Aligning Local Curricula to the Next Generation Mathematics Learning Standards (2017)

2020

New York State
EDUCATION DEPARTMENT
Knowledge › Skill › Opportunity

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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.*

Preface

In 2015, New York State (NYS) began a process of review and revision of its NYS P-12 Common Core Learning Standards for Mathematics, 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 (NYS) 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 Board of Regents' adoption of the New York State (NYS) Next Generation Mathematics Learning Standards (2017) initiates a call for school district leaders and educators to learn what grade-level benchmarks and expectations for student learning have been revised, moved, added or eliminated from the NYS P-12 Common Core Learning Standards for Mathematics (2011) **Curriculum and instruction that supports the content of the standards and the unique learning needs of students is locally determined by each individual district in New York State**. As with past implementations of new standards, locally chosen curricula will need to be adjusted and aligned to reflect the revisions that have occurred.

This document is designed to assist New York State school districts in the curriculum alignment process so that educators can be empowered to do this work.

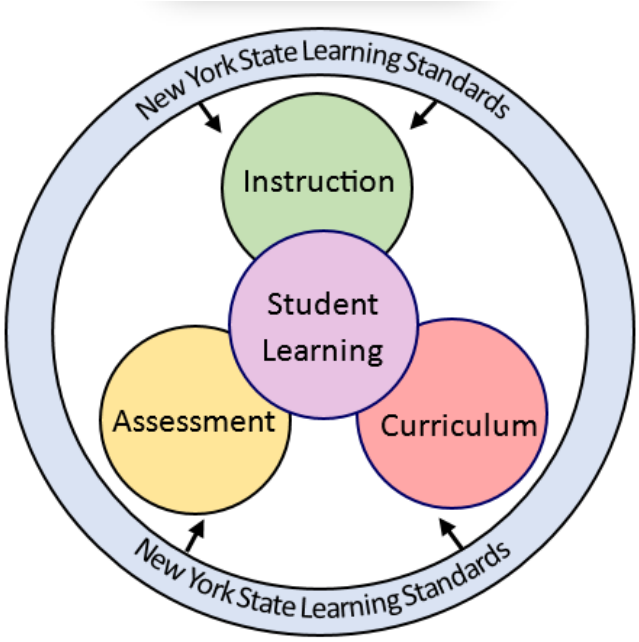
The suggestions that follow in this document can be used to aid in the revision or modification of all curricula, whether that be locally chosen curricula or the EngageNY voluntary modules. Professional collaboration with local and/or regional educational agencies during this process is always encouraged.

Learning Standards and Curriculum

What is the Difference?

Learning standards are defined as the knowledge, skills and understanding that individuals can habitually demonstrate over time because of instruction and learning experiences. The New York State Next Generation Mathematics Learning Standards (2017) are organized by grade levels/high school courses that provide an outline of a vision of how the learning of mathematics should progress over time.

The learning standards are not, however, curriculum. Learning Standards are statements of what students should know and be able to do at various stages in their mathematics development from Pre-Kindergarten through high school. Learning standards are not just a checklist of content and skills. Rather, they signal the understandings that students should gain from interaction with a curriculum. Curriculum brings the standards to life. It is the curriculum that weaves the learning standards into a story that builds the capacity of the learner to access and apply what has been learned.



Awareness of the Changes in the Standards

The starting point for making adaptations to local curriculum is an awareness of and attention to the standards. Educators need to know what has changed regarding the expectations for what students should know and be able to do at a grade level.

Educators need to consider:

- *What grade level/course standards have been added or removed?*
- *What grade level/course standards have shifted to a grade level above or below?*
- *What clarifications/limitations to the standards have been established?*
- *What changes in the language of the standards will affect instructional decisions?*
- *How will changes in the standards influence student understanding and how performance is measured?*

Educators are encouraged to read the provided grade/course overviews contained in the New York State Next Generation Mathematics Learning Standards (2017) document. These overviews provide a summary of the areas of focus and the associated key concepts for the grade or course. In conjunction with the crosswalks and snapshots, educators can read the standards for the grade/course, paying attention to the features of the standards document designed to support concept and lesson development. These features are explained on pg. 6 of the standards document and are also highlighted in the Next Generation Mathematics Teacher Support Features Toolkit.

