2011 P-12 Learning Standards

Phase II Build Capacity (Spring 2019 – Summer 2022)

- Professional development continuing on NYS Next Generation Learning Standards
- Two-day assessments measuring the 2011 P-12 Learning Standards

Phase III Full Implementation (September 2022 - ongoing)

- Full implementation of the NYS Next Generation Learning Standards

Spring 2023:
New Grades 3-8 tests measuring the NYS Next Generation Learning Standards.
Algebra I Regents aligned in June 2024



Awareness of the Changes in the Standards

The Results of Standards Review: **What happened?**

Movement of Standards to different grade levels to improve the focus of major content and skills for each grade-level and course; providing more time for students to develop deep levels of understanding of grade-level appropriate content;

Clarification of Standards to make expectations more clearly defined, without limiting instructional flexibility;

Addition and Consolidation of Standards to improve coherence, focus and reduce redundancy amongst grade levels;


Maintain the Rigor of the Standards by improving the balance of conceptual understanding, procedural skill and application;

Provide opportunities for students to **Explore** certain standards to ensure that the standards are grade-level appropriate. Exploring a standard allows a student to be introduced to and learn a concept without the expectation of mastering the concept at that grade level.

Next Generation Mathematics Learning Standards Document



NEW YORK STATE EDUCATION DEPARTMENT



New York State Next Generation Mathematics Learning Standards
Updated June 2019

2017

New York State Next Generation Mathematics Learning Standards (2017)

Introduction

In 2015, New York State (NYS) began a process of review and revision of its current mathematics standards adopted in January of 2011. Through numerous phases of public comment, virtual and face-to-face meetings with committees consisting of NYS educators (Special Education, Bilingual Education and English as a New Language teachers), parents, curriculum specialists, school administrators, college professors, and experts in cognitive research, the *New York State Next Generation Mathematics Learning Standards (2017)* were developed. These revised standards reflect the collaborative efforts and expertise of all constituents involved.

The *New York State Next Generation Mathematics Learning Standards (2017)* reflect revisions, additions, vertical movement, and clarifications to the current mathematics standards. 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. As with any set of standards, they need to be rigorous; they need to demand a balance of conceptual understanding, procedural fluency and application and represent a significant level of achievement in mathematics that will enable students to successfully transition to post-secondary education and the workforce.

Context for Revision of the NYS Next Generation Mathematics Learning Standards (2017)

Changing expectations for mathematics achievement

Today's children are growing up in a world very different from the one even 15 years ago. Seismic changes in the labor market mean that we are living and working in a knowledge-based economy—one that demands advanced literacy and Science, Technology, Engineering and Mathematics (STEM) skills, whether for application in the private or public sector. Today, information moves through media at lightning speeds and is accessible in ways that are unprecedented; technology has eliminated many jobs while changing and creating others, especially those involving mathematical and conceptual reasoning skills. One characteristic of these fast-growing segment of jobs is that the employee needs to be able to solve unstructured problems while working with others in teams. At the same time, migration and immigration rates around the world bring diversity to schools and neighborhoods. The exponential growth in interactions and information sharing from around the world means there is much to process, communicate, analyze and respond to in the everyday, across all settings. For a great majority of jobs, conceptual reasoning and technical writing skills are integral parts to the daily routine. 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.

Increasingly Diverse Learner Populations

The need for a deeper, more innovative approach to mathematics teaching comes at a time when the system is already charged with building up language skills among the increasingly diverse population. Students who are English Language Learners (ELLs)/Multilingual Learners (MLLs) now comprise over 20% of the school-age population, which reflects significant growth in the past several decades. Between 1980 and 2009, this population increased from 4.7 to 11.2 million young people, or from 10 to 21% of the school-age population. This growth will likely continue in U.S. schools; by 2030, it is anticipated that 40% of the school-age population in the U.S. will speak a language other than English at home.²¹ Today, in schools and districts across the U.S., many students other than those classified as ELLs are learning English as an additional language, even if not in the initial stages of language development—these children are often described as “language minority learners.” Likewise, many students, large numbers of whom are growing up in poverty, speak a dialect of English that is different from the academic English found in school curriculum.^{22,23,24}

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New York State Next Generation Mathematics Learning Standards (2017)

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[New York State Next Generation Mathematics Learning Standards](#)



Within the NGMLS document

New York State Next Generation Mathematics Learning Standards (2017)

Grade 8 Overview

In Grade 8, instructional time should focus on three areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and using the Pythagorean Theorem. Please note that while every standard/topic in the grade level has not been included in this overview, all standards should be included in the full document.

- Through their learning in the **Number System**, the **Expressions, Equations, and Inequalities**, and the **Probability and Statistics** domains, students:
 - recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$), understanding that the constant of proportionality is the slope (m) and the graphs are lines through the origin;
 - understand that the slope (m) of a line is a constant rate of change, as well as how the input and output change as a result of the constant rate of change;
 - interpret a model in the context of the data by expressing a linear relationship between the two quantities in question and interpret components (such as slope and y -intercept) in terms of the situation;
 - solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are coincident;
 - use linear equations, systems of linear equations, linear functions, and their understanding of slope of a line to represent, analyze, and solve problems.
- Through their learning in the **Functions** and the **Expressions, Equations, and Inequalities** domains, students:
 - grasp the concept of a function as a rule that assigns to each input exactly one output;
 - understand that functions describe situations where one quantity determines another; and
 - translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and describe how aspects of the function are reflected in the different representations.
- Through their learning in the **Geometry** domain, students:
 - use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems;
 - show that the sum of the angles in a triangle is the angle formed by a straight line, and understand the relationship between the angles created when a transversal cuts parallel lines;
 - understand the statement of the Pythagorean Theorem and its converse, and use the Pythagorean Theorem to find distances between points on the coordinate plane;
 - apply the Pythagorean Theorem to find distances between points on the coordinate plane.

Mathematical Practices

- 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.

How to Read the P-8 & HS Standards for Mathematical Content

Prekindergarten through Grade Eight

Domain	NY-3.OA	Operations and Algebraic Thinking	
Cluster Heading	Solve problems involving the four operations, and identify and extend patterns in arithmetic.		
Standards	8. Solve two-step word problems posed with whole numbers and having whole-number answers using the four operations. <ul style="list-style-type: none"> Represent these problems using equations or expressions with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. 9. Identify and extend arithmetic patterns (including patterns in the addition table or multiplication table).	Coherence Linkages Coherence: NY-2.OA.1 → NY-3.OA.8 → NY-4.OA.3 Note: Two-step problems need not be represented by a single expression or equation. Coherence: NY-2.OA.3 → NY-3.OA.9 → NY-4.OA.5	
	Connecting the Standards for Mathematical Practice to Mathematical Content: <ul style="list-style-type: none"> Students will analyze a number of situation types for multiplication and division, including arrays and measurement contexts. Extending their understanding of multiplication and division to these situations requires that they make sense of problems and persevere in solving them (MP.1), look for and make use of structure (MP.7) as they model these situations with mathematical forms (MP.4), and attend to precision (MP.6) as they distinguish different kinds of situations over time (MP.8).^[14] 		Notes to Clarify & Connect Standards Citation

