IAA Curriculum

Content Area	Mathematics	**Grade**	11
Course Name	Geometry		

Unit Number	Unit Topic	Instruction	Review/Reteach/Extension	Assessing	Buffer	Total
1	Essential Algebra review	6	1	1		8
2	Geometric Building Blocks: Definitions and Relationships	7	1	1	2	11
3	Conjectures, Conditionals And Reasoning: The beginning of Proof	15	1	1	2	19
4	Triangles and Congruence	8	1	1	2	12
5	Special Relationships in Triangles: Segments, Angles, Points and their real world significance	6	1	1	1	9
6	Polygons to Quadrilaterals to Special Quadrilaterals	11	1	1	2	15
7	Similarity and Proportional lengths	10	1	1	2	14
8	The Pythagorean theorem and Trigonometry along with Applications	9	1	1	2	13
9	Circles and their parts	11	1	1	2	15
10	Area and Surface Area	10	1	1	2	14
11	Volume	5	1	1	2	9
Extra Assessment Days/Days After Testing						35
Total Time		98	11	11	19	174
School Days	174					
Free Days	0					

Unit / Concept	Unit 1. Essential Algebra review
Big Idea	Solving problems involving geometric relationships often will require facility with previously learned algebraic concepts
Essential Q.	Algebra as an area of mathematics, is a valuable tool in Geometry. Students will be using the geometric relationships learned and discovered, and then be asked to solve problems involving missing side lengths and/or angle measures.
Competencies	• Algebraic expressions, writing and solving linear equations • Review and apply Associative, Commutative, Distributive, Identity and Inverse properties as justification for steps in transforming expressions • Solve Inequalities in one variable • Graph and write equations for lines using slope intercept form • Solve systems of equations in 2 variables by graphing, substitution or elimination methods • Simplifying radicals, including rationalizing the denominator

Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
1	Evaluate expressions given values for variables, using order of operations	Pg. 10 - 12 in text				Associative, commutative, distributive,substitution, elimination, radicals, slope, intercept
1	Simplify expressions using properties.	Teacher generated				
3	Solve equations with variables on both sides of = sign, requiring application of distributive property, combining like terms. Degree of use of rational/irrational coefficients at teacher discretion.	Pg. 10 - 12 in text				
1	Write and solve proportions	Teacher generated				

Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools. Geogebra.org
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling
Summative Assessments	Tests, quizzes and projects
Strategies for ELL and IEP Support	Built-in reteaching/extension days to show real world application. Textbook resources provide video lessons in both Spanish and English to help support ELL students. Resources in the textbook that facilitate interventions based on percent of students that get questions right/wrong. Scaffolded problems to provide each student with appropriate rigor.

Unit / Concept	Unit 2. Geometric Building Blocks: Definitions and Relationships
Big Ideas	There is a difference between defined vs undefined terms, conjectures based on observation vs proven relationships, inductive vs deductive reasoning.
Essential Q.	Geometry is “built” on knowing and understanding precise definitions along with accepted and proven relationships. It is more or less sequential - built from the ground up.
Competencies	● Definition and understanding of: ● Points, lines and planes ● Segments and distance, betweenness and collinearity ● Midpoint, midpoint formula ● Angle measure and relationships ● Polygon classifying and definitions.

Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
1	Draw, identify and define* the undefined terms: point, line and plane and give real world examples	Lesson 1-1 ● Drawing with ruler, paper folding	CC.2.3.8.A.2 Understand and apply congruence, similarity, and geometric transformations using various tools. CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.	G.2.2.1 Use and/or compare measurements of angles.	G.2.2.1.1 Use properties of angles formed by intersecting lines to find the measures of missing angles.	Point line plane collinear coplanar bisector segment angle midpoint obtuse complementary vertical adjacent polygon diagonal concave convex
1	Draw, identify and define ideas of segment, betweenness and collinearity and differentiate from undefined terms.	Lesson 1-2 ● Drawing and measuring with ruler paper folding.				
2	Defining and determining midpoint of a segment, discovering the midpoint formula	Lesson 1-3 ● Ruler measurement ● paper folding ● graphing points on graph paper				
2	Constructing and measuring angles, classifying angles as acute/obtuse, angle relationships (complementary vs supplementary, vertical, adjacent)	Lesson 1-4, 1-5 ● Ruler, protractor				
1	Defining a polygon using previously defined/undefined terms, naming polygons and classifying as concave vs convex	Lesson 1-6 ● Drawing polygons using ruler				

Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					
Summative Assessments	Tests, quizzes and projects					
Strategies for ELL and IEP Support	Built-in reteaching/extension days to show real world application. Textbook resources provide video lessons in both Spanish and English to help support ELL students. Resources in the textbook that facilitate interventions based on percentage of students that get questions right/wrong. Scaffolded problems to provide each student with appropriate rigor.					

