

Geometry

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
2.1.11	Numbers, Number Systems and Number Relationships		
2.1.11.A	Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).		
2.2.11	Computation and Estimation		
2.2.11.A	Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.	Unit 9: Surface Area and Volume	Section A, p. 16: Written Assignment: Surface Area and Volume of Objects
2.2.11.B	Use estimation to solve problems for which an exact answer is not needed.		
2.2.11.C	Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.		
2.2.11.D	Describe and explain the amount of error that may exist in a computation using estimates.		
2.2.11.E	Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.		
2.2.11.F	Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.		
2.3.11	Measurement and Estimation		

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2.3.11.A	Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations.	Unit 9: Surface Area and Volume	Section A, p. 16: Written Assignment: Surface Area and Volume of Objects
2.3.11.B	Measure and compare angles in degrees and radians.		
2.3.11.C	Demonstrate the ability to produce measures with specified levels of precision.	Unit 9: Surface Area and Volume	Section A, p. 16: Written Assignment: Surface Area and Volume of Objects
2.4.11	Mathematical Reasoning and Connections		
2.4.11.A	Use direct proofs, indirect proofs or proof by contradiction to validate conjectures.	Unit 2: Introduction to Proof	
2.4.11.B	Construct valid arguments from stated facts.		
2.4.11.C	Determine the validity of an argument.		

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2.4.11.D	Use truth tables to reveal the logic of mathematical statements.	Unit 2: Introduction to Proof	Section A, p. 26: Tutorial: Truth Tables
2.4.11.E	Demonstrate mathematical solutions to problems (e.g., in the physical sciences).		
2.5.11	Mathematical Problem Solving and Communication		
2.5.11.A	Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.	Unit 6: Similarity Unit 9: Surface Area and Volume	Section C, p. 16: Writing Assignment: Similar Polygons Section A, p. 16: Written Assignment: Surface Area and Volume of Objects
2.5.11.B	Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.	Unit 8: Right Triangles and Trigonometry Unit 10: Transformations	Section C, p. 6: Writing Assignment: Graphing the Cosine Function Section B, p. 11: Writing Assignment: Tessellations
2.5.11.C	Present mathematical procedures and results clearly, systematically, succinctly and correctly.	Unit 6: Similarity Unit 3: Lines and the Coordinate Plane	Section A, p. 14: Writing Assignment: Converting a Recipe Section A, p. 11: Writing Assignment: Construct a Parallel Line
2.5.11.D	Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.		

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2.6.11	Statistics and Data Analysis		
2.6.11.A	Design and conduct an experiment using random sampling. Describe the data as an example of a distribution using statistical measures of center and spread. Organize and represent the results with graphs. (Use standard deviation, variance and t-tests.)		
2.6.11.B	Use appropriate technology to organize and analyze data taken from the local community.		
2.6.11.C	Determine the regression equation of best fit (e.g., linear, quadratic, exponential).		
2.6.11.D	Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.		
2.6.11.E	Determine the validity of the sampling method described in a given study.		
2.6.11.F	Determine the degree of dependence of two quantities specified by a two-way table.		
2.6.11.G	Describe questions of experimental design, control groups, treatment groups, cluster sampling and reliability.		

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2.6.11.H	Use sampling techniques to draw inferences about large populations.		
2.6.11.I	Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.		
2.7.11	Probability and Predictions		
2.7.11.A	Compare odds and probability.		
2.7.11.B	Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.		
2.7.11.C	Draw and justify a conclusion regarding the validity of a probability or statistical argument.		
2.7.11.D	Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.		
2.7.11.E	Solve problems involving independent simple and compound events.		

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2.8.11	Algebra and Functions		
2.8.11.A	Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.		
2.8.11.B	Give examples of patterns that occur in data from other disciplines.		
2.8.11.C	Use patterns, sequences and series to solve routine and non-routine problems.		
2.8.11.D	Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situations.		
2.8.11.E	Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas).		
2.8.11.F	Identify whether systems of equations and inequalities are consistent or inconsistent.		
2.8.11.G	Analyze and explain systems of equations, systems of inequalities and matrices.		