High School Courses and Plus (+) Standards

Conceptual Category	Algebra	
Domain	Algebra I	
Cluster Heading	Arithmetic with Polynomials and Rational Expressions	
Standards	AI-A.APR.3 Understand the relationship between zeros and factors of polynomials. <ul style="list-style-type: none"> Identify zeros of polynomial functions when suitable factorizations are available. (Shared standard with Algebra II) 	
	Coherence Linkages Coherence: AI-A.APR.3 → AII-A.APR.3 Note: Algebra I tasks will focus on identifying the zeros of quadratic and cubic polynomial functions. For tasks that involve finding the zeros of cubic polynomial functions, the linear and quadratic factors of the cubic polynomial function will be given (e.g., find the zeros of $P(x) = (x - 2)(x^2 - 9)$). ^[14]	
	Within-Grade Connections: <ul style="list-style-type: none"> Identifying zeros of polynomial functions (AI-A.APR.3) is connected to using the structure of an expression to identify ways to rewrite it (AI-A.SSE.2) and to using an algebraic process to find zeros of a function (AI-F.IF.8a). 	Notes to Clarify & Connect Standards Citation



NGLS Roadmap Documents

Overview and FAQ

NGLS At-a-Glance Flyer



English Language Arts (ELA) and Mathematics Standards Implementation Roadmap FAQ

Overview

The Board of Regents adopted the New York State (NYS) [Next Generation Learning Standards](#) in September 2017. The following timeline outlines the transition period over a three-year state-wide collaborative review process. The following timeline outlines the transition period over full-implementation of the NYS Next Generation Learning Standards (Note: full-implementation means that all students will be aligned to the NYS Next Generation Learning Standards).

- **September 2017:** Adoption of NYS Next Generation Learning Standards.
- **Phase I: Raise Awareness (Winter 2018-Winter/Spring 2019):** Professional development on NYS Next Generation Learning Standards; two-day assessments measuring the 2011 P-12 CCLS standards.
- **Phase II: Build Capacity (Spring 2019-Summer 2022)** Professional development continuing on NYS Next Generation Learning Standards; two-day assessments measuring the 2011 P-12 NYS CCLS standards.
- **Phase III Full Implementation (September 2022-ongoing):** Full implementation of the NYS Next Generation Learning Standards.
- **Spring 2023:** New grade 3-8 tests measuring the NYS Next Generation Learning Standards. Timely instruction and assessment implementation for grades 3-8 and the high school are available for both math and ELA.

The NYS Next Generation ELA and Mathematics Standards Implementation Roadmap has been designed to assist districts and educators with the transition to full-implementation of the NYS Next Generation Learning Standards.

New York State Education Department – New York State Next Generation ELA and Mathematics Learning Standards Implementation Roadmap

NYS NEXT GENERATION ENGLISH LANGUAGE ARTS and MATHEMATICS LEARNING STANDARDS

Phase I: Raise Awareness

Make all education stakeholders aware of the revised standards and the timeline for implementation; highlight areas of impact with respect to current standards, instruction, and assessment. This collaborative phase will help identify the necessary professional development that will occur in Phase II.

Please note: In Spring 2023, the NYS 3-8 assessments will align to the NYS Next Generation Learning Standards. Timelines illustrating the instruction and assessment implementation for grades 3-8 and the high school are available for both math and ELA.

Goal(s)	Key Implementation Activities	Stakeholder Groups *				Timeline: Winter 2018-Winter/Spring 2019
		NYSED	S/CDN & BOCES	Local School Districts	Other Stakeholder Groups	
						Action Steps Taken (To be completed by local districts)
Goal 1: Clearly communicate the adoption and the implementation timeline of the Next Generation ELA and Mathematics Learning Standards.	Maintain updated NYSED ELA and Mathematics Curriculum and Instruction website and EngageNY.	✓				
	Conduct conference calls with Statewide Leaders of Professional Associations/Big 5 Districts.	✓				
	Conduct presentations on the implementation timeline at major statewide meetings.	✓	✓			
	Conduct presentations on the implementation timeline at district administrative meetings and/or regional local level meetings. Share information with administrators and teachers.	✓	✓	✓	✓	
	Utilize electronic communication and social media to inform stakeholders of the timeline for implementation.	✓	✓	✓	✓	

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* NYSED, S/CDN, BOCES, Big 5, Districts, professional organizations, NYSUT, NYS Teacher Centers, IHEs, PTA, and others

What other support is available for Standards implementation?

The State Education Department, individual BOCES, New York State Teacher Centers and Regional Bilingual Education Resource Networks, are available to assist in this work by providing resources and professional development.

1 September 2017: Adoption of NYS Next Generation Learning Standards.

2 Phase I: Raise Awareness (Winter 2018-Winter/Spring 2019): Professional development on NYS Next Generation Learning Standards; two-day assessments measuring the 2011 P-12 Learning Standards.

3 Phase II: Build Capacity (Spring 2019-Summer 2022): Professional development continuing on NYS Next Generation Learning Standards; two-day assessments measuring the 2011 P-12 Learning Standards.

4 Phase III Full Implementation (September 2022-ongoing): Full implementation of the NYS Next Generation Learning Standards.

5 Spring 2023: New Grades 3-8 assessments to measure the NYS Next Generation Learning Standards. The timeline regarding the full implementation/assessment alignment at the high school level has not yet been determined and will be forthcoming; however, full implementation/assessment alignment will not be before the school year 2022-2023.



At a glance

WHAT EDUCATORS NEED TO KNOW ABOUT THE STATE'S IMPLEMENTATION ROADMAP



The Next Generation Learning Standards describe what students are expected to know and be able to do at various grade levels in English Language Arts (ELA) and Mathematics. They will be rolled out strategically over the next three years, providing ample time to raise awareness, build capacity, and implement the standards.

How will NYSED help educators implement the new standards?

The Next Generation ELA and Mathematics Learning Standards Implementation Roadmap lays out a recommended three-year plan with shared goals and activities to achieve those goals to support educators and stakeholders during the transition to new standards.

It was developed through a collaborative process between the State Education Department and partners including New York State United Teachers, the Staff and Curriculum Development Network, the Big 5 School Districts, BOCES district superintendents, the statewide Professional Learning Team and representatives from school districts.

Where can I access the Roadmap?

The Roadmap is available on the State Education Department's [NYS Next Generation Learning Standards website on the implementation page](#). There, you can also find links to the standards, suggested resources and other helpful documents.

The standards will be in full use in classrooms in 2022, and students will be assessed on them beginning in 2023.

Please note: In Spring 2023, the NYS Grades 3-8 assessments will align to the NYS Next Generation Learning Standards. The instruction and implementation timelines, including high school and Regents exam information, are available for [ELA](#) and [math](#).

How do I use the Roadmap?

The Roadmap is organized into three phases:

1. Raising Awareness
2. Building Capacity and
3. Full Implementation.

Each of these phases contains goals, key implementation activities to achieve the goal, the stakeholder groups who need to complete each activity, and a timeline for completion. These goals and activities will be developed as a local decision.