Unit / Concept	Unit 3. Conjectures, Conditionals And Reasoning: The beginning of Proof
Big Ideas	Geometry is built on the *discovery* of relationships, followed by the *proof* of these relationships. Discovery and conjecture are inductive processes. They are then formalized by deductive reasoning, which is based upon accepted definitions and relationships as well as previously proven relationships.This is a Big idea that students will take a while to understand...
Essential Q.	Understanding the difference between inductive reasoning and deductive reasoning and the role each plays in building your geometry
Competencies	• Making conjectures based upon patterns in shapes and numbers • Writing If...then statements • Deductive reasoning applied to basic proofs • Applying deductive reasoning to simple proofs involving segments and angles • Relationships in parallel lines • Special Angle pairs in parallel lines and proving lines parallel.

Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
1	Write conjectures based on patterns in shapes and numbers, evaluate conjectures and provide counterexamples	Lesson 2-1	CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.	G.1.3.1 Use properties of congruence, correspondence, and similarity in problem-solving settings involving two- and three-dimensional figures. G.1.3.2 Write formal proofs and/or use logic statements to construct or validate arguments.	G.1.3.2.1 Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction).	Conjecture counterexample inductive reasoning deductive reasoning statement converse postulate axiom Proof Parallel Transversal corresponding alternate interior
1	Identify and write If then statements use counterexamples to determine whether a statement or its converse are true.	Lesson 2-2 • Only portions from conditionals				
1	Identify and distinguish between Inductive and deductive reasoning	Lesson 2-3 • Law of Syllogism = Transitive Property • Law of Detachment is extension of conditionals				
2	Learn and apply basic postulates and real number axioms to support beginning proofs	Lesson 2-4				
4	Proving Segment and angle relationships using the postulates and axioms	Lesson 2-5, 2-6 • Linking cubes for segment addition				

3	Definitions of parallel lines and resulting angles discovering their relationships and applying them to solve problems.	Lesson 2-7				
3	Using the idea of converse to prove two lines are parallel	Lesson 2-9				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, linking cubes, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					
Summative Assessments	Tests, quizzes and projects					
Strategies for ELL and IEP Support	Built-in reteaching/extension days to show real world application. Textbook resources provide video lessons in both Spanish and English to help support ELL students. Resources in the textbook that facilitate interventions based on percentage of students that get questions right/wrong. Scaffolded problems to provide each student with appropriate rigor.					

Unit / Concept	Unit 4. Triangles and Congruence					
Big Ideas	What is congruence and why is it easier to establish in triangles than in other polygons?					
Essential Q.	The triangle is used as a way to establish larger relationships. Once we prove relationships within and between triangles, we can prove relationships between other figures.					
Competencies	• Triangle Angle Sum • Congruence: What is it and how do you prove it? • Congruence shortcuts work in triangles only: What are they?					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
1	Discover, prove and use triangle angle sum (180°)	Lesson 4-1	CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.	G.1.3.1 Use properties of congruence, correspondence, and similarity in problem-solving settings involving two- and three- dimensional figures. G.1.3.2 Write formal proofs and/or use logic statements to construct or validate arguments. G.1.3.2 Write formal proofs and/or use logic statements to construct or validate arguments.	G.1.3.2.1 Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction). G.1.3.2.1 Write, analyze, complete, or identify formal proofs (e.g., direct and/or indirect proofs/proofs by contradiction).	Auxiliary exterior angle Congruence Included side/angle Vertex angle, leg, isosceles
1	Apply the definition of congruent polygons and their corresponding parts.	Lesson 4-2				
5	Discover and use triangle congruence shortcuts to prove congruence.	Lesson 4-3, 4-4, 4-5				
1	Use properties of isosceles and equilateral triangles.	Lesson 4-6				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools. Mathigon.org, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					
Summative Assessments	Tests, quizzes and projects					
Strategies for ELL and IEP Support	Built-in reteaching/extension days to show real world application. Textbook resources provide video lessons in both Spanish and English to help support ELL students. Resources in the textbook that facilitate interventions based on percentage of students that get questions right/wrong. Scaffolded problems to provide each student with appropriate rigor.					

