



## Sixth Grade Mathematics Mathematics Course Outline

<i>Unit &amp; Content Objectives</i>	<i>Time</i>	<i>Activities &amp; Methods</i>	<i>Books &amp; Materials</i>	<i>Evaluation Techniques</i>
<p><b>NUMBER AND OPERATION</b></p> <p><b><u>Numeration</u></b></p> <ul style="list-style-type: none"> <li>• Read and write whole numbers and decimals.</li> <li>• Place value to hundred trillions.</li> <li>• Number line (integers, fraction, rational and irrational numbers).</li> <li>• Expanded notation.</li> <li>• Scientific notation.</li> <li>• Compare and order rational numbers.</li> <li>• Compare and order real numbers.</li> </ul> <p><b><u>Basic Operations</u></b></p> <ul style="list-style-type: none"> <li>• Add, subtract, multiply and divide: integers, decimal numbers, fractions, mixed numbers and algebraic terms.</li> <li>• Mental math strategies.</li> <li>• Regrouping in addition, subtraction, and multiplication.</li> <li>• Division with remainders.</li> </ul> <p><b><u>Properties of Numbers and Operations</u></b></p> <ul style="list-style-type: none"> <li>• Even and odd integers.</li> <li>• Factors, multiples, and divisibility.</li> <li>• Prime and composite numbers.</li> <li>• Greatest common factor (GCF).</li> <li>• Least common multiple (LCM).</li> <li>• Divisibility tests (2,3,4,5,6,8,9,10).</li> <li>• Prime Factorization of whole numbers.</li> <li>• Positive exponents of whole numbers, decimals, fractions, and integers.</li> <li>• Negative exponents of whole numbers.</li> <li>• Square roots, and cube roots.</li> <li>• Order of operations (PEMDAS).</li> <li>• Inverse operations.</li> </ul> <p><b><u>Estimation</u></b></p> <ul style="list-style-type: none"> <li>• Round whole numbers, decimals, and mixed numbers.</li> <li>• Estimate sums, differences, products, quotients, squares, and square roots.</li> <li>• Determine reasonableness of solutions.</li> <li>• Approximate irrational numbers.</li> </ul>	<p>45 min/day            5 days/wk            2 semesters</p>	<ul style="list-style-type: none"> <li>• Fact Practice</li> <li>• Mental Math</li> <li>• Note Taking</li> <li>• Daily Lesson Practice</li> <li>• Daily Review of Previous Lessons</li> <li>• Discussion</li> <li>• Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• Holy Bible (NIV)</li> <li>• Saxon Math, Course 2</li> <li>• Saxon Math, Course 2 Power Up Workbook</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Homework</li> <li>• Tests</li> </ul>

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<p><b>ALGEBRA</b></p> <p><b><u>Ratio and Proportional Reasoning</u></b></p> <ul style="list-style-type: none"> <li>• Fractional part of a whole, group, set, or number.</li> <li>• Equivalent fractions.</li> <li>• Convert between fractions, terminating and repeating decimals, and percents.</li> <li>• Reciprocals of numbers.</li> <li>• Complex fractions involving one term in numerator/denominator.</li> <li>• Identify/find percent of a whole, group, set, or number.</li> <li>• Percents greater than 100%.</li> <li>• Percent of change.</li> <li>• Solve proportions with unknown in one term.</li> <li>• Find unit rates and ratios in proportional relationships.</li> <li>• Apply proportional relationships such as similarity, scaling, and rates.</li> <li>• Estimate and solve application problems involving percent.</li> <li>• Estimate and solve application problems involving proportional relationships such as similarity and rate.</li> </ul> <p><b><u>Patterns, Relations, and Functions</u></b></p> <ul style="list-style-type: none"> <li>• Generate a different representation of data.</li> <li>• Use, describe, extend arithmetic sequence (with a constant rate of exchange).</li> <li>• Input-output tables.</li> <li>• Analyze a pattern to verbalize a rule.</li> <li>• Analyze a pattern to write an algebraic expressions.</li> <li>• Evaluate an algebraic expression to extend a pattern.</li> <li>• Compare and contrast linear and nonlinear functions.</li> </ul> <p><b><u>Variables, Expressions, Equations, and Inequalities</u></b></p> <ul style="list-style-type: none"> <li>• Solve equations using concrete and pictorial models.</li> <li>• Formulate a problem situation for a given equation with one unknown variable.</li> </ul>	<p>45  min/day  5 days/wk  2  semesters</p>	<ul style="list-style-type: none"> <li>• Fact Practice</li> <li>• Mental Math</li> <li>• Note Taking</li> <li>• Daily Lesson Practice</li> <li>• Daily Review of Previous Lessons</li> <li>• Discussion</li> <li>• Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• Holy Bible (NIV)</li> <li>• Saxon Math, Course 2</li> <li>• Saxon Math, Course 2 Power Up Workbook</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Homework</li> <li>• Tests</li> </ul>