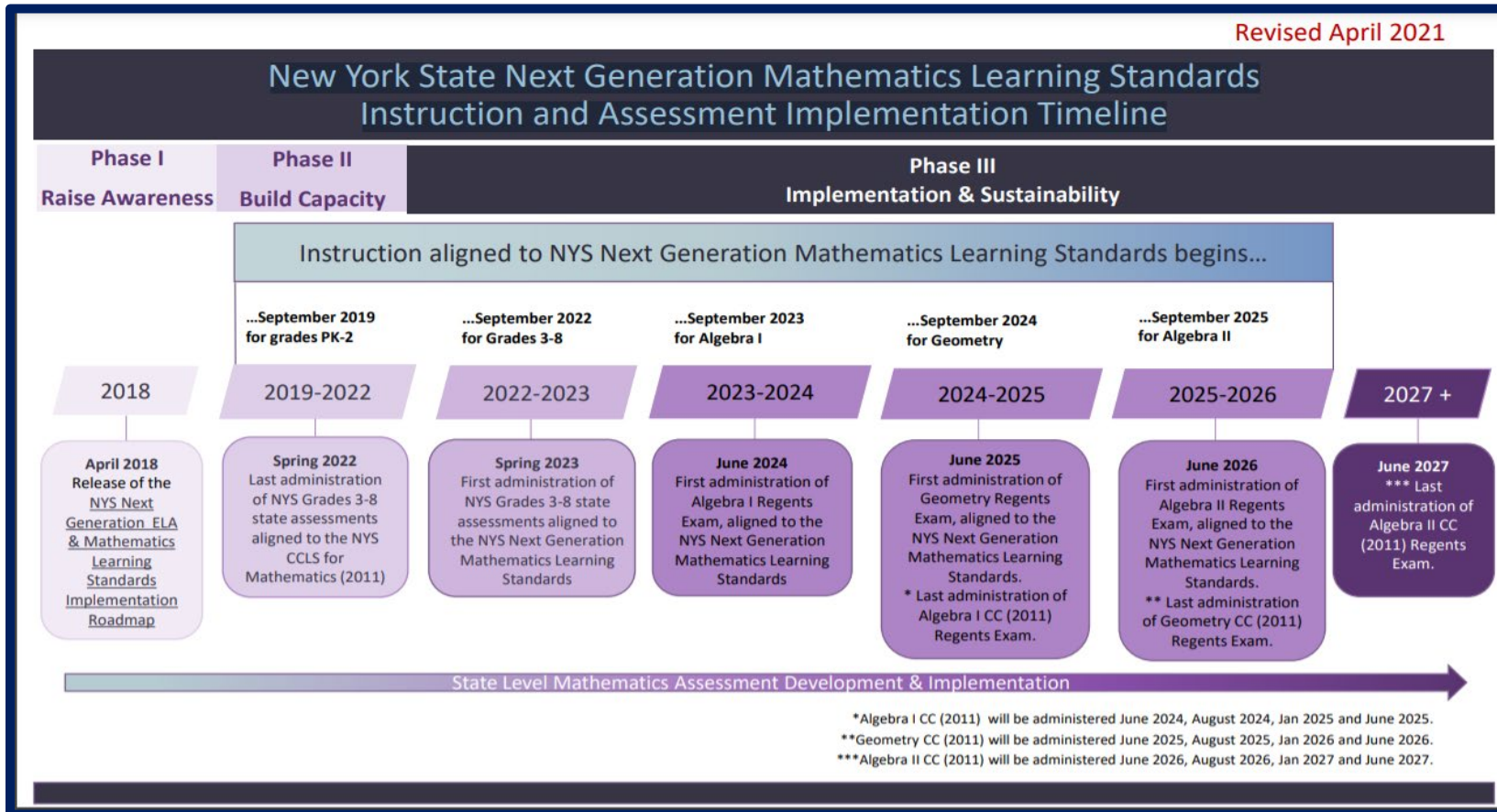
Can I adapt the Roadmap?

Decisions about curriculum and professional development are made locally based on district needs. Similarly, decisions about goals and determining success criteria within the Roadmap will be made locally.

NGLS Implementation Roadmap



NYS Next Generation Mathematics Learning Standards Instruction and Assessment Implementation Timeline



- ### Full Implementation begins:
- PreK-8: September 2022
 - Algebra I: September 2023
 - Geometry: September 2024
 - Algebra II: September 2025

[New York State Next Generation Mathematics Learning Standards Instruction and Assessment Implementation Timeline](#)



Next Generation Mathematics Learning Standards Crosswalks

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Operations and Algebraic Thinking		
Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
Represent and solve problems involving addition and subtraction.	<p>2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p>	<p>NY-2.OA.1a Use addition and subtraction within 100 to solve one-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.</p> <p>e.g., using drawings and equations with a symbol for the unknown number to represent the problem.</p> <p>NY-2.OA.1b Use addition and subtraction within 100 to develop an understanding of solving two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.</p> <p>e.g., using drawings and equations with a symbol for the unknown number to represent the problem.</p>
Add and subtract within 20.	<p>2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.</p> <p><u>Note:</u> See standard 1.OA.6 for a list of mental strategies.</p>	<p>NY-2.OA.2a Fluently add and subtract within 20 using mental strategies. Strategies could include:</p> <ul style="list-style-type: none"> • counting on; • making ten; • decomposing a number leading to a ten; • using the relationship between addition and subtraction; and • creating equivalent but easier or known sums. <p>Note: Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.</p> <p>NY-2.OA.2b Know from memory all sums within 20 of two one-digit numbers.</p>



Next Generation Mathematics Learning Standards Snapshots

Grade 6 Snapshot



Standards New to Grade 6

NY-6.G.5 Use area and volume models to explain perfect squares and perfect cubes.

NY-6.SP.1b Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population.

NY-6.SP.1c Understand that the method and sample size used to collect data for a particular question is intended to reduce the difference between a population and a sample taken from the population so valid inferences can be drawn about the population. Generate multiple samples (or simulated samples) of the same size to recognize the variation in estimates or predictions.

NY-6.SP.6 Understand that the probability of a chance event is a number between 0 and 1 inclusive, that expresses the likelihood of the even occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

NY-6.SP.7 Approximate the probability of a simple event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

NY-6.SP.8 Develop a probability model and use it to find probabilities of simple events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

NY-6.SP.8a Develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of simple events.

NY-6.SP.8b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

Standards Moved from Grade 6

No standards moved.

Highlights/Instructional Considerations

NY-6.RP.2 Unit rates are limited to non-complex fractions.

NY-6.RP.3 Students may utilize a strategy of their choice when solving real-world and mathematical problems using ratio and rate reasoning.

NY-6.RP.3b Unit rate problems may include unit pricing and constant speed.

NY-6.RP.3c Percent problems involve finding a percent as a rate per 100, finding the whole given a part and the percent; also finding a part of a whole given the percent.

NY-6.RP.3d Conversions are not across different measurement systems.

NY-6.NS.1 Students may utilize a strategy of their choice when interpreting, computing and solving word problems that involve quotients of fractions, including any standard algorithm.

NY-6.NS.2 (and 3) Any standard algorithm may be used for the division of multi-digit numbers.

NY-6.EE.2b Added "difference" as one of the mathematical terms.

NY-6.EE.2c Order of operations, expressions may or may not include parentheses. Expressions may contain whole-number exponents. No nested grouping symbols.

NY-6.EE.7 All four single-step equations are included. See standards document for analogous arithmetical and algebraic solution examples.

NY-6.EE.8 Added $x \geq c$ and $x \leq c$. Compound inequalities could be introduced here.

NY-6.EE.9 Students will be given an equation (no longer need to write) and will need to analyze/identify the relationship between the independent and dependent variable.

