

*Cliffside Park Public Schools*

	<b>September</b>	<b>October</b>	<b>November</b>	<b>December</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
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**MIDDLE SCHOOL MAP  
of  
MATH CURRICULUM TOPICS**

	<b>September</b>	<b>October</b>	<b>November</b>	<b>December</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
<b>GRADE 7 UNITS OF STUDY &amp; BENCHMARKS NJCCCS</b>	Number & Numerical Operations: -To identify Rational Number, Percents (%), Exponents, Roots	Making Proportions and Percents  -To estimate square and cube roots of numbers	Describe, extend and evaluate patterns involving: Rational numbers Whole numbers Integers  Function Graphs: rates of change	Modeling: -To Analyze functional relationships to explain how a change in quantity results n a change of another using charts, pictures, graphs and equations  Procedures: Solve simple linear equations	Polygons: -to understand and apply properties  -to use a coordinate grid to model and quantify transformations	Calculate measurements in word problems  -To Find perimeter and area of geometric figures	Measurement:  -to find volume of prisms and cones	Data: -To select and useto make decisions  Probability: -To interpret as ratios, percents and decimals	Permutations  -To use vertex-edge graphs to represent and solve problems	Review  As pre teacher re-commendation
	4.1.7.A 4.1.7.B 4.1.7.C	4.1.7.A 4.1.7.B 4.1.7.C	4.1.7.A 4.1.7.B 4.1.7.C 4.4.7.A 4.4.7.B 4.4.7.C 4.4.7.D	4.3.7.A 4.3.7.B 4.3.7.C 4.3.7.D	4.2.7.A 4.2.7.B 4.2.7.C 4.2.7.D 4.2.7.E	4.2.7.A 4.2.7.B 4.2.7.C 4.2.7.D 4.2.7.E	4.2.7.A 4.2.7.B 4.2.7.C 4.2.7.D 4.2.7.E	4.4.7.A 4.4.7.B 4.4.7.C 4.4.7.D	4.4.7.A 4.4.7.B 4.4.7.C 4.4.7.D	As pre teacher re-commendation
	<b>COMPUTATIONAL FLUENCY SPIRALING (Through daily review) PROBLEM OF THE DAY (use strategies to solve problems)</b> 4.1.7.A 4.1.7.B 4.1.7.C 4.5.A 4.5.B 4.5.C 4.5.D 4.5.E 4.5.F									

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<b>GRADE 8 UNITS OF STUDY &amp; BENCHMARKS NJCCCC</b>	Number System: Extend understanding of Compare and order numbers Write equivalent forms of the same number	Estimate square roots and cube roots  Explain procedures for Calculators  Solve problems using properties and percents	Pythagorean Theorem: Properties of polygons Tesselation Similarity  Model and quantify transformations	Solve measurement problems  Surface area and volume formulas	Recognize, extend and create patterns with whole numbers, rational numbers, integers using tables, rules, graphys, equations and expressions	Graph functions and relationships  Analyze relationships to explain how a change in one can result in a change in another	Solve simple linear equations	Measures of central tendency, box and whisker plots, scatter plots, surveys and samplings  Interpret probability; determine probability	Permutations, factorial notations  Use vertex edge graphs and algorithmic thinking to find solutions to practical problems	Review  As pre teacher re-commendation
	4.1.8.A 4.1.8.B 4.1.8.C	4.1.8.A 4.1.8.B 4.1.8.C	4.2.8.A 4.2.8.B 4.2.8.C 4.2.8.D	4.2.8.A 4.2.8.B 4.2.8.C 4.2.8.D	4.3.8.A 4.3.8.B 4.3.8.C 4.3.8.D	4.3.8.A 4.3.8.B 4.3.8.C 4.3.8.D 4.4.8.A 4.4.8.B 4.4.8.C 4.4.8.D	4.3.8.A 4.3.8.B 4.3.8.C 4.3.8.D 4.4.8.A 4.4.8.B 4.4.8.C 4.4.8.D	4.4.8.A 4.4.8.B 4.4.8.C 4.4.8.D	4.4.8.A 4.4.8.B 4.4.8.C 4.4.8.D	As pre teacher re-commendation
	<b>COMPUTATIONAL FLUENCY SPIRALING (Through daily review) PROBLEM OF THE DAY (use strategies to solve problems)</b> 4.1.8.A 4.1.8.B 4.1.8.C 4.5.A 4.5.B 4.5.C 4.5.D 4.5.E 4.5.F									

