The New York State Next Generation Mathematics Learning Standards

Crosswalk Documents

Reflection in Action

In 2015, New York State (NYS) began a process of review and revision of the New York State P-12 Common Core Learning Standards for Mathematics, adopted in January 2011. Through numerous phases of public comment, virtual and face-to-face meetings with committees consisting of NYS educators (including 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 standards reflect the collaborative efforts and expertise of all constituents involved and were adopted by the Board of Regents in September 2017.

Learning standards are defined as the knowledge, skills and understanding that individuals can habitually demonstrate over time because of instruction and learning experiences. The mathematics standards, collectively, need to be 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 and curricula 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, as well as represent a significant level of achievement in mathematics that will enable students to successfully transition to post-secondary education and the workforce.

In this regard, The New York State Next Generation Mathematics Learning Standards (2017) reflect revisions, additions, vertical movement, and clarifications to the NYS CCLS for Mathematics. Significant changes/modifications include the following:

- **High school standards listed by course** in the standards document (Algebra I, Geometry, Algebra II). There is also a section that contains the Plus (+) Standards; additional mathematics beyond Algebra II that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics. The Plus (+) Standards are not a high school course, however, may be dispersed throughout course curricula, including Algebra I, Algebra II and Geometry, to increase rigor and support the needs of individual students and mathematical programs. They will not, however, be addressed on state assessments. The Plus (+) Standards provide coherence and extend concepts previously taught in Algebra I, Geometry, and Algebra II.

- **Standards moved to different grade levels** to improve focus; providing more time for students to develop deep levels of understanding of major grade-level content and skills.
- **New standards added** to strengthen the coherency of the standards, allowing for a stronger connection of learning within and across grade levels.
- **Consolidation/removal of standards** to improve coherence, focus and reduce redundancy amongst the grade levels.
- **Added the language "explore"** to some standards to ensure standards are grade-level appropriate. Exploring a standard allows students to be introduced to and learn a concept without the expectation of mastering the concept at that grade level. Exploring the topic recognizes the importance of building a foundation toward mastering the concept in subsequent grades.
- **Clarified existing standards** to more clearly identify the expectation of the standard, helping to improve the focus of instruction. Clarification included the changing/deleting/adding of language, the addition of notes and diagrams, and the modification of prior examples.
- **Maintained the rigor of the standards** by balancing the need for conceptual understanding, procedural skill and application.
- **Added the supplement "Glossary of Verbs Associated with the Next Generation Mathematics Learning Standards"** that contains an explanation of the context in which certain verbs that appear throughout the standards are used.

How to Read/Utilize the Crosswalk Documents

The crosswalk documents were designed by a team of NYS educators as a guidance tool that can be utilized to identify the content similarities and differences between the NYS P-12 CCLSM and the NYS Next Generation Mathematics Learning Standards for each grade level/course. The crosswalks can assist educators in the preliminary work required in assessing the scope of the content changes and the impact those changes will have on student learning, locally devised curriculum/mathematics programs, instruction and instructional resources. The crosswalk documents are not as comprehensive in nature as the New York State Next Generation Mathematics Learning Standards document, found at http://www.nysed.gov/curriculum-instruction/teachers/new-york-state-next-generation-mathematics-learning-standards. To understand the full scope of the content and the learning progressions outlined in the Next Generation Mathematics Learning Standards, educators are encouraged to examine the coherence links and the within-grade connections that are provided throughout the standards document, as well as the cited research-based sources, such as the Progressions for the Common Core State Standards in Mathematics documents and the Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report.

There are two different types of crosswalks for each course/grade:

The **Grade-level Snapshot** which provides a condensed one-page summary that lists standards that were added to the grade/course, standards that were moved, and any instructional considerations that need to be highlighted based on new standard clarifications or language modification.

The **Grade-level Side-by-Side** uses the full-text (no diagrams or charts) of both sets of standards so that readers can review and compare the two sets side-by-side. Strike-through and bolded text can be seen throughout in order to highlight content differences and wording modifications between the two sets of standards.

The following two samples show some of the types of changes reflected in the **Side-by-Side** crosswalks:

New York State Next Generation Mathematics Learning Standards **Grade 6 Crosswalk** **Statistics and Probability**		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Summarize and describe distributions.	**6.SP.5c** Giving quantitative measures of center (median and/or mean) and variability (~~interquartile range and/or mean absolute deviation~~), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	**NY-6. SP.5c Calculate range and measures of center, as well as describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.** **Note: Measures of center are mean, median, and mode. The measure of variation is the range. Role of outliers should be discussed, but no formula required.**
	6.SP.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	**NY-6. SP.5d** Relate **the range** and the choice of measures of center to the shape of the data distribution and the context in which the data were gathered. **Note: Measures of center are mean, median, and mode. The measure of variation is the range.**
Investigate chance processes and develop, use and evaluate probability models.		**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 event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 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. **e.g., When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.** **Note: Compound events are introduced in grade 7.**

Text deleted from the CCLS standard to show that the content is no longer a grade-level expectation (strike-through), replacement text in the Next Generation standard is in bold.

Text modified in the Next Generation standard (bold) to further clarify grade-level expectation.

New standard added to grade-level/course.

New standard added to grade-level/course.

New York State Next Generation Mathematics Learning Standards **Geometry Crosswalk** **Geometry** **Circles (G.C)**		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand and apply theorems about circles.	**G-C.1** Prove that all circles are similar.	**GEO-G.C.1** Prove that all circles are similar.
	G-C.2 Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.* Note: Relationships include but are not limited to the listed relationships. Example: angles involving tangents and secants.	**GEO-G.C.2a** Identify, describe **and apply relationships between the angles and their intercepted arcs** of a circle. **GEO-G.C.2b**. Identify, describe and **apply relationships among radii, chords, tangents, and secants** of a circle. **Note: These relationships that pertain to the circle may be utilized to prove other relationships in geometric figures, e.g., the opposite angles in any quadrilateral inscribed in a circle are supplements of each other.** **Also includes algebraic problems built upon these concepts.**
	G-C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	**STANDARD REMOVED** **Constructing the incenter and circumcenter of a circle has been embedded in standard GEO-G.CO.12. The properties of the angles for a quadrilateral inscribed in a circle is now embedded in standard GEO-G.C.2a.**
Find arc lengths and area of sectors of circles.	**G-C.5** ~~Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality;~~ derive the formula for the area of a sector.	**GEO-G.C.5 Using proportionality, find one of the following given two others; the central angle, arc length, radius or area of sector.** **Note: Angle measure is in degrees.**

CCLS standard has been broken down into parts. The Next Generation standard contains modified/additional language in bold.

CCLS standard has been removed from the grade-level/course.

Text deleted from the CCLS standard to show that the content is no longer a grade-level expectation (strike-through), replacement text in the Next Generation standard is in bold.

Keeping in mind that the crosswalk documents were created by fellow state educators and highlight the changes/modifications they thought were necessary to bring to the forefront, districts are encouraged to edit the documents as they best see fit to assist with their curriculum/instructional planning.

New York State Next Generation Mathematics Learning Standards

This document is intended to help educators identify the key changes that have occurred to the content standards for this grade level/course and to assist with designing curriculum and lessons aligned to the NYS Next Generation Mathematics Learning Standards. This document does not contain the comprehensive list of learning standards for the grade level/course. The complete list of standards for the grade level/course can be found at NYS Next Generation Mathematics Learning Standards.

Grade 1 Snapshot 

Standards New to Grade 1

NY-1.MD.3a Tell and write time in hours and half-hours using analog and digital clocks. **Develop an understanding of common terms, such as, but not limited to, o'clock and half past.**
NY-1.MD.3b Recognize and identify coins (penny, nickel, dime and quarter) and their value and **use the cent symbol (¢) appropriately**.
NY-1.MD.3c Count a mixed collection of coins of dimes and pennies and determine the cent value (not to exceed 100 cents). Students should relate the value of coins (pennies and dimes) to place value concepts seen in the grade one standards from the Number and Operations in Base Ten domain.

Standards Moved from Grade 1

No standards moved.

Highlights/Instructional Considerations

NY-1.OA.1 Students are using addition and subtraction within 20 to solve *one-step* word problems. Problems should be represented using objects, drawings, and equations with a symbol for the unknown number. When solving any problem, students can use objects or drawings, and equations.
NY-1.OA.6b Fluently add and subtract within 10. Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.
NY-1.OA.8 Students are still determining the unknown (in all positions) in an addition/subtraction equation that relates three whole numbers. See examples in the standard.
NY-1.NBT.4 When adding within 100 (two-digit and one-digit, two-digit and multiple of ten) students should be taught/exposed to a variety of strategies based on place value, properties of operations, and the relationship that exists between addition; however, when solving a problem, students can choose any strategy.
NY-1.NBT.6 When subtracting multiples of 10 from multiples of 10 (range of 10-90), students should be taught/exposed to a variety of strategies based on place value, properties of operations, and the relationship between addition and subtraction. When solving any problem, students can choose a concrete model or a drawing that is based on the previous mentioned strategies that demonstrates their understanding.
NY-1.G.1 When working with two and three-dimensional shapes, students should be taught to build *and* draw shapes to possess defining attributes; however, when answering questions, student can choose to build *or* draw the shape.

