Mathematics – *PLANNED COURSE OUTLINE*

Avon Grove School District

Grade 7 – High Math

State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.1. Numbers, Number Systems and Number Relationships			
Enduring Understandings: Students will understand that: • A rational number can be written in equivalent forms. • Expressions can be simplified.		**Essential Questions:** 1. What makes a number rational? 2. How are fractions and ratios used? 3. What is an integer and how are they used? 4. Why do we use various forms of rational numbers?	
A. Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, exponents, scientific notation, square roots).	Convert between fractions, decimals and/or percents (e.g., 20% = 0.2 = 1/5) (terminating decimals only). **M.7.A.1.1.1**	Prentice Hall Course 2 Lessons 2-3, 2-5, 2-6, 2-8, 6-1, 6-2, 6-3, 8-6, p.95	
B. Simplify numerical expressions involving exponents, scientific notation and using order of operations.	Use the order of operations to simplify numerical expressions (may use parentheses, brackets, +, -, x, ÷, squares up to 10^2 and cubes up to 4^3; whole numbers only). **M.7.A.2.1.1**	Prentice Hall Course 2 Lessons 1-9, 2-1, 2-8, p.110	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.1. Numbers, Number Systems and Number Relationships			
C. Distinguish between and order rational and irrational numbers.	Compare and/or order whole numbers, mixed numbers, fractions and decimals (fractions and decimals may be mixed – no more than 5 numbers in a set to be ordered). **M.7.A.1.2.1** Locate/identify decimals, fractions, mixed numbers and/or integers on a number line (a mix of these number forms may be on the same number line). **M.7.A.1.2.3**	Prentice Hall Course 2 Lessons 2-4, 2-7, 8-6, p.86, p.95, p.101, p.278	
D. Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles.	Write ratios to compare quantities (e.g., ratio of boys to girls). **M.7.A.2.2.1** Use proportions to determine if two quantities are equivalent (e.g., similar figures, prices of different sized items, etc). **M.7.A.2.2.3** Calculate and/or apply unit rates or unit prices (terminating decimals through the hundredth place only). **M.7.A.2.2.4** Select and/or use ratios or proportions to solve problems. **M.7.A.2.2.5** Use proportions to find the missing length of a side in similar figures. **M.7.A.2.2.7**	Prentice Hall Course 2 Lessons: All of Chapter 5, p.242, p.243, p.249, p.251, p.256	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.1. Numbers, Number Systems and Number Relationships			
E. Simplify and expand algebraic expressions using exponential forms.	Use the order of operations to simplify numerical expressions (may use parentheses, brackets, +, -, x, ÷, squares up to 10^2 and cubes up to 4^3; whole numbers only). **M.7.A.2.1.1** Use substitution of one and/or two variables to simplify expressions (whole numbers only – use order of operations). **M.7.A.2.1.2**	Prentice Hall Course 2 Lessons 2-1, 4-1	
F. Use the number line model to demonstrate integers and their applications.	Compare and/or order integers (no more than five numbers in a set to be ordered). **M.7.A.1.2.2** Locate/identify decimals, fractions, mixed numbers and/or integers on a number line (a mix of these number forms may be on the same number line). **M.7.A.1.2.3**	Prentice Hall Course 2 Lessons 1-6, 1-7, p.36-37	
G. Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations.	Solve for a variable in a given proportion. **M.7.A.2.2.2** Select and/or use appropriate strategies to solve one-step equations (no negative numbers). **M.7.D.2.1.1**	Prentice Hall Course 2 Lessons 4-2, 4-3, 4-4, 4-6, p.179 Discuss the Property of Equality(p.52)	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.2. Computation and Estimation			
Enduring Understandings: Students will understand that: • They must follow the order of operations when computing with various forms of numbers. • Certain situations require estimation.		**Essential Questions:** 1. Why do we use an order of operations? 2. In what situations would estimation be appropriate? 3. In what situations would an exact answer be appropriate? **4.** How are the basic operations related to each other?	
A. Complete calculations by applying the order of operations.	Use substitution of one and/or two variables to simplify expressions (whole numbers only – use order of operations). **M.7.A.2.1.2** Use the order of operations to simplify numerical expressions may use parentheses, brackets, +, -, x, ÷, squares up to 10^2 and cubes up to 4^3; whole numbers only). **M.7.A.2.1.1**	Prentice Hall Course 2 Lessons 1-9, 2-1	
B. Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions.	Solve problems involving operations (+, -, x, ÷) of whole numbers, decimals, fractions, or mixed numbers (straight computation or word problems). **M.7.A.3.2.1** Solve problems involving addition and subtraction of integers. **M.7.A.3.2.2**	Prentice Hall Course 2 Lessons: 1-2, 1-3, 1-4, 1-7, 1-8, 3-2, 3-3, 3-4, 3-5, 6-4, 6-5, 6-6, 6-7, p.13, p.19, p.24-25, p.36-37, p.43, p.125, p.135, p.140, p.146-147, p.302, p.308	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.2. Computation and Estimation			
C. Estimate the value of irrational numbers.	Locate/identify irrational numbers at the approximate location on a number line. **M.11.A.1.3.1**	Prentice Hall Course 2 Lessons: 8-6	Assessed in Grade 11
D. Estimate amount of tips and discounts using ratios, proportions and percents.	Estimate answers to problems involving whole numbers, decimals, fractions or mixed numbers. **M.7.A.3.1.1** Assessed in Grade 8: Estimate answers to problems involving percents. **M.8.A.3.2.1**	Prentice Hall Course 2 Lessons 6-5, 6-6, 6-7, 6-8, p.309	
E. Determine the appropriateness of overestimating or underestimating in computation.	Identify, use, and/or explain when it is appropriate to round up or round down. **M.8.A.3.1.1**	Prentice Hall Course 2 Lessons 1-1, 1-3, p.158	Assessed in Grade 8
F. Identify the difference between exact value and approximation and determine which is appropriate for a given situation.	Identify, use, and/or explain when it is appropriate to round up or round down. **M.8.A.3.1.1**	Prentice Hall Course 2 Lessons 1-1, 1-3	Assessed in Grade 8

