Mathletics Illinois Learning Standards

Activities (Courses), Skill Quests and eBooks



Grades 7-8

August, 2025



Mathletics

Illinois Learning Standards Activities (Courses), Skill Quests and eBooks August, 2025

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Use functions to model relationships between quantities	
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Understand and apply the Pythagorean Theorem	
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres	
CC.8.SP Statistics & Probability	
Investigate patterns of association in bivariate data.	

Grade 7

CC.7.RP Ratios & Proportional Relationships

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

CC.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	
■ Activities	
Ratios & Proportional Relationships	Proportional Relationships
	Rate Word Problems
	Rates
	Average Speed
	Time Taken
业 Skill Quests	
Unit rates with fractions	Solving unit rate problems involving fractions
Ebooks	
Grade 8, Series I: Ratio, Rates and The Number Plane	Graphing ordered pairs and number patterns

CC.7.RP.2a

Recognize and represent proportional relationships between quantities. 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.

Teacher directed Skill Quests Identify proportional relationships Ebooks Grade 8, Series I: Ratio, Rates and The Number Plane Using ratios Rates

CC.7.RP.2b Recognize and represent proportional relationships between quantities.	
■ Activities	
Teacher directed	
★ Skill Quests	
Constant of proportionality	Identifying the constant of proportionality
☐ Ebooks	
Grade 8, Series I: Ratio, Rates and The Number Plane	Using ratios
	Rates

CC.7.RP.2c

Recognize and represent proportional relationships between quantities. Represent proportional relationships by equations.

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■ Activities	
Ratios & Proportional Relationships	y=ax
¥ Skill Quests	
Represent proportional relationships	Representing proportional relationships: equations
☐ Ebooks	
Grade 8, Series I: Ratio, Rates and The Number Plane	Using ratios
	Rates

CC.7.RP.2d

Recognize and represent proportional relationships between quantities. 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.

■ Activities	
Ratios & Proportional Relationships	Conversion Graphs
🕍 Skill Quests	
Graphs of proportional relationships	Interpreting graphs of proportional relationships
Ebooks	
Grade 8, Series I: Ratio, Rates and The Number Plane	Using ratios
	Rates

CC.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.

markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	
□ Activities	
Ratios & Proportional Relationships	Best Buy
	Commission
	Percent Increase and Decrease
	Percentage Word Problems
	Percentage Error
	Successive Discounts
	Profit and Loss
	Simple Interest
🕍 Skill Quests	
Ratio & percent problems	Solving multi-step ratio & percent problems
☐ Ebooks	
Grade 8, Series I: Percentages	Unitary method and percentages
	Problem solving and percentages
Grade 8, Series I: Percentages 2	Unitary method and percentages
	Problem solving and percentages
Grade 8, Series I: Ratio, Rates and The Number Plane	Problem solving

CC.7.NS The Number System

Apply and extend previous understandings of operations with fractions

CC.7.NS.1a

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. Describe situations in which opposite quantities combine to make 0.

Activities **Teacher directed Skill Quests Opposites** Describing situations involving opposites **Ebooks Grade 7, Series H: Directed Numbers** Addition of directed numbers Subtraction of directed numbers Addition of directed numbers Grade 7, Series H: Directed Numbers 2 Subtraction of directed numbers Addition and subtraction of fractions with different denominators **Grade 7, Series H: Fractions** Addition and subtraction of fractions with different denominators Grade 7, Series H: Fractions

CC.7.NS.1b

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. 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.

· · ·	, ·
□ Activities	
The Number System	Add Integers
	Adding Integers: Positive, Negative or Zero
	Add Unlike Fractions
	Add Mixed Numbers: Signs Can Differ
🕍 Skill Quests	
Add rational numbers	Opposites & absolute value
	Adding rational numbers
	Adding positive & negative fractions
	Adding positive & negative decimals
	Adding integers
Ebooks	
Grade 7, Series H: Directed Numbers	Addition of directed numbers
	Subtraction of directed numbers
Grade 7, Series H: Directed Numbers 2	Addition of directed numbers
	Subtraction of directed numbers
Grade 7, Series H: Fractions	Addition and subtraction of fractions with different denominators
Grade 7, Series H: Fractions	Addition and subtraction of fractions with different denominators

CC.7.NS.1c

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. 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.