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Represent and solve problems involving addition and subtraction.	**1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	**NY-1.OA.1** Use addition and subtraction within 20 to solve **one-step** word problems involving situations of adding to, taking from, putting together, taking apart, **and/or** comparing, with unknowns in all positions. Note: Problems should be **represented** using objects, drawings, and equations with a symbol for the unknown number. Problems should be **solved** using objects or drawings, and equations.
	1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	**NY-1.OA.2** Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20. e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
Understand and apply properties of operations and the relationship between addition and subtraction.	**1.OA.3** Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)* Note: Students need not use formal terms for these properties.	**NY-1.OA.3** Apply properties of operations as strategies to add and subtract. e.g., • If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) • To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) Note: Students need not use formal terms for these properties.
	1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.* Add and subtract within 20.	**NY-1.OA.4** Understand subtraction as an unknown-addend problem **within 20**. e.g., subtract 10 – 8 by finding the number that makes 10 when added to 8.

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Add and subtract within 20.	**1.OA.5** Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	**NY-1.OA.5** Relate counting to addition and subtraction. e.g., by counting on 2 to add 2
	1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).	**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.**
Work with addition and subtraction equations.	**1.OA.7** Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.	**NY-1.OA.7** Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. e.g., Which of the following equations are true and which are false? 6 = 6 7 = 8 – 1 5 + 2 = 2 + 5 4 + 1 = 5 + 2
	1.OA.8 Determine the unknown whole number in an addition or subtraction equation ~~relating three whole numbers~~. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = _ – 3, 6 + 6 = _.*	**NY-1.OA.8** Determine the unknown whole number in an addition or subtraction equation **with the unknown in all positions**. e.g., Determine the unknown number that makes the equation true in each of the equations 8 + ? = 11 __ – 3 = 5 6 + 6 = ☐

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Extend the counting sequence.	**1.NBT.1** Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	**NY-1.NBT.1** Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
Understand place value.	**1.NBT.2** Understand that the two digits of a two-digit number represent amounts of tens and ones. ~~Understand the following as special cases:~~ a. 10 can be thought of as a bundle of ten ones — called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	**NY-1.NBT.2** Understand that the two digits of a two-digit number represent amounts of tens and ones. **NY-1.NBT.2a Understand** 10 can be thought of as a bundle of ten ones, called a "ten". **NY-1.NBT.2b Understand** that the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. **NY-1.NBT.2c Understand** that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight or nine tens (and 0 ones).
	1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	**NY-1.NBT.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use place value understanding and properties of operations to add and subtract.	**1.NBT.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written ~~method~~ and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	**NY-1.NBT.4** Add within 100, including: • a two-digit number and a one-digit number; • a two-digit number and a multiple of 10. Use concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones, and sometimes it is necessary to compose a ten. Relate the strategy to a **written representation** and explain the reasoning used. **Notes:** **Students should be taught to use strategies based on place value, properties of operations, *and* the relationship between addition and subtraction; however, when solving any problem, students can choose any strategy.** **A *written representation* is any way of representing a strategy using words, pictures, or numbers.**
	1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	**NY-1.NBT.5** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use place value understanding and properties of operations to add and subtract.	**1.NBT.6** Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written ~~method~~ and explain the reasoning used.	**NY-1.NBT.6** Subtract multiples of 10 from multiples of 10 in the range 10-90 using • concrete models or drawings, and • strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Relate the strategy used to a **written representation** and explain the reasoning. **Notes:** **Students should be taught to use concrete models and drawings; as well as strategies based on place value, properties of operations, *and* the relationship between addition and subtraction. When solving any problem, students can choose to use a concrete model or a drawing. Their strategy must be based on place value, properties of operations, or the relationship between addition and subtraction.** **A *written representation* is any way of representing a strategy using words, pictures, or numbers.**

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Measure lengths indirectly and by iterating length units.	**1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object	**NY-1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object.
	1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. ~~*Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*~~	**NY-1.MD.2 Measure** the length of an object using same-size "length units" placed end to end with no gaps or overlaps. Express the length of an object as a whole number of "length units." **Note: "Length units" could include cubes, paper clips, etc.**
Tell and write time and money.	**1.MD.3** Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their value.	**NY-1.MD.3a** Tell and write time in hours and half-hours using analog and digital clocks. **Develop an understanding of common terms, such as, but not limited to, o'clock and half past**. **NY-1.MD.3b** Recognize and identify coins (penny, nickel, dime, and quarter) and their value and **use the cent symbol (¢) appropriately.** **NY-1.MD.3c Count a mixed collection of dimes and pennies and determine the cent value (total not to exceed 100 cents).** **e.g. 3 dimes and 4 pennies is the same as 3 tens and 4 ones, which is 34 cents (34 ¢)**
Represent and interpret data.	**1.MD.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	**NY-1.MD.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Reason with shapes and their attributes.	**1.G.1** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	**NY-1. G.1** Distinguish between defining attributes versus non-defining attributes **for a wide variety of shapes**. Build **and/or** draw shapes to possess defining attributes. e.g., • A defining attribute may include, but is not limited to: triangles are closed and three-sided. • Non-defining attributes include, but are not limited to: color, orientation, and overall size. **Note on and/or: Students should be taught to build *and* draw shapes to possess defining attributes; however, when answering questions, students can choose to build *or* draw the shape.**
	1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Note: Students do not need to learn formal names such as "right rectangular prism."	**NY-1.G.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Note: Students do not need to learn formal names such as "right rectangular prism."

New York State Next Generation Mathematics Learning Standards		
Grade 1 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Reason with shapes and their attributes.	**1.G.3** Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as *two of*, or *four of* the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	**NY-1. G.3** Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as *two of*, or *four of* the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

New York State Next Generation Mathematics Learning Standards

This document is intended to help educators identify the key changes that have occurred to the content standards for this grade level/course and to assist with designing curriculum and lessons aligned to the NYS Next Generation Mathematics Learning Standards. This document does not contain the comprehensive list of learning standards for the grade level/course. The complete list of standards for the grade level/course can be found at NYS Next Generation Mathematics Learning Standards.

Grade 2 Snapshot 

Standards New to Grade 2

No new standards.

Standards Moved from Grade 2

No standards moved.

Highlights/Instructional Considerations

NY-2.OA.1b Students are developing an understanding of solving two-step word problems using addition and subtraction within 100. Understanding requires a student to grasp sufficient knowledge of a mathematical concept in order to explain or apply it.
NY-2.OA.2a Students, with the use of mental strategies, should be fluent with addition/subtraction within 20. Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies. By the end of the K–2 grade span, students have sufficient experience with these strategies to know from memory all single-digit sums (NY-2.OA.2b).
NY-2.NBT.1 Understand that the digits of a three-digit number represent amounts of hundreds, tens and ones (e.g., 256 could be 2 hundreds, 5 tens and 6 ones or it could be 25 tens and 6 ones).
NY-2.NBT.5 Students, with the use of strategies based on place value, properties of operation, an/or the relationship between addition and subtraction, need to be fluent with addition/subtraction within 100. Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies. Students can choose any strategy.
NY-2.NBT.7a Students are utilizing concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction to add/subtract within 1000. Fluency is not an expectation until grade 3 (NY-3.NBT.2).
NY-2.MD.1 Measure the length of an object to the nearest whole by selecting and using appropriate tools such as rulers, yardsticks, meter sticks and measuring tapes.
NY-2.MD.2 Students are measuring objects twice, using different length units for each of the two measurements and then describing how the two measurements relate to the size of the unit chosen.
NY-2.MD.7 Students are developing and understanding language associated with telling time; such as quarter to, quarter past, and half past. This standard extends work done in grade 1 with standard NY-1.MD.3a and the terms o'clock and half-past (hour and half-hour).
NY-2.MD.8a and b Students will be counting a mixed collection of coins whose sum is less than or equal to one dollar, and solving real world and mathematical problems within one dollar involving quarters, dimes, nickels, and pennies using the cent (¢) sign appropriately. Since students are not introduced to decimals in grade 2, dollars and the dollar symbol are not an expectation at this grade level (expectation at grade 4 (NY-4.MD.2)).
NY-2.G.1 Standard was re-written. Students are classifying two-dimensional figures as polygons or non-polygons. Students will start classifying polygons based on number of sides and vertices in grade 3, standard NY-3. G.1.

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.	**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.	**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. e.g., using drawings and equations with a symbol for the unknown number to represent the problem. **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. e.g., using drawings and equations with a symbol for the unknown number to represent the problem.
Add and subtract within 20.	**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. Note: See standard 1.OA.6 for a list of mental strategies.	**NY-2.OA.2a** Fluently add and subtract within 20 using mental strategies. Strategies could include: • 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. **Note: Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.** **NY-2.OA.2b** Know from memory all sums within 20 of two one-digit numbers.

