Grade 6 Math: Curriculum Guide

Course Description	The grade 6 math content standards focus on five critical areas: (1) Connecting students' understanding of whole number multiplication and division to ratios and rates; (2) Extending prior learning of rational numbers to include integers (positive and negative numbers) and multiplying and dividing fractions; (3) Writing and operating with expressions and equations; (4) An introduction to statistical analysis using measures of center and spread; and (5) Build on prior learning about area, surface area, and volume of two and three dimensional shapes.

Unit 1: Area and Surface Area	
Learning Targets	• Find areas of polygons by decomposing, rearranging, and composing shapes. • Understand and use the terms "base" and "height," and find areas of parallelograms and triangles. • Approximate areas of non-polygonal regions by polygonal regions. • Represent polyhedra with nets and find their surface areas.
Skills/Standards/Topics	**Standards: 6.G.A, 6.EE.A** *Topics:* • Reasoning to find area • Parallelograms • Triangles • Polygons • Surface area • Squares and cubes
Resources	• *Illustrative Math Curriculum* - Primary source of instructional activities and routines • *Imagine Learning Classroom online platform* - Digital collection of curriculum materials and online learning tools • *iReady Diagnostic Tool* - Grade level common assessment and benchmarking tool • *DeltaMath* - Online skills-based practice

Unit 2: Introducing Ratios	
Learning Targets	• Understand and use the terms "ratio," "rate," "equivalent ratios," "per," "at this rate," "constant speed," and "constant rate," • Recognize when two ratios are or are not equivalent. • Represent ratios as expressions.

	• Represent equivalent ratios with double number line diagrams, tape diagrams, and tables. • Reason about situations involving color mixtures, recipes, unit pricing, and constant speed.
Skills/Standards/Topics	**Standards: 6.RP.A** *Topics:* • Defining ratios • Equivalent ratios • Representing equivalent ratios • Solving ratio and rate problems • Part-part-whole ratios
Resources	• *Illustrative Math Curriculum* - Primary source of instructional activities and routines • *Imagine Learning Classroom online platform* - Digital collection of curriculum materials and online learning tools • *iReady Diagnostic Tool* - Grade level common assessment and benchmarking tool • *DeltaMath* - Online skills-based practice

Unit 3: Unit Rates and Percentages	
Learning Targets	• Understand and use the terms “unit rate,” “speed,” “pace,” “percent,” and “percentage,” • Recognize that equivalent ratios have equal unit rates. • Represent percentages with tables, tape diagrams, and double number line diagrams. • Reason about situations involving unit price, constant speed, and measurement conversion.
Skills/Standards/Topics	**Standards: 6.RP.A** *Topics:* • Units of measurement • Unit conversion • Rates • Percentages
Resources	• *Illustrative Math Curriculum* - Primary source of instructional activities and routines • *Imagine Learning Classroom online platform* - Digital collection of curriculum materials and online learning tools • *iReady Diagnostic Tool* - Grade level common assessment and benchmarking tool • *DeltaMath* - Online skills-based practice

Unit 4: Dividing Fractions	
Learning Targets	• Examine how the relative sizes of numerator and denominator affect the size of their quotient when numerator or denominator (or both) is a fraction. • Understanding that dividing by $\frac{a}{b}$ has the same outcome as multiplying by b, then by $\frac{1}{a}$. • Compute quotients of fractions. • Solve problems involving lengths and areas of figures with fractional side lengths. • Extend the formula for the volume of a right rectangular prism to prisms with fractional edge lengths and use it to solve problems. • use tape diagrams, equations, and expressions to represent situations involving partitive or quotitive interpretations of division with fractions. Given a multiplication or division equation or expression with fractions, describe a situation that it could represent. • use tape diagrams and equations in reasoning about situations that involve multiplication and division of fractions.
Skills/Standards/Topics	**Standards: 6.NS.A, 6.G.A** *Topics:* • Making sense of division • Meanings of fraction division • Algorithm for fraction division • Fractions in lengths, areas and volumes
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Unit 5: Arithmetic in Base Ten	
Learning Targets	• Compute sums, differences, products, and quotients of multi-digit whole numbers and decimals, using efficient algorithms. • Use calculations with whole numbers and decimals to solve problems set in real-world contexts.
Skills/Standards/Topics	**Standards: 6.NS.B, 6.EE.A** *Topics:* • Introduction to decimals