□ Activities	
The Number System	Subtract Integers
	Subtract Unlike Fractions
	Subtract Mixed Numbers: Signs Differ
	Subtract Negative Mixed Numbers
🕍 Skill Quests	
Subtract rational numbers	Subtracting rational numbers: adding the inverse
	Subtracting positive & negative fractions
	Subtracting positive & negative decimals
	Subtracting integers
	Subtracting rational numbers: absolute value
Ebooks	
Grade 7, Series H: Directed Numbers	Addition of directed numbers
	Subtraction of directed numbers
Grade 7, Series H: Directed Numbers 2	Addition of directed numbers
	Subtraction of directed numbers
Grade 7, Series H: Fractions	Addition and subtraction of fractions with different denominators
Grade 7, Series H: Fractions	Addition and subtraction of fractions with different denominators

CC.7.NS.1d

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. Apply properties of operations as strategies to add and subtract rational numbers.

	numbers.
■ Activities	
The Number System	Negative or Positive?
	Integers: Add and Subtract
	More with Integers
¥ Skill Quests	
Rational numbers: addition properties	Add & subtract rational numbers: properties
Ebooks	
Grade 7, Series H: Directed Numbers	Addition of directed numbers
	Subtraction of directed numbers
Grade 7, Series H: Directed Numbers 2	Addition of directed numbers
	Subtraction of directed numbers
Grade 7, Series H: Fractions	Addition and subtraction of fractions with different denominators
Grade 7, Series H: Fractions	Addition and subtraction of fractions with different denominators

CC.7.NS.2a

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

■ Activities	
The Number System	Integers: Multiplication and Division
	Multiplying and Dividing Integers
	Multiply Two Fractions 2
★ Skill Quests	
Multiply rational numbers	Multiplying rational numbers
	Multiplying positive & negative fractions
	Multiplying positive & negative decimals
	Multiplying integers
	Products of rational numbers: real-world contexts
Ebooks	
Grade 7, Series H: Directed Numbers	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Directed Numbers 2	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Fractions	Multiplication of fractions
Grade 7, Series H: Fractions	Division of fractions
Grade 7, Series H: Fractions	Multiplication of fractions
	Division of fractions

CC.7.NS.2b

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 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 realworld contexts.

□ Activities	
The Number System	Integers: Multiplication and Division
	Multiplying and Dividing Integers
	Divide Fractions by Fractions 2
	Divide Mixed Numbers with Signs
🕍 Skill Quests	
Divide integers	Dividing integers
	Quotients of rational numbers: real-world contexts
Ebooks	
Grade 7, Series H: Directed Numbers	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Directed Numbers 2	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Fractions	Multiplication of fractions
Grade 7, Series H: Fractions	Division of fractions
Grade 7, Series H: Fractions	Multiplication of fractions
	Division of fractions

CC.7.NS.2c

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Apply properties of operations as strategies to multiply and divide rational numbers.

■ Activities	
The Number System	Integers: Multiplication and Division
	Multiplying and Dividing Integers
	Multiply Two Fractions 2
	Divide Fractions by Fractions 2
	Divide Mixed Numbers with Signs
	Fractions to Decimals 2
★ Skill Quests	
Rational numbers: properties	Multiply & divide rational numbers: properties
Ebooks	
Grade 7, Series H: Directed Numbers	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Directed Numbers 2	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Fractions	Multiplication of fractions
Grade 7, Series H: Fractions	Division of fractions
Grade 7, Series H: Fractions	Multiplication of fractions
	Division of fractions

CC.7.NS.2d

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

■ Activities	
The Number System	Fractions to Decimals 2
🕍 Skill Quests	
Convert rational numbers to decimals	Use long division to convert rationals to decimals
Ebooks	
Grade 7, Series H: Directed Numbers	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Directed Numbers 2	Multiplication of directed numbers
	Division of directed numbers
Grade 7, Series H: Fractions	Multiplication of fractions
Grade 7, Series H: Fractions	Division of fractions
Grade 7, Series H: Fractions	Multiplication of fractions
	Division of fractions

CC.7.NS.3

Solve real-world and mathematical problems involving the four operations with rational numbers.	
■ Activities	
The Number System	More Fraction Problems
	Integers: Order of Operations (PEDMAS)