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**
Work with equal groups of objects to gain foundations for multiplication.	**2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2's; write an equation to express an even number as a sum of two equal addends.	**NY-2.OA.3a** Determine whether a group of objects (up to 20) has an odd or even number of members. e.g., by pairing objects or counting them by 2's. **NY-2.OA.3b** Write an equation to express an even number as a sum of two equal addends.
	2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	**NY-2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. Write an equation to express the total as a sum of equal addends.

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand place value.	**2.NBT.1** Understand that the ~~three~~ digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a "hundred." b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	**NY-2.NBT.1** Understand that the digits of a three-digit number represent amounts of hundreds, tens, and ones. e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. **NY-2.NBT.1a Understand** 100 can be thought of as a bundle of ten tens, called a "hundred." **NY-2.NBT.1b Understand** the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
	2.NBT. 2 Count within 1000; skip-count by 5's, 10's, and 100's.	**NY-2.NBT. 2** Count within 1000; skip-count by 5's, 10's, and 100's.
	2.NBT. 3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	**NY-2.NBT. 3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. e.g., expanded form: 237 = 200 + 30 + 7
	2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	**NY-2.NBT.4** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use place value understanding and properties of operations to add and subtract.	**2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	**NY-2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. **Notes: Students should be taught to use strategies based on place value, properties of operations, and the relationship between addition and subtraction; however, when solving any problem, students can choose any strategy.** **Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.**
	2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.	**NY-2.NBT.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.
	2.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written ~~method~~. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	**NY-2.NBT.7a** Add and subtract within 1000, using • concrete models or drawings, and • strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Relate the strategy to a written **representation**. **Notes:** **Students should be taught to use concrete models and drawings; as well as strategies based on place value, properties of operations, and the relationship between addition and subtraction. When solving any problem, students can choose to use a concrete model or a drawing. Their strategy must be based on place value, properties of operations, and/or the relationship between addition and subtraction.** **A *written representation* is any way of representing a strategy using words, pictures, or numbers.** **NY-2.NBT.7b** Understand that in adding or subtracting up to three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones, and sometimes it is necessary to compose or decompose tens or hundreds.

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use place value understanding and properties of operations to add and subtract.	**2.NBT.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	**NY-2.NBT.8** Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
	2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. Note: Explanations may be supported by drawings or objects.	**NY-2.NBT.9** Explain why addition and subtraction strategies work, using place value and the properties of operations. Note: Explanations may be supported by drawings or objects.

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Measure and estimate lengths in standard units.	**2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	**NY-2.MD.1** Measure the length of an object **to the nearest whole** by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
	2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	**NY-2.MD.2** Measure the length of an object twice, **using different "length units"** for the two measurements; describe how the two measurements relate to the size of the unit chosen.
	2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.	**NY-2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.
	2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit.	**NY-2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard "length unit."

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Relate addition and subtraction to length.	**2.MD.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., ~~by~~ using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	**NY-2.MD.5** Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units. e.g., using drawings and equations with a symbol for the unknown number to represent the problem.
	2.MD.6 Represent whole numbers as lengths from 0 on a number line ~~diagram~~ with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line ~~diagram~~.	**NY-2.MD.6** Represent whole numbers as lengths from 0 on a **number line** with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a **number line**.
Work with time and money.	**2.MD.7** Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	**NY-2.MD.7** Tell and write time from analog and digital clocks **in five-minute increments**, using a.m. and p.m. **Develop an understanding of common terms, such as, but not limited to, quarter past, half past, and quarter to.**
	2.MD.8 Solve word problems involving ~~dollar bills~~, quarters, dimes, nickels, and pennies, using ~~$ and~~ ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	**NY-2.MD.8a Count a mixed collection of coins whose sum is less than or equal to one dollar.** e.g., If you have 2 quarters, 2 dimes and 3 pennies, how many cents do you have? **NY-2.MD.8b** Solve real world and mathematical problems **within one dollar involving quarters, dimes, nickels, and pennies, using the ¢ (cent) symbol appropriately**. **Note: Students are not introduced to decimals, and therefore the dollar symbol, until Grade 4.**

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Represent and interpret data.	**2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. ~~Show the measurements by~~ making a line plot, where the horizontal scale is marked off in whole-number units.	**NY-2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. **Present the measurement data** in a line plot, where the horizontal scale is marked off in whole-number units.
	2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	**NY-2.MD.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a picture graph or a bar graph.

New York State Next Generation Mathematics Learning Standards		
Grade 2 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Reason with shapes and their attributes.	**2.G.1** ~~Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.~~ ~~Note: Sizes are compared directly or visually, not compared by measuring.~~	**NY-2.G.1 Classify two-dimensional figures as polygons or non-polygons.**
	2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	**NY-2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
	2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	**NY-2.G.3** Partition circles and rectangles into two, three, or four equal shares. Describe the shares using the words *halves, thirds, half of, a third of,* etc. Describe the whole as *two halves, three thirds, four fourths*. Recognize that equal shares of identical wholes need not have the same shape.

New York State Next Generation Mathematics Learning Standards

This document is intended to help educators identify the key changes that have occurred to the content standards for this grade level/course and to assist with designing curriculum and lessons aligned to the NYS Next Generation Mathematics Learning Standards. This document does not contain the comprehensive list of learning standards for the grade level/course. The complete list of standards for the grade level/course can be found at NYS Next Generation Mathematics Learning Standards.

Grade 3 Snapshot 

Standards New to Grade 3

NY-3.NBT.4a Understand that the digits of a four-digit number represent amounts of thousands, hundreds, tens and ones.
(e.g., 3,245 equals 3 thousands, 2 hundreds, 4 tens and 5 ones or it could equal 32 hundreds, 4 tens and 5 ones)
NY-3.NBT.4b Read and write four-digit numbers using base-ten numerals, number names and expanded form.
(e.g., the number 3,245 in expanded form can be written as 3,245=3,000+200+40+5).
Both standards work with the place value progression from NY-2.NBT.1 and 3 to NY-4.NBT.2.

Standards Moved from Grade 3

No standards moved.

Highlights/Instructional Considerations

NY-3.OA.5 A variety of representations (pictorial/model) can be used when applying the properties of operations to multiply and divide, does not need to be solely equation form. For example, the area model (NY-3.MD.7c) is a multiplication/division strategy that students can utilize to apply the distributive property.
NY-3.OA.7a New wording, fluently solve single-digit multiplication and related divisions, still implies within 100. Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies. By the end of grade 3, students have sufficient experience with these strategies to know from memory all single-digit products (NY-3.OA.7b).
NY-3.OA.8a Expressions, in addition to equations can be utilized for two-step word problems. These problems do not need to be represented by one equation or expression, but can be broken down into more than one. Order of operations is an expectation of grade 5 (NY-5.OA.1).
NY-3.OA.9 Students will need to be able to identify arithmetic patterns and extend them.
NY-3.NBT.2 Fluently add and subtract within 1,000. Students should be taught to use strategies and algorithms based on place value, properties of operations, and the relationship between addition and subtraction; however, when solving any problem, students can choose any strategy. A range of algorithms may be used.
NY-3.NF (ALL) Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.
NY-3.NF.3 Took out "special cases", using denominator limitations 2,3,4,6 and 8, students need to explain the equivalence of fractions and compare fractions by reasoning about their size.
NY-3.MD.1 Other strategies can be utilized here besides the number line for one-step time word problems. One-step time word problems could involve crossing over into new hour.
NY-3.MD.7d Additive area problems involving finding the area of figures composed of non-overlapping rectangles could involve one unknown side length.
NY-3.MD.8b Changed wording of original standard from students "exhibiting" rectangles with perimeter/area relationships to students "identifying" rectangles with perimeter/area relationships.
NY-3.G.1 Recognize and classify polygons based on the number of sides and vertices, not types of angles and parallel/perpendicular lines (grade 4 (NY-4.G.2)). No hierarchy of the parallelogram family. Students should be exposed to regular and irregular polygons, though they do not need to utilize those formal terms when classifying.

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Represent and solve problems involving multiplication and division.	**3.OA.1** Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7.*	**NY-3.OA.1** Interpret products of whole numbers. e.g., Interpret 5×7 as the total number of objects in 5 groups of 7 objects each. Describe a context in which a total number of objects can be expressed as 5×7.
	3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*	**NY-3.OA.2** Interpret whole-number quotients of whole numbers. e.g., Interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. Describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
	3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., ~~by~~ using drawings and equations with a symbol for the unknown number to represent the problem.	**NY-3.OA.3** Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. e.g., using drawings and equations with a symbol for the unknown number to represent the problem.
	3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \_ \div 3$, $6 \times 6 = ?$*	**NY-3.OA.4** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. e.g., Determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \_\_ \div 3$, $6 \times 6 = ?$.