NY-6.G.1 Replaced special quadrilaterals with trapezoids; using the inclusive definition of a trapezoid (parallelograms are therefore also included).

NY-6.G.4 Clarification of three dimensional figures for nets/surface area; right rectangular prisms, right rectangular pyramids, and right triangular prisms.

NGMLS Glossary of Verbs


Word	Definition/context of use in the standards
Analyze	<i>Analyze</i> requires students to examine carefully, take apart mathematically, and break down into components or essential characteristics to identify causes, key factors, and possible results.
Apply	<i>Apply</i> requires a student to use mathematical knowledge in a variety of situations.
Calculate	<i>Calculate</i> requires a student to determine an answer.
Classify	Students <i>classify</i> by determining characteristics (attributes) that objects (numbers, shapes, etc.) share, and characteristics (attributes) they don't share.
Compare	Students <i>compare</i> by examining two or more objects, numbers or mathematical situations in order to determine similarities and differences.
Compose	<i>Compose</i> requires students to form or make something (numbers, functions, sets, etc.) by combining parts.
Convert	Students <i>convert</i> by changing the form (e.g. measurement, different units) without a change in the size or amount.

Explore	<p><i>Explore</i> requires the student to learn the concept in the standard through a variety of instructional activities. Repeated experiences with these concepts, with immersion in the concrete, are vital.</p> <p><i>Explore</i> indicates that the topic is an important concept that builds the foundation for progression toward mastery in later grades. However, mastery at the current level is not expected for that standard.</p>
Express	<i>Express</i> requires students to change an amount or quantity into a different form.
Fluent	<p>The word <i>fluent</i> is used in the Standards to mean “fast and accurate.” Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns and knowing some answers from the use of strategies.</p> <p>For additional information refer to pages 18-19 of Progressions for the Common Core State Standards in Mathematics (draft)</p> <p><i>Principles and Standards for School Mathematics</i> states, “Computational fluency refers to having efficient and accurate methods for computing. Students exhibit computational fluency when they demonstrate <i>flexibility</i> in the computational methods they choose, <i>understand</i> and can explain these methods, and produce accurate answers <i>efficiently</i>.”</p> <p>Required Grade Level Fluencies for Grades K-8: Required grade level fluencies are available from EngageNY at Required Fluencies for Grades K-8 Standards for Mathematics.</p> <p>Standards that are recommended fluencies at the High School level are identified in each set of standards for Algebra I, Algebra II and Geometry.</p>
Generate	<i>Generate</i> requires students to create something by the application of one or more mathematical rules or operations.
Identify	<i>Identify</i> requires students to recognize a mathematical concept using prior knowledge.

Downloadable Resource:

[PDF Version of this Glossary](#)

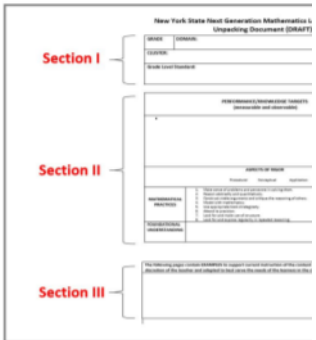
NGMLS Unpacking Documents



A Guide for Unpacking the New York State Next Generation Mathematics Learning Standards

The *Unpacking Document* provides educators with a series of conversations about what they want their students to know and do. It is not a lesson plan, but rather an analysis of a grade-level standard around the intent and rigor of the standard(s) will aid educators in choosing to unpack all standards for a specific grade level or progressions of mathematical concepts so that curricula developed in the unpacking process should include teachers from other disciplines, and other content areas (e.g., science, art, etc.), further support and inter-disciplinary connections.

The *Unpacking Document* is arranged in three sections, the unpacking process: (1) Analyzing How the Standard Learning Targets; (2) Identifying Foundational Understanding the Standards for Mathematical Practice; and (3) Design the Content Standard and the Attainment of the Learning Targets.



A Guide for Unpacking the New York State Next Generation Mathematics Learning Standards

New York State Next Generation Mathematics Learning Standards Unpacking Document (DRAFT)

GRADE:	DOMAIN:
CLUSTER:	
Grade Level Standard:	

Section I

Step 1: Analyzing How the Standard Relates to its Domain and Cluster

Educators should understand how an individual standard relates to the key ideas and concepts of the individual cluster as well as the other clusters of standards that comprise the domain for that grade level. Educators should also keep in mind that standards from different clusters and domains can be closely related. These standards are identified as "within grade-level connections." Additionally, educators will want to examine related clusters in adjacent grade levels to assist in developing a solid sense of the progression of skills. Resources for understanding how the grade-level standards relate to one another include, but are not limited to:

- Progressions Documents for the Common Core Math Standards
- EngageNY Curriculum Module (and Topic) Overviews (Introductory material provided in the beginning of each module and its sections)
- Note: The [PreK-Grade 5 Math Curriculum Map](#), [Grades 6-8 Math Curriculum Map](#), [Grades 9-12 Math Curriculum Map](#), the [CCLS Checklist for a Story of Units](#), [CCLS Checklist for a Story of Ratios](#), and [CCLS Checklist for Algebra I](#) each provide an at-a-glance view of where each standard is addressed in the EngageNY modules.
- NYS Next Generation Mathematics Learning Standards Document
- Achieve the Core Coherence Map

Section II

Step 2: Identifying Learning Targets

Learning targets are brief, concise statements written in student-friendly language that describe what a student can do when demonstrating mastery of the content standard. Attention should be given to the nouns and verbs used in the standard, and both should be reflected in the learning targets. The learning targets for a standard should be observable and measurable. The [Glossary of Verbs Associated with the NYS Next Generation Mathematics Learning Standards](#) contains a list of verbs that appear throughout the Mathematics Standards and are explained in the context in which they are used.

Step 3: Identifying Foundational Understanding

The NYS Next Generation Mathematics Learning Standards were developed with a purposeful sequencing of learning expectations across multiple developmental stages, ages, or grade levels. Identifying foundational understanding provides educators with an excellent insight into the relevance of a standard, its role at a particular level (focus), and how other levels continue to develop this standard (coherence). Pertinent foundational mathematical vocabulary should also be listed in this section. Resources that aid in identifying foundational knowledge include, but are not limited to:

Section III

Step 4: Design the Content Standard and the Attainment of the Learning Targets

This section provides educators with a series of conversations about what they want their students to know and do. It is not a lesson plan, but rather an analysis of a grade-level standard around the intent and rigor of the standard(s) will aid educators in choosing to unpack all standards for a specific grade level or progressions of mathematical concepts so that curricula developed in the unpacking process should include teachers from other disciplines, and other content areas (e.g., science, art, etc.), further support and inter-disciplinary connections.

New York State Next Generation Mathematics Learning Standards Unpacking Document (DRAFT)

GEOMETRY	DOMAIN: Similarity, Right Triangles, and Trigonometry
CLUSTER: Apply trigonometry to general triangles.	