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*CURRICULUM FOCAL POINTS (NCTM) GRADE 7	<p><b>Number and Operations and Algebra and Geometry:</b>  <b>Developing an understanding of and applying proportionality, including similarity</b>            Students extend their work with ratios to develop an understanding of proportionality that they apply to solve single and multistep problems in numerous contexts. They use ratio and proportionality to solve a wide variety of percent problems, including problems involving discounts, interest, taxes, tips, and percent increase or decrease. They also solve problems about similar objects (including figures) by using scale factors that relate corresponding lengths of the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and identify the unit rate as the slope of the related line. They distinguish proportional relationships (<math>y/x = k</math>, or <math>y = kx</math>) from other relationships, including inverse proportionality (<math>xy = k</math>, or <math>y = k/x</math>).</p>			<p><b>Measurement and Geometry and Algebra:</b> <b>Developing an understanding of and using formulas to determine surface areas and volumes of three-dimensional shapes</b>            By decomposing two- and three-dimensional shapes into smaller, component shapes, students find surface areas and develop and justify formulas for the surface areas and volumes of prisms and cylinders. As students decompose prisms and cylinders by slicing them, they develop and understand formulas for their volumes (<math>Volume = Area\ of\ base \times Height</math>). They apply these formulas in problem solving to determine volumes of prisms and cylinders. Students see that the formula for the area of a circle is plausible by decomposing a circle into a number of wedges and rearranging them into a shape that approximates a parallelogram. They select appropriate two- and three-dimensional shapes to model real-world situations and solve a variety of problems (including multistep problems) involving surface areas, areas and circumferences of circles, and volumes of prisms and cylinders.</p>			<p><b>Number and Operations and Algebra:</b> <b>Developing an understanding of operations on all rational numbers and solving linear equations</b>            Students extend understandings of addition, subtraction, multiplication, and division, together with their properties, to all rational numbers, including negative integers. By applying properties of arithmetic and considering negative numbers in everyday contexts (e.g., situations of owing money or measuring elevations above and below sea level), students explain why the rules for adding, subtracting, multiplying, and dividing with negative numbers make sense. They use the arithmetic of rational numbers as they formulate and solve linear equations in one variable and use these equations to solve problems. Students make strategic choices of procedures to solve linear equations in one variable and implement them efficiently, understanding that when they use the properties of equality to express an equation in a new way, solutions that they obtain for the new equation also solve the original equation.</p>			
	<p>Connections to the Focal Points  <b>Measurement and Geometry:</b> Students connect their work on proportionality with their work on area and volume by investigating similar objects. They understand that if a scale factor describes how corresponding lengths in two similar objects are related, then the square of the scale factor describes how corresponding areas are related, and the cube of the scale factor describes how corresponding volumes are related. Students apply their work on proportionality to measurement in different contexts, including converting among different units of measurement to solve problems involving rates such as motion at a constant speed. They also apply proportionality when they work with the circumference, radius, and diameter of a circle; when they find the area of a sector of a circle; and when they make scale drawings.  <b>Number and Operations:</b> In grade 4, students used equivalent fractions to determine the decimal representations of fractions that they could represent with terminating decimals. Students now use division to express any fraction as a decimal, including fractions that they must represent with infinite decimals. They find this method useful when working with proportions, especially those involving percents. Students connect their work with dividing fractions to solving equations of the form <math>ax = b</math>, where <math>a</math> and <math>b</math> are fractions. Students continue to develop their understanding of multiplication and division and the structure of numbers by determining if a counting number greater than 1 is a prime, and if it is not, by factoring it into a product of primes.  <b>Data Analysis:</b> Students use proportions to make estimates relating to a population on the basis of a sample. They apply percentages to make and interpret histograms and circle graphs.  <b>Probability:</b> Students understand that when all outcomes of an experiment are equally likely, the theoretical probability of an event is the fraction of outcomes in which the event occurs. Students use theoretical probability and proportions to make approximate predictions.</p>									

