

New York State Next Generation Mathematics Learning Standards

Grade 7 Crosswalk

Ratio and Proportional Reasoning

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Analyze proportional relationships and use them to solve real-world and mathematical problems.</p>	<p>7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{\frac{1}{2}}{\frac{1}{4}}$ miles per hour, equivalently 2 miles per hour.</i></p>	<p>NY-7.RP.1 Compute unit rates associated with ratios of fractions.</p> <p>e.g., If a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the rate as the complex fraction $\frac{\frac{1}{2}}{\frac{1}{4}}$ miles per hour, equivalently 2 miles per hour with 2 being the unit rate.</p> <p><i>Note:</i> Problems may include ratios of lengths, areas, and other quantities measured in like or different units, including across measurement systems.</p>
	<p>7.RP.2 Recognize and represent proportional relationships between quantities.</p>	<p>NY-7.RP.2 Recognize and represent proportional relationships between quantities.</p>
	<p>7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p>	<p>NY-7.RP.2a Decide whether two quantities are in a proportional relationship.</p> <p><i>Note: Strategies include but are not limited to the following:</i> testing for equivalent ratios in a table and/or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p>
	<p>7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p>	<p>NY-7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p>
	<p>7.RP.2c Represent proportional relationships by equations. <i>For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i></p>	<p>NY-7.RP.2c Represent a proportional relationship using an equation.</p> <p>e.g., If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</p>

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Ratio and Proportional Reasoning

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<p>Analyze proportional relationships and use them to solve real-world and mathematical problems.</p>	<p>7.RP.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.</p>	<p>NY-7.RP.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.</p>
	<p>7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</p>	<p>NY-7.RP.3 Use proportional relationships to solve multistep ratio and percent problems.</p> <p><u>Note:</u> Examples of percent problems include: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error.</p>

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Grade 7 Crosswalk

The Number System

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.</p>	<p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p>	<p>NY-7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. Represent addition and subtraction on a horizontal or vertical number line.</p>
	<p>7.NS.1a Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.</i></p>	<p>NY-7.NS.1a Describe situations in which opposite quantities combine to make 0.</p>
	<p>7.NS.1b Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p>	<p>NY-7.NS.1b Understand addition of rational numbers; $p + q$ is the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p>
	<p>7.NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p>	<p>NY-7.NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p>
	<p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p>	<p>NY-7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p>
	<p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p>	<p>NY-7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p>
	<p>7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p>	<p>NY-7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p>

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The Number System

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<p>Apply and extend previous understandings of operations with fractions to add, subtract, multiply and divide rational numbers.</p>	<p>7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.</p>	<p>NY-7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(\frac{p}{q}) = \frac{-p}{q} = \frac{p}{-q}$. Interpret quotients of rational numbers by describing real-world contexts.</p>
	<p>7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<p>NY-7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.</p>
	<p>7.NS.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>	<p>NY-7.NS.2d Convert a fraction to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>
	<p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><u>Note:</u> Computations with rational numbers extend the rules for manipulating fractions to complex fractions.</p>	<p>NY-7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><u>Note:</u> Computations with rational numbers extend the rules for manipulating fractions to complex fractions limited to $\frac{\frac{a}{b}}{\frac{c}{d}}$ where $a, b, c,$ and d are integers and $b, c,$ and $d \neq 0$.</p>

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Expressions and Equations (Inequalities)

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Use properties of operations to generate equivalent expressions.</p>	<p>7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p>	<p>NY-7.EE.1 Add, subtract, factor, and expand linear expressions with rational coefficients by applying the properties of operations.</p>
	<p>7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”</i></p>	<p>NY-7.EE.2 Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related.</p> <p>e.g., $a + 0.05a$ and $1.05a$ are equivalent expressions meaning that “increase by 5%” is the same as “multiply by 1.05.”</p>
<p>Solve real-life and mathematical problems using numerical and algebraic expressions, equations and inequalities.</p>	<p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <i>For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.</i></p>	<p>NY-7.EE.3 Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. Assess the reasonableness of answers using mental computation and estimation strategies.</p> <p>e.g.,</p> <ul style="list-style-type: none"> • If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. • If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

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Grade 7 Crosswalk

Expressions and Equations (Inequalities)

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Solve real-life and mathematical problems using numerical and algebraic expressions, equations and inequalities.</p>	<p>7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p>	<p>NY-7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. <u>Note:</u> Solving equations that contain variables on both sides is not an expectation in grade 7.</p>
	<p>7.EE.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific 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. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i></p>	<p>NY-7.EE.4a Solve word problems leading to equations of the form $px + q = r$ 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.</p> <p>e.g., The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</p> <p><u>Notes:</u> The words <i>leading to</i> 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.</p> <p>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.</p>
	<p>7.EE.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. <i>For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.</i></p>	<p>NY-7.EE.4b Solve word problems leading to inequalities of the form $px + q > r$, $px + q \geq r$, $px + q \leq r$, or $px + q < r$, where p, q, and r are rational numbers. Graph the solution set of the inequality on the number line and interpret it in the context of the problem.</p> <p>e.g., As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.</p> <p><u>Note:</u> The words <i>leading to</i> 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.</p>