Part I: Preparation

Collaborative Structures

Curriculum alignment to the Next Generation Mathematics Learning Standards can be undertaken as a collegial or individual effort. The New York State Education Department (NYSED) encourages teachers, school districts, and BOCES to work together to create a standards-based curriculum that meets the needs of all students and supports culturally responsive teaching practices. Curriculum development workshops can be arranged locally or regionally as a series of professional development opportunities that focus on aligning one unit at a time. A summer curriculum development institute is another approach with teams of educators each assigned to revise or develop a different unit. Vertical grade-level collaboration is another option for curriculum alignment. If, however, these types of collaboration are not possible, periodic conversations with colleagues about curriculum, instruction and assessment are highly encouraged. Modifying existing curriculum is part of reflective practice in action; an on-going process that allows districts and schools to expand upon and further develop their mathematical programs in order to support the needs of their learners.

Curricular and Supplementary Resources

The first stage of targeted preparation prior to making any alignment entails gathering the needed reference resources that will aid in the study and analysis of the standards, as well as assist in making and evaluating the necessary adaptations to curricular units. The following is a non-exhaustive list of links to resources of this nature. A synopsis of each listed resource is provided on the following pages 6-8 of this guide. These documents include, but are not limited to the:

- New York State Next Generation Mathematics Learning Standards (2017);
- Glossary of Verbs Associated with the NYS Next Generation Mathematics Learning Standards;
- Grade-Level Crosswalks and Snapshots;
- Grades 3-8 Post-Test Standards Designations;
- Unpacking Documents for the Standards;
- Mathematics Progression Documents;
- Achieve the Core Coherence Map;
- Blueprint for Improved Results for Students with Disabilities;
- Blueprint for English Language Learners Success; and
- EQuIP Rubric.

Note: The Mathematics Progression Documents and The Achieve the Core Coherence Map are aligned to the NYS P-12 Common Core Learning Standards for Mathematics (2011) (CCLSM), but are still significant for understanding the development of mathematics on which the 2017 standards are based.

The New York State Next Generation Mathematics Learning Standards (2017) are arranged by grade level and high school course. Coherence links to other grades, notes that clarify and connect standards, and citations were also included in the document. The Standards for Mathematical Practice (pgs. 7-9) were not altered by the standards review and revision process and are referenced throughout. A narrative about the changing expectations for mathematics achievement with an acknowledgement of diverse learner populations and students with disabilities is also contained in the introduction to the learning standards document.

The Glossary of Verbs Associated with the NYS Next Generation Mathematics Learning Standards contains a list of key vocabulary (verbs) that appear throughout the Mathematics Standards and are explained in the context in which they are used.

The Grade-Level Crosswalks use the full text of the 2011 and 2017 sets of standards, exempt of diagrams and charts, so that educators can review and compare the two sets of standards side-by-side. Bold text and strike-through text signal content differences and wording modifications between the two sets of standards.

The Grade-Level Snapshots provide a condensed one-page summary that lists standards that were added to the grade or course, standards that were moved, and any instructional considerations that accompany the clarification of a standard. Information about language that was modified in a standard is also included.

The Grades 3-8 Post-Test Standards Designations are to be used as districts move into the Building Capacity stage of the Next Generation Learning Standards Roadmap and Implementation Timeline. The first goal of this stage is "Support local school district needs to integrate the Next Generation Mathematics Learning Standards into local curriculum." It will be important for districts to consider the changes that have occurred with the post-test standards designations as they begin examining their current district curricular materials and resources and determining the changes needed to ensure alignment to the NYS Next Generation Mathematics Learning Standards.

The Unpacking Documents for the Standards are exemplars of a process that educators can engage in to help determine what student learning looks like in regards to a standard, also aiding in lesson and curriculum design. These documents highlight some of the considerations that go into the unpacking process when trying to

determine what the learning expectation is for a standard (what the standard is expecting a student to know and be able to demonstrate), such as:

- Analyzing how the standard relates to its domain and cluster;
- Aspects of rigor (procedural, conceptual, application);
- The Standards for Mathematical Practice;
- Measurable and observable performance/knowledge targets;
- Foundational understanding;
- Examples that highlight multiple representations, as well as show the transition from the concrete, pictorial to the abstract; and
- Examples that demonstrate accessibility for all learners with multiple entry points.