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.3. Measurement and Estimation			
Enduring Understandings: Students will understand that: • Measurements can be calculated by choosing and applying a formula. • Scale drawings are representations of real objects.		**Essential Questions:** 1. Why are formulas used in measurement? 2. What are the relationships among various units of measurement? 3. Why are scales used in the interpretation of maps and drawings?	
A. Develop formulas and procedures for determining measurements (e.g., area, volume, distance).	Develop and/or use strategies to find the perimeter and/or area of compound figures (compound figures should only include quadrilaterals and triangles). Area formulas provided on the reference sheet. **M.7.B.2.1.1** Find the circumference and/or area of circles (formulas provided on the reference sheet). **M.7.B.2.1.2** Find the area of triangles and/or all types of parallelograms (formulas provided on the reference sheet). **M.7.B.2.1.3**	Prentice Hall Course 2 Lessons 8-2, 8-3, 8-4, 8-5, 8-9, 8-10, 9-8, p.379, p.398-399, p.476	
B. Solve rate problems (e.g., rate × time = distance, principal × interest rate = interest).	Select and/or use ratios or proportions to solve problems. **M.7.A.2.2.5** Represent or solve rate problems (e.g. unit rates, simple interest, distance, etc.) Students may be asked to solve for any term (formulas provided on the reference sheet for distance and interest). **M.8.A.2.2.2**	Prentice Hall Course 2 Lessons 9-7, 9-8	Assessed in Grade 8

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.3. Measurement and Estimation			
C. Measure angles in degrees and determine relations of angles.	Measure angles using a protractor up to 180° - one side of the angle to be measured should line up with the straight edge of the protractor. **M.6.B.2.1.3** Define, identify, and/or use properties of angles formed by intersecting lines (complimentary, supplementary, adjacent, and/or vertical angles). **M.8.C.1.1.2**	Prentice Hall Course 2 Lessons 7-2, p.329, p.335	Assessed in Grade 6 Assessed in Grade 8
D. Estimate, use and describe measures of distance, rate, perimeter, area, volume, weight, mass and angles.	Add, subtract, or convert measurements, using only the units below, with and without regrouping (e.g., 4ft – 2ft 5in = 1ft 7in). Answer should be converted to the largest whole unit (e.g., 37oz = 2 Lb 5oz or 39 in = 1 yd 3 in. Conversion chart provided on the reference sheet. • in, ft, yd • fl oz, cup, pint, quart, gallon • oz, Lb • sec, min, hours, days • metric units including milli, centi and kilo (m, g or L) **M.7.B.1.1.1**	Prentice Hall Course 2 Lessons 1-5, 3-6, 3-7, 8-1, 8-2, 8-3, 8-4, 8-5, p.58, p.153, p.236, p.426	

