Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 1: Essentials of Geometry

Unit Essential Question: **How are the basic geometric figures described, named, and measured?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Geometric Figures	**Distance & Midpoint Formulas**	**Angles**	**Polygons**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Point, Line, Plane, Collinear, Coplanar, Segment, Ray, Opposite Rays, Intersection, Coordinate, Distance, Length of Segment, Congruent Segments, Theorem, Postulate, Axiom	Coordinate, Distance, Length of Segment, Congruent Segments, Midpoint, Segment Bisector, Midpoint Formula, Distance Formula	Angle, Sides, Vertex, Protractor, Congruent Angles, Acute, Right, Obtuse, Straight, Angle Bisector, Complementary Angles, Supplementary Angles, Adjacent Angles, Linear Pair, Vertical Angles	Polygon, Sides, Vertex, Concave, Convex, Equilateral, Equiangular, Regular, Triangle, Quadrilateral, Pentagon, Hexagon, Heptagon, Septagon, Octagon, Nonagon, Decagon, Dodecagon, n-gon, Interior Angles
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know the undefined terms of geometry • Know the names of geometric figures • Know how to sketch geometric figures • Know how to identify congruent segments	• Know the distance formula • Know the midpoint formula • Know how to use Algebra to solve distance and midpoint formulas	• Know how to name angles • Know how to measure angles • Know how to classify angles • Know angle pair relationships • Know how to identify congruent angles	• Know the names of polygons • Know how to sketch any polygon

UNDERSTAND	UNDERSTAND	UNDERSTAND	UNDERSTAND
• Understand the importance of vocabulary • Understand the symbols associated with naming geometric figures • Understand the significance of how geometric figures are drawn	• Understand the process of using the distance formula • Understand the process of using the midpoint formula • Understand how to solve equations in order to find length of a segment	• Understand the importance of naming an angle properly • Understand how to use a protractor • Know how to group angles based on characteristics they exhibit	• Understand how to mark up a diagram with given information • Understand the difference between concave and convex
LEARNING OUTCOME	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**
• Learners will be able to use the proper vocabulary when discussing geometric figures • Learners will be able to utilize the proper symbols when naming geometric figures • Learners will be able to properly sketch geometric figures complete with the correct markings for congruence	• Learners will be able to solve real-life situations involving distance between two objects • Learners will be able to solve real-life situations involving midpoint between two objects • Learners will be able to apply the midpoint formula to find a missing endpoint	• Learners will be able to distinguish between various angles on the same diagram • Learners will be able to use a protractor to find the exact measure of any given angle • Learners will be able to identify similarities and differences between types of angles • Learners will be able to apply their Algebra skills to find missing angle measures	• Learners will be able to draw any given polygon with the proper markings • Learners will be able to apply Algebraic properties to find a missing side length or perimeter for any given polygon

Pa Core Standards:

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.

CC.2.3.HS.A.11 Apply coordinate geometry to prove simple geometric theorems algebraically.

CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: **Unit Assessment, Vocabulary Quizzes, 1.1-1.3 Quiz**

Pacing: **17 days (including assessment)**

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 2: Reasoning & Proof

Unit Essential Question: **How are inductive and deductive reasoning used?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Inductive Reasoning	**Conditional Statements**	**Deductive Reasoning & Proofs**	**Special Angle Pairs**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Inductive Reasoning, Conjecture, Counterexample	Conditional, If-then Form, Hypothesis, Conclusion, Converse, Inverse, Contrapositive, Biconditional, Equivalent Statements, Negation	Deductive Reasoning, Addition Property of Equality, Subtraction Property of Equality, Multiplication Property of Equality, Division Property of Equality, Substitution Property, Reflexive Property, Symmetric Property, Transitive Property, Two-Column Proof, Theorem, Postulate	Complementary Angles, Supplementary Angles, Linear Pair, Vertical Angles
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know what inductive reasoning is • Know how to make a conjecture • Know how to test a conjecture	• Know how to write a conditional statement • Know how to tell if a statement is true or false • Know how to reach a conclusion • Know what a counter	• Know Algebraic properties • Know what a proof looks like	• Know angle pair relationships • Know how different types of angle pairs are related

