

**NJCCCS AREA: Math**  
**North Brunswick Township Public Schools**

**Academic Support for Math – Grade 6**

**Acknowledgements**

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**Revision\_\_\_\_\_**

**Board Adoption\_\_\_\_\_**

## New Jersey Core Curriculum Content Standard Area: Mathematics

Topic/Course: Academic Support for Math– Grade 6

Grade: 6

Date: 8/2008

Essential Question NJCCC Standard	NJCCCS – Skills/Objectives/ Areas of Focus	Instructional Strategies Activities/ Materials / Technology Interdisciplinary Connections Cultural Diversity	Modifications ELL / Special Education Academic Support/ G&T	Assessments Formative Summative Benchmarks	PACING
<p><b>4.1.6.A7</b> How can we develop and apply key properties of numbers to help us solve problems? Focus on:</p> <ul style="list-style-type: none"> <li>• primes, factors, multiples</li> <li>• common multiples, common factors</li> <li>• greatest common factors, least common multiples</li> </ul> <p><b>4.1.6.B1, 2</b> How can we appropriately use arithmetic operations in problem situations? (focus on multiplication and division)</p>	<p><b>CMP2 - Prime Time</b> <i>Factors &amp; Multiples</i></p> <ul style="list-style-type: none"> <li>• Build proficiency with multiplication facts</li> <li>• Review division of whole numbers using the partial product and traditional long division algorithms</li> <li>• Understand relationships among factors, multiples, divisors, and products</li> <li>• Recognize and use properties of prime and composite numbers, even and odd numbers, and square numbers</li> <li>• Develop strategies for finding factors and multiples, least common multiples, and greatest common factors</li> </ul>	<ul style="list-style-type: none"> <li>• Play travel or other fact games</li> <li>• Create rectangles to represent area models of multiplication facts</li> <li>• Play the Factor Game and the Product Game (see Prime Time TG)</li> <li>• Create a concept map to visually represent connections between unit ideas and vocabulary</li> </ul>	<ul style="list-style-type: none"> <li>• Multiplication chart</li> <li>• Fact family strips or triangles</li> <li>• <i>Special Needs Handbook</i> for <b>Prime Time</b> (not assessments)</li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Timed fact tests Cooperative work Post-Assessment</p>	<p>September through Mid-October (10 days)</p>

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<p><b>4.1.6.A1</b> How can we use real-life experiences, physical materials, and technology to construct meanings for decimals and fractions as part of a whole, as subset of a set, as a location on a number line, &amp; as divisions of whole numbers?</p> <p><b>4.1.6.A3, 8</b> How can we demonstrate a sense of the relative magnitudes of numbers?</p> <p><b>4.1.6.C1</b> How can we decide when to use an exact answer and when to use an estimate?</p> <p><b>4.3.6.D.2</b> How can we understand and apply the properties of operations and numbers: Distributive property; The product of a number and its reciprocal is 1.</p>	<p><b>CMP2- Bits &amp; Pieces 1</b> <i>Rational Numbers</i></p> <ul style="list-style-type: none"> <li>• Develop ways to model situations involving fractions, decimals, and percents</li> <li>• Move flexibility between fraction, decimal, and percent representations</li> <li>• Compare and order fractions and decimals</li> <li>• Use benchmarks such as 0, <math>\frac{1}{2}</math>, 1, and <math>1\frac{1}{2}</math> to help estimate the size of a number or sum</li> </ul>	<ul style="list-style-type: none"> <li>• Use fraction tiles to represent equivalent fractions, compare them, and classify them according to benchmarks</li> <li>• Use <i>Decimal Squares</i> and related teacher materials to compare and order decimals</li> <li>• Create equivalency tables, number lines, and pictorial representations</li> <li>• Use measuring cups to represent and compare fractions</li> <li>• Use real-world data to demonstrate uses of percents</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Special Needs Handbook</i> for <b>Bits &amp; Pieces 1</b> (not assessments)</li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>Mid-October through Mid-November (12 days)</p>