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Standard: 2.3. Measurement and Estimation			
D. (Continued)	Develop and/or use strategies to find the perimeter and/or area of compound figures (compound figures should only include quadrilaterals and triangles). Area formulas provided on the reference sheet. **M.7.B.2.1.1** Find the circumference and/or area of circles (formulas provided on the reference sheet). **M.7.B.2.1.2** Find the area of triangles and/or all types of parallelograms (formulas provided on the reference sheet). **M.7.B.2.1.3**		
E. Describe how a change in linear dimension of an object affects its perimeter, area and volume.	Develop and/or use strategies to find the perimeter and/or area of compound figures (compound figures should only include quadrilaterals and triangles). Area formulas provided on the reference sheet. **M.7.B.2.1.1/ M.11.B.2.3.1**	Prentice Hall Course 2 Lessons p.419	Assessed in Grade 11
F. Use scale measurements to interpret maps or drawings.	Interpret and/or apply scales shown on maps, blueprints, models, etc. **M.7.B.2.3.1**	Prentice Hall Course 2 Lessons 5-6, p.258, p.264	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.3. Measurement and Estimation			
G. Create and use scale models.	Interpret and/or apply scales shown on maps, blueprints, models, etc. **M.7.B.2.3.1** Determine and/or apply an appropriate scale for reduction or enlargement. **M.7.B.2.3.2**	Prentice Hall Course 2 Lessons 5-6, p.258	
A. Convert linear measurements within the same system. (From 5th Grade) **B. Add and subtract measurements. (From 5th Grade)**	Add, subtract, or convert measurements, using only the units below, with and without regrouping (e.g., 4ft – 2ft 5in = 1ft 7in). Answer should be converted to the largest whole unit (e.g., 37oz = 2 Lb 5oz or 39 in = 1 yd 3 in. Conversion chart provided on the reference sheet. • in, ft, yd • fl oz, cup, pint, quart, gallon • oz, Lb • sec, min, hours, days • metric units including milli, centi and kilo (m, g or L) **M.7.B.1.1.1**		

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.4. Mathematical Reasoning and Connections			
Enduring Understandings: Students will understand that: • Logical connections can be made throughout mathematics.		**Essential Questions:** 1. How does prior knowledge of various concepts affect understanding of new material? 2. How does logical reasoning help in decision making in mathematics?	
A. Make conjectures based on logical reasoning and test conjectures by using counter-examples.	Formulate predictions, and/or draw conclusions based on data displays (bar graphs, circle graphs, and line graphs) or probability. **M.7.E.4.1.1**	Integrate and Apply throughout the year. Prentice Hall Course 2 Lessons 9.1	
B. Combine numeric relationships to arrive at a conclusion.	Develop and use strategies to find the perimeter and/or area of compound figures. Compound figures should only include triangles and quadrilaterals. Area formulas provided on the reference sheet. **M.7.B.2.1.1**	Integrate and Apply throughout the year. Prentice Hall Course 2 Lessons 8.4, Properties of Addition and Multiplication (p.52)	
C. Use if…then statements to construct simple, valid arguments		Integrate and Apply throughout the year.	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.4. Mathematical Reasoning and Connections			
D. Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers.	Solve problems involving operations of whole numbers, decimals, fractions, or mixed numbers (straight computation or word problems). **M.7.A.3.2.1** Solve problems involving addition and subtraction of integers. **M.7.A.3.2.2**	Integrate and Apply throughout the year. Prentice Hall Course 2 Lessons 1.2, 1.3, 1.4, 1.7, 1.8, 3.2, 3.3, 3.4, 3-5, 6-4, 6-5, 6-6, 6-7	
E. Distinguish between inductive and deductive reasoning.	Describe, extend, or find the missing element of a pattern (show 3 repetitions of the pattern) • fractions or decimals – may use only one operation from +, -, or x whole numbers, may use one operation from +, -, x, or squares. **M.7.D.1.1.1**	Integrate and Apply throughout the year.	
F. Use measurements and statistics to quantify issues (e.g., in family, consumer science situations).			