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2.8.11.H	Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.		
2.8.11.I	Use matrices to organize and manipulate data, including matrix addition, subtraction, multiplication and scalar multiplication.		
2.8.11.J	Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.		
2.8.11.K	Select, justify and apply an appropriate technique to graph a linear function in two variables, including slope-intercept, x- and y-intercepts, graphing by transformations and the use of a graphing calculator.		
2.8.11.L	Write the equation of a line when given the graph of the line, two points on the line, or the slope of the line and a point on the line.	Unit 3: Lines and the Coordinate Plane	Section C, p. 7: Think & Click: Equation of a Line Section C, p. 15: Memory Game: Equation of a Graph
2.8.11.M	Given a set of data points, write an equation for a line of best fit.		
2.8.11.N	Solve linear, quadratic and exponential equations both symbolically and graphically.		
2.8.11.O	Determine the domain and range of a relation, given a graph or set of ordered pairs.	Unit 8: Right Triangles and Trigonometry	Section C, p. 6: Writing Assignment: Graphing the Cosine Function

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2.8.11.P	Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.		
2.8.11.Q	Represent functional relationships in tables, charts and graphs.	Unit 8: Right Triangles and Trigonometry	Section C, p. 4: Graph of the Sine Function Section C, p. 6: Writing Assignment: Graphing the Cosine Function
2.8.11.R	Create and interpret functional models.		
2.8.11.S	Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).		
2.8.11.T	Analyze and categorize functions by their characteristics.		
2.9.11	Geometry		
2.9.11.A	Construct geometric figures using dynamic geometry tools (e.g., Geometer's Sketchpad, Cabri Geometre).		
2.9.11.B	Prove that two triangles or two polygons are congruent or similar using algebraic, coordinate and deductive proofs.	Unit 4: Triangles	Section B, p. 9: Think & Click: Proving Triangles Congruent p. 15: Writing Assignment: Proofs on Congruent Triangles

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2.9.11.C	Identify and prove the properties of quadrilaterals involving opposite sides and angles, consecutive sides and angles and diagonals using deductive proofs.	Unit 5: Quadrilaterals and Polygons	Section B, p. 14: Parallelogram Proof Assignment
2.9.11.D	Identify corresponding parts in congruent triangles to solve problems.	Unit 4: Triangles	Section B, p. 11: Flashcards: Congruence Postulates
2.9.11.E	Solve problems involving inscribed and circumscribed polygons.		
2.9.11.F	Use the properties of angles, arcs, chords, tangents and secants to solve problems involving circles.	Unit 7: Circles	Section A, p. 7: Tutorial: Properties of Chords p. 10: Properties of Secants p. 15: Properties of Tangents Section B, p. 4: Arcs of Circles Section B, p. 12: Angles Made by Chords, Secants, and Tangents
2.9.11.G	Solve problems using analytic geometry.	Unit 4: Triangles	Section C, p. 14: Flashcards: Real World Applications of the Pythagorean Theorem
2.9.11.H	Construct a geometric figure and its image using various transformations.	Unit 10: Transformations	Section B, p. 11: Writing Assignment: Tessellations
2.9.11.I	Model situations geometrically to formulate and solve problems.	Unit 9: Surface Area and Volume	Section A, p. 16: Written Assignment: Surface Area and Volume of Objects

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2.9.11.J	Analyze figures in terms of the kinds of symmetries they have.		
2.10.11	Trigonometry		
2.10.11.A	Use graphing calculators to display periodic and circular functions; describe properties of the graphs.		
2.10.11.B	Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem.	Unit 4: Triangles Unit 8: Right Triangles and Trigonometry	Section C, p. 14: Flashcards: Real World Applications of the Pythagorean Theorem Section B, p. 17 Trigonometric Ratios in Real-Life Problems
2.11.11	Concepts of Calculus		
2.11.11.A	Determine maximum and minimum values of a function over a specified interval.		
2.11.11.B	Interpret maximum and minimum values in problem situations.		
2.11.11.C	Graph and interpret rates of growth/decay.		

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2.11.11.D	Determine sums of finite sequences of numbers and infinite geometric series.		
2.11.11.E	Estimate areas under curves using sequences of areas.		