



Skills available for New York seventh-grade math standards

Standards are in bold, followed by a list of the IXL math skills that are aligned to that standard. Students can practice these skills online at www.ixl.com.

Standards: New York State P-12 Common Core Learning Standards

7RP Ratios and Proportional Relationships

7 Analyze proportional relationships and use them to solve real-world and mathematical problems.

7RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

Divide fractions and mixed numbers: word problems (Seventh grade - G.14)

Understanding ratios (Seventh grade - J.1)

Unit rates (Seventh grade - J.5)

Unit prices (Seventh grade - M.3)

Unit prices with unit conversions (Seventh grade - M.4)

7RP.2 Recognize and represent proportional relationships between quantities.

7RP.2.a 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.

Equivalent ratios (Seventh grade - J.2)

Equivalent ratios: word problems (Seventh grade - J.3)

Do the ratios form a proportion? (Seventh grade - J.6)

Do the ratios form a proportion: word problems (Seventh grade - J.7)

Identify proportional relationships (Seventh grade - K.6)

7RP.2.b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Find the constant of proportionality from a table (Seventh grade - K.1)

Find the constant of proportionality from a graph (Seventh grade - K.3)

Find the constant of proportionality: word problems (Seventh grade - K.7)

7RP.2.c Represent proportional relationships by equations.

Solve proportions: word problems (Seventh grade - J.9)

Write equations for proportional relationships (Seventh grade - K.4)

Write equations for proportional relationships (Eighth grade - I.4)

7RP.2.d 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.

7RP.3 Use proportional relationships to solve multistep ratio and percent problems.

Estimate population size using proportions (Seventh grade - J.10)

Estimate percents of numbers (Seventh grade - L.4)

Percents of numbers and money amounts (Seventh grade - L.5)

Percents of numbers: word problems (Seventh grade - L.6)

Solve percent equations (Seventh grade - L.7)

Solve percent equations: word problems (Seventh grade - L.8)

Percent of change (Seventh grade - L.9)

Percent of change: word problems (Seventh grade - L.10)

Unit prices with unit conversions (Seventh grade - M.4)
Unit prices: find the total price (Seventh grade - M.5)
Percent of a number: tax, discount, and more (Seventh grade - M.6)
Find the percent: tax, discount, and more (Seventh grade - M.7)
Sale prices: find the original price (Seventh grade - M.8)
Multi-step problems with percents (Seventh grade - M.9)
Estimate tips (Seventh grade - M.10)
Simple interest (Seventh grade - M.11)
Compound interest (Seventh grade - M.12)
Experimental probability (Seventh grade - CC.3)

7NS The Number System

7 Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

7NS.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.

7NS.1.a Describe situations in which opposite quantities combine to make 0.

Absolute value and opposite integers (Seventh grade - B.4)

7NS.1.b 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.

Integers on number lines (Seventh grade - B.2)
Absolute value and opposite integers (Seventh grade - B.4)
Integer inequalities with absolute values (Seventh grade - B.6)
Integer addition and subtraction rules (Seventh grade - C.1)
Add and subtract integers (Seventh grade - C.3)
Complete addition and subtraction equations with integers (Seventh grade - C.4)
Add and subtract integers: word problems (Seventh grade - C.5)
Decimal number lines (Seventh grade - D.3)
Absolute value of rational numbers (Seventh grade - H.3)
Add and subtract rational numbers (Seventh grade - H.6)

7NS.1.c 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.

Understanding integers (Seventh grade - B.1)
Integers on number lines (Seventh grade - B.2)
Integer addition and subtraction rules (Seventh grade - C.1)
Add and subtract integers (Seventh grade - C.3)
Complete addition and subtraction equations with integers (Seventh grade - C.4)
Add and subtract integers: word problems (Seventh grade - C.5)
Decimal number lines (Seventh grade - D.3)
Add and subtract rational numbers (Seventh grade - H.6)

7NS.1.d Apply properties of operations as strategies to add and subtract rational numbers.

Evaluate numerical expressions involving integers (Seventh grade - C.9)
Add and subtract decimals (Seventh grade - E.1)
Evaluate numerical expressions involving decimals (Seventh grade - E.11)

- Add and subtract fractions (Seventh grade - G.1)
- Add and subtract mixed numbers (Seventh grade - G.3)
- Apply addition and subtraction rules (Seventh grade - H.7)
- Properties of addition and multiplication (Seventh grade - S.1)

7NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

7NS.2.a 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.

- Integer multiplication and division rules (Seventh grade - C.6)
- Multiply and divide integers (Seventh grade - C.7)
- Complete multiplication and division equations with integers (Seventh grade - C.8)
- Multiply and divide rational numbers (Seventh grade - H.8)
- Distributive property (Seventh grade - S.2)

7NS.2.b 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.