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies, Resources & Assessments	Assessments
Standard: 2.5. Mathematical Problem Solving and Communication			
Enduring Understandings: Students will understand that: • Problems can be solved in various ways. • It is essential to communicate using precise mathematical language.		**Essential Questions:** 1. How does mathematical reasoning help solve problems? 2. How does precise mathematical language help show our understanding of the solution to a problem? 3. What information is pertinent to solving a problem? 4. How do you choose an appropriate strategy to solve a problem?	
A. Invent, select, use and justify the appropriate methods, materials and strategies to solve problems.		Prentice Hall Course 2 Lessons p.24-25, p.80-81, p.116-117, p.146-147, p.152, p.192-193, p.249, p.466, p.496-497	
B. Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams.	Analyze data and/or answer questions pertaining to data represented in histograms, double bar graphs, multiple line graphs or stem-and-leaf plots. **M.7.E.1.1.1** Formulate predictions and/or draw conclusions based on data displays (bar graphs, circle graphs or line graphs) or probability. **M.7.E.4.1.1**	Integrate and Apply throughout the year.	
C. Justify strategies and defend approaches used and conclusions reached.		Integrate and Apply throughout the year.	
D. Determine pertinent information in problem situations and whether any further information is needed for solution.		Integrate and Apply throughout the year.	

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State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies and Resources	Assessments
Standard: 2.6. Statistics and Data Analysis			
Enduring Understandings: Students will understand that: • Data and data displays can be analyzed in a variety of ways. • Statistics can be manipulated to obscure the truth		**Essential Questions:** 1. What criteria do you use when choosing a data display? 2. In what ways can data and data displays be misleading?	
A. Compare and contrast different plots of data using values of mean, median, mode, quartiles and range.	Identify/calculate the mean (average), median, mode or range of a set of data. **M.7.E.2.2.1** Decide/choose which measure of central tendency (mean, median, mode or range) would be most appropriate for a given situation. **M.7.E.2.2.2**	Prentice Hall Course 2 Lessons 1-10, p.58, p.558-559	
B. Explain effects of sampling procedures and missing or incorrect information on reliability.	Make predictions based on survey results or graphs (bar, line, circle, scatterplots, etc.) **M.8.E.4.1.2**	Prentice Hall Course 2 Lessons 11-4, 11-5, 11-6	Assessed in Grade 8
C. Fit a line to the scatter plot of two quantities and describe any correlation of the variables.	Fit a line to a scatter plot and/or describe any correlation between the two variables (positive, negative, strong, weak, none). **M.8.E.4.1.1**	Prentice Hall Course 2 Lessons 11-7, p.436, p.576-577	Assessed in Grade 8

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Standard: 2.6. Statistics and Data Analysis			
D. Design and carry out a random sampling procedure.		Prentice Hall Course 2 Lessons 11-4, p.537	
E. Analyze and display data in stem-and-leaf and box-and-whisker plots.	Analyze data and/or answer questions pertaining to data represented in histograms, double bar graphs, multiple line graphs or stem-and-leaf plots. **M.7.E.1.1.1**	Prentice Hall Course 2 Lessons 11-3, p.58, p.548	
F. Use scientific and graphing calculators and computer spreadsheets to organize and analyze data.		**Prentice Hall Course 2** **Lessons 11-2, p.72, p.543**	
G. Determine the validity of the sampling method described in studies published in local or national newspapers.			