<ul style="list-style-type: none"><li>• Formulate an equation with one unknown variable given a problem situation.</li><li>• Solve one and two-step equations with whole numbers, fractions, and decimals.</li><li>• Graph an inequality on a number line.</li><li>• Solve inequalities with one unknown.</li><li>• Validate an equation solution using mathematical properties.</li></ul>				
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<p><b>MEASUREMENT</b>  <b><u>Measuring Physical Attributes</u></b></p> <ul style="list-style-type: none"> <li>• Use customary units of length, area, volume, weight, and capacity.</li> <li>• Use metric units of length, area, volume, weight, and capacity.</li> <li>• Use temperature scales: Fahrenheit, and Celsius.</li> <li>• Use units of time.</li> </ul> <p><b><u>Systems of Measurement</u></b></p> <ul style="list-style-type: none"> <li>• Convert units of measure.</li> <li>• Convert between systems.</li> <li>• Convert between temperature scales.</li> <li>• Unit multipliers.</li> </ul> <p><b><u>Solving Measurement Problems</u></b></p> <ul style="list-style-type: none"> <li>• Perimeter of polygons, circles, and complex figures.</li> <li>• Area of triangles, rectangles, and parallelograms.</li> <li>• Area of a trapezoid.</li> <li>• Area of circles.</li> <li>• Area of semicircles and sectors.</li> <li>• Area of complex figures.</li> <li>• Surface area of spheres.</li> <li>• Estimate area.</li> <li>• Volume of right prisms, cylinders, pyramids, and cones.</li> <li>• Volume of spheres.</li> <li>• Estimate volume.</li> </ul> <p><b><u>Solving Problems of Similarity</u></b></p> <ul style="list-style-type: none"> <li>• Scale factor.</li> <li>• Similar triangles.</li> <li>• Indirect measurement.</li> <li>• Scale drawings: two-dimensional.</li> </ul> <p><b><u>Use Appropriate Measurement Instruments</u></b></p> <ul style="list-style-type: none"> <li>• Ruler (U.S. Customary and Metric).</li> <li>• Compass.</li> <li>• Protractor.</li> <li>• Thermometer.</li> </ul>	<p>45 min/day 5 days/wk 2 semesters</p>	<ul style="list-style-type: none"> <li>• Fact Practice</li> <li>• Mental Math</li> <li>• Note Taking</li> <li>• Daily Lesson Practice</li> <li>• Daily Review of Previous Lessons</li> <li>• Discussion</li> <li>• Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• Holy Bible (NIV)</li> <li>• Saxon Math, Course 2</li> <li>• Saxon Math, Course 2 Power Up Workbook</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Homework</li> <li>• Tests</li> </ul>