- Multiplicative inverses (Seventh grade - A.3)
- Divisibility rules (Seventh grade - A.4)
- Integer multiplication and division rules (Seventh grade - C.6)
- Multiply and divide integers (Seventh grade - C.7)
- Complete multiplication and division equations with integers (Seventh grade - C.8)
- Divide decimals by whole numbers: word problems (Seventh grade - E.6)
- Understanding fractions: word problems (Seventh grade - F.3)
- Divide fractions and mixed numbers: word problems (Seventh grade - G.14)
- Multiply and divide rational numbers (Seventh grade - H.8)

7NS.2.c Apply properties of operations as strategies to multiply and divide rational numbers.

- Evaluate numerical expressions involving integers (Seventh grade - C.9)
- Multiply decimals (Seventh grade - E.3)
- Divide decimals (Seventh grade - E.5)
- Evaluate numerical expressions involving decimals (Seventh grade - E.11)
- Multiply fractions and whole numbers (Seventh grade - G.7)
- Multiply fractions (Seventh grade - G.9)
- Multiply mixed numbers (Seventh grade - G.10)
- Divide fractions (Seventh grade - G.12)
- Divide mixed numbers (Seventh grade - G.13)
- Apply multiplication and division rules (Seventh grade - H.9)
- Properties of addition and multiplication (Seventh grade - S.1)

7NS.2.d 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.

- Classify numbers (Seventh grade - A.10)
- Convert between decimals and fractions or mixed numbers (Seventh grade - H.2)

7NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

- Add and subtract integers (Seventh grade - C.3)
- Complete addition and subtraction equations with integers (Seventh grade - C.4)

Add and subtract integers: word problems (Seventh grade - C.5)
Integer multiplication and division rules (Seventh grade - C.6)
Multiply and divide integers (Seventh grade - C.7)
Complete multiplication and division equations with integers (Seventh grade - C.8)
Add and subtract decimals (Seventh grade - E.1)
Add and subtract decimals: word problems (Seventh grade - E.2)
Multiply decimals (Seventh grade - E.3)
Multiply decimals and whole numbers: word problems (Seventh grade - E.4)
Divide decimals (Seventh grade - E.5)
Divide decimals by whole numbers: word problems (Seventh grade - E.6)
Add, subtract, multiply, and divide decimals: word problems (Seventh grade - E.8)
Add and subtract fractions (Seventh grade - G.1)
Add and subtract fractions: word problems (Seventh grade - G.2)
Add and subtract mixed numbers (Seventh grade - G.3)
Add and subtract mixed numbers: word problems (Seventh grade - G.4)
Inequalities with addition and subtraction of fractions and mixed numbers (Seventh grade - G.5)
Multiply fractions and whole numbers (Seventh grade - G.7)
Multiply fractions (Seventh grade - G.9)
Multiply mixed numbers (Seventh grade - G.10)
Multiply fractions and mixed numbers: word problems (Seventh grade - G.11)
Divide fractions (Seventh grade - G.12)
Divide mixed numbers (Seventh grade - G.13)
Divide fractions and mixed numbers: word problems (Seventh grade - G.14)
Add, subtract, multiply, and divide fractions and mixed numbers: word problems (Seventh grade - G.16)
Add and subtract rational numbers (Seventh grade - H.6)
Multiply and divide rational numbers (Seventh grade - H.8)
Add, subtract, multiply, and divide money amounts: word problems (Seventh grade - M.1)
Price lists (Seventh grade - M.2)

7EE Expressions and Equations

7 Use properties of operations to generate equivalent expressions.

7EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Add and subtract like terms (Seventh grade - R.8)
Add, subtract, and multiply linear expressions (Seventh grade - R.9)
Properties of addition and multiplication (Seventh grade - S.1)
Distributive property (Seventh grade - S.2)
Write equivalent expressions using properties (Seventh grade - S.3)

7EE.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.

7 Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

7EE.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.

Scientific notation (Seventh grade - A.8)
Compare numbers written in scientific notation (Seventh grade - A.9)

Evaluate numerical expressions involving integers (Seventh grade - C.9)
Round decimals (Seventh grade - D.4)
Estimate sums, differences, and products of decimals (Seventh grade - E.7)
Multi-step inequalities with decimals (Seventh grade - E.9)
Maps with decimal distances (Seventh grade - E.10)
Evaluate numerical expressions involving decimals (Seventh grade - E.11)
Equivalent fractions (Seventh grade - F.1)
Simplify fractions (Seventh grade - F.2)
Compare and order fractions (Seventh grade - F.5)
Compare fractions: word problems (Seventh grade - F.6)
Convert between mixed numbers and improper fractions (Seventh grade - F.7)
Compare mixed numbers and improper fractions (Seventh grade - F.8)
Round mixed numbers (Seventh grade - F.9)
Estimate sums and differences of mixed numbers (Seventh grade - G.6)
Estimate products and quotients of fractions and mixed numbers (Seventh grade - G.15)
Maps with fractional distances (Seventh grade - G.17)
Convert between decimals and fractions or mixed numbers (Seventh grade - H.2)
Compare ratios: word problems (Seventh grade - J.4)
Convert between percents, fractions, and decimals (Seventh grade - L.2)
Compare percents to fractions and decimals (Seventh grade - L.3)
Unit prices with unit conversions (Seventh grade - M.4)
Unit prices: find the total price (Seventh grade - M.5)
Estimate to solve word problems (Seventh grade - N.1)
Multi-step word problems (Seventh grade - N.2)
Guess-and-check word problems (Seventh grade - N.3)
Use Venn diagrams to solve problems (Seventh grade - N.4)
Find the number of each type of coin (Seventh grade - N.5)
Elapsed time word problems (Seventh grade - N.6)

