Course Title: Geometry
Board Approval Date: 4/14/14
Credit / Hours: 1 credit
Reviewed Annually

Course Description:

This course focuses on master of the PA Academic Standards for Mathematics. Geometry may be selected either second or third in the college prep curriculum. This course will allow students to apply their background of algebra to better understand and appreciate the basic structure of Geometry and how it is related to other academic disciplines. Students will improve their thinking skills to solve practical and challenging problems from everyday life. As students progress through this course they will participate in a systematic study of the following topics: points, lines, planes, and angles: deductive reasoning, parallel lines and planes; congruent triangles; quadrilaterals; inequalities of geometry; similar polygons; right triangles; circles; areas of plane figures; areas and volumes of solids; and coordinate geometry.

Learning Activities / Modes of Assessment:

Large group instruction	Tests and Quizzes (Formative and Summative)
Checklists / Teacher Observation	Small group work
Projects with Rubrics	Journals / Write-ups
Note-Taking	Homework

Instructional Resources:

Geometry (Prentice Hall 2004)
Geometer's Sketchpad V4
ExamView
Scientific Calculator (Ti-30/34 or higher)

Course Pacing Guide

Course: **Honors Geometry and Geometry**

Course Unit (Topic)	**Length of Instruction (Days/Periods)**
1. Tc1 Basic Terms and Definitions	10 days
2. Tc2 Reasoning and Proofs	10 days
3. Tc3 Parallel Lines and Planes	12 days
4. Tc4 Triangle Properties	12 days
5. Tc5 Triangle Congruence	15 days
6. Tc6 Polygons and Quadrilaterals	15 days
7. Tc7 Coordinate Geometry	12 days
8. Tc8 Similarities and Ratios	12 days
9. Tc9 Right Triangles	18 days
10. Tc10 Circles	15 days
11. Tc11 Area	15 days
12. Tc12 Surface Area and Volume	15 days
13. Tc13 Enrichment-Constructions and Transformations	10 days
DAYS TOTAL	171 days

Topic: T1 Basic Terms and Definitions **Days:10**
Subject(s): Math **Grade(s):** 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B -- Important COMMUNICATION - 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. **2.9.G.A -- Essential** DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. Points, Lines and Planes Segments and Their Measurements Angles and their Measurements Angle Pairs 2.5.G.B - COMMUNICATION - Use symbols, mathematical terminology, standard notation, mathematical rules, graphing, and other types of mathematical representations to communicate	In plane geometry all definitions are based upon three basic terms. Measurements are used to classify angles and segments.	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.

Topic: T1 Basic Terms and Definitions
Subject(s): Math

Days: 9
Grade(s): 9th, 10th, 11th, 12th

Know:	Understand:	Do:
observations, predictions, concepts, procedures, generalizations, ideas, and results. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations.		

Curriculum: CCSD CURRICULUM PENNSYLVANIA

Course: Geometry **Date:** 6/2022

Topic: T1 Basic Terms and Definitions **Days: 10**

Subject(s): Math **Grade(s):** 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Topic: T1 Basic Terms and Definitions
Subject(s): Math
Days: /.
Grade(s): 9th, 10th, 11th, 12th

Key Learning:
In plane geometry, all definitions are based upon three basic terms. Measurements are used to classify angles and segments.

Unit Essential Question(s):

How are the basic terms, points, lines and planes used to establish definitions, postulates and theorems in geometry?

Concept:	Concept:	Concept:
Points, Lines, &Planes	**Segments &Their Measurements**	**Angles &Their Measurements**
(Pg 10 - 12)	**(Pg 17, 25-26)**	**(Pg 27 - 28)**
2.5.G.B	2.5.G.B, 2.9.G.A	2.5.G.B, 2.9.G.A
Lesson Essential Question(s): What are the basic terms and their importance to geometry? (A)	**Lesson Essential Question(s):** How do you compare and contrast lines, segments, rays and angles? (A)	**Lesson Essential Question(s):** How are angles classified and used in geometry? (A)
Vocabulary: geometry, point, line, plane, space, collinear, coplanar	**Vocabulary:** line segment, ray, congruent	**Vocabulary:** vertex, sides of angles, angle, acute angle, right angle, obtuse angle, straight angle