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand properties of multiplication and the relationship between multiplication and division.	**3.OA.5** Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)* Note: Students need not use formal terms for these properties.	**NY-3.OA.5** Apply properties of operations as strategies to multiply and divide. e.g., • If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication) • 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication) • Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property) Note: Students need not use formal terms for these properties. **Note: A variety of representations can be used when applying the properties of operations, which may or may not include parentheses.**
	3.OA.6 Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	**NY-3.OA.6** Understand division as an unknown-factor problem. e.g., Find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
Multiply and divide within 100.	**3.OA.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	**NY-3.OA.7a Fluently solve single-digit multiplication and related divisions**, using strategies such as the relationship between multiplication and division or properties of operations. e.g., Knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8. **NY-3.OA.7b** Know from memory all products of two one-digit numbers. **Note: Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.**

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Solve problems involving the four operations, and identify and extend patterns in arithmetic.	**3.OA.8** Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. Note: This standard is limited to problems posed with whole numbers and having whole-number answers; ~~students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order~~.	**NY-3.OA.8** Solve two-step word problems **posed with whole numbers and having whole-number answers** using the four operations. **NY-3.OA.8a** Represent these problems using **equations or expressions** with a letter standing for the unknown quantity. **NY-3.OA.8b** Assess the reasonableness of answers using mental computation and estimation strategies including rounding. **Note: Two-step problems need not be represented by a single expression or equation.**
	3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and ~~explain them using properties of operations~~. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	**NY-3.OA.9 Identify and extend arithmetic patterns** (including patterns in the addition table or multiplication table).

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use place value understanding and properties of operations to perform multi-digit arithmetic.	**3.NBT.1** Use place value understanding to round whole numbers to the nearest 10 or 100.	**NY-3.NBT.1** Use place value understanding to round whole numbers to the nearest 10 or 100.
	3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	**NY-3.NBT.2** Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **Note: Students should be taught to use strategies and algorithms based on place value, properties of operations, *and* the relationship between addition and subtraction; however, when solving any problem, students can choose any strategy.** **Note: A range of algorithms may be used.**
	3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	**NY-3.NBT.3** Multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations. e.g., 9 × 80, 5 × 60
		NY-3.NBT.4a Understand that the digits of a four-digit number represent amounts of thousands, hundreds, tens, and ones. **e.g., 3,245 equals 3 thousands, 2 hundreds, 4 tens, and 5 ones.** **NY-3.NBT.4b Read and write four-digit numbers using base-ten numerals, number names, and expanded form.** **e.g., The number 3,245 in expanded form can be written as 3,245= 3,000 + 200 + 40 + 5.**

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Develop understanding of fractions as numbers.	**3.NF.1** Understand a fraction *1/b* as the quantity formed by 1 part when *a* whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by *a* parts of size *1/b*.	**NY-3.NF.1** Understand a **unit fraction**, $\frac{1}{b}$, is the quantity formed by 1 part when a whole is partitioned into *b* equal parts. Understand a fraction $\frac{a}{b}$ as the quantity formed by *a* parts of size $\frac{1}{b}$. **Note: Fractions are limited to those with denominators 2, 3, 4, 6, and 8.**
	3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line ~~diagram~~. a. Represent a fraction *1/b* on a number line ~~diagram~~ by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size *1/b* and that the endpoint of the part based at 0 locates the number *1/b* on the number line. b. Represent a fraction *a/b* on a number line ~~diagram~~ by marking off *a* lengths *1/b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.	**NY-3.NF.2** Understand a fraction as a number on the number line; represent fractions on a **number line**. **Note: Fractions are limited to those with denominators 2, 3, 4, 6, and 8.** **NY-3.NF.2a** Represent a fraction $\frac{1}{b}$ on a **number line** by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part starting at 0 locates the number $\frac{1}{b}$ on the number line. **NY-3.NF.2b** Represent a fraction $\frac{a}{b}$ on a **number line** by marking off *a* lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Develop understanding of fractions as numbers.	**3.NF.3** Explain equivalence of fractions ~~in special cases~~, and compare fractions by reasoning about their size.	**NY-3.NF.3** Explain equivalence of fractions and compare fractions by reasoning about their size. **Note: Fractions are limited to those with denominators 2, 3, 4, 6, and 8.**
	a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	**NY-3.NF.3a** Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
	b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., ~~by~~ using a visual fraction model.	**NY-3.NF.3b** Recognize and generate equivalent fractions. e.g., $\frac{1}{2} = \frac{2}{4}; \frac{4}{6} = \frac{2}{3}$. Explain why the fractions are equivalent. e.g., using a visual fraction model.
	c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*	**NY-3.NF.3c** Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. e.g., Express 3 in the form 3 = $\frac{3}{1}$, recognize that $\frac{6}{3}$ = 2, and locate $\frac{4}{4}$ and 1 at the same point on a number line.
	d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., ~~by~~ using a visual fraction model.	**NY-3.NF.3d**. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons rely on the two fractions referring to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions. e.g., using a visual fraction model.

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	**3.MD.1** Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., ~~by~~ representing the problem on a number line ~~diagram~~.	**NY-3.MD.1** Tell and write time to the nearest minute and measure time intervals in minutes. Solve **one-step** word problems involving addition and subtraction of time intervals in minutes. e.g., representing the problem on a number line or **other visual model.** **Note: This includes one-step problems that cross into a new hour.**
	3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., ~~by~~ using drawings (such as a beaker with a measurement scale) to represent the problem. Note: Excludes compound units such as cm^3 and finding the geometric volume of a container. Excludes multiplicative comparison problems.	**NY-3.MD.2a** Measure and estimate liquid volumes and masses of objects using grams (g), kilograms (kg), and liters (l). Note: Does not include compound units such as cm^3 and finding the geometric volume of a container. **NY-3.MD.2b** Add, subtract, multiply, or divide to solve one-step word problems involving masses or liquid volumes that are given in the same units. e.g., using drawings (such as a beaker with a measurement scale) to represent the problem. Note: Does not include multiplicative comparison problems involving notions of "times as much."

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Represent and interpret data.	**3.MD.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	**NY-3.MD.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in a scaled picture graph or a scaled bar graph. e.g., Draw a bar graph in which each square in the bar graph might represent 5 pets.
	3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	**NY-3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.
Geometric measurement: understand concepts of area and relate area to multiplication and addition.	**3.MD.5** Recognize area as an attribute of plane figures and understand concepts of area measurement. a. 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. b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	**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 squares is said to have an area of *n* square units.

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	**3.MD.6** Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units).	**NY-3.MD.6** Measure areas by counting unit squares. Note: Unit squares include square cm, square m, square in., square ft., and improvised units.
	3.MD.7 Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	**NY-3.MD.7** Relate area to the operations of multiplication and addition. **NY-3.MD.7a** Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. **NY-3.MD.7b** Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. **NY-3.MD.7c** Use tiling to show in a concrete case that the area of a rectangle with whole-number side length a and side length $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. **NY-3.MD.7d** Recognize area as additive. Find areas of figures composed of non-overlapping rectangles, and apply this technique to solve real world problems. **Note: Problems include no more than one unknown side length.**

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	**3.MD.8** Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and ~~exhibiting~~ rectangles with the same perimeter and different areas or with the same area and different perimeters.	**NY-3.MD.8a** Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths or finding one unknown side length given the perimeter and other side lengths. **NY-3.MD.8b Identify** rectangles with the same perimeter and different areas or with the same area and different perimeters.

New York State Next Generation Mathematics Learning Standards		
Grade 3 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Reason with shapes and their attributes.	**3.G.1** Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and ~~draw examples of quadrilaterals that do not belong to any of these subcategories~~.	**NY-3.G.1 Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons, and hexagons). Identify shapes that do not belong to one of the given subcategories.** **<u>Note</u>: Include both regular and irregular polygons, however, students need not use formal terms "regular" and "irregular," e.g., students should be able to classify an irregular pentagon as "a pentagon," but do not need to classify it as an "irregular pentagon."**
	3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*	**NY-3.G.2** Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. e.g., Partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.

New York State Next Generation Mathematics Learning Standards

This document is intended to help educators identify the key changes that have occurred to the content standards for this grade level/course and to assist with designing curriculum and lessons aligned to the NYS Next Generation Mathematics Learning Standards. This document does not contain the comprehensive list of learning standards for the grade level/course. The complete list of standards for the grade level/course can be found at NYS Next Generation Mathematics Learning Standards.

Grade 4 Snapshot 

Standards New to Grade 4

No new standards.

Standards Moved from Grade 4

No standards moved.