	• Adding and subtracting decimals • Multiplying decimals • Dividing decimals
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Unit 6: Expressions and Equations	
Learning Targets	• Understand and use the terms "variable," "coefficient," "solution," "equivalent expressions," "exponent," "independent variable," and "dependent variable." • Write coefficients next to variables without a multiplication symbol. • Understand other situations in which the multiplication symbol can be omitted, e.g., $6 \cdot (3+2)$ can be written as $6(3+2)$. • Evaluate expressions that have positive whole-number exponents and whole-number, fraction, or variable bases, given a value for the variable. Find solutions for linear equations in one variable and simple equations that include exponents, e.g., $2x=32$ and $100=x^2$. • Reason about real-world and geometrical situations, understanding that some values of variables may not make sense in a given context. • Represent collections of equivalent ratios as equations and make connections between tables, graphs, and linear equations that represent the same relationships.
Skills/Standards/Topics	**Standards: 6.EE.A, 6.EE.B, 6.EE.C** *Topics:* • Equations in one variable • Equal and equivalent • Expressions with exponents • Relationships between quantities
Resources	• *Illustrative Math Curriculum* - Primary source of instructional activities and routines • *Imagine Learning Classroom online platform* - Digital collection of curriculum materials and online learning tools • *iReady Diagnostic Tool* - Grade level common assessment and benchmarking tool • *DeltaMath* - Online skills-based practice

Unit 7: Rational Numbers	
Learning Targets	• Interpret signed numbers in contexts (e.g., temperature above or below zero, elevation above or below sea level). • Understand and use the terms “positive number,” “negative number,” “rational number,” “opposite,” “sign,” “absolute value,” “a solution to an inequality,” “less than,” “greater than,” and the corresponding symbols. • Plot points with signed rational number coordinates on the number line. • use absolute value notation, understanding the absolute value of a number as its distance from zero on the number line. • Graph inequalities in one variable on number line diagrams, using a circle or disk to indicate when a given point is, respectively, excluded or included. • Solve simple inequalities, understanding that there may be infinitely many solutions, and show solutions symbolically and on the number line. • Interpret solutions of inequalities in contexts. • Plot pairs of signed number coordinates in the plane, understanding the relationship between the signs of a pair of coordinates and the quadrant of the corresponding point. • Use coordinates to calculate horizontal and vertical distances between two points. • Understand and use the terms “common factor,” “greatest common factor,” “common multiple,” and “least common multiple,” • Solve problems set in real-world contexts in which common factors or multiples occur.
Skills/Standards/Topics	**Standards: 6.NS.B, 6.NS.C, 6.EE.B, 6.G.A** *Topics:* • Negative numbers and absolute value • Inequalities • The coordinate plane • Common factors and common multiples
Resources	• *Illustrative Math Curriculum* - Primary source of instructional activities and routines • *Imagine Learning Classroom online platform* - Digital collection of curriculum materials and online learning tools • *iReady Diagnostic Tool* - Grade level common assessment and benchmarking tool • *DeltaMath* - Online skills-based practice

Unit 8: Data Sets and Distributions	
Learning Targets	• Explore populations of data sets and study variables associated with a population. • Understand and use the terms “numerical data,” “categorical data,” “survey” (as noun and verb), “statistical question,” “variability,” “distribution,” and “frequency.” • Create and interpret histograms, bar graphs, tables of frequencies, and box plots. • Describe distributions (shown on graphical displays) using terms such as “symmetrical,” "peaks," “gaps,” and “clusters.” • Interpret measures of center—understanding and using the terms “mean,” “average,” and “median.” • Interpret measures of variability—understanding and using the terms “range,” ”mean absolute deviation” or MAD, “quartile,” and “interquartile range” or IQR.
Skills/Standards/Topics	**Standards: 6.SP.A, 6.SP.B, 6.NS.B** *Topics:* • Data, variability and statistical questions • Dot plots and histograms • Measures of center and variability • Median and IQR
Resources	• *Illustrative Math Curriculum* - Primary source of instructional activities and routines • *Imagine Learning Classroom online platform* - Digital collection of curriculum materials and online learning tools • *iReady Diagnostic Tool* - Grade level common assessment and benchmarking tool • *DeltaMath* - Online skills-based practice