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Geometry

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Draw, construct and describe geometrical figures and describe the relationships between them.</p>	<p>7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>	<p>NY-7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>
	<p>7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p>	<p>NY-7.G.2 Draw triangles when given measures of angles and/or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p> <p>Note: Create triangles through the use of freehand drawings, materials (scaffolds may include: pipe cleaners, Legos®, and toothpicks), rulers, protractors, and/or technology.</p>
	<p>7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p>	<p>NY-7.G.3 Describe the two-dimensional shapes that result from slicing three-dimensional solids parallel or perpendicular to the base.</p> <p>Note: Focus of standard is on plane sections resulting from the slicing of right rectangular prisms and right rectangular pyramids.</p>
<p>Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</p>	<p>7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.</p>	<p>NY-7.G.4 Apply the formulas for the area and circumference of a circle to solve problems.</p> <p>Note: Students in grade 7 are not expected to calculate the radius of a circle given its area.</p>
	<p>7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p>	<p>NY-7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p> <p>Note: Students in grade 7 are limited to solving equations that involve linear expressions on one side of the equation.</p>

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Expressions and Equations (Inequalities)

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Solve real-life and mathematical problems involving angle measure, area, surface area and volume.</p>	<p>7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p>	<p>NY-7.G.6 Solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles and trapezoids.</p> <p>Solve surface area problems involving right prisms and right pyramids composed of triangles and trapezoids.</p> <p>Find the volume of right triangular prisms, and solve volume problems involving three-dimensional objects composed of right rectangular prisms.</p> <p><u>Notes:</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.” (This definition includes parallelograms and rectangles.) Right prisms include cubes.</p>

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Statistics and Probability

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Use random sampling to draw inferences about a population.</p>	<p>7.SP.1 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. Understand that random sampling tends to produce representative samples and support valid inferences.</p>	<p>STANDARD REMOVED.</p>
	<p>7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i></p>	<p>STANDARD REMOVED</p>

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Statistics and Probability

Cluster	NYS P-12 CCLS	NYS Next Generation Learning Standard
<p>Draw informal comparative inferences about two populations.</p>		<p>NY-7.SP.1 Construct and interpret box-plots, find the interquartile range, and determine if a data point is an outlier.</p> <p><u>Note:</u> Students in grade 7 are <i>not</i> expected to <i>construct</i> box-plots that include outliers in the data, but students <i>are</i> expected to <i>interpret</i> box-plots that may contain outliers.</p>
	<p>7.SP.3 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i></p>	<p>NY-7.SP.3 Informally assess the degree of visual overlap of two quantitative data distributions.</p>
	<p>7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh grade science book are generally longer than the words in a chapter of a fourth grade science book.</i></p>	<p>NY-7.SP.4 Use measures of center and measures of variability for quantitative data from random samples or populations to draw informal comparative inferences about the populations.</p> <p><u>Note:</u> Measures of center are mean, median, and mode. The measures of variation include range and the interquartile range.</p>

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Statistics and Probability

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<p>Investigate chance processes and develop, use and evaluate probability models.</p>	<p>7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 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.</p>	<p>STANDARD REMOVED</p>
	<p>7.SP.6 Approximate the probability of a chance 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. <i>For example, 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.</i></p>	<p>STANDARD REMOVED</p>
	<p>7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.</p>	<p>STANDARD REMOVED</p>

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Statistics and Probability

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<p>Investigate chance processes and develop, use and evaluate probability models.</p>	<p>7.SP.7a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class find the probability that Jane will be selected and the probability that a girl will be selected.</i></p>	<p>STANDARD REMOVED</p>
	<p>7.SP.7b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>For example, fin 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?</i></p>	<p>STANDARD REMOVED</p>
	<p>7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p>	<p>NY-7.SP.8 Find probabilities of compound events using organized list, sample space tables, tree diagrams, and simulation.</p>
	<p>7.SP.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</p>	<p>NY-7.SP.8a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.</p>

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Statistics and Probability

Cluster	Standard Code	NYS P-12 CCLS	NYS Next Generation Learning Standard
Investigate chance processes and develop, use and evaluate probability models.	7.SP.8b	7.SP.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling doubles sixes”), identify the outcomes in the sample space which compose the event.	NY-7.SP.8b Represent sample spaces for compound events using methods such as organized lists, sample space tables, and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event. e.g., “rolling double sixes”
	7.SP.8c	7.SP.8c Design and use a simulation to generate frequencies for compound events. <i>For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood what is the probability that it will take at least 4 donors to find one with type A blood?</i>	NY-7.SP.8c Design and use a simulation to generate frequencies for compound events. e.g., Use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?