UNDERSTAND • Understand how to describe a pattern • Understand how to make a conjecture	example is **UNDERSTAND** • Understand the different forms of a conditional statement • Understand how to find a counterexample	**UNDERSTAND** • Understand how to distinguish between the Algebraic properties • Understand how a proof is developed	**UNDERSTAND** • Understand different types of angle pair relationships
LEARNING OUTCOME • Learners will be able to put into words the pattern they see • Learners will be able to generalize what is happening in a pattern to write a conjecture • Learners will be able to make predictions based on their conjectures	**LEARNING OUTCOME** • Learners will be able to write conditional, converse, inverse, and contrapositive statements • Learners will be able to determine whether a statement is true or false. • Learners will be able to provide a counterexample for any false statement.	**LEARNING OUTCOME** • Learners will be able to provide a reason for each statement • Learners will be able to use properties and postulates to write a two-column proof	**LEARNING OUTCOME** • Learners will be able to identify which angle pair relationships are represented in a diagram • Learners will be able to draw a diagram accurately depicting given information regarding angles • Learners will be able to construct proofs using properties, angle relationships, and postulates

Pa Core Standards:

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.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes, 2.1-2.3 Quiz

Pacing: 13 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 3: Parallel & Perpendicular Lines

Unit Essential Question: **How do the position of coplanar lines and the measurement of the angles formed impact each other?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Special Angle Pairs	**Proving Angle Relationships**	**Proving Lines Parallel**	**Parallel & Perpendicular Lines**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Parallel Lines, Skew Lines, Transversal, Corresponding Angles, Alternate Interior Angles, Alternate Exterior Angles, Consecutive Interior Angles, Same-Side Interior Angles, Postulate	Parallel Lines, Skew Lines, Transversal, Corresponding Angles, Alternate Interior Angles, Alternate Exterior Angles, Consecutive Interior Angles, Same-Side Interior Angles, Postulate	Parallel Lines, Skew Lines, Transversal, Corresponding Angles, Alternate Interior Angles, Alternate Exterior Angles, Consecutive Interior Angles, Same-Side Interior Angles, Postulate, Two-Column Proof, Converse	Parallel Lines, Perpendicular Lines, Skew Lines, Slope, Rise, Run, Horizontal Change, Vertical Change, Negative Slope, Positive Slope, Zero Slope, Undefined Slope, Horizontal, Vertical, y-intercept, Slope-Intercept Form
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know angle pair relationships • Know difference between types of lines	• Know the angle pair relationships • Know what is significant about each angle pair relationship	• Know angle pair relationships • Know what is significant about each angle pair relationship	• Know slope formula • Know slope-intercept form • Know how to find y-intercept

UNDERSTAND	UNDERSTAND	UNDERSTAND	UNDERSTAND
• Understand the definitions for different angle pair relationships • Understand how to draw information	• Understand how to write a proof	• Understand the	• Understand the difference between parallel and perpendicular lines • Understand how to write the equation of parallel lines and perpendicular lines
LEARNING OUTCOME	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**
• Learners will be able to explain the similarities and differences between different angle relationships • Learners will be able to sketch a real life example of each type of angle pair relationship	• Learners will be able to apply angle pair relationship knowledge to a proof • Learners will be able to explain the significance of each type of angle pair relationship	• Learners will be able to distinguish between the conditional postulate and the converse of the postulate • Learners will be able to use angle pair relationship knowledge to prove two lines are parallel	• Learners will be able to apply the slope formula to given lines to determine whether they are parallel, perpendicular, or neither • Learners will be able to make connections between parallel and perpendicular lines to lines discussed in Algebra 1

Pa Core Standards:

CC.2.3.HS.A.3 Verify and apply geometric theorems as they relate to geometric figures.