Unit / Concept	Unit 5. Special Relationships in Triangles: Segments, Angles, Points and their real world significance					
Big Ideas	The triangle contains many relationships and properties that have been used in navigation, construction and measurement. This unit investigates these relationships.					
Essential Q.	Each of the following is a segment connected to a triangle and has its own definition and properties: Median, Angle bisector, Altitude, Perpendicular bisector.					
Competencies	• Perpendicular bisectors and angle bisectors: The circumcenter and the incenter • Medians and Altitudes: The centroid and the orthocenter. • Triangle Inequalities					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
2	Define, construct and understand the properties of perpendicular bisectors and their concurrency in a triangle (circumcenter) Define, construct and understand the properties of angle bisectors and their concurrency in a triangle (incenter)	Lesson 5-1	CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures. CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.	G.1.2.1 Recognize and/or apply properties of angles, polygons, and polyhedra. G.1.3.1 Use properties of congruence, correspondence, and similarity in problem-solving settings involving two- and three-dimensional figures.	G.1.2.1.1 Identify and/or use properties of triangles G.1.2.1.3 Identify and/or use properties of isosceles and equilateral triangles. G.1.3.1.1 Identify and/or use properties of congruent and similar polygons or solids.	Perpendicular bisector concurrent lines Point of concurrency Circumcenter Incenter Median Centroid Altitude Orthocenter
2	Define, construct and understand the properties of medians and their concurrency in a triangle (centroid) Define, construct and understand the properties of altitudes and their concurrency in a triangle (orthocenter)	Lesson 5-2				
1	Discover and apply angle/side inequalities in a triangle	Lesson 5 -3; possibly include 5-6 for Hinge Theorem				
1	Discover and apply the triangle Inequality: What makes a triangle and what does not?	Lesson 5-5				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					

Summative Assessments	Tests, quizzes and projects
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Unit / Concept	Unit 6. Polygons to Quadrilaterals to Special Quadrilaterals					
Big Ideas	The idea of hierarchy is common in our world. We see hierarchy in geometry especially when we investigate, prove and apply relationships in different types of quadrilaterals.					
Essential Q.	What is the difference between a definition and a sufficient condition?					
Competencies	• Interior and exterior angle sum of polygons • Definition and properties of parallelograms • Sufficient conditions for a parallelogram • Rectangle and its properties • Rhombus and square properties • Trapezoids and Kites					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
3	Discover, prove and apply polygon angle sum (use the power of the triangle)	Lesson 6-1 • Geoboards	CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.	G.1.2.1 Recognize and/or apply properties of angles, polygons, and polyhedra.	G.1.2.1.2 Identify and/or use properties of quadrilaterals. G.1.2.1.3 Identify and/or use properties of isosceles and equilateral triangles. G.1.2.1.4 Identify and/or use properties of regular polygons	Diagonal Parallelogram Rectangle Rhombus Square Trapezoid Kite Base Base angles Isosceles trapezoid midsegment
2	Define and discover properties of the parallelogram	Lesson 6-2				
2	Discover sufficient conditions for parallelogram, apply to proofs	Lesson 6-3				
1	Define and discover properties of rectangles, apply to solve problems	Lesson 6-4				
1	Define and discover properties of Rhombi and Squares, apply to solve problems	Lesson 6-5				
2	Define and discover properties of Trapezoids and Kites, apply to solve problems	Lesson 6-6				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org, geoboards, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					