Concept:
Angle Pairs (Pg 96 - 99)
2.9.G.A

Lesson Essential Question(s):
How are the pairs of angles classified? (ET)

Vocabulary:
complementary angles, supplementary angles, vertical angles, linear pairs, adjacent angles

Topic: T1 Basic Terms and Definitions
Days: /.
Subject(s): Math
Grade(s): 9th, 10th, 11th, 12th

Additional Information:
ruler, protractor, graph/number line paper, dynamic geometric software

Attached Document(s):

Vocab Report for Topic: T1 Basic Terms and Definitions
Subject(s): Math
Days: /.
Grade(s): 9th, 10th, 11th, 12th

Concept:

Points, Lines, &Planes

(Pg 10 - 12)

geometry -
point -
line -
plane -
space -
collinear -

points contained in the same line

coplanar - points and lines in the same plane

Concept:

Segments &Their Measurements

(Pg 17, 25-26)

line segment -
ray -
congruent -

Concept:

Angles &Their Measurements

(Pg 27 - 28)

vertex -
sides of angles -
angle -
acute angle -
right angle -
obtuse angle -
straight angle -

Concept: Angle Pairs (Pg 96 - 99)

complementary angles -
supplementary angles -

adjacent angles -

Topic: T2 - Reasoning And Proofs
Subject(s): Math

Days: 10
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B -- Important COMMUNICATION - 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. **2.4.G.A -- Essential** REASONING - Write formal proofs (direct proofs, indirect proofs/ proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. **2.4.G.B -- Essential** CONNECTIONS - Use statements, converses, inverses, and contrapositives to construct valid arguments or to validate arguments relating to geometric theorems. **2.8.G.B -- Essential** ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry. Statements of Logic Types of Reasoning	By using inductive and deductive logic, there are direct and indirect ways of coming to a conclusion or proving something.	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.

Topic: T2 - Reasoning And Proofs
Days: 9
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
Proofs 2.5.G.B - COMMUNICATION - 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. 2.4.G.A - REASONING - Write formal proofs (direct proofs, indirect proofs/proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. 2.4.G.B - CONNECTIONS - Use statements, converses, inverses, and contrapositives to construct valid arguments or to validate arguments relating to geometric theorems. 2.8.G.B - ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry.		

Topic: T2 - Reasoning And Proofs
Days: 9
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

Course: Geometrw

PENNSYLVANIA

Date: 4-0. 00

Topic: T2 - Reasoning And Proofs

Days: 9

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: There are direct and indirect ways of coming to a conclusion or proving something (inductive and deductive logic).

Unit Essential Question(s):

On what strategies can we base conclusions in geometry?

Concept:	Concept:	Concept:
Statements of Logic (Pgs. 68-80, 264-265)	**Types of Reasoning (Pgs. 4-8, 82-93, 265-269)**	**Constructing Proofs (Pgs. 117, 212 - 213)**
2.5.G.B, 2.4.G.B, 2.8.G.B	2.5.G.B	2.4.G.A, 2.8.G.B
Lesson Essential Question(s): What are the different types of conditional statements? (A)	Lesson Essential Question(s): What is the difference between inductive and deductive reasoning? (A)	Lesson Essential Question(s): Why are justifications necessary when constructing a proof? (A)
Vocabulary: hypothesis, conclusion, converse, inverse, contrapositive, bi-conditional	Vocabulary: inductive reasoning, deductive reasoning, proof, direct proof, indirect proof, counter-example	Vocabulary: given, postulate, theorems, corollary

Additional Information:

Attached Document(s):

Vocab Report for Topic: T2 - Reasoning And Proofs Days: 9
Subject(s): Math Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Statements of Logic (Pgs. 68-80, 264-265)

hypothesis -
conclusion -
converse -
inverse -
contrapositive -
bi-conditional -

Concept: Types of Reasoning (Pgs. 4-8, 82-93, 265-269)

inductive reasoning -
deductive reasoning -
proof -
direct proof -
indirect proof -
counter-example -

Concept: Constructing Proofs (Pgs. 117, 212 - 213)

given -
postulate -
theorems -
corollary -

Topic: T4 Triangle Properties
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B -- Important COMMUNICATION - 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. **2.5.G.A -- Essential** PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.4.G.A -- Essential** REASONING - Write formal proofs (direct proofs, indirect proofs/ proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. **2.9.G.B -- Essential** TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes.	Classification and properties of triangles can be determined by their distinct characteristics.	CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures. CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.