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*CURRICULUM FOCAL POINTS (NCTM) GRADE 8	<p><b>Algebra: Analyzing and representing linear functions and solving linear equations and systems of linear equations</b> Students use linear functions, linear equations, and systems of linear equations to represent, analyze, and solve a variety of problems. They recognize a proportion (<math>y/x = k</math>, or <math>y = kx</math>) as a special case of a linear equation of the form <math>y = mx + b</math>, understanding that the constant of proportionality (<math>k</math>) is the slope and the resulting graph is a line through the origin. Students understand that the slope (<math>m</math>) of a line is a constant rate of change, so if the input, or <math>x</math>-coordinate, changes by a specific amount, <math>a</math>, the output, or <math>y</math>-coordinate, changes by the amount <math>ma</math>. Students translate among verbal, tabular, graphical, and algebraic representations of functions (recognizing that tabular and graphical representations are usually only partial representations), and they describe how such aspects of a function as slope and <math>y</math>-intercept appear in different representations. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines that intersect, are parallel, or are the same line, in the plane. Students use linear equations, systems of linear equations, linear functions, and their understanding of the slope of a line to analyze situations and solve problems.</p>			<p><b>Geometry and Measurement: Analyzing two- and three-dimensional space and figures by using distance and angle</b> Students use fundamental facts about distance and angles to describe and analyze figures and situations in two- and three-dimensional space and to solve problems, including those with multiple steps. They prove that particular configurations of lines give rise to similar triangles because of the congruent angles created when a transversal cuts parallel lines. Students apply this reasoning about similar triangles to solve a variety of problems, including those that ask them to find heights and distances. They use facts about the angles that are created when a transversal cuts parallel lines to explain why the sum of the measures of the angles in a triangle is 180 degrees, and they apply this fact about triangles to find unknown measures of angles. Students explain why the Pythagorean theorem is valid by using a variety of methods—for example, by decomposing a square in two different ways. They apply the Pythagorean theorem to find distances between points in the Cartesian coordinate plane to measure lengths and analyze polygons and polyhedra.</p>			<p><b>Data Analysis and Number and Operations and Algebra: Analyzing and summarizing data sets</b> Students use descriptive statistics, including mean, median, and range, to summarize and compare data sets, and they organize and display data to pose and answer questions. They compare the information provided by the mean and the median and investigate the different effects that changes in data values have on these measures of center. They understand that a measure of center alone does not thoroughly describe a data set because very different data sets can share the same measure of center. Students select the mean or the median as the appropriate measure of center for a given purpose.</p>			
	<p>Connections to the Focal Points</p> <p><b>Algebra:</b> Students encounter some nonlinear functions (such as the inverse proportions that they studied in grade 7 as well as basic quadratic and exponential functions) whose rates of change contrast with the constant rate of change of linear functions. They view arithmetic sequences, including those arising from patterns or problems, as linear functions whose inputs are counting numbers. They apply ideas about linear functions to solve problems involving rates such as motion at a constant speed.</p> <p><b>Geometry:</b> Given a line in a coordinate plane, students understand that all “slope triangles”—triangles created by a vertical “rise” line segment (showing the change in <math>y</math>), a horizontal “run” line segment (showing the change in <math>x</math>), and a segment of the line itself—are similar. They also understand the relationship of these similar triangles to the constant slope of a line.</p> <p><b>Data Analysis:</b> Building on their work in previous grades to organize and display data to pose and answer questions, students now see numerical data as an aggregate, which they can often summarize with one or several numbers. In addition to the median, students determine the 25th and 75th percentiles (1st and 3<sup>rd</sup> quartiles) to obtain information about the spread of data. They may use box-and-whisker plots to convey this information. Students make scatterplots to display bivariate data, and they informally estimate lines of best fit to make and test conjectures.</p> <p><b>Number and Operations:</b> Students use exponents and scientific notation to describe very large and very small numbers. They use square roots when they apply the Pythagorean theorem.</p>									

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<b>ACCOMMODATIONS (ESL &amp; SPECIAL EDUCATION)</b>	<ul style="list-style-type: none"> <li>• Visual Models</li> <li>• Concrete Objects</li> <li>• Pictorial Models</li> <li>• Leading Questions</li> <li>• Act Out</li> <li>• Tools (rulers, measuring cups, scales, etc.)</li> <li>• Pattern Blocks</li> <li>• <b>Cooperative Learning: Team Assisted Individualization (TAI)</b> – heterogenous groups helping each other</li> <li>• Explicit Systematic Instruction: teacher demonstration, thinking aloud, about decision-making, opportunities for student questions and answers</li> <li>• Small group/Strategy Groups</li> </ul>									
<b>ASSESSMENT</b>	Formative: conversation, observation, journal writing, self-assessment and daily work Summative: Chapter Tests/Quizzes, Minute Math Book Performance-based: Hands-on Activities SmartBoard Activities Study Island Learnia Porfolios									
<b>RESOURCES</b>	Hyde, Atrthur. <i>Comprehending Math.: Adapting Reading Strategies to Teach Mathematics, K-6.</i> 2006 Murray, Miki. <i>The Differentiated Math Classroom: A Guide for Teachers, K-8.</i> 2007. <i>Math Process Standards Series.</i> 2007. Heinemann. Thompson, Denisse,, et al. <i>Mathematical Literacy.</i> 2008. <i>Mathematics: Applications &amp; Connections: Course 2&amp;3</i> (Glencoe, 2001) Websites: <ul style="list-style-type: none"> <li>• <a href="http://www.mathblaster.com">www.mathblaster.com</a></li> <li>• <a href="http://www.atmath.com">www.atmath.com</a></li> <li>• <a href="http://www.funbrain.com">www.funbrain.com</a></li> <li>• <a href="http://www.mhschool.com/math">www.mhschool.com/math</a></li> <li>• <a href="http://www.scholastic.com">www.scholastic.com</a></li> <li>• <a href="http://www.elearning4kids.com">www.elearning4kids.com</a></li> <li>• <a href="http://www.enchantedlearning.com">www.enchantedlearning.com</a></li> <li>• <a href="http://www.nctm.org">www.nctm.org</a></li> </ul> SmartBoard Learnia									

\* The set of three **curriculum focal points** and related connections for mathematic. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.