	Integers: Operations Order
🕍 Skill Quests	
Rational numbers problems: 4 operations	Rational numbers problems: 4 operations
Ebooks	
Grade 7, Series H: Directed Numbers	The four operations with directed numbers
Grade 7, Series H: Directed Numbers 2	The four operations with directed numbers
Grade 7, Series H: Fractions	Fractions with mixed numbers
	Problem solving with fractions
Grade 7, Series H: Fractions	Fractions with mixed numbers
	Problem solving with fractions

CC.7.EE Expressions & Equations

Use properties of operations to generate equivalent expressions

CC.7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. Electronic Activities		
Expressions & Equations	Using the Distributive Property	
	Factoring	
业 Skill Quests		
Linear expressions: properties	Simplify algebraic expressions: add & subtract	
	Distributive property: algebraic expressions	
	Factoring algebraic expressions	
□ Ebooks		
Grade 7, Series H: Algebra Basics		

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

CC.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.

Activities

Teacher directed	
站 Skill Quests	
Problems with rational numbers	Solving problems with rational numbers
	Converting terminating decimals
Ebooks	
Grade 7, Series H: Algebra Basics	
Grade 8, Series I Curriculum Ready: Equations	

CC.7.EE.4a

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. 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.

■ Activities	
Expressions & Equations	Write an Equation: Word Problems
	Writing Equations
	Solve Equations: Add, Subtract 1
	Solve Equations: Add, Subtract 2
	Solve Equations: Multiply, Divide 1
	Solve Equations: Multiply, Divide 2
	Solve Two-Step Equations
	Solving Simple Equations
业 Skill Quests	
Solve 2-step equations	Solving 2-step equations: word problems
	2-step equations, positive integer coefficients
	2-step equations, integer coefficients
	2-step equations, positive rational coefficients
	2-step equations, rational coefficients
	2-step equations, distributive property
☐ Ebooks	
Grade 8, Series I Curriculum Ready: Simplifying Algebra	

CC.7.EE.4b

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. 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.

□ Activities	
	Inequalities on a Number Line: Basics
	Inequalities on a Number Line: Mixed Basics
	Graphing Inequalities 2
	Graphing Inequalities on Number Line
	Solve One-Step Inequalities 1
	Solve One-Step Inequalities 2
🕍 Skill Quests	
Solve 2-step inequalities	Creating & solving 2-step inequalities
	Representing inequalities

	Graphing the solution of an inequality
	Solving 2-step inequalities
☐ Ebooks	
Grade 8, Series I Curriculum Ready: Simplifying Algebra	

CC.7.G Geometry

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

CC.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.	
■ Activities	
Geometry 1 & 3	Scale Factor
	Scale Measurement
	Floor Plans
	Perimeter, Area, Dimension Change
	Relate Shapes and Solids
🕍 Skill Quests	
Scale drawings	Scale drawings
☐ Ebooks	
Grade 7, Series H: Algebra Basics	Scale and distance

CC.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.

or no triangle. E Activities Teacher directed Y Skill Quests Construct triangles Triangle Inequality Theorem Constructing triangles with given conditions

CC.7.G.3

Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular pyramids

prisms and right rectangular pyramids.	
☐ Activities	
Teacher directed	
Skill Quests	
Cross sections of 3-D figures	Describing cross sections of 3-D figures

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

CC.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. Activities Geometry 4-6 Calculate Circumference of Circles Area: Circles 1 Area: Circles 2 Area: Annulus **Skill Quests** Circles: area & circumference Finding the area of a circle Introducing the parts of a circle Finding the circumference of a circle **Ebooks Grade 8, Series I: Circles and Cylinders** Parts of a circle The circumference of a circle

The area of a circle

	CC.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.		
■ Activities		
Geometry 4-6	Equal, Complement, or Supplement?	
	Vertically Opposite: Value of x	
业 Skill Quests		
Using angle facts to solve problems	Supplementary angles	
	Complementary angles	
	Adjacent angles	
	Vertical angles	
□ Ebooks		
Grade 8, Series I: Circles and Cylinders	Parts of a circle	
	The circumference of a circle	
	The area of a circle	

CC.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.	
□ Activities	
Geometry 4-6	Area: Triangles
	Area: Squares and Rectangles
	Area: Parallelograms
	Area: Quadrilaterals
	Area: Compound Figures
	Area: Composite Shapes