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<p><b>4.2.6.B1</b> What situations can be analyzed using transformations and symmetries?</p> <p><b>4.2.6D1</b> How can we apply properties of parallel, perpendicular, and intersecting lines?</p> <p><b>4.2.6D2</b> How can we describe, compare, and classify polygons by angles and sides?</p>	<p><b>CMP2- Shapes &amp; Designs</b> <i>Two-dimensional Geometry</i></p> <ul style="list-style-type: none"> <li>• Draw or sketch polygons with certain properties</li> <li>• Compare and contrast polygons and their properties</li> <li>• Investigate the symmetries of a shape-rotation or reflection</li> <li>• Explore parallel lines and angles created by lines intersecting parallel</li> </ul>	<ul style="list-style-type: none"> <li>• Use protractors and rulers to analyze figures</li> <li>• Create webs to make connections between types of quadrilaterals</li> <li>• Cut apart a paper triangle to discover the relationships between angles</li> <li>• Create designs using reflections and rotations.</li> <li>• Use plastic polygons to sort and classify them</li> <li>• Analyze figures in the classroom</li> <li>• Compare regular and non-regular polygons</li> <li>• Use activities from <i>Navigating Through Geometry</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Special Needs Handbook</i> for <b>Shapes &amp; Designs</b> (<b>not</b> assessments)</li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>Mid-November through December (10 Days)</p>

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<p><b>4.1.6.B1</b> How can we appropriately use each arithmetic operation in problem situations?</p> <p><b>4.1.6.B2</b> How can we construct, use, and explain procedures for performing calculations with <b>fractions</b> using pencil &amp; paper, mental math, and calculator?</p> <p><b>4.1.6.B7</b> How can we use the relationships among operations and properties of operations?</p> <p><b>4.1.6.C3</b> How can we determine the reasonableness of an answer?</p>	<p><b>CMP2- Bits &amp; Pieces 2</b> <i>Fraction Operations</i></p> <ul style="list-style-type: none"> <li>• Estimate the reasonableness of results of operations with fractions</li> <li>• Develop ways to model sums, differences, products, and quotients with areas, strips, and number lines</li> <li>• Develop fluency with algorithms for adding, subtracting, multiplying, and dividing fractions</li> <li>• Recognize when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem</li> </ul>	<ul style="list-style-type: none"> <li>• Use fraction tiles, fraction strips, and number lines to represent operations with fractions</li> <li>• Create equivalency tables, number lines, and pictorial representations</li> <li>• Use benchmarks (0, 1/2, 1, 1 1/2, 2) to estimate the reasonableness of results of operations with fractions</li> <li>• Use measuring cups to represent fraction sums and differences</li> <li>• Use real-world data to demonstrate uses of fractions</li> <li>• Write fact families to show inverse relationships between addition, subtraction, and between multiplication and division</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Special Needs Handbook for Bits &amp; Pieces 2 (not assessments)</i></li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>January (11 Days)</p>

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<p><b>4.4.6.A2</b> How do we effectively read, interpret, select, construct, analyze, generate questions about, and draw inferences from displays of data? (Bar graph, line graph, circle graph, table, histogram; Range, median, and mean; Calculators and computers used to record and process information.)</p>	<p><b>CMP2- Data About Us Statistics</b></p> <ul style="list-style-type: none"> <li>• Represent distributions of data using line plots, bar graphs, stem-and-leaf plots, tables, and coordinate graphs</li> <li>• Compute the mean, median, mode, and range of data</li> <li>• Make informed decisions about which graphs and which of the measures of center (mean, median, or mode) and range may be used to describe a distribution of data</li> </ul>	<ul style="list-style-type: none"> <li>• Use real-world data to construct graphs</li> <li>• Use Excel or other programs to show the relationships between data and graphs</li> <li>• Compare the uses of various types of graph</li> <li>• Use simulations to demonstrate how changes in data affect the median, mean, and mode of a set of data</li> <li>• Identify outliers in a distribution and show how they affect each measure of central tendency</li> <li>• Pose questions, collect data, and conduct surveys</li> <li>• Analyze student data and make interpretations about the data</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Special Needs Handbook for Data About Us (not assessments)</i></li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Use activities from <i>Navigating Through Data</i></li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>February (5 Days)</p>