Educators are encouraged to add on to these documents and adapt them to best fit the needs of their learners, as well as unpack other grade-level standards. Engaging in the unpacking process for grade-level standards at the district level can provide valuable foundational work that can assist with determining curriculum materials.

The Mathematics Progression Documents narrate an account of the development of mathematics within a domain and across multiple grades. Woven into this narrative are references to standards and to instructional models that illustrate the development of concepts from pictorial to abstract. These progression documents are aligned to the New York State P-12 Common Core Learning Standards for Mathematics (2011) (CCLSM), but are still essential for understanding the development of mathematics rooted in the NYS Next Generation Mathematics Learning Standards (2017).

The Achieve the Core Coherence Map shows the vertical progression of mathematical concepts across grade levels, and also provides standard aligned math tasks.

The Blueprint for Improved Results for Students with Disabilities focuses on seven core evidence-based principles for students with disabilities to ensure they have the opportunity to benefit from high quality instruction and to reach the same standards as all students.

The Blueprint for English Language Learners Success provides a statewide framework of eight guiding principles for administrators, policy makers, and practitioners to prepare ELLs for success, beginning in prekindergarten, to lay the foundation for college and career readiness.

The EQuIP Rubric, originally called the *Tri-State Quality EQuIP Rubric*, was developed by an educational consortium from Connecticut, Massachusetts, and New York State. The rubric can be used to evaluate the modifications and enhancements made to local curricula for alignment purposes. This rubric is designed to ensure that the key features of a high-quality mathematics curriculum (i.e., focus, coherence, and rigor) are maintained. It also provides criteria to confirm that adaptations are accessible and equitable for all students.

Design Principles

The primary design principles for a standards-aligned mathematics curriculum are Focus, Coherence and Rigor.

- **Focus** is an emphasis on the major concepts within a domain.
- **Coherence** refers to the progression of mathematics within and across grade levels, including the development of concepts within a topic.
- **Rigor**, the third component of a standards-aligned mathematics curriculum, attends to the cognitive complexity needed for conceptual understanding, procedural fluency, and application of the learning.

When making changes, including possible additions, care must be taken to maintain these design principles and preserve a smooth transition from one grade-level to the next. Changing a lesson could impact the focus and coherence of other lessons, and the flow of the unit.

Part II: Examining Current Local Curricula

Examine, Analyze, and Study

Alignment of curriculum begins with an examination of the available resources to see how they align to the Next Generation Mathematics Learning Standards. Reviewing local curricular units begins with an examination of the unit-level summative information. Next, an analysis of the unit's lessons will prepare educators for determining where and what alignment to the standards is needed.

Curriculum Alignment

Give close attention to the standards that have been revised, moved, added, or eliminated. Adjust the units, lessons, and assessments as necessary and confirm that any adjustments maintain the level of rigor for students to achieve grade-level proficiency.

When examining the Next Generation Mathematics Learning Standards Document, as well as the crosswalks and snapshot documents, consider the following questions:

1. What standards are completely new to the grade level?
2. What standards have been clarified? (i.e. the standard was split up into sub-standards)
3. What standards have been moved or removed from the grade level?
4. What standards have new notes added?
5. What standards have new examples and/or illustrations?
6. What standards are "explore" standards?
7. In grades 3-8, have any of the pre/post assessment standards been moved?

Before analyzing the impact of modifications made to the learning standards, educators may choose to refer to the Mathematics Progression Documents. As stated previously, even though these documents are not fully aligned to the Next Generation Mathematics Learning Standards, they are still a viable resource that could assist in explaining the focus, flow and rigor of mathematical content throughout the grade levels (see synopsis on page 7).

An Example of Aligning Curriculum When There is a New Standard

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

Questions to consider:

- How significantly does the new standard change/alter the current curriculum?
- What foundational knowledge will students need to have?
- What connections to the new content can be made within the grade level with respect to other grade-level standards? Does current curriculum already refer to the content of the new standard through other grade-level connections?
- How does this new standard/skill support student learning of mathematical concepts at future grade levels?
- Will there be any learning gaps that will need to be addressed?