Topic: T4 Triangle Properties
Subject(s): Math

Days: 12
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.9.G.A -- Essential DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. Triangle Classifications Segments of Triangles Proofs of Triangle Congruence Applications of Congruent Triangles Triangle Angle Sums Triangle Inequalities 2.5.G.B - COMMUNICATION - 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. 2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry		

Topic: T4 Triangle Properties
Subject(s): Math

Days: 12
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.4.G.A - REASONING - Write formal proofs (direct proofs, indirect proofs/proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. 2.9.G.B - TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations.		

Topic: T4 Triangle Properties
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM
Course: Geometry

PENNSYLVANIA
Date: 6/2022

Topic: T4 Triangle Properties
Subject(s): Math

Days: 12
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Classification and properties of triangles can be determined by their distinct characteristics.**

Unit Essential Question(s):

What special properties exist for the segments and angles of each type of triangle?

Concept:	Concept:	Concept:
Classifying Triangles (Pgs. 133) 2.5.G.B, 2.5.G.A, 2.9.G.A	**Triangle Angle Sums (Pgs. 131-133)** 2.5.G.A, G.1.3.2.1	**Segments of Triangles Pgs. 243-245, 249, 255-259)** 2.5.G.B, 2.5.G.A
Lesson Essential Question(s): LEQ: How are triangles classified and what theorems can be applied to special triangles? (A)	**Lesson Essential Question(s):** LEQ: What are the relationships between the interior and the exterior angles of a triangle? (A)	**Lesson Essential Question(s):** LEQ: What are the special segments of a triangle and what are their properties? (A)
Vocabulary: acute triangle, right triangle, obtuse triangle, scalene triangle, isosceles triangle, equilateral triangle, equiangular triangle, regular triangle	**Vocabulary:** interior angle sum, remote interior angles, exterior angle, exterior angle sum	**Vocabulary:** median, altitude, perpendicular bisector, angle bisector, midsegment, centroid, altitude, concurrent, point of concurrency, incenter, orthocenter, circumcenter

Concept:

Triangle Inequalities (Pgs. 273-276)

2.5.G.A, G.1.3.2.1

Lesson Essential Question(s):
LEQ: What can inequalities tell us about triangles (A)

Vocabulary:
inequality, maximum, minimum, comparison property

Topic: T4 Triangle Properties

Days: 12

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Additional Information:
rulers, protractors, manipulatives

Attached Document(s):

Vocab Report for Topic: T4 Triangle Properties
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept:

Classifying Triangles (Pgs. 133)

acute triangle -
right triangle -
obtuse triangle -
scalene triangle -
isosceles triangle -
equilateral triangle -
equiangular triangle -
regular triangle -

Concept: Triangle Angle Sums (Pgs. 131-133)

interior angle sum -
remote interior angles -
exterior angle -
exterior angle sum -

Concept:

Segments of Triangles Pgs. 243-245, 249, 255-259)

median -
altitude -
perpendicular bisector -
angle bisector -
midsegment -
centroid -
altitude, concurrent, point of concurrency, incenter, orthocenter, circumcenter -

Concept: Triangle Inequalities (Pgs. 273-276)

inequality -
maximum -
minimum -
comparison property -

Topic: T3 Parallel Lines and Planes
Subject(s): Math

Days: 12
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A – Essential PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.5.G.B -- Important** COMMUNICATION - 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. **2.8.G.B -- Essential** ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry. **2.4.G.A – Essential** REASONING - Write formal proofs (direct proofs, indirect proofs/ proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments.	Parallel and perpendicular lines and planes have proven properties based on their slopes.	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.