Section I

Step 1: Analyzing How the Standard Relates to its Domain and Cluster

Educators should understand how an individual standard relates to the key ideas and concepts of the individual cluster as well as the other clusters of standards that comprise the domain for that grade level. Educators should also keep in mind that standards from different clusters and domains can be closely related. These standards are identified as "within grade-level connections." Additionally, educators will want to examine related clusters in adjacent grade levels to assist in developing a solid sense of the progression of skills. Resources for understanding how the grade-level standards relate to one another include, but are not limited to:

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- NYS Next Generation Mathematics Learning Standards Document
- Achieve the Core Coherence Map

Section II

Step 2: Identifying Learning Targets

Learning targets are brief, concise statements written in student-friendly language that describe what a student can do when demonstrating mastery of the content standard. Attention should be given to the nouns and verbs used in the standard, and both should be reflected in the learning targets. The learning targets for a standard should be observable and measurable. The [Glossary of Verbs Associated with the NYS Next Generation Mathematics Learning Standards](#) contains a list of verbs that appear throughout the Mathematics Standards and are explained in the context in which they are used.

Step 3: Identifying Foundational Understanding

The NYS Next Generation Mathematics Learning Standards were developed with a purposeful sequencing of learning expectations across multiple developmental stages, ages, or grade levels. Identifying foundational understanding provides educators with an excellent insight into the relevance of a standard, its role at a particular level (focus), and how other levels continue to develop this standard (coherence). Pertinent foundational mathematical vocabulary should also be listed in this section. Resources that aid in identifying foundational knowledge include, but are not limited to:

Section III

Step 4: Design the Content Standard and the Attainment of the Learning Targets

This section provides educators with a series of conversations about what they want their students to know and do. It is not a lesson plan, but rather an analysis of a grade-level standard around the intent and rigor of the standard(s) will aid educators in choosing to unpack all standards for a specific grade level or progressions of mathematical concepts so that curricula developed in the unpacking process should include teachers from other disciplines, and other content areas (e.g., science, art, etc.), further support and inter-disciplinary connections.

New York State Next Generation Mathematics Learning Standards Unpacking Document (DRAFT)

GRADE: 7	DOMAIN: Ratio and Proportional Reasoning
CLUSTER: Analyze proportional relationships and use them to solve real-world and mathematical problems.	
Grade Level Standard:	
PERFORMANCE/KNOWLEDGE TARGETS (measurable and observable)	
ASPECTS OF RIGOR	
MATHEMATICAL PRACTICES	
FOUNDATIONAL UNDERSTANDING	

Section I

Step 1: Analyzing How the Standard Relates to its Domain and Cluster

Educators should understand how an individual standard relates to the key ideas and concepts of the individual cluster as well as the other clusters of standards that comprise the domain for that grade level. Educators should also keep in mind that standards from different clusters and domains can be closely related. These standards are identified as "within grade-level connections." Additionally, educators will want to examine related clusters in adjacent grade levels to assist in developing a solid sense of the progression of skills. Resources for understanding how the grade-level standards relate to one another include, but are not limited to:

- Progressions Documents for the Common Core Math Standards
- EngageNY Curriculum Module (and Topic) Overviews (Introductory material provided in the beginning of each module and its sections)
- Note: The [PreK-Grade 5 Math Curriculum Map](#), [Grades 6-8 Math Curriculum Map](#), [Grades 9-12 Math Curriculum Map](#), the [CCLS Checklist for a Story of Units](#), [CCLS Checklist for a Story of Ratios](#), and [CCLS Checklist for Algebra I](#) each provide an at-a-glance view of where each standard is addressed in the EngageNY modules.
- NYS Next Generation Mathematics Learning Standards Document
- Achieve the Core Coherence Map

Section II

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Statistics Progression Video & Toolkit



New York State
EDUCATION DEPARTMENT
Knowledge > Skill > Opportunity


The New York State Next Generation
Mathematics Learning Standards

Statistics Progression
Prekindergarten – Algebra II

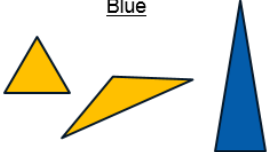
Stats Progression Video

Statistics: Pk-12

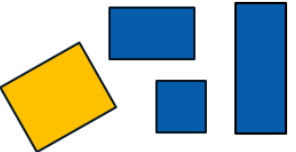
Is the number of blue shapes greater than, less than, or equal to the number of yellow shapes?



Blue




Yellow

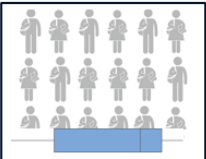


Statistics: Pk-12

What is the average height of the students at **Lincoln** Middle School and **Washington** Middle School?



Lincoln
Middle School



(Population)

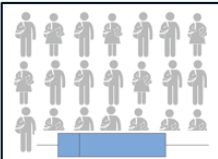
56 57 58 59 60

58 59 56 59 60

(Sample)

Sample Mean = 58.4 in.

Washington
Middle School




(Population)

55 56 57 58 59

56 55 57 59 56


(Sample)

Sample Mean = 56.6 in.

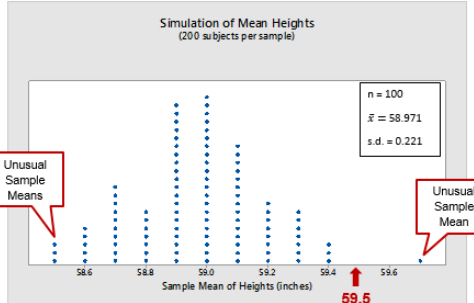


Statistics: Pk-12

Since **59.5** inches falls outside of the 95% interval, it is an unusual mean height for seventh-grade students.



Simulation of Mean Heights
(200 subjects per sample)




Unusual Sample Means

Unusual Sample Mean

n = 100
 \bar{x} = 58.971
s.d. = 0.221

95%

Middle 95% Interval centered on the mean:
(58.529, 59.413)




Guide to Aligning Local Curricula & Toolkit

Curriculum decisions are **locally determined**, and this alignment guide is an **optional resource** for school districts to utilize.

This document is designed to assist New York State school districts in the curriculum alignment process, so **educators are empowered** to do this work.

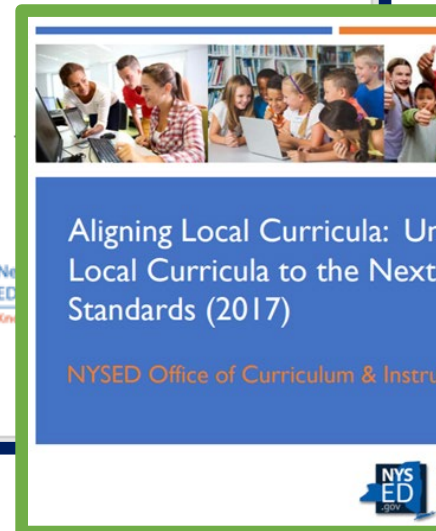
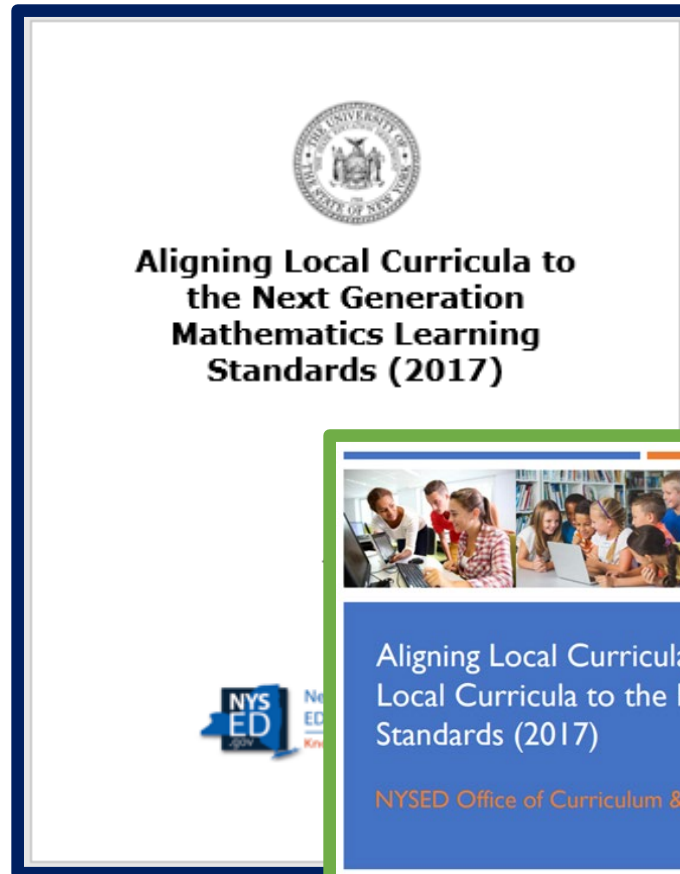


