## NYS P-12 CCLS

PK.CC. 3 b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

## NYS Next Generation Learning Standard

NY-PK.CC.3b Explore and develop the concept that the last number name said tells the number of objects counted, (cardinality). The number of objects is the same regardless of their arrangement or the order in which they were counted.

## NYS P-12 CCLS

PK.OA. 1 Demenstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?).

## NYS Next Generation Learning Standard

NY-PK.OA. 1 Explore addition and subtraction by using objects, fingers, and responding to real world situations.
e.g., If we have 3 apples and add two more, how many apples do we have all together?

## NYS P-12 CCLS

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 twodigit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

## NYS Next Generation Learning Standard

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 str81 328.56 1.2.29 179.81 350.333

## NYS P-12 CCLS

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.

## NYS Next Generation Learning Standard

NY-1.MD.3a Tell and write time in hours and half-hours using analog and digital clocks. Develop an understanding of common terms,

NY-1.MD.3b Recognize and identify coins (penny, nickel, dime, and quarter) and their value and use the cent symbol (c) 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 c )

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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

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|  | NY-3.NBT.4a Understand that the digits of a four-digit number <br> 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 |
|  | $\mathbf{3 , 2 4 5 = 3 , 0 0 0 + 2 0 0 + 4 0 + 5 .}$ |

## NYS P-12 CCLS

NYS Next Generation Learning Standard
3.NF. 1 Understand a fraction $1 / b$ as the quantity formed by

1 part when $a$ whole is partitioned into $b$ equal parts;
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.

## NYS P-12 CCLS

5.NF. 4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
a. Interpret the product $(a / b) \times q$ as $a$ parts of a partition of $q$ into $b$ equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use $a$ visual fraction model to show $(2 / 3) \times 4=8 / 3$, and create a story context for this equation. Do the same with $(2 / 3) \times$ $(4 / 5)=8 / 15$. (In general, $(a / b) \times(c / d)=a c / b d$. $)$
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.

## NYS Next Generation Learning Standard

NY-5.NF. 4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

NY-5.NF.4a Interpret the product $-\times q$ 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 $-\times 4=-$, and create a story context for this equation. Do the same with $-\times-=-$.

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.,


$-1$


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| 5.NF. 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 <br> on the basis of the size of the other factor, without <br> performing the indicated multiplication. | NY-5.NF.5a Compare the size of a product to the size of one factor on <br> the basis of the size of the other factor, without performing the <br> indicated multiplication. |
| e.g., In the case of $\mathbf{1 0} \mathbf{x ~ - ~ = ~ 5 , ~ 5 ~ i s ~ h a l f ~ o f ~} \mathbf{1 0}$ and $\mathbf{5}$ is $\mathbf{1 0}$ times larger |  |
| than.- |  |
| b. Explaining why multiplying a given number by a <br> fraction greater than 1 results in a product greater than the <br> given number (recognizing multiplication by whole <br> numbers greater than 1 as a familiar case); explaining why <br> multiplying a given number by a fraction less than 1 results <br> in a product smaller than the given number; and relating <br> the principle of fraction equivalence $a / b=(n \times a) /(n \times b)$ <br> to the effect of multiplying $a / b$ by 1. | NY-5.NF.5b Explain why multiplying a given number by a fraction <br> greater than 1 results in a product greater than the given number <br> (recognizing multiplication by whole numbers greater than 1 as a <br> familiar case). Explain why multiplying a given number by a fraction <br> less than 1 results in a product smaller than the given number. Relate <br> the principle of fraction equivalence $-=-\times-$ to the effect of <br> multiplying - by 1. |

## NYS P-12 CCLS

7.EE.4a Solve word problems leading to equations of the form $p x+q=r$ and $p(x+q)=r$, where $p, q$, and $r$ are specifie rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm . Its length is 6 cm . What is its width?

## NYS Next Generation Learning Standard

NY-7.EE.4a Solve word problems leading to equations of the form $p x$ $+q=r$ and $p(x+q)=r$, where $p, q$, and $r$ are rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.
e.g., The perimeter of a rectangle is 54 cm . Its length is 6 cm . What is its width?

Notes: The words leading to in the standard may require students to simplify or combine like terms on the same side of the equation before it is in the form stated in the standard.

This standard is a fluency expectation for grade 7. For more guidance, see Fluency in the Glossary of Verbs Associated with the New York State Next Generation Mathematics Learning Standards.
7.SP. 5 Understand that the probta s wi0(. C)-2 Fe , ns ubhter

## NYS P-12 CCLS

8.SP. 4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected $f$

## NYS P-12 CCLS

A-REI.4b Solve quadratic equations by inspection (e.g., for $x^{2}=49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a+b i$, $a$-bi for real numbers $a$ and $b$.

PARCC: Tasks do not require students to write solutions for quadratic equations that have roots with non-zero imaginary parts. However, tasks can require the student to recognize cases in which a quadratic equation has no real solutions.

## NYS Next Generation Learning Standard

AI-A.REI.4b Solve quadratic equations by:
i) inspection,
ii) taking square roots,
iii) factoring,
iv) completing the square,
v) the quadratic formula, and
vi) graphing.

## Recognize when the process yields no real solutions.

(Shared standard with Algebra II)

## Notes:

Solutions may include simplifying radicals or writing solutions in simplest radical form.
An example for inspection would be $x^{2}=49$, where a student should know that the solutions would include 7 and -7 .
When utilizing the quadratic formula, there are no coefficient limits.
The discriminant is a sufficient way to recognize when the process yields no real solutions.

## NYS P-12 CCLS

G-GPE. 5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

## NYS Next Generation Learning Standard

GEO-G.GPE. 5 On the coordinate plane:
GEO-G.GPE.5a Explore the proof for the relationship between slopes of parallel and perpendicular lines;
GEO-G.GPE.5b Determine if lines are parallel, perpendicular, or neither, based on their slopes; and
GEO-G.GPE.5c Apply properties of parallel and perpendicular lines to solve geometric problems.

Note: This standard is a fluency recommendation for Geometry. Fluency with the use of coordinates to establish geometric results and the use of geometric representations as a modeling tool are some of the most valuable tools in mathematics and related fields.

| NYS P-12 CCLS | NYS Next Generation Learning Standard |
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| N-RN. 1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define - to be the cube root of 5 because we want $={ }^{-}$to hold, so ${ }^{-}$must equal 5. | AII-N.RN. 1 Explore how the meaning of rational exponents follows from extending the properties of integer exponents. <br> e.g., We define ${ }^{-}$to be the cube root of 5 because we want $={ }^{-}$to hold, so ${ }^{-}$must equal 5 . |


| NYS P-12 CCLS | NYS Next Generation Learning Standard |
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|  | AII-F.BF.7 Explore the derivation of the formulas for finite <br> arithmetic and finite geometric series. Use the formulas to solve <br> problems. |