Topic: T3 Parallel Lines and Planes
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
Parallel lines and Transversals Properties and Proofs of Parallel and Perpendicular lines and planes. Slopes of Lines on a Coordinate plane 2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.5.G.B - COMMUNICATION - 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. 2.8.G.B - ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve		

Topic: T3 Parallel Lines and Planes
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
problems using coordinate geometry. 2.4.G.A - REASONING - Write formal proofs (direct proofs, indirect proofs/proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments.		

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 4-0. 00

Topic: T3 Parallel Lines and Planes

Days: 12

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 4-0. 00

Topic: T3 Parallel Lines and Planes

Days: 12

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning:

Parallel and perpendicular lines and planes have proven properties based on their slopes.

Unit Essential Question(s):

What relationships exist between the angles formed by parallel lines and a transversal?

Concept:	Concept:	Concept:
Parallel Lines and Transversals (Pgs. 115-118) 2.5.G.A, G.2.2.1.1 , 2.8.G.B	**Properties and Proofs of Parallel and Perpendicular Lines and Planes (Pgs. 117, 122-125)** 2.5.G.A, G.2.2.1.1 , 2.4.G.A	**Slopes of Lines on a Coordinate Plane (Pgs. 158-161)** 2.5.G.A, G.2.2.1.1 , 2.8.G.B
Lesson Essential Question(s): How do we classify pairs of angles formed by two lines and a transversal? (A)	Lesson Essential Question(s): How can lines be proven parallel or perpendicular? (A)	Lesson Essential Question(s): How can slope be used to determine if lines are parallel or perpendicular on a coordinate plane? (A)
Vocabulary: corresponding angles, alternate-interior angles, same-side interior angles, alternate-exterior angles, transversal, parallel, skew	Vocabulary: proof, given, definition, theorem, hypothesis, conclusion, coplanar, space, intersection	Vocabulary: slope, linear equations, system of linear equations

Additional Information:
manipulatives, geometric software

Attached Document(s):

Vocab Report for Topic: T3 Parallel Lines and Planes
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Parallel Lines and Transversals (Pgs. 115-118)

corresponding angles -
alternate-interior angles -
same-side interior angles -
alternate-exterior angles -
transversal -
parallel -
skew -

Concept: Properties and Proofs of Parallel and Perpendicular Lines and Planes (Pgs. 117, 122-125)

proof -
given -
definition -
theorem -
hypothesis -
conclusion -
coplanar, space, intersection -

Concept: Slopes of Lines on a Coordinate Plane (Pgs. 158-161)

slope, linear equations, system of linear equations -

Topic: T5 Triangle Congruence
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B – Important COMMUNICATION - 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. **2.5.G.A – Essential** PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.4.G.A – Essential** REASONING - Write formal proofs (direct proofs, indirect proofs/ proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. **2.9.G.B – Essential** TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes.	Classification and properties of triangles can be determined by their distinct characteristics.	CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures. CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects. CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.

Topic: T5 Triangle Congruence **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.9.G.A -- Essential DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. Triangle Classifications Segments of Triangles Proofs of Triangle Congruence Applications of Congruent Triangles Triangle Angle Sums Triangle Inequalities 2.5.G.B - COMMUNICATION - 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. 2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry		

Topic: T5 Triangle Congruence **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.4.G.A - REASONING - Write formal proofs (direct proofs, indirect proofs/proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. 2.9.G.B - TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations.		

Topic: T5 Triangle Congruence
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM
PENNSYLVANIA

Course: Geometry
Date: 6/2022

Topic: T5 Triangle Congruence
Days: 15

Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Classification and properties of triangles can be determined by their distinct characteristics.**

Unit Essential Question(s):

How can triangle congruency be determined?