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• Curricular and Supplementary Resources	
• Design Principles	
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Appendix A (Standard Progression Analysis Template)	
Appendix B (Guiding Questions for Lesson Alignment)	
Appendix C (Guiding Questions for Homework/Problem Set Alignment)	

IMPORTANT NOTE:

Full Implementation of the NYS Next Generation Pre-K through 8 Mathematics Standards (2017) will begin in 2020-2021, with the Commencement-level Standards to follow. Please see the [Instruction and Assessment Implementation Timeline](#) for further details.

1 | Page

NGMLS Pk-8 Glossary



NYS Next Generation LEARNING STANDARDS

[Disclaimers
and Notices](#)



New York State Next Generation Mathematics Learning Standards GLOSSARY Grades **PreK - 8**

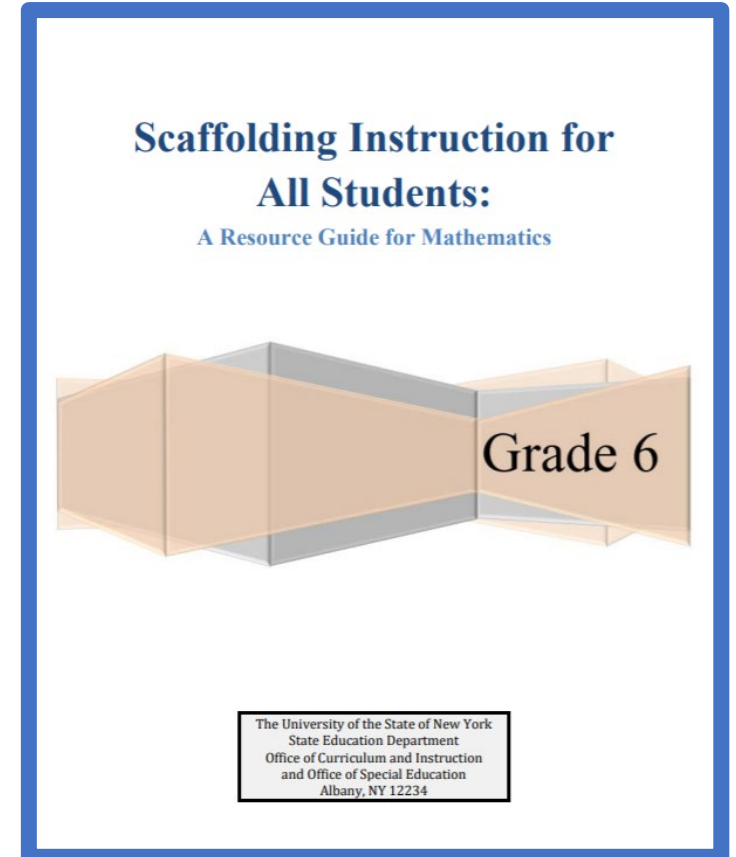
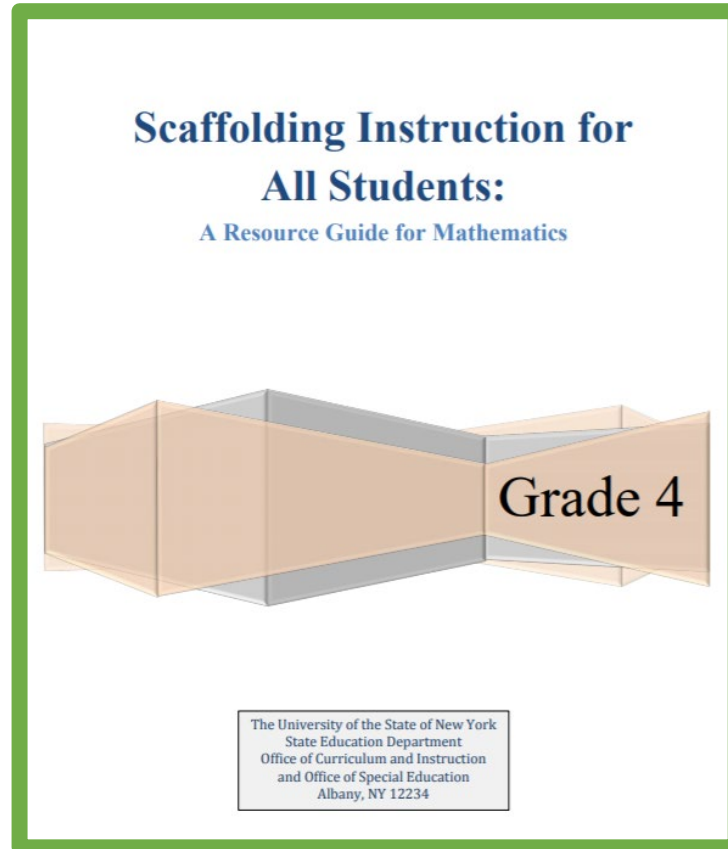
Mathematical language provides a common platform for students to explore perspectives and to construct viable mathematical arguments. This Glossary provides some mathematical terms used in PreK – grade 8 level instruction and in the State Next Generation Mathematics Learning Standards. This non-exhaustive glossary helps teachers what is meant by various terms when the New York State Education Department mathematics. At times, there are alternative definitions for some glossary terms in the community and some terms/definitions contained within this glossary can vary. However, it is important to use these terms as they are used within the New York State Standards. After numerous reviews in consultation with NYS educators, the definitions contained in this glossary. We therefore encourage all teachers to use these definitions and use them consistently throughout a student's educational program.

<u>A</u>	<u>F</u>	<u>L</u>	<u>Q</u>	<u>V</u>
<u>B</u>	<u>G</u>	<u>M</u>	<u>R</u>	<u>W</u>
<u>C</u>	<u>H</u>	<u>N</u>	<u>S</u>	<u>X</u>
<u>D</u>	<u>I</u>	<u>O</u>	<u>T</u>	<u>Y</u>
<u>E</u>	<u>K</u>	<u>P</u>	<u>U</u>	<u>Z</u>



Scaffolding Guides (Grades 3-8)

Goal: To support teachers with designing instruction that makes general education curriculum more accessible to ALL students without interfering with the rigor of grade-level content.