Highlights/Instructional Considerations

NY-4.OA.3 Expressions, in addition to equations can be utilized for multi-step word problems. These problems do not need to be represented by one equation or expression, but can be broken down into more than one. Order of operations is an expectation of grade 5 (NY-5.OA.1).
NY-4.OA.5 Students need to be able to generate a pattern given a rule, as well as identify and informally explain features that appear within the pattern not explicitly defined in the rule itself.
NY-NBT (ALL) Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000**.**
NY-4.NBT.4 Students may use any standard algorithm for the addition/subtraction of multi-digit whole numbers.
NY-4.NBT.5 (and 6) Students can utilize any strategy for finding whole-number products and quotients. Algorithms for multiplication and division are not an expectation until grades 5 and 6 respectively.
NY-4.NF (ALL) Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8,10,12 and 100.
NY-4.NF.4 The focus of the **s**tandard is multiplying a whole number by a fraction (4 x 1/3), whereas multiplication of a fraction by a whole number (1/3 x 4) is introduced in grade 5 with standard NY-5.NF.4a.
NY-4.MD.1 Students must know conversion factors for ft., in.; km, m, cm; hr., min., sec. Conversions factors for all other single systems of measurement will be given. Conversion of measurements are from a larger unit to a smaller unit.
NY-4.MD.2 Problems involving fractions will be limited to denominators 2, 3, 4, 5 ,6, 8, 10, 12 and 100.
NY-4. G.2 Students need to be able to identify and name triangles based on angles. Students need to be able to identify quadrilaterals that are parallelograms, as well as identify quadrilaterals that are rectangles. Hierarchy of two-dimensional figures, including the quadrilateral family is an expectation of grade 5 (NY-5.G.3 and 4).

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use the four operations with whole numbers to solve problems.	**4.OA.1** Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	**NY-4.OA.1** Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations. e.g., • Interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 or 7 times as many as 5. • Represent "Four times as many as eight is thirty-two" as an equation, 4 x 8 = 32.
	4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	**NY-4.OA.2** Multiply or divide to solve word problems involving multiplicative comparison, distinguishing multiplicative comparison from additive comparison. Use drawings and equations with a symbol for the unknown number to represent the problem.
	4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	**NY-4.OA.3** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. **NY-4.OA.3a** Represent these problems **using equations or expressions** with a letter standing for the unknown quantity. **NY-4.OA.3b** Assess the reasonableness of answers using mental computation and estimation strategies including rounding. **Note: Multistep problems need not be represented by a single expression or equation.**

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Gain familiarity with factors and multiples.	**4.OA.4** Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	**NY-4.OA.4** Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.
Generate and analyze patterns.	**4.OA.5** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	**NY-4.OA.5** Generate a number or shape pattern that follows a given rule. **Identify and informally explain apparent features** of the pattern that were not explicit in the rule itself. e.g., Given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Generalize place value understanding for multi-digit whole numbers.	**4.NBT.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.* Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**NY-4.NBT.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. e.g., Recognize that **70 × 10 = 700 (and, therefore, 700 ÷ 10 = 70)** by applying concepts of place value, **multiplication**, and division. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.
	4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**NY-4.NBT.2a**. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. e.g., 50,327 = 50,000 + 300 + 20 + 7 **NY-4.NBT.2b** Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.
	4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place. Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**NY-4.NBT.3** Use place value understanding to round multi-digit whole numbers to any place. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use place value understanding and properties of operations to perform multi-digit arithmetic.	**4.NBT.4** Fluently add and subtract multi-digit whole numbers using ~~the~~ standard algorithm. Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**NY-4.NBT.4** Fluently add and subtract multi-digit whole numbers using **a standard algorithm**. Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.
	4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**NY-4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Note on and/or: Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy.** Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.
	4.NBT.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	**NY-4.NBT.6** Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Notes on and/or: Students should be taught to use strategies based on place value, the properties of operations, and the relationship between multiplication and division; however, when solving any problem, students can choose any strategy. Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy.** Note: Grade 4 expectations are limited to whole numbers less than or equal to 1,000,000.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Extend understanding of fraction equivalence and ordering.	**4.NF.1** Explain why a fraction a/b is equivalent to a fraction *(n × a)/(n × b)* 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.	**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.
	4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., ~~by~~ using a visual fraction model. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**NY-4.NF.2** Compare two fractions with different numerators and different denominators. Recognize that comparisons are valid only when the two fractions refer to the same whole. e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Record the results of comparisons with symbols >, =, or <, and justify the conclusions. e.g., using a visual fraction model. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	**4.NF.3** Understand a fraction *a/b* with a > 1 as a sum of fractions 1/*b*. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8 ;* $2\frac{1}{8}$ *= 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* c. Add and subtract mixed numbers with like denominators, e.g., ~~by~~ replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., ~~by~~ using visual fraction models and equations to represent the problem. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**NY-4.NF.3** Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$. **Note: $\frac{1}{b}$ refers to the unit fraction for $\frac{a}{b}$.** **NY-4.NF.3a** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. **NY-4.NF.3b** Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions. e.g., by using a visual fraction model such as, but not limited to: • $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ • $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$ • $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$ **NY-4.NF.3c** Add and subtract mixed numbers with like denominators. e.g., replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. **NY-4.NF.3d** Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators. e.g., using visual fraction models and equations to represent the problem. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	**4.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	**NY-4.NF.4** Apply and extend previous understandings of multiplication to multiply a **whole number by a fraction**. **Note: This standard refers to *n* groups of a fraction (where *n* is a whole number), e.g., 4 groups of $\frac{1}{3}$; which lends itself to being thought about as repeated addition. In grade 5 (NY-5. NF.4) students will be multiplying a fraction by a whole number, e.g., $\frac{1}{3}$ of 4.**
	a. Understand a fraction *a/b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*	**NY-4.NF.4a** Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. e.g., Use a visual fraction model to represent $\frac{5}{4}$ as the product $5 \times \frac{1}{4}$, recording the conclusion with the equation $\frac{5}{4} = 5 \times \frac{1}{4}$.
	b. Understand a multiple of *a/b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*	**NY-4.NF.4b** Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to **multiply a whole number by a fraction**. e.g., Use a visual fraction model to express $3 \times \frac{2}{5}$ as $6 \times \frac{1}{5}$, recognizing this product as $\frac{6}{5}$, in general, $n \times \frac{a}{b} = \frac{(n \times a)}{b}$.
	c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?* Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**NY-4.NF.4c** Solve word problems involving **multiplication of a whole number by a fraction**. e.g., using visual fraction models and equations to represent the problem. e.g., If each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie? Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand decimal notation for fractions, and compare decimal fractions.	**4.NF.5** Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.* Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**NY-4.NF.5** Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. e.g., express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$. Notes: • Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade. • Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
	4.NF.6 Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.* Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**NY-4.NF.6** Use decimal notation for fractions with denominators 10 or 100. e.g., • Rewrite 0.62 as $\frac{62}{100}$ or $\frac{62}{100}$ as 0.62. • Describe a length as 0.62 meters. • Locate 0.62 on a number line. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
	4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.	**NY-4.NF.7** Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions. e.g., using a visual model. Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	**4.MD.1** Know relative sizes of measurement units ~~within one system of units including~~ km, m, cm; ~~kg, g; lb, oz.; l, ml~~; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches ~~listing the number pairs (1, 12), (2, 24), (3, 36), ...~~*	**NY-4.MD.1 Know relative sizes of measurement units: ft., in.; km, m, cm** **e.g.,** **An inch is about the distance from the tip of your thumb to your first knuckle.** **A foot is the length of two-dollar bills.** **A meter is about the height of a kitchen counter.** **A kilometer is 2 ½ laps around most tracks.** **Know the conversion factor and use it to convert** measurements in a larger unit in terms of a smaller unit**: ft., in.; km, m, cm; hr., min., sec.** e.g., Know that 1 ft. is 12 times as long as 1 in. and express the length of a 4 ft. snake as 48 in. **Given the conversion factor, convert all other measurements within a single system of measurement from a larger unit to a smaller unit.** **e.g., Given the conversion factors, convert kilograms to grams, pounds to ounces, or liters to milliliters.** Record measurement equivalents in a two-column table. e.g., Generate a conversion table for feet and inches.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	**4.MD.2** Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving ~~simple~~ fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line ~~diagrams~~ that feature a measurement scale.	**NY-4.MD.2** Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money. **NY-4.MD.2a** Solve problems involving **fractions** or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. **NY-4.MD.2b** Represent measurement quantities using diagrams that feature a measurement scale, such **as number lines.** **Note: Grade 4 expectations are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.**
	4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*	**NY-4.MD.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. e.g., Find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
Represent and interpret data.	**4.MD.4** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, ~~from a line plot~~ find and interpret the difference in length between the longest and shortest specimens in an insect collection.*	**NY-4.MD.4** Make a line plot to display a data set of measurements in fractions of a unit $\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$. Solve problems involving addition and subtraction of fractions by using information presented in line plots. e.g., **Given measurement data on a line plot**, find and interpret the difference in length between the longest and shortest specimens in an insect collection.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Geometric measurement: understand concepts of angle and measure angles.	**4.MD.5** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	**4.MD.5** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. **4.MD.5a**. **Recognize** an angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles. **4.MD.5b Recognize** an angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.
	4.MD.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	**NY-4.MD.6** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
	4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., ~~by~~ using an equation with a symbol for the unknown angle measure.	**NY-4.MD.7** Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems. e.g., using an equation with a symbol for the unknown angle measure.