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Standard: 2.7. Probability and Predictions			
Enduring Understandings: Students will understand that: • Probability is the mathematics of chance. • Predictions can be made using probability.		**Essential Questions:** 1. When would you use probability? 2. How do past observations help predict future outcomes? 3. How do you use given information to help count possible outcomes?	
A. Determine the number of combinations and permutations for an event.	Determine/show all possible combinations involving no more than 20 total arrangements (e.g. tree diagram, table, grid) **M.6.E.3.1.2** Determine/show the number of permutations and/or combinations for an event using up to 4 choices (e.g. organized list, etc.) **M.8.E.3.2.1** Determine the number of permutations or combinations or apply the fundamental counting principle (formula provided on the reference sheet).**M.11.E.3.2.1**	Prentice Hall Course 2 Lessons 12-3, 12-5, 12-6, p.590	Assessed in Grade 6 Assessed in Grade 8 Assessed in Grade 11
B. Present the results of an experiment using visual representations (e.g., tables, charts, graphs).	Use data displayed in charts, graphs or tallies to find experimental probability **M.7.E.3.1.3**	Prentice Hall Course 2 Lessons 7-7, 11-1, 12-2, p.596	
C. Analyze predictions (e.g., election polls).	Formulate predictions and/or draw conclusions based on data displays (bar graphs, circle graphs or line graphs) or probability. **M.7.E.4.1.1**	Prentice Hall Course 2 Lessons p.358, p.359-360	

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Standard: 2.7. Probability and Predictions			
D. Compare and contrast results from observations and mathematical models.		Prentice Hall Course 2 Lessons p.209, p.289, p.590, p.596	
E. Make valid inferences, predictions and arguments based on probability.	Formulate predictions and/or draw conclusions based on data displays (bar graphs, circle graphs or line graphs) or probability. **M.7.E.4.1.1**	Prentice Hall Course 2 Lessons 12-1, 12-4, p.584, p.590, p.596, p.604-605, p.622-623	
A. Determine the probability of an event involving "and", "or" or "not". (From 5th Grade) **B. Calculate the probability of a simple event. (From 5th Grade)**	Find the theoretical probability of a simple and/or compound even. **M.7.E.3.1.1** Find the theoretical probability of an event NOT occurring. **M.7.E.3.1.2**		

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Standard: 2.8 Algebra and Functions			
Enduring Understandings: Students will understand that: • Equations or inequalities can be solved for an unknown quantity. • Tables and graphs can show relationships between two quantities. • Algebra solves real-life problems when numbers are unknown.		**Essential Questions:** 1. How can expressions, equations, and inequalities be used to model situations? 2. How can the relationship between two quantities be shown? 3. Why do we use patterns?	
A. Apply simple algebraic patterns to basic number theory and to spatial relations	Describe, extend or find a missing element of a pattern (show 3 repetitions of the pattern) • fractions or decimals – may use only one operation from +, - or x • whole numbers – may use only one operation from +, -, x, ÷ or squares **M.7.D.1.1.1**	Prentice Hall Course 2 Lessons 9-1, 9-2, p.73, p.168, p.502, p.528-529	
B. Discover, describe and generalize patterns, including linear, exponential and simple quadratic relationships.	Describe, extend or find a missing element of a pattern (show 3 repetitions of the pattern) • fractions or decimals – may use only one operation from +, - or x • whole numbers – may use only one operation from +, -, x, ÷ or squares **M.7.D.1.1.1**	Prentice Hall Course 2 Lessons 9-1, 9-2, p.101, p.168, p.441	

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Standard: 2.8 Algebra and Functions			
C. Create and interpret expressions, equations or inequalities that model problem situations.	Identify expressions, equations or inequalities that model mathematical situations (using whole numbers or decimals, no more than two operations and one variable). **M.7.D.2.2.1**	Prentice Hall Course 2 Lessons 4-1, 4-5, 4-7, p.451	
D. Use concrete objects to model algebraic concepts.	Select and/or use appropriate strategies to solve one-step equations (no negative numbers) **M.7.D.2.1.1**		
E. Select and use a strategy to solve an equation or inequality, explain the solution and check the solution for accuracy.	Select and/or use appropriate strategies to solve one-step equations (no negative numbers) **M.7.D.2.1.1**	Prentice Hall Course 2 Lessons 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9	
F. Solve and graph equations and inequalities using scientific and graphing calculators and computer spreadsheets.		**Prentice Hall Course 2** **Lessons p.173**	
G. Represent relationships with tables or graphs in the coordinate plane and verbal or symbolic rules.	Describe and/or use the relationship of data displayed on a rate of change graph (e.g., how does the x-axis data relate to the y-axis data). **M.7.D.3.1.2**	Prentice Hall Course 2 Lessons 9-3, 9-4, 9-6, 10-1, p.460, p.490, p.528-529, p.566	