Concept:	**Concept:**
Proving Triangles Congruent (Pgs. 180-182, 186-188, 194-196, 217-218)	**Using Congruent Triangles (Pgs. 203-204, 224-226, 210 - 212)**
~~2.5.G.B~~, ~~2.5.G.A~~, ~~2.4.G.A~~, ~~2.9.G.B~~, ~~2.9.G.A~~, ~~G.1.2.1.1~~ , ~~G.1.3.1.1~~ , ~~G.1.3.2.1~~	~~2.4.G.A~~, ~~2.5.G.B~~, ~~G.1.2.1.3~~, ~~G.1.2.1.1~~
Lesson Essential Question(s): LEQ: When are triangles congruent? (A)	**Lesson Essential Question(s):** LEQ: What is CPCTC and how is it used to relate triangles? (A)
Vocabulary: congruent triangles, SAS, SSS, ASA, AAS, HL, corresponding parts	**Vocabulary:** corresponding angles, corresponding sides, CPCTC (corresponding parts of congruent triangles are congruent), overlapping

Additional Information:
rulers, protractors, manipulatives

Attached Document(s):

Vocab Report for Topic: T5 Triangle Congruence
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Proving Triangles Congruent (Pgs. 180-182, 186-188, 194-196, 217-218)

congruent triangles -
SAS -
SSS -
ASA -
AAS -
HL -
corresponding parts -

Concept: Using Congruent Triangles (Pgs. 203-204, 224-226, 210-212)

corresponding angles -
corresponding sides -
CPCTC (corresponding parts of congruent triangles are congruent) -overlapping

Topic: T6 Polygons
Subject(s): Math
Days: 15
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B – Important COMMUNICATION - 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. **2.5.G.A – Essential** PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.9.G.B – Essential** TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes. **2.4.G.A – Essential** REASONING - Write formal proofs (direct proofs, indirect proofs/ proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments.	The number of sides of a polygon determines its name and its angle sum.	CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures. CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects.

Topic: T6 Polygons
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
Polygon Classifications Interior and Exterior Angle Sums 2.5.G.B - COMMUNICATION - 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. 2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.9.G.B - TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes. 2.4.G.A - REASONING - Write formal proofs (direct proofs, indirect proofs/proofs by		

Topic: T6 Polygons **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments.		

Topic: T6 Polygons
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 6/2022

Topic: T6 Polygons

Days: 15

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **The number of sides of a polygon determines its name and its angle sum.**

Unit Essential Question(s): **What differences exist among the different types of polygons?**

Concept:	**Concept:**
Classification of Polygons (Pg 143-144)	**Interior and Exterior Angle Sums of Polygons(Pg 145-146)**
~~2.9.G.B~~, ~~2.5.G.B~~	~~2.4.G.A~~, ~~2.5.G.B~~, ~~2.5.G.A~~
Lesson Essential Question(s): What information is needed to classify a polygon? (ET) What information is needed to classify a polygon (ET)	**Lesson Essential Question(s):** What is special about the interior and exterior angle sums of any polygon? (A)
Vocabulary: regular, convex, concave, quadrilateral, pentagon, hexagon, octagon, n-gons	**Vocabulary:** Interior Angle Sum, Exterior Angle Sum, Diagonal

Additional Information:
manipulatives, calculators

Attached Document(s):

Vocab Report for Topic: T6 Polygons
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Classification of Polygons (Pg 143-144)

regular -
convex -
concave -
quadrilateral -
pentagon -
hexagon -
octagon -
n-gons -

Concept: Interior and Exterior Angle Sums of Polygons (Pg 145-146)

Interior Angle Sum -
Exterior Angle Sum -
Diagonal -

Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A -- Essential PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.5.G.B -- Important** COMMUNICATION - 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. **2.4.G.B -- Essential** CONNECTIONS - Use statements, converses, inverses, and contrapositives to construct valid arguments or to validate arguments relating to geometric theorems. **2.9.G.A -- Essential** DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations.	Each type of qualdrilateral has its own set of specialized properties.	CC.2.3.HS.A.3 - Verify and apply geometric theorems as they relate to geometric figures. CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects. CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.

Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.5.G.B - COMMUNICATION - 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. 2.4.G.B - CONNECTIONS - Use statements, converses, inverses, and contrapositives to construct valid arguments or to validate arguments relating to geometric theorems. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for		

Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
arguments related to geometric relations.		

Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Each type of quadrilateral has its own set of special properties.**

Unit Essential Question(s):

Which of the quadrilaterals is the most specialized?

Concept:	**Concept:**	**Concept:**
Classification of Quadrilaterals (Pg 288-290) ~~2.5.G.B~~, ~~2.9.G.A~~	**Parallelograms (Pg 294-297)** ~~2.5.G.A~~, ~~2.9.G.A~~	**Special Parallelograms (Rhombi, Rectangles, and Squares) (Pg 312-315)** ~~2.5.G.B~~, ~~2.9.G.A~~
Lesson Essential Question(s): What properties distinguish one quadrilateral from another? (A)	**Lesson Essential Question(s):** What are the properties of parallelograms? (A)	**Lesson Essential Question(s):** What are the properties of the special parallelograms? (A)
Vocabulary: quadrilateral, parallelogram, rectangle, rhombus, square, trapezoid, kite	**Vocabulary:** diagonal, opposite sides, opposite angles, consecutive angles, consecutive sides	**Vocabulary:** square, rhombus, diagonals, rectangle

Concept:	**Concept:**
Trapezoids and other Quadrilaterals (Pg 320-322, 332) ~~2.5.G.B~~, ~~2.9.G.A~~	**Quadrilateral Proofs (Pg 303-306, 314)** ~~2.5.G.A~~, ~~2.4.G.B~~
Lesson Essential Question(s): What are the properties of a trapezoid and kite that make them distinct from parallelograms? (A)	**Lesson Essential Question(s):** How can you use properties to determine what type of quadrilateral it is? (A)
Vocabulary: base, median, base angles, legs, trapezoid, isosceles trapezoid, midsegment	**Vocabulary:**

Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Additional Information:
manipulatives, geo-boards, geometric software

Attached Document(s):

Vocab Report for Topic: T7 Quadrilaterals
Days: 12
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Classification of Quadrilaterals (Pgs. 289-290)

quadrilateral -
parallelogram -
rectangle -
rhombus -
square -
trapezoid -
kite -

Concept: Parallelograms (Pg 294-297)

diagonal -
opposite sides -
opposite angles -
consecutive angles -
consecutive sides -

Concept: Special Parallelograms (Rhombi, Rectangles, and Squares) (Pg 312-315)

square -
rhombus -
diagonals -
rectangle -

Concept: Trapezoids and other Quadrilaterals (Pg 320-322, 332)

base -
median -
base angles -
legs -
trapezoid -
isosceles trapezoid -
midsegment -

Topic: T8 Coordinate Geometry

Days: 12

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B -- Important COMMUNICATION - 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. **2.8.G.B -- Essential** ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry. **2.9.G.C -- Essential** COORDINATE GEOMETRY - Use techniques from coordinate geometry to establish properties of lines, 2-dimensional shapes. **2.9.G.B -- Essential** TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes.	Coordinate geometry provides a framework for connecting geometry to algebra.	CC.2.3.HS.A.7 - Apply trigonometric ratios to solve problems involving right triangles. CC.2.3.HS.A.11 - Apply coordinate geometry to prove simple geometric theorems algebraically. CC.2.3.8.A.3 - Understand and apply the Pythagorean Theorem to solve problems.

Topic: T8 Coordinate Geometry

Days: 12

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.9.G.A -- Essential DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. Midpoints on a Coordinate Plane Distance on a Coordinate Plane Figures in the Coordinate Plane 2.5.G.B - COMMUNICATION - 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. 2.8.G.B - ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry. 2.9.G.C - COORDINATE GEOMETRY - Use techniques from coordinate geometry to		

Topic: T8 Coordinate Geometry
Subject(s): Math

Days: 12
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
establish properties of lines, 2-dimensional shapes. 2.9.G.B - TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations.		