	Nets	
	Surface Area: Cuboids	
	Surface Area: Rectangular Prisms	
	Surface Area: Triangular Prisms 1	
	Volume of Rectangular Prisms 1	
	Volume of Triangular Prisms	
	Volume: Prisms	
™ Skill Quests		
Area, volume & surface area	Area: polygons	
	Solving real-life problems: area of polygons	
	Volume: right prisms	
	Surface area: rectangular & triangular prisms	
Ebooks		
Grade 7, Series H: Area, Volume and Capacity	Composite areas	
	Volume of rectangular prisms	
	Volume of triangular prisms	
Grade 7, Series H Curriculum Ready: Area and Perimeter	Area of composite shapes	
Grade 7, Series H Curriculum Ready: Solids	Volume of right prisms	
	Volume of rectangular prisms	
Grade 9, Series J: Surface Area and Volume	Surface area of a right prism	

CC.7.SP Statistics & Probability

Use random sampling to draw inferences about a population

CC.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.

Activities

Teacher directed



Understand sampling Understanding sampling

CC.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.

Activities

Teacher directed



Draw inferences from samplesDrawing inferences from samples

Draw informal comparative inferences about two populations

CC.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.

Activities

Teacher directed

Skill Quests

Compare data distributions Comparing data distributions

CC.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.

Activities

Statistics & Probability	Mean
	Median
	Mode
	Data Extremes and Range
🕍 Skill Quests	
Draw comparative inferences	Drawing comparative inferences
☐ Ebooks	
Grade 7, Series H Curriculum Ready: Data for statistics	Measures of central tendency

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

CC.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.

Probability Scale

Activities

Skill Quests

Statistics & Probability

Introduction to probability Introducing probability

Ebooks

Grade 6, Series G: Chance and Probability Chance and data

CC.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.

- Activities	
Statistics & Probability	Chance Dial
	Find the Probability
	Simple Probability
	Introductory Probability

🕍 Skill Quests	
Probability of chance events	Probability of chance events: relative frequency
☐ Ebooks	
Grade 6, Series G: Chance and Probability	Chance and data

CC.7.SP.7a

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

■ Activities	
Statistics & Probability	Probability Tables
¥ Skill Quests	
Determine the probability of events	Theoretical probability
	Predicting outcomes of chance experiments
	Finding the complement of an event
☐ Ebooks	
Grade 6, Series G: Chance and Probability	Chance and data

CC.7.SP.7b

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

Teacher directed *** Skill Quests Observe frequencies in data Finding the approximate probability Comparing observed frequency & expected frequency Ebooks Grade 6, Series G: Chance and Probability Chance and data

CC.7.SP.8a

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

	occurs.
■ Activities	
Statistics & Probability	Dice and Coins
	Probability- Replacement
	Probability-No Replacement
¥ Skill Quests	
Probability: compound events	Investigating mutually exclusive events
	Calculating probabilities of compound events
Ebooks	
Grade 6, Series G: Chance and Probability	Chance and data
Grade 8, Series I Curriculum Ready: Probability	Independent and dependent events

CC.7.SP.8b

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

■ Activities	
Statistics & Probability	Counting Principle
	Counting Techniques 1
¥ Skill Quests	
Sample spaces for compound events	Representing sample spaces & identifying outcomes
☐ Ebooks	
Grade 6, Series G: Chance and Probability	Chance and data
Grade 8, Series I Curriculum Ready: Probability	Independent and dependent events

CC.7.SP.8c

Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. Design and use a simulation to generate frequencies for compound events.	
■ Activities	
Teacher directed	
Independent & dependent compound events	Independent & dependent compound events
☐ Ebooks	
Grade 6, Series G: Chance and Probability	Chance and data
Grade 8. Series I Curriculum Ready: Probability	Independent and dependent events

Grade 8

CC.8.NS The Number System

Grade 9 Curriculum Ready: Decimals

Know that there are numbers that are not rational, and approximate them by rational numbers

CC.8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.		
□ Activities		
The Number System	Irrational Numbers	
	Fraction to Terminating Decimal	
	Repeated Decimals	
🕍 Skill Quests		
Rational & irrational numbers	Describing properties of irrational numbers	
	Classifying real numbers	
	Converting repeating decimals to rational numbers	
	Repeating & terminating decimals as fractions	
Ebooks		

CC.8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). Estimating Square Roots Skill Quests Approximate irrational numbers Comparing irrational numbers Locating irrational numbers on a number line Approximating the value of an irrational number Finding square roots of non-perfect squares