New York State Next Generation Mathematics Learning Standards		
Grade 4 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	**4.G.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	**NY-4.G.1** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
	4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	**NY-4.G.2a**. **Identify and name triangles based on angle size (right, obtuse, acute).** **NY-4.G.2b Identify and name all quadrilaterals with 2 pairs of parallel sides as parallelograms.** **NY-4.G.2c Identify and name all quadrilaterals with four right angles as rectangles.**
	4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	**NY-4.G.3** Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

New York State Next Generation Mathematics Learning Standards

This document is intended to help educators identify the key changes that have occurred to the content standards for this grade level/course and to assist with designing curriculum and lessons aligned to the NYS Next Generation Mathematics Learning Standards. This document does not contain the comprehensive list of learning standards for the grade level/course. The complete list of standards for the grade level/course can be found at NYS Next Generation Mathematics Learning Standards.

Grade 5 Snapshot 

Standards New to Grade 5

No new standards.

Standards Moved from Grade 5

No standards moved.

Highlights/Instructional Considerations

NY-5.OA.1 This is the first formal experience with order of operations (see modifications to standards NY-3.OA.8 and NY-4.OA.3) and links to work with writing simple expressions in standard NY-5.OA.2. There is no expectation of nested (use of brackets) order of operations problems or order of operations problems that involve exponents at this level.
NY-5.NBT.3a Introduction of the use of ( ) when writing a number in its expanded form. Work is linked to standards NY-5.OA.1 and 2, and NY-5.NBT.2.
NY-5.NBT.5 Students may use any standard algorithm for the multiplication of multi-digit whole numbers.
NY-5.NBT.6 (and 7) Students can utilize any strategy (concrete model or drawing) based on place value, properties of operations, and/or the relationship between operations for finding whole-number quotients and performing operations with decimals. In 5th grade, problems should not be so complex as to require the use of an algorithm (e.g., 0.37 ÷ 0.05). Use of a standard algorithm for both standards are an expectation for grade 6.
NY-5.NF.4b Students should be able to calculate the area of a rectangle with fractional side lengths by tiling it with rectangles with appropriate unit fraction side lengths. *See illustration in standards document for clarification.
NY-5.NF.7 Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement until grade 6 (NY-6.NS.1).
NY-5.MD.1 Students used conversion factors in grade four to convert measurements in a larger unit in terms of a smaller unit. Known conversion factors from grade 4 (NY-4.MD.1 ft., in.; km, m, cm; hr., min., sec.) will not be given. All other conversion factors will be given in grade 5, with the focus of the standard being on the process of converting units (large to small, and small to large). Decimal operations are limited to work with decimals to the hundredths.
NY-5.MD.5a Part of standard has been removed, "Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication", however, still implied in new wording of standard.
NY-5.G.3 The inclusive definition of a trapezoid will be utilized which defines a trapezoid as "A quadrilateral with at least one pair of parallel sides."

New York State Next Generation Mathematics Learning Standards

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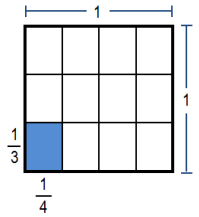
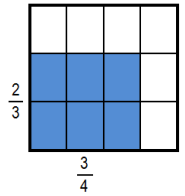
New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Operations and Algebraic Thinking		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Write and interpret numerical expressions.	**5.OA.1** Use parentheses, ~~brackets, or braces~~ in numerical expressions, and evaluate expressions with these symbols.	**NY-5.OA.1 Apply the order of operations to evaluate numerical expressions.** **e.g.,** • **6 + 8 ÷ 2** • **(6 + 8) ÷ 2** **Note: Exponents and nested grouping symbols are not included.**
	5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	**NY-5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. e.g., Express the calculation "add 8 and 7, then multiply by 2" as (8 + 7) × 2. Recognize that 3 × (18,932 + 921) is three times as large as 18,932 + 921, without having to calculate the indicated sum or product.
Analyze patterns and relationships.	**5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	**NY-5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. e.g., Given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand the place value system.	**5.NBT. 1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	**NY-5.NBT. 1** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.
	5.NBT.2 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. Use whole number exponents to denote 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.
	5.NBT.3 Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, ~~**e.g.,** 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).~~ b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	**NY-5.NBT.3** Read, write, and compare decimals to thousandths. **NY-5.NBT.3a** Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. **e.g.,** • **47.392 = 4 × 10 + 7 × 1 + 3 × $\frac{1}{10}$ + 9 × $\frac{1}{100}$ + 2 × $\frac{1}{1000}$** • **47.392 = (4 × 10) + (7 × 1) + (3 × $\frac{1}{10}$) + (9 × $\frac{1}{100}$) + (2 × $\frac{1}{1000}$)** • **47.392 = (4 × 10) + (7 × 1) + (3 × 0.1) + (9 × 0.01) + (2 × 0.001)** **NY-5.NBT.3b** Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	5.NBT.4 Use place value understanding to round decimals to any place.	**NY-5.NBT.4** Use place value understanding to round decimals to any place.

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Number and Operations in Base Ten		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Perform operations with multi-digit whole numbers and with decimals to hundredths.	**5.NBT.5** Fluently multiply multi-digit whole numbers using ~~the~~ standard algorithm.	**NY-5.NBT.5** Fluently multiply multi-digit whole numbers using **a standard algorithm.**
	5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**NY-5.NBT.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Notes on and/or:** • **Students should be taught to use strategies based on place value, the properties of operations, and the relationship between multiplication and division; however, when solving any problem, students can choose any strategy.** • **Students should be taught to use equations, rectangular arrays, and area models; however, when illustrating and explaining any calculation, students can choose any strategy.**
	5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	**NY-5.NBT.7** Using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between operations: • add and subtract decimals to hundredths; • multiply and divide decimals to hundredths. Relate the strategy to a written method and explain the reasoning used. **Notes on and/or: Students should be taught to use concrete models and drawings; as well as strategies based on place value, properties of operations, *and* the relationship between operations. When solving any problem, students can choose to use a concrete model *or* a drawing. Their strategy must be based on place value, properties of operations, or the relationship between operations.** **Note: Division problems are limited to those that allow for the use of concrete models or drawings, strategies based on properties of operations, and/or the relationship between operations (e.g., 0.25 ÷ 0.05). Problems should not be so complex as to require the use of an algorithm (e.g., 0.37 ÷ 0.05).**

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Use equivalent fractions as a strategy to add and subtract fractions.	**5.NF.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12.* ~~*(In general, a/b + c/d = (ad + bc)/bd.)*~~	**NY-5.NF.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. e.g., • $\frac{1}{3}+\frac{2}{9} = \frac{3}{9}+\frac{2}{9} = \frac{5}{9}$ • $\frac{2}{3}+\frac{5}{4} = \frac{8}{12}+\frac{15}{12} = \frac{23}{12}$
	5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	**NY-5.NF.2** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. e.g., using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. e.g., Recognize an incorrect result $\frac{2}{5}+\frac{1}{2}=\frac{3}{7}$ by observing that $\frac{3}{7}<\frac{1}{2}$.

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of multiplications and division to multiply and divide fractions.	**5.NF.3** Interpret a fraction as division of the numerator by the denominator *(a/b = a ÷ b)*. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people, each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	**NY-5.NF.3** Interpret a fraction as division of the numerator by the denominator *($\frac{a}{b}$ = a ÷ b)*. e.g., Interpret $\frac{3}{4}$ as the result of dividing 3 by 4, noting that $\frac{3}{4}$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $\frac{3}{4}$. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. e.g., using visual fraction models or equations to represent the problem. e.g., If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?

New York State Next Generation Mathematics Learning Standards **Grade 5 Crosswalk** **Number and Operations - Fractions**		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of multiplications and division to multiply and divide fractions.	**5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product *(a/b) × q* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* b. Find the area of a rectangle with fractional side lengths by tiling it with ~~unit squares~~ of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	**NY-5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number or a fraction. **NY-5.NF.4a** Interpret the product $\frac{a}{b} \times q$ as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. e.g., Use a visual fraction model to show $\frac{2}{3} \times 4 = \frac{8}{3}$, and create a story context for this equation. Do the same with $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$. **NY-5.NF.4b** Find the area of a rectangle with fractional side lengths by tiling it with **rectangles** of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. **e.g.,** The shaded portion shows the rectangle with the appropriate unit fraction side lengths.  The area of a $\frac{2}{3} \times \frac{3}{4}$ rectangle is $\frac{6}{12}$ because the whole is partitioned into 12 parts with 6 of them shaded. 

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of multiplications and division to multiply and divide fractions.	**5.NF.5** Interpret multiplication as scaling (resizing), ~~by~~:	**NY-5.NF.5** Interpret multiplication as scaling (resizing).
	a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	**NY-5.NF.5a** Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. **e.g., In the case of 10 x $\frac{1}{2}$ = 5, 5 is half of 10 and 5 is 10 times larger than $\frac{1}{2}$.**
	b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a/b = (n × a)/(n × b)* to the effect of multiplying *a/b* by 1.	**NY-5.NF.5b** Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case). Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. Relate the principle of fraction equivalence $\frac{a}{b} = \frac{a}{b} \times \frac{n}{n}$ to the effect of multiplying $\frac{a}{b}$ by 1. **e.g.,** **Explain why $4 \times \frac{3}{2}$ is greater than 4.** **Explain why $4 \times \frac{1}{2}$ is less than 4.** **$\frac{1}{3}$ is equivalent to $\frac{2}{6}$ because $\frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$.**
	5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	**NY-5.NF.6** Solve real world problems involving multiplication of fractions and mixed numbers. e.g., using visual fraction models or equations to represent the problem.