Summative Assessments	Tests, quizzes and projects
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Unit / Concept	Unit 7. Similarity and Proportional Lengths
Big Ideas	A figure can be made larger or smaller without changing its shape. Linear proportions within the figure remain the same.
Essential Q.	A “dilation” can be achieved on the coordinate plane. There are shortcuts to prove similarity in triangles. Similar shapes produce proportional relationships that can be used to solve for missing lengths.
Competencies	• Identifying and creating dilations on the coordinate plane. • Similar polygons and missing lengths • Proving and using similarity in triangles: AA • Proving and using similarity in triangles: SSS and SAS • Proportionality in parallel lines • Proportionality in triangles (a by product of the angle bisector)

Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
1	Create and identify dilations on the coordinate plane	Lesson 7-1	CC.2.3.HS.A.6 Verify and apply theorems involving similarity as they relate to plane figures. CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures. CC.2.3.HS.A.6 Verify and apply theorems involving similarity as they relate to plane figures.	G.1.3.1 Use properties of congruence, correspondence, and similarity in problem-solving settings involving two- and three-dimensional figures.	G.1.3.1.2 Identify and/or use proportional relationships in similar figures. G.1.3.1.1 Identify and/or use properties of congruent and similar polygons or solids.	Dilation Similarity Scale factor Midsegment of triangle Proportional
3	Define and apply properties of similar polygons	Lesson 7-2				
1	Investigate and apply AA similarity in triangles	Lesson 7-3				
2	Investigate and apply SSS and SAS similarity in triangles	Lesson 7-4				
2	Discover and apply proportionality in parallel lines	Lesson 7-5				
1	Discover and apply proportionality created by angle bisectors in triangles	Lesson 7-6				

Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org, Geogebra.org
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling

Summative Assessments	Tests, quizzes and projects
Strategies for ELL and IEP Support	Built-in reteaching/extension days to show real world application. Textbook resources provide video lessons in both Spanish and English to help support ELL students. Resources in the textbook that facilitate interventions based on percentage of students that get questions right/wrong. Scaffolded problems to provide each student with appropriate rigor.

Unit / Concept	Unit 8. The Pythagorean Theorem and Trigonometry along with Applications					
Big Ideas	The right triangle has a power all its own, known for centuries and used in many pursuits (navigation, architecture, building, measurement, astronomy…).					
Essential Q.	The idea of indirect measurement: To find a missing distance, we do not need to actually measure that distance					
Competencies	• The pythagorean theorem: What is it, why does it work, how does it work, and how do you use it? • Special right triangles - an outgrowth of the Pythagorean theorem, applying understanding of 45 45 right, and 30 60 90 triangles. • Understanding and applying the basic trig functions • Applying the Law of Sines • Applying the law of Cosines					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
3	Discover and apply the Pythagorean theorem and its converse	Lesson 8 - 2	CC.2.3.8.A.3 Understand and apply the Pythagorean theorem to solve problems. CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.	G.2.1.1 Solve problems involving right triangles.	G.2.1.1.1 Use the Pythagorean theorem to write and/or solve problems involving right triangles. G.2.1.1.2 Use trigonometric ratios to write and/or solve problems involving right triangles.	Pythagorean theorem Ratio Hypotenuse, leg Angle of elevation/depression Sine cosine tangent inverse law of sines,cosines
2	Investigate and formalize the relationships in the two special right triangles, apply to solve for missing lengths	Lesson 8 - 3 • 1 day on 45-45-90 • 1 day on 30-60-90				
4	Learn and apply the trig ratios	Lesson 8 - 4, 8-5				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org, graph paper, rulers, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					
Summative Assessments	Tests, quizzes and projects					
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Unit / Concept	Unit 9. Circles and their parts					
Big Idea	A circle can be measured in degrees or length. If length is measured then we must use and understand pi					
Essential Q.	There are provable relations between segments in a circle and their *intercepted arcs*.					
Competencies	• Identifying circle parts and finding circumference • Arc measure vs arc length length and finding both • Arc - chord relationships • The inscribed angle • Tangents and lengths • Secants and tangents and their intercepted arcs					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
2	Identifying circle parts and calculating circumference	Lesson 9-1	CC.2.3.HS.A.8 Apply geometric theorems to verify properties of circles.	G.1.1.1 Identify and/or use parts of circles and segments associated with circles, spheres, and cylinders.	G.1.1.1.2 Identify, determine, and/or use the arcs, semicircles, sectors, and/or angles of a circle. G.1.1.1.3 Use chords, tangents, and secants to find missing arc measures or missing segment measures G.1.1.1.1 Identify, determine, and/or use the radius, diameter, segment, and/or tangent of a circle.	Circle center radius chord diameter circumference pi central angle inscribes angle arc, intercepted arc Tangent Secant inscribed/circumscribed Arc length vs arc measure
2	Finding missing arc measure and finding arc length	Lesson 9-2				
2	Discovering and using arc - chord relationships	Lesson 9-3				
1	Discovering and applying the properties of inscribed angles	Lesson 9-4				
2	Segment lengths involving tangents	Lesson 9-5				
2	Tangents, chords and secants: discovering relationships between their *intercepted arcs*, and applying those relationships to solve for missing angle measures.	Lesson 9-6				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org, compasses, rulers, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					