STANDARD PROGRESSION ANALYSIS

Domain: Solve real-world and mathematical problems involving area, surface area and volume.

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

Foundational Knowledge	Within Grade Connections	Subsequent Knowledge (What does it lead to ?)
Intro of the Square Unit in Grade 3 NY-3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement. NY-3.MD.5a Recognize a square with side length 1 unit, called "a unit square," is said to have "one square unit" of area and can be used to measure area. NY-3.MD.5b Recognize a plane figure which can be covered without gaps or overlaps by *n* unit square units. NY-3.MD.7 Relate area to the operations of multiplication and addition. **Intro to the Cube unit in Grade 5** NY-5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. NY-5.MD.3a Recognize that a cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. NY-5.MD.3b Recognize that a solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of n cubic units. NY-5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units. NY-5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. NY-5.MD.5a Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. **Intro to Exponents and Powers of 10** NY-5.NBT.2 Use whole-number exponents to denote powers of 10. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.	NY-6.EE.1 Write and evaluate numerical expressions involving whole-number exponents. NY-6. G.2 Find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	**Intro to Irrational Numbers in Grade 7/8** NY-7.NS.2d Convert a fraction to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. NY-8.NS.1 Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion eventually repeats. Know that other numbers that are not rational are called irrational. NY-8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Know square roots of perfect squares up to 225 and know that the square root of a non-perfect square is irrational. cube roots of perfect cubes up to 125. **Operations with Radicals and Completing the Square in Algebra I** AI-N.RN.3 Use properties and operations to understand the different forms of rational and irrational numbers. AI-N.RN.3a Perform all four arithmetic operations and apply properties to generate equivalent forms of rational numbers and square roots. AI-A.REI.4 Solve quadratic equations in one variable. Note: Solutions may include simplifying radicals. AI-A.REI.4b Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions.
	Skills (Verbs)	**Areas of Concern/Potential Gaps:**
	Recognize the shapes of squares and cubes. **Build/compose** models of squares and cubes from unit squares (cubes). **Draw** squares/cubes. **Write** the area (volume) of a perfect square (cube) using exponent notation. **Explain** why certain whole numbers are not perfect squares (cubes).	

Standard Progression Analysis Template can be found in Appendix A.

An Example of Aligning Curriculum When a Standard Was Clarified

NY-1.OA.6a Add and subtract within 20. Use strategies such as:

- 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.

NY-1.OA.6b Fluently add and subtract within 10.

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

Questions to consider:

- What content and skills are clarified in each sub-standard?
- How impactful is the clarification with respect to current curriculum?
- Have the clarifications changed the emphasis of the standard?
- What grade-level connections can be made in other units?
- Do these sub-standards belong in multiple units?
- Should the sub-standards be separated into different units of the curriculum?

An Example of Aligning Curriculum When a Standard Was Moved/Removed

8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

Questions to consider:

- How does this removal impact prior and future grade levels?
- What vertical grade-level conversations should occur to minimize gaps and ensure coherence across grade levels?

An Example of Aligning Curriculum When New Notes were Added

AI-A.SSE.2 Recognize and use the structure of an expression to identify ways to rewrite it.
(Shared standard with Algebra II)

e.g.,
$x^3 – x^2 – x = x(x^2 – x – 1)$
$53^2 – 47^2 = (53 + 47)(53 – 47)$
$16x^2 – 36 = (4x)^2 – (6)^2 = (4x + 6)(4x – 6) = 4(2x + 3)(2x – 3)$ or
$16x^2 – 36 = 4(4x^2 – 9) = 4(2x + 3)(2x – 3)$
$-2x^2 + 8x + 10 = -2(x^2 – 4x – 5) = -2(x – 5)(x + 1)$
$x^4 + 6x^2 – 7 = (x^2 + 7)(x^2 – 1) = (x^2 + 7)(x + 1)(x – 1)$

Note: Algebra I expressions are limited to numerical and polynomial expressions in one variable. Use factoring techniques such as factoring out a greatest common factor, factoring the difference of two perfect squares, factoring trinomials of the form ax^2+bx+c with a lead coefficient of 1, or a combination of methods to factor completely. Factoring will not involve factoring by grouping and factoring the sum and difference of cubes.