CC.2.3.8.A.2 Understand and apply congruence, similarity, and geometric transformations using various tools.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes, 3.1-3.3 Quiz

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry Grade: 9, 10, 11, 12

Unit 4: Congruent Triangles

Unit Essential Question: How are triangles proven congruent?

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Triangle Characteristics	**Congruent Figures**	**Proving Triangles Congruent**	**Corresponding Parts of Congruent Triangles**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Scalene, Isosceles, Equilateral, Equiangular, Acute, Right, Obtuse, Regular, Interior Angles, Exterior Angles, Corollary, Legs, Vertex Angle, Base, Base Angles	Corresponding Angles, Corresponding Sides, Congruent Figures, Corresponding Parts	Corresponding Angles, Corresponding Sides, Congruent Figures, SSS, SAS, ASA, AAS, HL, Sides, Angles, Corresponding Parts, Hypotenuse, Leg, Base Angles, Converse, Base, Vertex Angles	Corresponding Angles, Corresponding Sides, Congruent Figures, SSS, SAS, ASA, AAS, HL, CPCTC, Corresponding Parts, Hypotenuse, Leg, Base Angles, Vertex Angle
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know vocabulary associated with triangle • Know measures of angles	• Know types of triangles • Know what congruent means	• Know how to find side length of a triangle • Know difference between angles and sides of a triangle • Know how to find angle measure of a triangle	• Know ways to prove triangles congruent • Know difference between angles and sides of a triangle

UNDERSTAND	UNDERSTAND	UNDERSTAND	UNDERSTAND
• Understand how to classify triangles • Understand how the measures of angles are determined	• Understand how to identify corresponding parts of triangles • Understand how to identify congruent figures	• Understand the difference between the hypotenuse and legs of a right triangle • Understand what combinations of sides and angles can be used to prove triangles congruent	• Understand how to identify corresponding parts of triangles • Understand how to prove triangles are congruent
LEARNING OUTCOME	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**
• Learners will be able to differentiate between different types of triangles given characteristics • Learners will be able to	• Learners will be able to use information to determine if figures are identical	• Learners will be able to construct a two-column proof in order to prove two triangles are congruent	• Learners will be able to expand upon their knowledge of proving triangles congruent to further prove additional information about triangles

Pa Core Standards:

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.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes, 4.1-4.4 Quiz

Pacing: 21 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 5: Relationships within Triangles

Unit Essential Question: What are the special relationships that occur within a triangle?

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Midsegments	**Bisectors**	**Medians & Altitudes**	**Triangle Inequalities**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Midsegment, Coordinate Proof	Perpendicular Bisector, Equidistant, Concurrent, Point of Concurrency, Circumcenter, Incenter, Angle Bisector, Distance	Median, Centroid, Altitude, Orthocenter	Opposite Side, Inequality, Included Angle
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know the properties of midsegment	• Know the properties of perpendicular bisectors • Know the properties of angle bisectors	• Know the properties of the centroid of a triangle	• Know how to simplify an inequality
UNDERSTAND	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**
• Understand the correlation between the midsegment of a triangle and the triangle it belongs to	• Understand the connection between segment bisectors, perpendicular lines and triangles	• Understand the connection between perpendicular bisectors angle bisectors of triangles	• Understand how to find possible side lengths of a triangle

LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME
• Learners will be able to use indirect measure to find the height of an object	• Learners will be able to construct and interpret (the importance of) the circumcenter of any given triangle • Learners will be to construct and interpret (the importance of) the incenter of any given triangle	• Learners will be able to construct the centroid of any given triangle • Learners will be able to construct the orthocenter of any given triangle	• Learners will be able to determine what type of triangle is formed when given any three side lengths • Learners will be able to compare two triangles using inequalities

Pa Core Standards:

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.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes,

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 6: Similarity

Unit Essential Question: How can triangles be proven similar?