Summative Assessments	Tests, quizzes and projects
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Unit / Concept	Unit 10. Area and Surface Area					
Big Idea	Formulas for area are based on the formula for rectangles area (length x width). All other area formulae can be derived from the rectangle.					
Essential Q.	Finding the area of a figure involves first classifying the figure, or breaking it up into classifiable figures, and then choosing and applying the formula.					
Competencies	• Area of parallelograms, triangles, trapezoids and rhombuses • Area of circles and sectors • Surface area of solids					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
2	Discover and apply the area for parallelograms and triangles	Lesson 10-1	CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.	G.2.2.2 Use and/or develop procedures to determine or describe measures of perimeter, circumference, and/or area. (May require conversions within the same system.)	G.2.2.2.2 Find the measurement of a missing length, given the perimeter, circumference, or area G.2.2.2.1 Estimate area, perimeter, or circumference of an irregular figure. G.2.2.2.4 Develop and/or use strategies to estimate the area of a compound / composite figure. G.2.2.2.5 Find the area of a sector of a circle	Base vs height Sector Lateral Face vs edge Prism pyramid cone cylinder
1	Discover and apply the area for Trapezoids and Kites	Lesson 10-2				
2	Apply the area formula for circles and sectors	Lesson 10-3 • Day 1: Area of circles • Day 2: Sectors				
2	Find areas of regular polygons and composite figures.	Lesson 10-4 • Day 1: Regular polygons • Day 2: Composite figures				
3	Find Area of Solids	Lesson 10-6				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org,Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					
Summative Assessments	Tests, quizzes and projects					
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Unit / Concept	Unit 11. Volume					
Big Ideas	Whereas Area multiplying 2 dimensions resulting in square units, Volume involves multiplying 3 dimensions resulting in cubic units					
Essential Q.	Finding the volume of a figure involves first classifying the figure, or breaking it up into classifiable figures, and then choosing and applying the formula.					
Competencies	• Volume of prisms, cylinders, pyramids, cones, and spheres					
Dates (estimates only)	**Smart Objectives**	**Instructional Strategies and Activities**	**NCTM/PA/CC Standards**	**Keystone or PSSA Anchors**	**Keystone / PSSA Eligible Content**	**Vocabulary**
2	Discover and apply the volume of prisms and cylinders	Lesson 11 - 2	CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems. CC.2.3.HS.A.12 Explain volume formulas and use them to solve problems. CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.	G.2.3.1 Use and/or develop procedures to determine or describe measures of surface area and/or volume. (May require conversions within the same system.)	G.2.3.1.1 Calculate the surface area of prisms, cylinders, cones, pyramids, and/or spheres. Formulas are provided on a reference sheet G.2.3.1.2 Calculate the volume of prisms, cylinders, cones, pyramids, and/or spheres. Formulas are provided on a reference sheet. G.2.3.1.3 Find the measurement of a missing length given the surface area or volume.	Volume cross section great circle hemisphere
2	Discover and apply the volume of pyramids and cones	Lesson 11- 3				
1	Apply the volume formula for spheres	Lesson 11- 4				
Resources	Teacher generated materials, videos, Textbook, various manipulatives including traditional and non traditional geometric tools, mathigon.org, Geogebra.org					
Formative Assessments	Formative assessments such as exit tickets, quizzes, teacher-student, student-student discussions, mini-projects/presentations, polling					
Summative Assessments	Tests, quizzes and projects					
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