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Number and Operations - Fractions		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of multiplications and division to multiply and divide fractions.	**5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.	**NY-5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
	a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*	**NY-5.NF.7a** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. e.g., Create a story context for $\frac{1}{3} \div 4$ and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $\frac{1}{3} \div 4 = \frac{1}{12}$ because $\frac{1}{12} \times 4 = \frac{1}{3}$.
	b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*	**NY-5.NF.7b** Interpret division of a whole number by a unit fraction, and compute such quotients. e.g., Create a story context for $4 \div \frac{1}{5}$ and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div \frac{1}{5} = 20$ because $20 \times \frac{1}{5} = 4$.
	c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?* Note: Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement ~~at this grade~~.	**NY-5.NF.7c** Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions. e.g., using visual fraction models and equations to represent the problem. e.g., How much chocolate will each person get if 3 people share $\frac{1}{2}$ lb. of chocolate equally? How many $\frac{1}{3}$-cup servings are in 2 cups of raisins? Note: Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement **until grade 6 (NY-6. NS.1).**

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Convert like measurement units within a given measurement system.	**5.MD.1** Convert among different-sized standard measurement units within a given measurement system ~~(e.g., convert 5 cm to 0.05 m)~~, and use these conversions in solving multi-step, real world problems**.**	**NY-5.MD.1** Convert among different-sized standard measurement units within a given measurement system **when the conversion factor is given.** Use these conversions in solving multi-step, real world problems. **Notes:** • **The known conversion factors from grade 4 include ft., in.; km, m, cm; hr., min., sec. and will not be given. All other conversion factors will be given.** • **Grade 5 expectations for decimal operations are limited to work with decimals to hundredths.**
Represent and interpret data.	**5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, ~~find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally~~.*	**NY-5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit $\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$. Use operations on fractions for this grade to solve problems involving information presented in line plots. e.g., Given different measurements of liquid in identical beakers, **make a line plot to display the data and find the total amount of liquid in all of the beakers.**

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Geometric measurement: understand concepts of volume and relate volume to multiplication and addition.	**5.MD.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	**NY-5.MD.3** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
	a. 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.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.
	b. 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.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.
	5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	**NY-5.MD.4** Measure volumes by counting unit cubes, using cubic cm, cubic in., cubic ft., and improvised units.

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Measurement and Data		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Geometric measurement: understand concepts of volume and relate volume to multiplication and addition.	**5.MD.5** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. 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. ~~Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.~~ b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	**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. **NY-5.MD.5b**. Apply the formulas $V = l \times w \times h$ and $\boldsymbol{V = B \times h}$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. **NY-5.MD.5c** Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

New York State Next Generation Mathematics Learning Standards		
Grade 5 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Graph points on the coordinate plane to solve real-world and mathematical problems.	**5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	**NY-5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond. e.g., x-axis and x-coordinate, y-axis and y-coordinate.
	5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**NY-5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
Classify two-dimensional figures into categories based on their properties.	**5.G.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	**NY-5.G.3** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. e.g., All rectangles have four right angles and squares are rectangles, so all squares have four right angles. **<u>Note</u>: The inclusive definition of a trapezoid will be utilized, which defines a trapezoid as "A quadrilateral with at least one pair of parallel sides."**
	5.G.4 Classify two-dimensional figures in a hierarchy based on properties.	**NY-5.G.4** Classify two-dimensional figures in a hierarchy based on properties.

New York State Next Generation Mathematics Learning Standards

This document is intended to help educators identify the key changes that have occurred to the content standards for this grade level/course and to assist with designing curriculum and lessons aligned to the NYS Next Generation Mathematics Learning Standards. This document does not contain the comprehensive list of learning standards for the grade level/course. The complete list of standards for the grade level/course can be found at NYS Next Generation Mathematics Learning Standards.

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 ½ 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.
NY-6.SP.1b Data should be representative of the situation. This standard came from 7th grade NYS P-12 CCLS (7. SP.1).
NY-6.SP.1c Examples of obtaining representative samples include, but are not limited to, a simple random sample for a given population or a systematic random sample for an unknown population. Examples of unacceptable methods of sampling include, but are not limited to, online polls and convenience sampling. This standard came from 7th grade NYS P-12 CCLS (7. SP.2).
NY-6.SP.2 Students need to determine and justify the most appropriate graph to display a given set of data (histogram, dot plot). Students extend their knowledge of symmetric shapes to describe displayed data.
NY-6.SP.3 Measures of center are mean, median, and mode. Measure of variation is the range only.
NY-6.SP.4 Box plots is now an expectation for grade 7. Visual representation of quantitative data includes dot plots and histograms.
NY-6.SP.5c and 5d Measures of center include mean, median, and mode. Measure of variation is the range only. MAD has been removed and IQR is an expectation of grade 7. Role of outliers should be discussed, but no formula required.
NY-6.SP.6, 7, and 8 These standards came from 7th grade NYS P-12 CCLS (7. SP.5, 6, and 7). The focus at the grade 6 level is simple events. Compound events are introduced in grade 7.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Ratio and Proportional Reasoning		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand ratio concepts and use ratio reasoning to solve problems.	**6.RP.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	**NY-6.RP.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. e.g., "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received three votes."
	6.RP.2 Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* Note: Expectations for unit rates in this grade are limited to non-complex fractions.	**NY-6.RP.2** Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$ (b not equal to zero), and use rate language in the context of a ratio relationship. e.g., "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there are ¾ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger." Note: Expectations for unit rates in this grade are limited to non-complex fractions.
	6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line ~~diagrams~~, or equations.	**NY-6.RP.3** Use ratio and rate reasoning to solve real-world and mathematical problems. Note: **Strategies may include but are not limited to the following**: tables of equivalent ratios, tape diagrams, double number lines, and equations.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Ratio and Proportional Reasoning		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Understand ratio concepts and use ratio reasoning to solve problems.	**6.RP.3a** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	**NY-6.RP.3a** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
	6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	**NY-6.RP.3b** Solve unit rate problems. e.g., If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? **What is the unit rate**? Note: Problems may include unit pricing and constant speed.
	6.RP.3c Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	**NY-6.RP.3c** Find a percent of a quantity as a rate per 100. Solve problems that involve finding the whole given a part and the percent, and **finding a part of a whole given the percent.** e.g., 30% of a quantity means $\frac{30}{100}$ times the quantity.
	6.RP.3d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	**NY-6.RP.3d** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. **Note: Conversion of units occur within a given measurement system, not across different measurement systems.**

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
The Number System		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	**6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	**NY-6.NS.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions. Note: Strategies may include but are not limited to the following: using visual fraction models**, a standard algorithm**, and equations to represent the problem. e.g., Create a story context for $(\frac{2}{3}) \div (\frac{3}{4})$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(\frac{2}{3}) \div (\frac{3}{4}) = \frac{8}{9}$ because $\frac{3}{4}$ of $\frac{8}{9}$ is $\frac{2}{3}$. In general, $(\frac{a}{b}) \div (\frac{c}{d}) = \frac{ad}{bc}$. e.g., • How much chocolate will each person get if 3 people share $\frac{1}{2}$ lb of chocolate equally? • How many $\frac{3}{4}$ cup servings are in $\frac{2}{3}$ of a cup of yogurt? • How wide is a rectangular strip of land with length $\frac{3}{4}$ mi and area $\frac{1}{2}$ square mi?
Compute fluently with multi-digit numbers and find common factors and multiples.	**6.NS.2** Fluently divide multi-digit numbers using ~~the~~ standard algorithm.	**NY-6.NS.2** Fluently divide multi-digit numbers using **a standard algorithm.**
	6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using ~~the~~ standard algorithm for each operation.	**NY-6.NS.3** Fluently add, subtract, multiply, and divide multi-digit decimals using **a standard algorithm** for each operation.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
The Number System		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Compute fluently with multi-digit numbers and find common factors and multiples.	**6.NS.4** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*	**NY-6.NS.4** Find the greatest common factor of two whole numbers less than or equal to 100. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers **with no common factor other than 1**. Find the least common multiple of two whole numbers less than or equal to 12. e.g., Express 36 + 8 as 4 (9 + 2).
Apply and extend previous understandings of numbers to the system of rational numbers.	**6.NS.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	**NY-6.NS.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. Use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge.
	6.NS.6 Understand a rational number as a point on the number line. Extend number line ~~diagrams~~ and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	**NY-6.NS.6** Understand a rational number as a point on the number line. **Use number lines and coordinate axes to represent points on a number line and in the coordinate plane with negative number coordinates.**