Questions to consider:

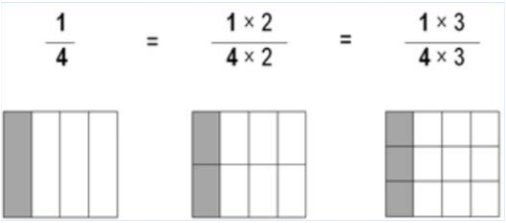
- Have the new notes narrowed the expectations of the standard?
- Have the new notes expanded the expectations of the standard?
- How do the new notes impact current curriculum?
- Does this standard appear in multiple units and how does the note impact grade-level connections (other grade-level standards)?
- How do the new notes impact prior and future grade levels?
- What vertical grade-level conversations should occur to minimize gaps and ensure coherence across grade levels?

An Example of Aligning Curriculum When New Examples and/or Illustrations were Added

NY-4.NF.1 Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{a \times n}{b \times n}$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

e.g.,



Questions to consider:

- How do the examples or illustrations relate to the standard?
- How can the examples or illustrations be utilized to impact student understanding?
- How do the examples or illustrations impact current curriculum?
- What vertical grade-level conversations should occur around the examples or illustrations to ensure coherence across grade levels?

An Example of Aligning Curriculum with "Explore" Standards

NY-K.MD.4 Explore coins (pennies, nickels, dimes, and quarters) and begin identifying pennies and dimes.

***Explore* 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.**

***Explore* 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.**

Questions to consider:

- How does the "explore" standard impact current curriculum?
- What foundational knowledge will students need to support the content of the "explore" standard?
- What connections can be made within the grade level? Have these connections already been made?
- Is this "explore" standard new foundational learning? Or did it narrow the expectations at the grade level?
- How does this standard support student learning of mathematical concepts at future grade levels?

An Example of Aligning Curriculum with Changes to the Pre/Post Grades 3-8 Assessment Standards

NY-7.G.4 Apply the formulas for the area and circumference of a circle to solve problems. (Post-test for Next Generation)

Note: Students in grade 7 are not expected to calculate the radius of a circle given its area.

Questions to consider:

- How does the movement of this standard impact current curriculum?
- Will an entire unit need to move? Or will topics within a unit need to move to reflect these changes?
- How does this movement impact future grade levels?
- What vertical grade-level conversations should occur to minimize gaps and ensure coherence across grade levels?

Post-test content (at district/teacher's discretion) may be introduced at various points throughout the year, then reinforced and built upon during the remaining months of school.

Part III: Identifying Meaningful Tasks

Unpacking Grade-Level Standards

Unpacking the standards provides educators with one possible structure they can utilize to have collaborative conversations about what they want their students to know and be able to do. Developing a collective clarity around the intent and rigor of the standard(s) will aid educators in designing their curriculum.

The Unpacking process includes the following five integral steps: (1) Analyzing How the Standard Relates to its Domain and Cluster; (2) Identifying Learning Targets; (3) Identifying Foundational Understanding; (4) Reflecting on the Aspects of Rigor and the Standards for Mathematical Practice; and (5) Designing Examples to Support Current Instruction of the Content Standard and the Attainment of the Learning Targets.

Questions to Consider, specifically for Step 5 (Designing Examples):

- What learning experiences will best support and develop mathematical language surrounding the content standard? What new mathematical language will be introduced?
- What type of learning experiences support the transition from the concrete, to the pictorial, to the abstract for the standard?
- What type of learning experiences highlight multiple representations/solution paths?
- Does the example or sample task have multiple entry points that will allow accessibility for all learners?
- Does the task support and develop content by providing a culturally relevant learning experience?
- Do any of the examples provide/demonstrate connections to other grade-level standards?

Further information on the process utilized in developing the unpacking exemplars can be found in A Guide for Unpacking the New York State Next Generation Mathematics Learning Standards.

The Unpacking Documents contain exemplars of unpacked standards.

Additional questions that might be considered when aligning lessons and homework/problem sets to the NYS Next Generation Mathematics Learning Standards can be found in Appendix B and Appendix C.