Recurring decimals

CC.8.EE Expressions & Equations

Work with radicals and integer exponents

CC.8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.	
Expressions & Equations 1-3	Exponent Notation
	Properties of Exponents
	Exponent Laws with Brackets
	The Zero Exponent
	Negative Exponents

	Integer Exponents
	Multiplication with Exponents
	Simplifying with Exponent Laws 1
	Exponent Laws and Algebra
	Exponent Form to Numbers
业 Skill Quests	
Properties of integer exponents	Using exponent notation
	Product of powers, numerical base
	Product of powers, algebraic base
	Quotient of powers, numerical base
	Quotient of powers, algebraic base
	Power of a power, numerical base
	Power of a power, algebraic base
	Zero exponents, numerical base
	Zero exponents, algebraic base
	Negative exponents, numerical base
	Negative exponents, algebraic base
	Simplifying expressions, numerical base
	Simplifying expressions, algebraic base
Ebooks	
Grade 9 Curriculum Ready: Indices	

CC.8.EE.2

Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

□ Activities	
Expressions & Equations 1-3	Square Roots 1
	Square and Cube Roots
站 Skill Quests	
Square & cube roots	Investigating square roots & cube roots
	Squares & square roots
	Evaluating expressions with square & cube roots
	Square roots of fractions & decimals
	Cubes & cube roots
Ebooks	
Grade 7, Series H: Special Numbers, Factors and Multiples	Square numbers
	Triangular numbers

CC.8.EE.3

Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.

to express now many times as much one is than the other.	
□ Activities	
Expressions & Equations 1-3	Scientific Notation
	Scientific Notation 1
	Scientific Notation 2
	Scientific notation to decimal

	Ordering Scientific Notation
¥ Skill Quests	
Write numbers in scientific notation	Introducing scientific notation
	Converting scientific notation to standard form
	Converting standard form to scientific notation
Ebooks	
Grade 9 Curriculum Ready: Indices	Using our knowledge

CC.8.EE.4

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Understand the connections between proportional relationships, lines, and linear equations

CC.8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. Expressions & Equations 5-8 Expressions & Equations 5-8 Y=ax Skill Quests Proportional relationships Graphing proportional relationships Comparing proportional relationships Comparing proportional relationships Ebooks Grade 8, Series I Curriculum Ready: Linear Relationships

CC.8.EE.6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

	b.
□ Activities	
Expressions & Equations 5-8	Determining a Rule for a Line Gradient
	Slope
	Slope of a Line
	Equation of a Line 1
	Which Straight Line?
	Equation from Point and Slope
	Modeling Linear Relationships

址 Skill Quests	
Understand slope & y-intercept	Using similar triangles to understand slope
	Writing equations of proportional relationships
	Writing equations of nonproportional relationships
	Identifying the slope in an equation or graph
	Identifying the y-intercept on a graph
	Graphing equations in slope-intercept form
	Graphing equations not in slope-intercept form
	Finding the y-intercept algebraically
☐ Ebooks	
Grade 8, Series I Curriculum Ready: Linear Relationships	

Analyze and solve linear equations and pairs of simultaneous linear equations

CC.8.EE.7a Solve linear equations in one variable. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers). Eacher directed Solution types of linear equations Solution types of linear equations Solution types of linear equations Grade 8, Series I Curriculum Ready: Equations

CC.8.EE.7b Solve linear equations in one variable. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	
■ Activities	
Expressions & Equations 5-8	Equations with Grouping Symbols
	Equations with Fractions
	Equations with Decimals
	Equations to Solve Problems
	Equations: Variables, Both Sides
	Solving More Equations
	Solve Multi-Step Equations
业 Skill Quests	
Solve linear equations	Solving 3-step linear equations
	Solving linear equations, variables on both sides
	Solving linear equations, distributive property
	Using substitution to check solutions
Ebooks	
Grade 8, Series I Curriculum Ready: Equations	

CC.8.EE.8a

Analyze and solve pairs of simultaneous linear equations. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

■ Activities	
Expressions & Equations 5-8	Solve Systems by Graphing
	Linear Modelling
	Simultaneous Equations 1
	Simultaneous Equations 2
	Simultaneous Linear Equations
址 Skill Quests	
Identify solutions, systems of equations	Identifying solutions, systems of equations
☐ Ebooks	
Grade 9 Curriculum Ready: Linear Relationships	Thinking more