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Ratio & Proportion	**Similar Polygons**	**Proving Triangles Similar**	**Proportional Relationships within Triangles**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Ratio, Proportion, Geometric Mean, Means, Extremes, Cross Multiplication, Reciprocal Property, Diagonal Switch, Add Denominator, Numerator, Denominator	Similar Polygon, Scale Factor, Similarity Ratio	AA Similarity, SSS Similarity, SAS Similarity	Triangle Proportionality Theorem, Parallel Line Theorem, Angle Bisector Theorem
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know how to simplify a ratio • Know how to solve a proportion • Know how to write a proportion	• Know how to find a missing side length • Know how to find scale factor	• Know how to identify which parts of a triangle are given	• Know how to solve a proportion

UNDERSTAND	UNDERSTAND	UNDERSTAND	UNDERSTAND
• Understand the various methods used to solve a proportion	• Understand what it means for two polygons to be similar • Understand how to use proportions to identify similar polygons	• Understand what theorems may and may not be used to prove triangles similar	• Understand how missing side lengths can be found using proportions
LEARNING OUTCOME	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**
• Learners will be able to create a scale drawing or model	• Learners will be able to explain the relationship between the scale factor, perimeter, and area of similar figures	• Learners will be able to construct a two column proof proving two triangles are similar	• Learners will be able to use prior knowledge of parallel lines being cut by a transversal and apply it to similar triangles • Learners will be able to use indirect measurement and similarity to find a length that would be otherwise be inconvenient or impossible to measure

Pa Core Standards:

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.

CC.2.3.HS.A.6 Verify and apply theorems involving similarity as they relate to plane figures.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes,

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 7: Right Triangles and Trigonometry

Unit Essential Question: What are the special relationships that occur within a triangle?

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Square Roots	**Pythagorean Theorem & Its Converse**	**Special Right Triangles**	**Trigonometry**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Square Roots, Rationalize	Hypotenuse, Leg, Pythagorean Theorem, Converse	45-45-90 Triangle, 30-60-90 Triangle, Short Leg, Long Leg, Hypotenuse	Hypotenuse, Adjacent Leg, Opposite Leg, Right Angle, Right Triangle, Sine, Cosine, Tangent, Inverse
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know how to simplify square roots	• Know the Pythagorean Theorem • Know the converse of the Pythagorean Theorem	• Know how to determine when you have a special triangle	• Know the tangent ratio • Know the sine ratio • Know the cosine ratio
UNDERSTAND	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**
• Understand the process for simplifying non-perfect square roots	• Understand how to use the Pythagorean Theorem to find missing side lengths	• Understand the relationship between the side lengths of a 45-45-90 triangle • Understand the relationship between the side lengths of a 30-60-90 triangle	• Understand how to determine whether you need to use the adjacent leg, opposite leg, or the hypotenuse

LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME
• Learners will be able to perform operations with square roots	• Learners will be able to apply the Pythagorean Theorem to real life application of find the shortest distance between two locations	• Learners will be able to complete any given special right triangle	• Learners will be able to find all missing measurements of any given right triangle to solve the triangle • Learners will be able to explain how they know whether they are using trig functions or inverse trig functions

Pa Core Standards:

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.

CC.2.2.HS.C.9 Prove the Pythagorean identity and use it to calculate trigonometric ratios.

CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

CC.2.3.8.A.3 Understand and apply the Pythagorean theorem to solve problems.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes,

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 8: Quadrilaterals

Unit Essential Question: **How are the properties of quadrilaterals and other polygons used to find side lengths and angle measures?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Convex Polygons	**Parallelograms**	**Special Parallelograms**	**Trapezoids & Kites**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Diagonal, Regular Polygon, Interior Angle, Exterior Angles, Convex	Parallelogram, Diagonal, Perpendicular, Right Angle	Rectangle, Square, Rhombus, Diagonal, Perpendicular	Trapezoid, Isosceles Trapezoid, Kite, Base, Leg, Base Angle, Midsegment, Opposite Angles, Diagonal
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know the interior angle formula	• Know the properties of a parallelogram	• Know the definition of a rectangle • Know the definition of a square • Know the definition of a rhombus	• Know the definition of a trapezoid • Know the definition of a kite
UNDERSTAND	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**
• Understand the process for determining angle measures in polygons of any size, regardless of how many sides it has	• Understand how to find angle and side measures in parallelograms	• Understand the properties of a rectangle • Understand the properties of a square • Understand the properties of a rhombus	• Understand the properties of a midsegment of a trapezoid • Understand the properties of a trapezoid • Understand the properties of a kite

LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME
• Learners will be able to determine the number of sides a polygon contains when given the angle measurement • Learners will be able to determine the angle measure of any convex polygon	• Learners will be able to prove that a quadrilateral is a parallelogram	• Learners will be able to compare and contrast a rectangle, square and rhombus	• Learners will be able to distinguish between the type of quadrilateral they are working with when given characteristics of the shape • Learners will be able to classify quadrilaterals by their properties

Pa Core Standards:

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

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.

Assessments: Unit Assessment, Vocabulary Quizzes

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 10: Properties of Circles

Unit Essential Question: **How can the relationships between a circle and its arcs, lines, segments, and angles be used to solve problems?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Circle Basics	**Tangents & Segments**	**Arcs & Sectors**	**Angles in a Circle**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Circle, Center, Radius, Diameter, Chord, Secant, Tangent, Concentric Circles	Tangent, Segment, Chord, Secant, Radius, Diameter	Arc, Central Angle, Intercepted Arc, Minor Arc, Major Arc, Semicircle	Inscribed Angle, Inscribed Polygon, Circumscribed Polygon
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know the basic definitions for parts of a circle	• Know the relationship between tangent, segment, and chord • Know the relationship between arcs and chords	• Know how to name an arc • Know how to classify an arc	• Know the difference between an inscribed polygon and a circumscribed polygon
UNDERSTAND	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**
• Understand how the different parts of a circle are related	• Understand how to relate tangent length to segment length • Understand how to determine the measures of segments formed by chords, secants, and tangents	• Understand the process for determining the measure of an arc • Understand the process for determining the length of an arc	• Understand how to find the measure of an inscribed angle • Understand how to find the measure of angles both inside and outside a circle
LEARNING OUTCOME	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**

• Learners will be able to explain similarities and differences between the parts of a circle	• Learners will be able to construct tangents to circles • Learners will be able to apply properties of chords • Learners will be able to find segment lengths in circles that are formed by tangents and chords	• Learners will be able to apply the area formula to find the measure and length of any given arc	• Learners will be able to apply the properties of chords, secants, and tangents to determining the measures of angles formed by chords, secants, and tangents

Pa Core Standards:

CC.2.3.HS.A.8 Apply geometric theorems to verify properties of circles.

CC.2.3.HS.A.9 Extend the concept of similarity to determine arc lengths and areas of sectors of circles.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

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.

Assessments: Unit Assessment, Vocabulary Quizzes

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
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Course: Geometry **Grade**: 9, 10, 11, 12

Unit 11: Measuring Length and Area

Unit Essential Question: **How are the dimensions and area of plane figures determined?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT	CONCEPT
Parallelograms & Triangles	**Trapezoids, Kites, Rhombi**	**Circumference & Arc Length**	**Area of a Circle & a Sector**	**Area of Regular Polygons**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Parallelogram, Triangle, Area, Perimeter, Base, Height	Trapezoid, Height, Diagonal, Base, Kite, Rhombus	Circumference, Arc, Arc Length, Radius, Diameter, Measure of an Arc, Sector	Area, Sector, Radius, Diameter, Arc, Arc Length	Center, Radius, Apothem, Central Angle
KNOW	**KNOW**	**KNOW**	**KNOW**	**KNOW**
• Know how to find area and perimeter of a parallelogram • Know how to find area and perimeter of a triangle	• Know how to find area and perimeter of a trapezoid • Know how to find area and perimeter of a kite • Know how to find area and perimeter of a rhombus	• Know how to find the circumference of a circle • Know how to find arc length	• Know how to find the area of a circle • Know how to find the area of a sector of a circle	• Know how to find the area of a regular polygon
UNDERSTAND	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**
• Understand how to find the missing length given the area or perimeter of a parallelogram • Understand how to	• Understand how to find the missing length given the area or perimeter of a trapezoid • Understand how to	• Understand how to find the measurement of a missing length given the circumference of a circle	• Understand how to find the measurement of a missing length given the area of a circle	• Understand how to use the apothem of a polygon to find its area