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<p><b>4.4.6.B1</b> How do we determine probabilities of events? (Also complementary event, Multiplication rule for probabilities; Probability of certain event is 1 and of impossible event is 0; Sum of probability of event and complementary event is 1.)</p> <p><b>4.4.6.B2</b> How do we determine probability using intuitive, experimental, and theoretical methods?</p> <p><b>4.4.6.C1</b> How do we solve counting problems and justify that all possibilities have been enumerated without duplication? (Organized lists, charts, tree diagrams, tables; Venn diagrams.)</p> <p><b>4.4.6.C2</b> How do we apply the multiplication principle</p>	<p><b>CMP2- How Likely Is It? Probability</b></p> <ul style="list-style-type: none"> <li>Understand the concepts of equally likely and not equally likely, and how they relate to the fairness of games</li> <li>Develop strategies for finding both experimental and theoretical probabilities</li> <li>Interpret statements of probability to make decisions or answer questions</li> </ul>	<ul style="list-style-type: none"> <li>Use spinners, dice, marbles in a bag, etc. to model probability experiments</li> <li>Create fair and unfair games</li> <li>Use simulations: Given numbers of various types of items in a bag, what is the probability that an item of one type will be picked? Given data obtained experimentally, what is the likely distribution of items in the bag?</li> <li>Create organized lists, charts, tree diagrams, tables, and Venn diagrams to represent data</li> <li>Determine the number of ways to form a committee of 2 from a group of 12 students</li> <li>Determine the number of ways students in a class could be elected to offices</li> <li>Determine the number of handshakes among a given number of people</li> <li>Determine the number of license plates; Then, without repeated numbers</li> </ul>	<ul style="list-style-type: none"> <li><i>Special Needs Handbook</i> for <b>How Likely Is It?</b> (not assessments)</li> <li>Questions read aloud</li> <li>Leveled small groups</li> <li>Calculator (when appropriate)</li> <li>Vocabulary charts (bilingual for ELL)</li> <li>Flip book glossary</li> <li>Word wall of key terms</li> <li>Additional time</li> <li>Periodic notebook maintenance assistance</li> <li>See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>Mid-Feb to Mid- March (11 days)</p>

of counting?		or letters.			
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<p><b>4.1.6.B1</b> How do we appropriately use each arithmetic operation in problem situations?</p> <p><b>4.1.6.B2</b> How can we construct, use, and explain procedures for performing calculations with <b>decimals &amp; percents</b> using pencil &amp; paper, mental math, and calculator?</p> <p><b>4.1.6.B7</b> How can we apply the relationships among operations and properties of operations?</p> <p><b>4.1.6.C3</b> How can we determine the reasonableness of an answer?</p>	<p><b>CMP2- Bits &amp; Pieces 3</b> <i>Decimals &amp; Percents</i></p> <ul style="list-style-type: none"> <li>• Estimate the answers to computations with decimals</li> <li>• Use various methods to multiply decimals (partial products, lattice, and traditional multiplication)</li> <li>• Use partial quotients and traditional division to divide decimals</li> <li>• Solve problems using the four operations with decimals</li> <li>• Solve percent problems of the form of a % of b equals c for any for any one of the variables a, b, or c</li> </ul>	<ul style="list-style-type: none"> <li>• Use <i>Decimal Squares</i> and related teacher materials to compare and order decimals</li> <li>• Create equivalency tables, number lines, and pictorial representations</li> <li>• Use real-world data to demonstrate uses of percents</li> <li>• Use decimals in measurement problems</li> <li>• Estimate decimal answers using benchmarks such as 0.5, 1. 1.5, 2.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Special Needs Handbook</i> for <b>Bits &amp; Pieces 3</b> (<b>not</b> assessments)</li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>Mid-March through April (15 Days)</p>