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
The Number System		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of numbers to the system of rational numbers.	**6.NS.6a** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	**NY-6.NS.6a** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line. Recognize that the opposite of the opposite of a number is the number itself, and that 0 is its own opposite. e.g., With the number 3, – (–3) = 3
	6.NS.6b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	**NY-6.NS.6b** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane. Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
	6.NS.6c Find and position integers and other rational numbers on a horizontal or vertical number line ~~diagram~~; find and position pairs of integers and other rational numbers on a coordinate plane.	**NY-6.NS.6c** Find and position integers and other rational numbers on a horizontal or **vertical number line**. Find and position pairs of integers and other rational numbers on a coordinate plane.
	6.NS.7 Understand ordering and absolute value of rational numbers.	**NY-6.NS.7** Understand ordering and absolute value of rational numbers.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
The Number System		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of numbers to the system of rational numbers.	**6.NS.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line ~~diagram~~. *For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right*.	**NY-6.NS.7a** Interpret statements of inequality as statements about the relative position of two numbers on a **number line.** e.g., Interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.
	6.NS.7b Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write –3° C > –7° C to express the fact that –3° C is warmer than –7 ° C.*	**NY-6.NS.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts. e.g., Write –3°C > –7°C to express the fact that –3°C is warmer than –7°C.
	6.NS.7c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*	**NY-6.NS.7c** Understand the absolute value of a rational number as its distance from 0 on the number line. Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. e.g., For an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.
	6.NS.7d Distinguish comparisons of absolute value from statements about order. ~~*For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*~~	**NY-6.NS.7d** Distinguish comparisons of absolute value from statements about order. **e.g., Someone with a balance of $100 in their bank account has more money than someone with a balance of –$1000, because 100 > –1000. But, the second person's debt balance is much greater than the first person's credit balance because |–1000| > |100|.**

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
The Number System		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of numbers to the system of rational numbers.	**6.NS.8** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	**NY-6.NS.8** Solve real-world and mathematical problems by graphing points **on a coordinate plane**. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Expressions and Equations (Inequalities)		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of arithmetic to algebraic expressions.	**6.EE.1** Write and evaluate numerical expressions involving whole-number exponents.	**NY-6.EE.1** Write and evaluate numerical expressions involving whole-number exponents.
	6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.	**NY-6.EE.2** Write, read, and evaluate expressions in which letters stand for numbers.
	6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*	**NY-6.EE.2a** Write expressions that record operations with numbers and with letters standing for numbers. e.g., Express the calculation "Subtract y from 5" as 5 – y.
	6.EE.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*	**NY-6.EE.2b** Identify parts of an expression using mathematical terms (term, coefficient, sum, **difference**, product, factor, and quotient); view one or more parts of an expression as a single entity. e.g., Describe the expression 2(8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.
	6.EE.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = ½.*	**NY-6.EE.2c** Evaluate expressions given specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order (Order of Operations). e.g., Use the formulas $V = s^3$ and $SA = 6s^2$ to find the volume and surface area of a cube with sides of length s = ½. **<u>Note</u>: Expressions may or may not include parentheses. Nested grouping symbols are not included.**

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Expressions and Equations (Inequalities)		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Apply and extend previous understandings of arithmetic to algebraic expressions.	**6.EE.3** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	**NY-6.EE.3** Apply the properties of operations to generate equivalent expressions. e.g., Apply the distributive property to the expression 3(2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.
	6.EE.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them*). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	**NY-6.EE.4** Identify when two expressions are equivalent. e.g., The expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y represents.
Reason about and solve one-variable equations and inequalities.	**6.EE.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	**NY-6.EE.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
	6.EE.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	**NY-6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem. Understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Expressions and Equations (Inequalities)		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Reason about and solve one-variable equations and inequalities.	**6.EE.7** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.	**NY-6.EE.7** Solve real-world and mathematical problems by writing and solving equations of the form x + p = q; **x – p = q**; px = q; and $\frac{x}{p}$**= q** for cases in **which p, q and x are all nonnegative rational.** **Note: For the $\frac{x}{p}$ = q case, p ≠ 0.**
	6.EE.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line ~~diagrams~~.	**NY-6.EE.8** Write an inequality of the form x > c**, x ≥ c, x ≤ c** or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of **these forms** have infinitely many solutions; represent solutions of such inequalities on a **number line**.
Represent and analyze quantitative relationships between dependent and independent variables.	**6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; ~~write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable~~. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	**NY-6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another. **Given a verbal context and an equation, identify the dependent variable, in terms of the other quantity, thought of as the independent variable.** Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. e.g., In a problem involving motion at constant speed, list and graph ordered pairs of distances and times. e.g., **Given the equation** d = 65t to represent the relationship between distance and time, identify t as the independent variable and d as the dependent variable.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Solve real-world and mathematical problems involving area, surface area and volume.	**6.G.1** Find the area of right triangles, other triangles, ~~special quadrilaterals~~, and polygons by composing into rectangles or decomposing into triangles ~~and other shapes~~; apply these techniques in the context of solving real-world and mathematical problems.	**NY-6.G.1** Find area of **triangles, trapezoids, and other polygons** by composing into rectangles or **decomposing into triangles and quadrilaterals**. Apply these techniques in the context of solving real-world and mathematical problems. **Note: The inclusive definition of a trapezoid will be utilized, which defines a trapezoid as "A quadrilateral with at least one pair of parallel sides." (This definition includes parallelograms.)**
	6.G.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	**NY-6.G.2 Find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.**
	6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	**NY-6.G.3** Draw polygons in the coordinate plane given coordinates for the vertices. Use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Geometry		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Solve real-world and mathematical problems involving area, surface area and volume.	**6.G.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	**NY-6.G.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. **Note: Three-dimensional figures include only right rectangular prisms, right rectangular pyramids, and right triangular prisms. When finding surface areas, all necessary measurements will be given.**
		NY-6.G.5 Use area and volume models to explain perfect squares and perfect cubes.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Statistics and Probability		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Develop an understanding of statistical variability.	**6.SP.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*	**NY-6. SP.1a** Recognize that a statistical question is one that anticipates variability in the data related to the question and accounts for it in the answers. e.g., "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.
		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. **Note: Students need to understand that data are generated with respect to particular contexts or situations and can be used to answer questions about those contexts or situations.**
		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. **Note: Examples of acceptable methods to obtain a representative sample from a population include, but are not limited to, a simple random sample for a given population or a systematic random sample for an unknown population. Examples of unacceptable methods of sampling include, but are not limited to, online polls and convenience sampling because they introduce bias and are not representative of the population.**

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Statistics and Probability		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Develop an understanding of statistical variability.	**6.SP.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	**NY-6. SP.2** Understand that a set of **quantitative** data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. **Notes:** • **Students need to determine and justify the most appropriate graph to display a given set of data (histogram, dot plot).** • **Students extend their knowledge of symmetric shapes, to describe data displayed in dot plots and histograms in terms of symmetry. They identify clusters, peaks and gaps, recognizing common shapes and patterns in these displays of data distributions, and ask why a distribution takes on a particular shape for the context of the variable being considered.**
	6.SP.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	**NY-6. SP.3** Recognize that a measure of center for a quantitative data set summarizes all of its values with a single number while a measure of variation describes how its values vary with a single number. **Note: Measures of center are mean, median, and mode. The measure of variation is the range.**
Summarize and describe distributions.	**6.SP.4** Display ~~numerical~~ data in plots on a number line, including dot plots, histograms, and ~~box plots~~**.**	**NY-6. SP.4** Display **quantitative** data in plots on a number line, including dot plots and histograms.
	6.SP.5 Summarize ~~numerical~~ data sets in relation to their context, such as by:	**NY-6. SP.5** Summarize **quantitative** data sets in relation to their context.
	6.SP.5a Reporting the number of observations.	**NY-6. SP.5a** Report the number of observations.
	6.SP.5b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement**.**	**NY-6. SP.5b** Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Statistics and Probability		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Summarize and describe distributions.	**6.SP.5c** Giving quantitative measures of center (median and/or mean) and variability (~~interquartile range and/or mean absolute deviation~~), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	**NY-6. SP.5c Calculate range and measures of center, as well as describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.** **Note: Measures of center are mean, median, and mode. The measure of variation is the range. Role of outliers should be discussed, but no formula required.**
	6.SP.5d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	**NY-6. SP.5d** Relate **the range** and the choice of measures of center to the shape of the data distribution and the context in which the data were gathered. **Note: Measures of center are mean, median, and mode. The measure of variation is the range.**
Investigate chance processes and develop, use and evaluate probability models.		**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 event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 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. **e.g., When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.** **Note: Compound events are introduced in grade 7.**

New York State Next Generation Mathematics Learning Standards		
Grade 6 Crosswalk		
Statistics and Probability		
Cluster	**NYS P-12 CCLS**	**NYS Next Generation Learning Standard**
Investigate chance processes and develop, use and evaluate probability models.		**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. **e.g., The probability of rolling a six-sided fair number cube and landing on a 2 is $\frac{1}{6}$. The probability of landing on an even number is $\frac{3}{6}$.**
		NY-6. SP.8b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. **e.g., Find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?**