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Standard: 2.8 Algebra and Functions			
H. Graph a linear function from a rule or table.	Graph a linear function based on an x/y table (integers only). **M.8.D.4.1.1**	Prentice Hall Course 2 Lessons 9-5, 10-2, p.460, p.495	Assessed in Grade 8
I. Generate a table or graph from a function and use graphing calculators and computer spreadsheets to graph and analyze functions.	Solve problems involving a constant rate of change (e.g., word problems, graphs or data tables). **M.7.D.3.1.1** Match the graph of a linear function to its x/y table (integers only). **M.8.D.4.1.2**	Prentice Hall Course 2 Lessons 9-4, 9-5, p.173, p.460	Assessed in Grade 8
J. Show that an equality relationship between two quantities remains the same as long as the same change is made to both quantities; explain how a change in one quantity determines another quantity in a functional relationship.	Select and/or use appropriate strategies to solve one-step equations (no negative numbers) **M.7.D.2.1.1** Solve problems involving a constant rate of change (e.g., word problems, graphs or data tables). **M.7.D.3.1.1**	Prentice Hall Course 2 Lessons 4-5, 4-6, 9-3, 9-4, 9-5, p.178, p.179, p.199	
K. Locate and identify points on a coordinate system. (From 5th Grade)	Identify Quadrants I, II, III, IV, the x- & y-axes and the origin on a coordinate plane. **M.7.C.3.1.2**		

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Standard: 2.9. Geometry			
Enduring Understandings: Students will understand that: • Relationships exist among the angles, sides, lengths, perimeters and areas of various figures. • Various shapes, solids, lines, and angles have specific properties.		**Essential Questions:** 1. How do we use geometric properties to describe relationships among shapes, solids, lines, and angles?	
A. Construct figures incorporating perpendicular and parallel lines, the perpendicular bisector of a line segment and an angle bisector using computer software.		Prentice Hall Course 2 Lessons 7-1, 7-8	
B. Draw, label, measure and list the properties of complementary, supplementary and vertical angles.	Define, identify, and/or use properties of angles formed by intersecting line (complementary, supplementary, adjacent, and/or vertical angles). **M.8.C.1.1.2**	Prentice Hall Course 2 Lessons 7-2	Assessed in Grade 8
C. Classify familiar polygons as regular or irregular up to a decagon.	Identify, classify, and/or compare polygons (up to 10 sides). **M.6.C.1.1.1**	Prentice Hall Course 2 Lessons 7-3, 7-4	Assessed in Grade 6

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Mathematics – *PLANNED COURSE OUTLINE*

Avon Grove School District

Grade 7 – High Math

State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies and Resources	Assessments
Standard: 2.9. Geometry			
D. Identify, name, draw and list all properties of squares, cubes, pyramids, parallelograms, quadrilaterals, trapezoids, polygons, rectangles, rhombi, circles, spheres, triangles, prisms and cylinders.	Identify, describe and/or define diameter, radius, chord and/or circumference in circles. **M.7.C.1.1.1** Solve problems involving the relationship between the radius and diameter of the same circle. **M.7.C.1.1.2**	Prentice Hall Course 2 Lessons 7-3, 7-4, 7-6, 8-8	
E. Construct parallel lines, draw a transversal and measure and compare angles formed (e.g., alternate interior and exterior angles).	Define, identify, and/or use properties of angles formed when two parallel lines are cut by a transversal (alternate interior, alternate exterior, vertical and/or corresponding). **M.8.C.1.1.3**		Assessed in Grade 8
F. Distinguish between similar and congruent polygons.	Identify and/or use polygons that are similar and/or congruent, given either measurements or tic and angle marks **M.7.C.1.2.1** Identify corresponding sides and/or angles of congruent or similar polygons. **M.7.C.1.2.2**	Prentice Hall Course 2 Lessons 7-5, p.251	
G. Approximate the value of π (pi) through experimentation.	Identify, describe and/or define diameter, radius, chord and/or circumference in circles. **M.7.C.1.1.1** Solve problems involving the relationship between the radius and diameter of the same circle. **M.7.C.1.1.2**	Prentice Hall Course 2 Lessons 8-5, p.393	