find the missing length given the area of perimeter of a triangle	find the missing length given the area of perimeter of a kite • Understand how to find the missing length given the area or perimeter of a rhombus			
LEARNING OUTCOME	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**	**LEARNING OUTCOME**
• Learners will be able to maximize the area of a parallelogram or triangle • Learners will be able to explain how a change in linear dimension of a parallelogram or triangle affects its perimeter or area	• Learners will be able to maximize the area of a trapezoid, rhombus, or kite • Learners will be able to explain how a change in linear dimension of a trapezoid, kite, or rhombus affects its perimeter or area	• Learners will be able to explain how a change in linear dimension of a circle affects its circumference	• Learners will be able to explain how a change in linear dimension of a circle affects its area	• Learners will be able to demonstrate how isosceles triangles can be used to find the area of a regular polygon

Pa Core Standards:

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.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

Assessments: Unit Assessment, Vocabulary Quizzes

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook

Pequea Valley School District
Math

Course: Geometry **Grade**: 9, 10, 11, 12

Unit 12: Surface Area and Volume of Solids

Unit Essential Question: **How are the surface area and volume of three dimensional shapes determined?**

CONCEPT	CONCEPT	CONCEPT	CONCEPT
Prisms & Cylinders	**Pyramids**	**Cones**	**Spheres**
VOCABULARY	**VOCABULARY**	**VOCABULARY**	**VOCABULARY**
Right Prism, Right Cylinder, Surface Area, Lateral Surface Area, Volume, Polyhedron, Face, Edge, Vertex, Base, Platonic Solids, Cross Section	Pyramid, Regular Pyramid, Slant Height, Face, Edge, Vertex, Base	Slant Height, Cone, Base, Vertex, Lateral Edge	Sphere, Hemisphere
KNOW	**KNOW**	**KNOW**	**KNOW**
• Know how to identify solids • Know how to find the volume of right prisms and cylinders • Know how to find the surface area of prisms and cylinders	• Know how to find the volume of pyramids • Know how to find the surface area of a pyramid	• Know how to find the volume of cones • Know how to find the surface area of a cone	• Know how to find the volume of a sphere • Know how to find the surface area of a sphere
UNDERSTAND	**UNDERSTAND**	**UNDERSTAND**	**UNDERSTAND**
• Understand how to find the measurement of a missing length given the volume or surface area of a prism or cylinder	• Understand how to find the measurement of a missing length given the volume or surface area of a pyramid	• Understand how to find the measurement of a missing length given the volume or surface area of a cone	• Understand how to find the measurement of a missing length given the volume or surface area of a sphere

LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME	LEARNING OUTCOME
• Learners will be able to explain how a change in the linear dimension of a prism or cylinder in the volume or surface area affect the value of the measurement	• Learners will be able to explain how a change in the linear dimension of a pyramid in the volume or surface area affect the value of the measurement	• Learners will be able to explain how a change in the linear dimension of a cone in the volume or surface area affect the value of the measurement	• Learners will be able to explain how a change in the linear dimension of a sphere in the volume or surface area affect the value of the measurement

Pa Core Standards:

CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

CC.2.3.HS.A.14 Apply geometric concepts to model and solve real-world problems.

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.

CC.2.3.8.A.1 Apply the concepts of volumes 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.

Assessments: Unit Assessment, Vocabulary Quizzes

Pacing: 14 days (including assessment)

Resources: Schoology, McDougal Littell Geometry, McDougal Littell Geometry eWorkbook