CC.8.EE.8b

Analyze and solve pairs of simultaneous linear equations. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.

estimate solutions by graphing the equations. Solve simple cases by inspection.	
□ Activities	
Expressions & Equations 5-8	Solve Systems by Graphing
	Linear Modelling
	Simultaneous Equations 1
	Simultaneous Equations 2
	Simultaneous Linear Equations
站 Skill Quests	
Solve systems of equations	Solving systems of equations graphically
	Solving systems of equations using elimination
	Solving systems of equations using substitution
	Checking the solution of a system of equations
□ Ebooks	
Grade 9 Curriculum Ready: Linear Relationships	Thinking more

CC.8.EE.8c

Analyze and solve pairs of simultaneous linear equations. Solve real-world and mathematical problems leading to two linear equations in two variables.

equations in two variables.	
■ Activities	
Expressions & Equations 5-8	Solve Systems by Graphing
	Linear Modelling
	Simultaneous Equations 1
	Simultaneous Equations 2
	Simultaneous Linear Equations
🕍 Skill Quests	
Write & solve systems of equations	Writing & solving systems of equations
Ebooks	
Grade 9 Curriculum Ready: Linear Relationships	Thinking more

CC.8.F Functions

Define, evaluate, and compare functions

CC.8.F.1

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.

□ Activities	
Functions	Function Rules and Tables
	Vertical Line Test
¥ Skill Quests	
Identify functions	Identifying functions
☐ Ebooks	
Grade 6, Series G Curriculum Ready: Patterns and Algebra	Patterns and functions
Grade 10 Curriculum Peady: Functions	Definition of functions

CC.8.F.2

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

verbal descriptions).	
□ Activities	
Teacher directed	
' Skill Quests	
Compare functions	Comparing functions represented in different ways

CC.8.F.3

Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

	linear.
■ Activities	
Functions	Find the Function Rule
址 Skill Quests	
Interpret y = mx + b as linear	Represent linear relationships in different forms
	Equations of linear & non-linear relationships
Ebooks	
Grade 9: Linear and Non-linear Relationships	

Use functions to model relationships between quantities

CC.8.F.4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Activities

Teacher directed

业 Skill Quests	
Rate of change & initial value	Rate of change & initial value
☐ Ebooks	
Grade 8, Series I Curriculum Ready: Linear Relationships	
Grade 8, Series I Curriculum Ready: Straight Lines	

CC.8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	
Functions	Travel Graphs
业 Skill Quests	Line Graphs: Interpretation
Distance-time graphs	Distance-time graphs
Ebooks	
Grade 8, Series I Curriculum Ready: Linear Relationships Grade 8, Series I Curriculum Ready: Straight Lines	

CC.8.G Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software

CC.8.G.1a Verify experimentally the properties of rotations, reflections, and translations. Lines are taken to lines, and line segments to line segments of the same length.		
□ Activities		
Geometry 1-5	Transformations: Coordinate Plane	
	Rotations: Coordinate Plane	
业 Skill Quests		
Introduction to rigid transformations	Translating points on the coordinate plane	
	Reflecting points across the x- or y-axis	
	Rotating points about the origin	
Preserved properties: length	Preserved properties: length	

CC.8.G.1b Verify experimentally the properties of rotations, reflections, and translations. Angles are taken to angles of the same measure.		
■ Activities		
Geometry 1-5	Transformations: Coordinate Plane	
	Rotations: Coordinate Plane	
业 Skill Quests		
Introduction to rigid transformations	Translating points on the coordinate plane	
	Reflecting points across the x- or y-axis	
	Rotating points about the origin	
Preserved properties: angles	Preserved properties: angles	

CC.8.G.1c

Verify experimentally the properties of rotations, reflections, and translations. Parallel lines are taken to parallel lines.