Mathematics – *PLANNED COURSE OUTLINE*

Avon Grove School District

Grade 7 – High Math

State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies and Resources	Assessments
Standard: 2.9. Geometry			
H. Use simple geometric figures (e.g., triangles, squares) to create, through rotation, transformational figures in three dimensions.	Draw or identify a translation (slide), reflection (flip), or rotation (turn) of a 2-dimensional shape. **M.5.C.2.1.1**	Prentice Hall Course 2 Lessons 10-5, p.518	Assessed in Grade 5
I. Generate transformations using computer software.	Draw or identify a translation (slide), reflection (flip), or rotation (turn) of a 2-dimensional shape. **M.5.C.2.1.1**	Prentice Hall Course 2 Lessons 10-5	Assessed in Grade 5:
J. Analyze geometric patterns (e.g., tessellations, sequences of shapes) and develop descriptions of the patterns.	Find missing elements in numeric or geometric patterns and/or functions (may be given a table or rule – pattern must show 3 repetitions). **M.8.D.1.1.2**	Prentice Hall Course 2 Lessons p.509, p.518	Assessed in Grade 8:
K. Analyze objects to determine whether they illustrate tessellations, symmetry, congruence, similarity and scale.	Identify the number of lines of symmetry and/or draw all lines of symmetry in a 2-dimensional polygon. **M.5.C.2.1.2** Identify and/or use polygons that are similar and/or congruent, given either measurements or tic and angle marks **M.7.C.1.2.1** Identify and/or use properties of congruent and similar polygons or solids. **M.11.C.1.3.1**		
L. Identify properties of geometric figures (e.g., parallel, perpendicular, similar, congruent, and symmetrical). (From 5th Grade)	Identify parallel, perpendicular and/or skew line segments within three-dimensional figures. **M.7.C.1.1.3**		

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Mathematics – *PLANNED COURSE OUTLINE*

Avon Grove School District

Grade 7 – High Math

State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies and Resources	Assessments
Standard: 2.10. Trigonometry			
Enduring Understandings: Students will understand that • Lengths of missing sides of triangles can be found using the properties of triangles.		**Essential Questions:** 1. What relationships exist in a right triangle? 2. When is indirect measurement necessary?	
A. Compute measures of sides and angles using proportions, the Pythagorean Theorem and right triangle relationships.	Solve for a variable in a given proportion. **M.7.A.2.2.2** Use proportions to find the missing length of a side in a similar figure. **M.7.A.2.2.6** Use the Pythagorean Theorem to find the measure of a missing side of a right triangle (formula provided on the reference sheet – whole numbers only). **M.8.C.1.2.1**	Prentice Hall Course 2 Lessons 5-5, 8-6, 8-7, p.404	Assessed in Grade 8
B. Solve problems requiring indirect measurement for lengths of sides of triangles.	Solve for a variable in a given proportion. **M.7.A.2.2.2** Use proportions to find the missing length of a side in a similar figure. **M.7.A.2.2.6** Use the Pythagorean Theorem to find the measure of a missing side of a right triangle (formula provided on the reference sheet – whole numbers only). **M.8.C.1.2.1**	Prentice Hall Course 2 Lessons 5-5, 8-7, p.404	Assessed in Grade 8

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Mathematics – *PLANNED COURSE OUTLINE*

Avon Grove School District

Grade 7 – High Math

State Benchmarks (K,3,5,8,11) & Grade Specific Benchmark	Eligible Content	Instructional Strategies and Resources	Assessments
Standard: 2.10. Trigonometry			
Enduring Understandings: Students will understand that: • Students will understand that a change in one quantity can affect another.		**Essential Questions:** 1. How can the change in one quantity affect the other?	
A. Analyze graphs of related quantities for minimum and maximum values and justify the findings.			
B. Describe the concept of unit rate, ratio and slope in the context of rate of change.	Represent of solve rate problems. **M.8.A.2.2.2**	Prentice Hall Course 2 Lessons 5-4, 10-3, p.502, p.528-529, p.566	Assessed in Grade 8
Continue a pattern of numbers or objects that could be extended infinitely.	Describe, extend or find a missing element of a pattern (show 3 repetitions of the pattern) • fractions or decimals - may use only one operation from +, - or x • whole numbers – may use only one operation from +, -, x, ÷ or squares **M.7.D.1.1.1**		

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