Part IV: Evaluation – Pulling It All Together

The EQuIP Rubric

It is important to remember that curriculum is not static, but rather fluid. To keep lessons viable, educators need a means to assess whether the changes made add a component of functionality without undue complexity, diminished rigor, or a loss of alignment.

The EQuIP Rubric, originally called the Tri-State Quality EQuIP Rubric, was developed by an educational consortium from Connecticut, Massachusetts, and New York State. Criteria that define the rubric are organized as a list describing quality in **four dimensions**:

- Alignment to the Depth of the Standards;
- Key Shifts of Focus;
- Instructional Supports; and
- Assessment.

Use of the rubric can assist educators in confirming that the adaptations made satisfy the characteristics of accessibility, equity, and excellence for all populations of students. It provides an opportunity to share the rationale behind modifications and enhancements made within the curriculum, as well as identify and discuss areas that might need further adaptations. Sharing curricular adjustments fosters communication between educators, creating a deeper understanding of the concepts embedded in the mathematics for all. The rubric also provides a context for expanding conversations into the areas of instructional practice and assessment.

Conclusion

Making constructive adaptations to any curriculum is an integral component of on-going reflective practice. The parts in this document provide suggestive guidance on aligning curricula to The Next Generation Mathematics Learning Standards (2017). Providing curriculum development opportunities for educators at the local or regional level will yield a collective curriculum product that will serve to fortify the learning experiences of the students.

Resources

Blueprint for English Language Learners Success

Blueprint for Improved Results for Students with Disabilities

Creative Commons Attribution Non-Commercial Share-Alike

EQuIP Rubric for Lessons & Units: Mathematics

Grade-Level Crosswalks

Grade-Level Snapshots

K-12 Publisher's Criteria for the Common Core State Standards for Mathematics

Key Shifts in Mathematics

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

Next Generation Learning Standards Roadmap and Implementation Timeline

New York State Next Generation Mathematics Learning Standards (2017)

New York State P-12 Learning Standards for Mathematics (2011)

Progressions Documents for the Common Core Math Standards

Scaffolding Instruction for English Language Learners: Resource Guides for English Language Arts and Mathematics

Supporting All Students: Resource Guides for Scaffolding Instruction of English Language Arts and Mathematics

Unpacking Documents

Utilizing the New Teacher-Support Features Built into the New Math Standards Document

Appendix A

Domain:

<table>
<tr><td colspan="3">Standard:</td></tr>
<tr><td rowspan="4">Foundational Knowledge</td><td>Within Grade Connections</td><td>Subsequent Knowledge</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Skills (Verbs)</td><td>Areas of Concern/Potential Gaps:</td></tr>
<tr><td></td><td></td></tr>
</table>

Appendix B
Guiding Questions for Lesson Alignment

Question	Notes
How does this lesson contribute to the overall intention of the standards?	
What are the student outcome targets, key concepts and skills for the lesson?	
What foundational and supporting standards for this lesson have been revised, moved or eliminated? How will these changes affect the lesson objectives?	
Where might gaps exist for students that pertain to the lesson objectives? Are there gaps in the development of the concepts that will need to be bridged?	
What should the essential characteristics of the lesson be?	
How does the concept development in the lesson connect to what was previously learned? How will the lesson connect to future lessons/learning?	
When might an explicit explanation be needed?	
Does the dialogue of the lesson illustrate the kind of questioning techniques that engage students in actively building their understanding?	
What is the purpose of the examples that are provided?	
Is there a connection between teacher-led examples and student-driven exercises? Do the examples and exercises need modification to reflect the revised standards?	
Do the exercises and examples support independent student success on the exit tickets?	
What instructional strategies might be used to differentiate instruction for this lesson?	
Does the lesson allow for multiple representations and entry points?	
What are the practice standards that are being employed?	

Appendix C

Guiding Questions for Homework / Problem Set Alignment

Question	Notes
Do the questions need modification to reflect the revised expectation of the learning standard and any modifications to the lesson that have occurred?	
What is the purpose of each problem?	
What additional problems could be added to provide more practice? What extensions to a problem could be created?	
Should an annotated model problem be included so students have a model to reference when completing the homework?	