■ Activities	
Geometry 1-5	Transformations: Coordinate Plane
	Rotations: Coordinate Plane
★ Skill Quests	
Introduction to rigid transformations	Translating points on the coordinate plane
	Reflecting points across the x- or y-axis
	Rotating points about the origin
Preserved properties: parallel lines	Preserved properties: parallel lines

CC.8.G.2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

□ Activities	
Geometry 1-5	Congruent Figures (Dot Grid)
	Congruent Figures (Grid)
★ Skill Quests	
Congruency: rigid transformations	Congruency: rigid transformations

CC.8.G.3		
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.		
■ Activities		
Geometry 1-5	Transformations: Coordinate Plane	
	Rotations: Coordinate Plane	
	Scale Factor	
业 Skill Quests		
Transformations, coordinates	Dilations, coordinates	
	Translations, coordinates	
	Rotations, coordinates	
	Reflections, coordinates	
	Sequences of transformations	
Ebooks		
Grade 7, Series H Curriculum Ready: Polygons	Transformations	
	Transformations on the Cartesian Plane	

CC.8.G.4

Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

□ Activities	
Geometry 1-5	Similar Figures 1
业 Skill Quests	

Similarity: transformations	Introducing similarity
	Similarity: transformations
Ebooks	
Grade 7, Series H Curriculum Ready: Polygons	Transformations
	Transformations on the Cartesian Plane

CC.8.G.5

Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

■ Activities	
Geometry 1-5	Angles on Parallel Lines
	Introduction to Angles on Parallel Lines 1
	Parallel Lines
	Vertically Opposite: Value of x
	Using Similar Triangles
	Similar Triangles
	Angle Measures in a Triangle
	Exterior Angles of a Triangle
	Angle Sum of a Triangle
🕍 Skill Quests	
Triangles & angle relationships	Angle sum theorem
	Exterior angle theorem
	Angle relationships: parallel lines, transversal
	Using scale to analyze similar triangles
	Identifying similar triangles
Ebooks	
Grade 7, Series H Curriculum Ready: Angles and Polygons	Angle sum of a triangle
	External angle of a triangle

Understand and apply the Pythagorean Theorem

CC.8.G.6 Explain a proof of the Pythagorean Theorem and its converse.		
■ Activities		
Geometry 6-9	Pythagorean Triads	
业 Skill Quests		
The Pythagorean Theorem & its converse	Identifying the hypotenuse, right triangles	
	Identifying right triangles, Pythagorean Theorem	
	Pythagorean triples	
Ebooks		
Grade 8, Series I: Pythagoras' theorem		

CC.8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. Activities Geometry 6-9 Pythagorean Theorem Pythagorean: Find a Short Side (integers only) Pythagorean: Find a Short Side (rounding needed) Pythagorean: Find a Short Side (decimal values) Pythagorean' Theorem Find Slant Height **Skill Quests Apply the Pythagorean Theorem** Pythagorean Theorem: missing short side Pythagorean Theorem: missing hypotenuse Pythagorean Theorem: missing side Pythagorean Theorem in 2-D & 3-D **Ebooks** Grade 8, Series I: Pythagoras' theorem

CC.8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	
■ Activities	
Geometry 6-9	Distance Between Two Points
🕍 Skill Quests	
Distance between two points	Finding the distance between two points
Ebooks	
Grade 8, Series I: Pythagoras' theorem	

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres

CC.8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	
■ Activities	
Geometry 6-9	Volume: Cylinders
	Volume: Cones
	Volume: Spheres
业 Skill Quests	
Volume: cones, cylinders & spheres	Volume: cones
	Volume: cylinders
	Volume: spheres
☐ Ebooks	
Grade 8, Series I: Circles and Cylinders	The volume of a cylinder
Grade 9 Curriculum Ready: Measuring Solids	Volume of basic solids
	Cones
	Spheres

CC.8.SP Statistics & Probability

Investigate patterns of association in bivariate data

CC.8.SP.1

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities.

Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

Activities

Statistics & Probability Data Analysis: Scatter Plots

Scatter Plots

Skill Quests

Use & interpret scatter plots

Using & interpreting scatter plots

CC.8.SP.2

Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

Activities

Teacher directed

Skill Quests

Estimate the line of best fitEstimating the line of best fit

CC.8.SP.3

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

Activities

Teacher directed

Skill Quests

Interpret the line of best fit Interpreting the line of best fit

Ebooks

Grade 8, Series I Curriculum Ready: Straight Lines

CC.8.SP.4

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

Activities

Statistics & Probability	Probability Tables
	Relative Frequency
	Two-way Table Probability

Skill Quests

Two-way tables Constructing & interpreting two-way tables

Ebooks

Grade 8, Series I Curriculum Ready: Probability

Two-way table probabilities



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