[Supporting All Students: Resource Guides for Scaffolding Instruction of English Language Arts and Mathematics](#)



NGLS Parent Brochure

A Parent's Guide to the NYS Next Generation ELA & Math Learning Standards

NYS ED NYS Next Generation LEARNING STANDARDS



A Parent's Guide to the New York State Next Generation ELA & Math Learning Standards



What are the Next Generation Learning Standards?

The Next Generation Learning Standards are the educational goals for all of New York State's students from prekindergarten through grade 12 in English Language Arts and Mathematics.

Why were the standards revised?

The standards were revised to ensure they are appropriate for students' grade levels and reflect what students should know and be able to do in math and ELA.

When will the Next Generation Standards be implemented?

Full implementation of the NYS Next Generation Learning Standards begins during the 2022-2023 school year for prekindergarten through grade 8. The [implementation timeline](http://www.nysed.gov/curriculum-instruction/next-generation-learning-standards-and-assessment-implementation-timeline) can be found at <http://www.nysed.gov/curriculum-instruction/next-generation-learning-standards-and-assessment-implementation-timeline>.

How will the standards be assessed?

While teachers assess standards daily in their classrooms, students will also be assessed on the Next Generation Learning Standards beginning in spring of 2023 on the Grades 3-8 New York State ELA and Mathematics Assessments.

How can I learn more?

You can learn more about the [Next Generation ELA and Mathematics Learning Standards](#) by talking to your child's teacher or visiting www.nysed.gov/next-generation-learning-standards.

Parent Resources

Supporting Learning at Home



[Next Generation Learning Standards in English Language Arts & Mathematics](#)
www.nysed.gov/next-generation-learning-standards

[New York State Parent Teacher Association \(PTA\) Parent Resources](#)
nyspta.org/home/parent-resources/

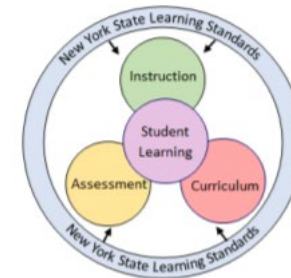
[Resources for Parents of Students with Disabilities](#)
www.p12.nysed.gov/specialed/quality/parents.htm

[Multilingual Learner/English Language Learner Parent Resources](#)
www.nysed.gov/bilingual-ed/english-language-learner/multilingual-learner-parent-resources

[New York State Education Department Office of Curriculum & Instruction](#)
www.nysed.gov/curriculum-instruction
Email: EMSCURRIC@nysed.gov
Phone: (518) 474-5922

Standards and My Child's Classroom Learning

Student learning is best supported when goals are well defined. The model below shows how key parts of learning work together. The central focus, student learning, depends on curriculum, instruction, and assessment. The learning standards represent the overall knowledge and skills students need to learn by the end of each school year.



Standards <i>"What do we need to learn?"</i>	Standards are: <ul style="list-style-type: none"> goals for New York State students organized by subjects and grade levels the learning intended to be accomplished by the end of a specific school year approved by the New York State Board of Regents Example of a Kindergarten Math Standard: Duplicate and extend simple patterns using concrete objects. Ex: Colored blocks or tiles.
Curriculum <i>"What are we learning?"</i>	Curriculum is: <ul style="list-style-type: none"> the content, concepts, and skills students will learn to enable them to meet the standards determined by individual school districts Example: locally developed units of study, such as a unit on poetry or multiplication of two-digit numbers.
Instruction <i>"How are we learning?"</i>	Instruction is: <ul style="list-style-type: none"> the approaches and strategies an educator chooses to teach the curriculum based on the needs of students determined by classroom teachers and districts Example: small group instruction or cooperative learning
Assessment <i>"What have we learned?"</i> <i>"What should we do next?"</i>	Assessments: <ul style="list-style-type: none"> are processes used to learn about student progress guide and inform teaching are determined by local districts and/or teachers, as well as New York State * New York State administrators: <ul style="list-style-type: none"> ELA and Mathematics Assessments in Grades 3-8 Science Assessments in Grades 4 & 8 Regents Examinations English as a Second Language Achievement Test (NYSESLAT) Alternate Assessment (NYSAA) Example: classroom observation of a student recognizing patterns or analyzing a student's classroom writing sample



Professional Development Toolkits - Math



New York State
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Turnkey Guidance for Let Me Introduce Myself: The Next Generation Mathematics Learning Standards Introduction

Goal: To provide educators with essential questions and discussion points that will guide upcoming work with regards to transitioning to the NYS Next Generation Mathematics Learning Standards and how to support all learner populations during the process.

Professional Development Toolkits



New York State
EDUCATION DEPARTMENT
Knowledge > Skill > Opportunity

Turnkey Guidance for Utilizing the New Teacher-Support Features Built into the Next Generation Mathematics Standards

Goal: To provide educators with essential turnkey information they will need to prepare instructors for the transition to the NYS Next Generation Mathematics Learning Standards and how to support all learner populations during the process.



New York State
EDUCATION DEPARTMENT
Knowledge > Skill > Opportunity

Turnkey Guidance for Let's Talk Crosswalk: How to Utilize the NYS Next Generation Mathematics Learning Standards Crosswalk Documents

Goal: To provide educators with an overview of the content changes and modifications that are reflected in the NYS Next Generation Mathematics Learning Standards in comparison to the NYS P-12 CCLS for Mathematics, as well as provide discussion points as to how these changes/modifications will impact student learning, instruction and curriculum planning.



New York State
EDUCATION DEPARTMENT
Knowledge > Skill > Opportunity

Turnkey Guidance for Developing a Standards-Based IEP

Goal: To provide educators with essential questions that will guide the transition to the NYS Next Generation Learning Standards and the development of standards-based IEPs.



NGMLS Post-test Standard Designations



- **Grade 3:** Scaled pictograph/bar graph (NY-3.MD.3) (Additional)
- **Grade 5:** Order of Operations Standards (NY-5.OA.1 and 2) (Additional)
- **Grade 6:** All Probability and Statistics
- **Grade 7:** Area and Circumference of a Circle (NY-7.G.4) (Additional)
- **Grade 8:** Scientific Notation (NY-8.EE.3 and 4), Linear Systems of Equations (NY-8.EE.8)

Post-test content
(at teacher's discretion) may be introduced at various points through out the year. Then, reinforced during the remaining months of school.

[Post-test Standards Designations](#)

Grades 3 – 8 Performance Level Descriptions

New York State Testing Program Next Generation Mathematics Test

Performance Level Descriptions

GRADE 8

Performance level descriptions (PLDs) help communicate to the public the specific knowledge and skills expected of proficiency of a learning standard. The PLDs serve several purposes in assessment. They are the foundation of rich discussion and are used to explain the progression of learning. They are also crucial in explaining student performance on the NY State Testing Program. The connection between the scale score, the performance level, and the typical demonstrated at that level.

Policy Definitions of Performance Levels

For each subject area, students perform along a continuum of achievement to meet the demands of the Learning Standards for English Language Arts and Mathematics. There are students who excel in standards, students who are proficient, and students who are below proficient. New York State classifies student performance into one of four levels based on the level of achievement that has demonstrated. These performance levels are defined as:

NYS Level 4

Students performing at this level **excel** in standards for their grade and demonstrate **excellent** knowledge, skills, and practices embodied by the Learning Standards **sufficient** for the expectations at this grade.