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<p><b>DATA ANALYSIS AND PROBABILITY</b>  <u><b>Data Collection and Representation</b></u></p> <ul style="list-style-type: none"> <li>• Collect and display data.</li> <li>• Tables and charts.</li> <li>• Frequency tables.</li> <li>• Pictographs.</li> <li>• Line graphs.</li> <li>• Histograms.</li> <li>• Bar graphs.</li> <li>• Circle graphs.</li> <li>• Venn diagrams.</li> <li>• Line plots.</li> <li>• Stem-and-leaf plots.</li> <li>• Box-and-whisker plots.</li> <li>• Choose an appropriate graph.</li> <li>• Identify bias in data collection.</li> <li>• Draw and compare different representations.</li> </ul> <p><u><b>Data Set Characteristics</b></u></p> <ul style="list-style-type: none"> <li>• Mean, median, mode, and range.</li> <li>• Select the best measure of central tendency for a given situation.</li> <li>• Determine trends from data.</li> <li>• Predict from graphs.</li> <li>• Recognize misuses of graphical or numerical information.</li> <li>• Evaluate predictions and conclusions based on data analysis.</li> </ul> <p><u><b>Probability</b></u></p> <ul style="list-style-type: none"> <li>• Experimental probability.</li> <li>• Make predictions based on experiments.</li> <li>• Accuracy of predictions in experiments.</li> <li>• Theoretical probability.</li> <li>• Sample spaces.</li> <li>• Simple probability.</li> <li>• Probability of compound events.</li> <li>• Probability of the complement of an event.</li> <li>• Probability of independent events.</li> <li>• Probability of dependent events.</li> </ul>	<p>45  min/day  5 days/wk  2  semesters</p>	<ul style="list-style-type: none"> <li>• Fact Practice</li> <li>• Mental Math</li> <li>• Note Taking</li> <li>• Daily Lesson Practice</li> <li>• Daily Review of Previous Lessons</li> <li>• Discussion</li> <li>• Manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• Holy Bible (NIV)</li> <li>• Saxon Math, Course 2</li> <li>• Saxon Math, Course 2 Power Up Workbook</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Observation</li> <li>• Homework</li> <li>• Tests</li> </ul>

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<p><b>GEOMETRY</b></p> <p><b><u>Describe Basic Terms</u></b></p> <ul style="list-style-type: none"> <li>Point, segment, ray, line, angle, and plane.</li> </ul> <p><b><u>Describe Properties and Relationships of Lines</u></b></p> <ul style="list-style-type: none"> <li>Parallel, perpendicular, and intersecting.</li> <li>Horizontal, vertical and oblique.</li> <li>Slope.</li> </ul> <p><b><u>Describe Properties and Relationships of Polygons</u></b></p> <ul style="list-style-type: none"> <li>Regular.</li> <li>Interior and exterior angles.</li> <li>Sum of angles.</li> <li>Diagonals.</li> <li>Effects of scaling on area and volume.</li> <li>Similarity and congruence.</li> <li>Classify triangles and quadrilaterals.</li> </ul> <p><b><u>Pythagorean Theorem</u></b></p> <ul style="list-style-type: none"> <li>Use the Pythagorean Theorem involving whole numbers.</li> </ul> <p><b><u>3-Dimensional Figures</u></b></p> <ul style="list-style-type: none"> <li>Represent in 2-dimensional world using nets.</li> <li>Draw 3-dimensional figures.</li> </ul> <p><b><u>Coordinate Geometry</u></b></p> <ul style="list-style-type: none"> <li>Name and graph ordered pairs.</li> <li>Intercepts of a line.</li> <li>Determine slope from the graph of a line.</li> <li>Identify reflections, translations, rotations, and symmetry.</li> <li>Graph reflections across the horizontal and vertical axes.</li> <li>Graph translations.</li> <li>Graph linear equations.</li> </ul> <p><b><u>PROBLEM SOLVING</u></b></p> <ul style="list-style-type: none"> <li>Four step problem solving process.</li> <li>Problem solving strategies.</li> </ul>	<p>45 min/day 5 days/wk 2 semesters</p>	<ul style="list-style-type: none"> <li>Fact Practice</li> <li>Mental Math</li> <li>Note Taking</li> <li>Daily Lesson Practice</li> <li>Daily Review of Previous Lessons</li> <li>Discussion</li> <li>Manipulative</li> </ul>	<ul style="list-style-type: none"> <li>Holy Bible (NIV)</li> <li>Saxon Math, Course 2</li> <li>Saxon Math, Course 2 Power Up Workbook</li> </ul>	<ul style="list-style-type: none"> <li>Teacher Observation</li> <li>Homework</li> <li>Tests</li> </ul>