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<p><b>4.2.6.E2</b> How can we develop and apply strategies and formulas for finding perimeter and area? (Triangle, square, rectangle, parallelogram, and trapezoid; Circumference and area of a circle.)</p> <p><b>4.2.6.E5</b> How can we develop informal ways of approximating the measures of familiar objects (e.g., use a grid to approximate the area of the bottom of one’s foot)?</p>	<p><b>CMP2- Covering &amp; Surrounding</b> <i>2D Measurement</i></p> <ul style="list-style-type: none"> <li>• Develop strategies for finding areas and perimeters of rectangular shapes and non-rectangular shapes</li> <li>• Develop formulas and procedures, stated in words and or symbols, for finding areas and perimeters of rectangles, parallelograms, triangles and circles</li> <li>• Develop techniques for estimating the area and perimeter of an irregular figure</li> </ul>	<ul style="list-style-type: none"> <li>• Estimate areas and perimeters using grid paper</li> <li>• Estimate the areas of irregular objects using grid paper</li> <li>• Analyze how the area of a triangle and the area of a parallelogram are related to the area of a rectangle by cutting out figures</li> <li>• Graph figures with the same area but varying perimeters</li> <li>• Graph figures with the same perimeter but varying areas</li> <li>• Measure everyday surfaces to find perimeter and area</li> <li>• List uses of perimeter and uses of area to emphasize the differences</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Special Needs Handbook</i> for <b>Covering &amp; Surrounding (not assessments)</b></li> <li>• Use activities from <i>Navigating Through Geometry</i></li> <li>• List of key formulas</li> <li>• Questions read aloud</li> <li>• Leveled small groups</li> <li>• Calculator (when appropriate)</li> <li>• Vocabulary charts (bilingual for ELL)</li> <li>• Flip book glossary</li> <li>• Word wall of key terms</li> <li>• Additional time</li> <li>• Periodic notebook maintenance assistance</li> <li>• See <i>Implementing and Teaching Guide</i> p. 87-101</li> </ul>	<p>Pre-Assessment Oral responses Homework Class Practice Quizzes Cooperative work Post-Assessment</p>	<p>May to June (12 Days)</p>

<b>Other essential standards:</b>					
<p>4.2.6.A8 Identify a three-dimensional shape with a given net (i.e., a flat pattern that folds into a 3D shape).</p> <p>4.2.6.D5 Compare properties of cylinders, prisms, cones, pyramids, and spheres.</p> <p>4.2.6.D6 Identify, describe, and draw the faces or shadows (projections) of three-dimensional geometric objects from different perspectives.</p> <p>4.2.6.D7 Identify a three-dimensional shape with given projections (top, front and side views).</p> <p>4.2.6.E3 Develop and apply strategies and formulas for finding the surface area and volume of rectangular prisms and cylinders.</p>	<p>4.3.6.A1 Recognize, describe, extend, and create patterns involving whole numbers and rational numbers: Descriptions using tables, verbal rules, simple equations, and graphs</p> <p>4.3.6.B1 Describe the general behavior of functions given by formulas or verbal rules (e.g., graph to determine whether increasing or decreasing, linear or not).</p> <p>4.3.6.C1 Use patterns, relations, and linear functions to model situations: Using variables to represent unknown quantities; Using concrete materials, tables, graphs, verbal rules, algebraic expressions/equations/inequalities.</p>	<p>4.3.6.D1 Solve simple linear equations with manipulatives and informally: Whole-number coefficients only, answers also whole numbers; Variables on one or both sides of equation.</p> <p>4.4.6.D2 Analyze vertex-edge graphs and tree diagrams: Can a picture or a vertex-edge graph be drawn with a single line? (degree of vertex); Can you get from any vertex to any other vertex? (connectedness)</p> <p>4.4.6.D3 Use vertex-edge graphs to find solutions to practical problems: Delivery route that stops at specified sites but involves least travel; Shortest route from one site on a map to another.</p>			