NYS Level 3

Students performing at this level are **proficient** in standards for their grade and demonstrate **strong** knowledge, skills, and practices embodied by the Learning Standards **sufficient** for the expectations at this grade.

NYS Level 2

Students performing at this level are **partially proficient** in standards for their grade and demonstrate **partial** knowledge, skills, and practices embodied by the Learning Standards. Students at this level are considered partial but insufficient for the expectations at this grade. Students at this level are considered on track to meet current New York high school graduation requirements but are **not yet proficient** in Learning Standards at this grade.

NYS Level 1

Students performing at this level are **below proficient** in standards for their grade and demonstrate **limited** knowledge, skills, and practices embodied by the Learning Standards that are considered **insufficient** for the expectations at this grade.

Elementary- and Intermediate-level Tests

Past Grades 3-8 Tests

Grades 3-8 Test Schedules

Grades 3-8 Test Manuals ▶

Grades 3-8 English Language Arts and Mathematics


Science ▶

Scoring Information

Field Testing

Technical Information and Reports

Grades 3-8 ELA and Mathematics Tests

- Past Grades 3-8 Released Questions
- Memo: Spring 2021 Grades 3–8 English Language Arts and Mathematics Tests 
- 2021 Grades 3-8 English Language Arts and Mathematics Test Manuals, Educator Guides and Teacher's Directions
- 2019 Grades 3-8 English Language Arts and Mathematics Score Report and Understanding Report Samples
- Grades 5-8 Mathematics Reference Sheets (All Languages)

Next Generation Learning Standards

- Next Generation Learning Standards English Language Arts Performance Level Descriptions
- Next Generation Learning Standards Mathematics Performance Level Descriptions



NYSED Office of Standards and Instruction

The screenshot shows the website's navigation menu with categories: NYSED, Education Areas, Standards and Instruction, Assessments, Certification & Licensing, School Business, and Data & Reporting. The main content area is titled "Standards and Instruction" and includes a descriptive paragraph about the department's role. Below this are two columns of "Standards and Instructional Resources (A-K)" and "(L-Z)". A sidebar on the left lists subjects: Arts, CDOS Standards, Computer Science and Digital Fluency, English Language Arts (ELA), and Family and Consumer Sciences. The main content is divided into "Guidance and Resources" and "Programs and Initiatives". The "Guidance and Resources" section lists: Part 100 Regulations, Interstate Compact on Educational Opportunity for Military Children, Summer School Handbook, and Transfer Student Information. The "Programs and Initiatives" section lists: Early Learning, Middle Level Education, School Library Services, and Teacher Centers. A "Remote/Hybrid Instructional and Learning Resources" section contains buttons for "DIGITAL LEARNING RESOURCES", "DIPLOMA REQUIREMENTS", and "STAYING CONNECTED". A "SUBSCRIBE FOR UPDATES" button is also present. A green-bordered box at the bottom of the screenshot contains the text "NYSED Office of Standards and Instruction".

DIPLOMA REQUIREMENTS

A collection of call-to-action buttons arranged vertically: "SUBSCRIBE FOR UPDATES" (orange), "CONTACT US" (dark blue), and "A CALL FOR EXPERTISE" (blue).



OSI Mathematics

Frequently Asked Questions




Math Frequently Asked Questions


Learning Standards/Curriculum/Instruction

Graduation Requirements/Part 100 Regulations


State Assessments

Math Frequently Asked Questions


Learning Standards/Curriculum/Instruction 

Graduation Requirements/Part 100 Regulations 

1. What are the mathematics requirements for a Regents Diploma?

According to the Part 100 ([100.5\(a\)\(3\)\(iv\)](#)) of the Regulations of the Commissioner of Education, to receive a Regents Diploma a student must earn three commencement-level mathematics credits (more advanced than grade eight and must meet the commencement-level mathematics learning standards as determined by the commissioner) and achieve a passing score on one Mathematics Regents Examination or [Department Approved Alternative](#)  mathematics examination.

2. What are the mathematics requirements for a Regents Diploma with Advanced Designation?

In order to earn a Regents Diploma with Advanced Designation Students must earn 3 commencement level Mathematics credits and pass the Regents examinations in Algebra I, Geometry and Algebra II or the [Department Approved Alternative](#)  for the examination requirements. Further information regarding diploma requirements and the STEM pathway can be found on the [C/I website](#).

3. Can a student earn two credits for Algebra I?

According to the Part 100 ([100.5\(a\)\(3\)\(iv\)](#)) of the Regulations of the Commissioner of Education ... *no more than two credits shall be earned for any Algebra I, Geometry, or Algebra II commencement level mathematics course.* Algebra I is designed to be a one-unit course, however, the content of Algebra I (Geometry or Algebra II) may be spread out over two years with each year culminating in one credit.



Expanded Math Access Program



- State initiative to promote the math fluency and the love of math in K-5 students across New York.
- Not a curriculum; Curriculum decisions are locally determined
- Online, standards-based math games and activities at no cost to districts; standards correlation document available
- Optional program with flexible use
- Use of free resource is not a requirement for districts; an additional asset to promote mathematical thinking and fluency

FIRST IN MATH[®]
Energizing Every Child to Learn, Love and Live Math[®]



PAEMST Announcement



Presidential Awards for Excellence
in Mathematics and Science Teaching

Rewarding & Inspiring Great Teaching Since 1983

2020 PAEMST

National Mathematics Awardees for New York State (K-6)

**Leslie Anson, Millbrook Middle School,
Millbrook CSD, Millbrook, NY**

**Lynda Brennan, RP Connor Elementary
School, Suffern CSD, Suffern, NY**

- Content knowledge
- Instructional methods and assessments
- Broad range of learners and teaching environments
- Reflective teaching practice
- Leader in math education



For more information, please visit www.paemst.org



PAEMST Announcement



2022 PAEMST NY State Finalists for Mathematics (K-6)

Kristin Hanley
Lakewood Elementary School,
Clarkstown CSD,
New City, NY

Justin Wiedrick
Adirondack Middle School,
Adirondack CSD,
Boonville, NY

For additional information, please visit www.paemst.org



PAEMST AWARD



Presidential Awards for Excellence
in Mathematics and Science Teaching

Rewarding & Inspiring Great Teaching Since 1983



2022-2023 PAEMST Award Cycle grade 7-12 educators

The Nation's Highest Honors for Teachers of
Science, Technology, Engineering, and Mathematics
(STEM, including Computer Science)

**Three Application Components:
Administrative, Narrative, Video**

**Nominations open:
Fall 2022**


















Please visit www.paemst.org for more information.

Content Area Notification Service



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Health 	Math 	Middle Level 	N-6 	Physical Education 
School Counselors 	School Library 	Science 	Social Studies 	World Languages 

Contact Information

Graduation Requirements:

EMSCGRADREQ@nysed.gov

Assessment Questions:

EMSCASSESSINFO@nysed.gov

Standards/Presentation Questions:

EMSCURRIC@nysed.gov



**NYSED's
Office of Standards & Instruction
(518) 474-5922**

**[www.nysed.gov/curriculum-
instruction](http://www.nysed.gov/curriculum-instruction)**

**Andrea Faoro
Assistant in Instructional Services
Andrea.Faoro@nysed.gov**

**Connie Nephew
Associate in Instructional Services
Connie.Nephew@nysed.gov**