7EE.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.

7EE.4.a 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.

Solve proportions: word problems (Seventh grade - J.9)
Solve equations using properties (Seventh grade - S.4)
Model and solve equations using algebra tiles (Seventh grade - T.3)
Solve one-step equations (Seventh grade - T.5)
Solve two-step equations (Seventh grade - T.6)
Solve equations: word problems (Seventh grade - T.7)
Solve equations involving like terms (Seventh grade - T.8)
Solve word problems involving two-variable equations (Seventh grade - V.4)

7EE.4.b 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.

Solutions to inequalities (Seventh grade - U.1)
Write inequalities from number lines (Seventh grade - U.2)
Graph inequalities on number lines (Seventh grade - U.3)
Solve one-step inequalities (Seventh grade - U.4)
Graph solutions to one-step inequalities (Seventh grade - U.5)

Solve two-step inequalities (Seventh grade - U.6)

Graph solutions to two-step inequalities (Seventh grade - U.7)

7G Geometry

7 Draw, construct, and describe geometrical figures and describe the relationships between them.

7G.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.

Scale drawings and scale factors (Seventh grade - J.13)

Similar and congruent figures (Seventh grade - X.12)

Similar figures: side lengths and angle measures (Seventh grade - X.13)

Similar figures and indirect measurement (Seventh grade - X.14)

Congruent figures: side lengths and angle measures (Seventh grade - X.15)

Congruence statements and corresponding parts (Seventh grade - X.16)

Perimeter, area, and volume: changes in scale (Seventh grade - X.30)

7G.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.

7G.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.

Front, side, and top view (Seventh grade - X.25)

Names and bases of 3-dimensional figures (Seventh grade - X.26)

7 Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

7G.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.

Parts of a circle (Seventh grade - X.21)

Circles: calculate area, circumference, radius, and diameter (Seventh grade - X.22)

Circles: word problems (Seventh grade - X.23)

7G.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.

Identify complementary, supplementary, vertical, adjacent, and congruent angles (Seventh grade - X.4)

Find measures of complementary, supplementary, vertical, and adjacent angles (Seventh grade - X.5)

7G.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.

Area of rectangles and parallelograms (Seventh grade - X.18)

Area of triangles and trapezoids (Seventh grade - X.19)

Area and perimeter: word problems (Seventh grade - X.20)

Nets of 3-dimensional figures (Seventh grade - X.27)

Surface area (Seventh grade - X.28)

Volume (Seventh grade - X.29)

7SP Statistics and Probability

7 Use random sampling to draw inferences about a population.

7SP.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.

Identify representative, random, and biased samples (Seventh grade - BB.5)

7SP.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.

Estimate population size using proportions (Seventh grade - J.10)

7 Draw informal comparative inferences about two populations.

7SP.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.

7SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.

Calculate mean, median, mode, and range (Seventh grade - BB.1)

Interpret charts to find mean, median, mode, and range (Seventh grade - BB.2)

Mean, median, mode, and range: find the missing number (Seventh grade - BB.3)

Changes in mean, median, mode, and range (Seventh grade - BB.4)

7 Investigate chance processes and develop, use, and evaluate probability models.

7SP.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.

Probability of simple events (Seventh grade - CC.1)

7SP.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.

Experimental probability (Seventh grade - CC.3)

Make predictions (Seventh grade - CC.4)

7SP.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.

7SP.7.a Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

Probability of simple events (Seventh grade - CC.1)

7SP.7.b Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.

Experimental probability (Seventh grade - CC.3)

7SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

7SP.8.a 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.

Probability of opposite, mutually exclusive, and overlapping events (Seventh grade - CC.2)

Identify independent and dependent events (Seventh grade - CC.6)

Probability of independent and dependent events (Seventh grade - CC.7)

7SP.8.b 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 double sixes"), identify the outcomes in the sample space which compose the event.

Compound events: find the number of outcomes (Seventh grade - CC.5)

Factorials (Seventh grade - CC.8)

Permutations (Seventh grade - CC.9)

Counting principle (Seventh grade - CC.10)

Combination and permutation notation (Seventh grade - CC.11)

7SP.8.c Design and use a simulation to generate frequencies for compound events.

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