

# Grade 6 Mathematics: *Open Up* Course Syllabus

<p><b>Unit 1: Area and Surface Area</b> <small>• Approx. 4.5 weeks</small></p>	<ul style="list-style-type: none"> <li>• Find areas of polygons by decomposing, rearranging, and composing shapes.</li> <li>• Use the terms “base” and “height,” and find areas of parallelograms and triangles.</li> <li>• Approximate areas of non-polygonal regions by polygonal regions.</li> <li>• Represent polyhedra with nets and find their surface areas.</li> </ul>
<p><b>Unit 2: Introducing Ratios</b> <small>• Approx. 4.5 weeks</small></p>	<ul style="list-style-type: none"> <li>• Understand and use the terms “ratio,” “rate,” “equivalent ratios,” “per,” “at this rate,” “constant speed,” and “constant rate.”</li> <li>• Recognize when two ratios are or are not equivalent.</li> <li>• Represent ratios as expressions, and represent equivalent ratios with double number line diagrams, tape diagrams, and tables.</li> <li>• Use these terms and representations in reasoning about situations involving color mixtures, recipes, unit pricing, and constant speed.</li> </ul>
<p><b>Unit 3: Unit Rates and Percentages</b> <small>• Approx. 4 weeks</small></p>	<ul style="list-style-type: none"> <li>• Understand and use the terms “unit rate,” “speed,” “pace,” “percent,” and “percentage.”</li> <li>• Recognize that equivalent ratios have equal unit rates.</li> <li>• Represent percentages with tables, tape diagrams, and double number line diagrams, and as expressions.</li> <li>• Use these terms and representations in reasoning about situations involving unit price, constant speed, and measurement conversion.</li> </ul>
<p><b>Unit 4: Dividing Fractions</b> <small>• Approx. 4 weeks</small></p>	<ul style="list-style-type: none"> <li>• Examine how the relative sizes of numerator and denominator affect the size of their quotient when numerator or denominator (or both) is a fraction.</li> <li>• Understand that dividing by <math>\frac{a}{b}</math> has the same outcome as multiplying by <math>b</math>, then by <math>\frac{1}{a}</math>.</li> <li>• Compute quotients of fractions.</li> <li>• Solve problems involving lengths and areas of figures with fractional side lengths and extend the formula for the volume of a right rectangular prism to prisms with fractional edge lengths and use it to solve problems.</li> <li>• Use tape diagrams, equations, and expressions to represent situations involving partitive or quotitive interpretations of division with fractions.</li> <li>• Given a multiplication or division equation or expression with fractions, describe a situation that it could represent.</li> <li>• Use tape diagrams and equations in reasoning about situations that involve multiplication and division of fractions.</li> </ul>
<p><b>Unit 5: Arithmetic in Base Ten</b> <small>• Approx. 4 weeks</small></p>	<ul style="list-style-type: none"> <li>• Compute sums, differences, products, and quotients of multi-digit whole numbers and decimals, using efficient algorithms.</li> <li>• Use calculations with whole numbers and decimals to solve problems set in real-world contexts.</li> </ul>

<p><b>Unit 6: Expressions and Equations</b> <small>• Approx. 4.5 weeks</small></p>	<ul style="list-style-type: none"> <li>• Understand and use the terms “variable,” “coefficient,” “solution,” “equivalent expressions,” “exponent,” “independent variable,” and “dependent variable.”</li> <li>• Write coefficients next to variables without a multiplication symbol, e.g., <math>10x</math> rather than <math>10 \cdot x</math>, and note that <math>x</math> is <math>1 \cdot x</math>.</li> <li>• Learn other situations in which the multiplication symbol can be omitted, e.g., <math>6 \cdot (3+2)</math> can be written <math>6(3+2)</math>.</li> <li>• Work with expressions that have positive whole-number exponents and whole-number, fraction, or variable bases, using properties of exponents strategically to evaluate these expressions, given a value for the variable.</li> <li>• Find solutions for linear equations in one variable and simple equations that include exponents, e.g., <math>2^x=32</math> and <math>100=x^2</math>.</li> </ul>
--	---

	<ul style="list-style-type: none"> <li>• Use these terms and representations (including expressions with two variables) in reasoning about real-world and geometrical situations, understanding that some values of variables may not make sense in a given context.</li> <li>• Represent collections of equivalent ratios as equations and use and make connections between tables, graphs, and linear equations that represent the same relationships.</li> </ul>
<p><b>Unit 7: Rational Numbers</b> • Approx. 4 weeks</p>	<ul style="list-style-type: none"> <li>• Interpret signed numbers in contexts (e.g., temperature above or below zero, elevation above or below sea level).</li> <li>• 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.</li> <li>• Plot points with signed rational number coordinates on the number line, and recognize and use the connection between relative position of two points on the number line and inequalities involving the coordinates of the points.</li> <li>• Understand and use absolute value notation, understanding that the absolute value of a number as its distance from zero on the number line.</li> <li>• 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.</li> <li>• Solve simple inequalities, understanding that there may be infinitely many solutions, and show solutions symbolically and on the number line.</li> <li>• Interpret solutions of inequalities in contexts, understanding that some solutions do not make sense in some contexts.</li> <li>• 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, and use coordinates to calculate horizontal and vertical distances between two points.</li> <li>• Understand and use the terms “common factor,” “greatest common factor,” “common multiple,” and “least common multiple,” and solve problems set in real-world contexts in which common factors or multiples occur.</li> </ul>
<p><b>Unit 8: Data Sets and Distributions</b> • Approx. 5.5 weeks</p>	<ul style="list-style-type: none"> <li>• Learn about populations and study variables associated with a population.</li> <li>• Understand and use the terms “numerical data,” “categorical data,” “survey” (as noun and verb), “statistical question,” “variability,” “distribution,” and “frequency.”</li> <li>• Make and interpret histograms, bar graphs, tables of frequencies, and box plots.</li> <li>• Describe distributions (shown on graphical displays) using terms such as “symmetrical,” “peaks,” “gaps,” and “clusters.”</li> <li>• Work with measures of center—understanding and using the terms “mean,” “average,” and “median.”</li> <li>• Work with measures of variability—understanding and using the terms “range,” “mean absolute deviation” or MAD, “quartile,” and “interquartile range” or IQR.</li> <li>• Interpret measurements of center and variability in contexts.</li> </ul>