Topic: T8 Coordinate Geometry

Days: 12

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM
Course: Geometry

PENNSYLVANIA
Date: 6/2022

Topic: T8 Coordinate Geometry
Subject(s): Math

Days: 12
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Coordinate geometry provides a framework for connecting geometry to algebra.**

Unit Essential Question(s):
How can you use coordinate geometry to prove that a quadrilateral is a rhombus?

Concept:	Concept:	Concept:
Distance on a Coordinate Plane (Pg. 43)	**Midpoints on a Coordinate Plane (Pgs. 44-45)**	**Proving Figures in the Coordinate Plane (Pgs. 326-329)**
~~2.9.G.C~~, ~~2.5.G.B~~, ~~2.8.G.B~~	~~2.9.G.C~~, ~~2.5.G.B~~, ~~2.8.G.B~~	~~2.9.G.C~~, ~~2.5.G.B~~, ~~2.8.G.B~~, ~~2.9.G.B~~, ~~2.9.G.A~~
Lesson Essential Question(s): How can the distance between two points be found on a coordinate plane? (A)	**Lesson Essential Question(s):** How can the midpoint of a segment be determined on the coordinate plane? (A)	**Lesson Essential Question(s):** What special properties can be used to prove various geometric figures on a coordinate plane? (A)
Vocabulary: x-coordinate, y-coordinate, coordinate plane, distance, length, distance formula	**Vocabulary:** Midpoint Formula	**Vocabulary:** Square, Rhombus, Daigonals, Rectangle

Additional Information:
manipulatives, geometric software, protractor, ruler, calculator, graph paper, geo-board

Attached Document(s):

Vocab Report for Topic: T8 Coordinate Geometry **Days:** 12
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Concept: Distance on a Coordinate Plane (Pg. 43)

x-coordinate-
y-coordinate -
coordinate plane, distance, length, distance formula -

Concept: Midpoints on a Coordinate Plane (Pgs. 44-45)

Midpoint Formula-

Concept: Proving Figures in the Coordinate Plane (Pgs. 326-329)

Square, Rhombus, Diagonals, Rectangle -

Topic: T9 Similarities and Ratios **Days:** 18
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B – Important COMMUNICATION - 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. **2.5.G.A – Essential** PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.1.G.C – Important** CONCEPTS OF NUMBERS AND RELATIONSHIPS - Use ratio and proportion to model relationships between quantities. **2.9.G.B – Essential** TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes.	Similar figures can be used to model real-world applications.	CC.2.3.HS.A.1 - Use geometric figures and their properties to represent transformations in the plane. CC.2.3.HS.A.6 - Verify and apply theorems involving similarity as they relate to plane figures. CC.2.3.HS.A.5 - Create justifications based on transformations to establish similarity of plane figures. CC.2.3.HS.A.2 - Apply rigid transformations to determine and explain congruence. CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.

Topic: T9 Similarities and Ratios **Days:** 18
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.9.G.A -- Essential DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. Problem Solving with Ratios and Proportions Similar Polygons Proofs of Similar Triangles Theorems Involving Proportions Perimeters and Areas of Similar Figures 2.5.G.B - COMMUNICATION - 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. 2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry		

Topic: T9 Similarities and Ratios **Days:** 18
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.1.G.C - CONCEPTS OF NUMBERS AND RELATIONSHIPS - Use ratio and proportion to model relationships between quantities. 2.9.G.B - TRANSFORMATIONS AND SYMMETRY - Use arguments based on transformations to establish congruence or similarity of 2-dimensional shapes. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations.		

Topic: T9 Similarities and Ratios **Days:** 18
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 6/2022

Topic: T9 Similarities and Ratios

Days: 18

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning:

Similar figures can be used to model real-world applications.

Unit Essential Question(s): **How can you use a scale drawing to determine the actual measurements of an object?**

Concept:	Concept:	Concept:
Problem Solving with Ratios & Proportions **Pg 416 - 418** ~~2.5.G.A~~, ~~2.1.G.C~~, ~~2.9.G.A~~	**Similar Polygons** **Pgs 423 - 425** ~~2.5.G.B~~, ~~2.9.G.A~~, ~~G.1.3.1.1~~	**Proving Triangles Similar** **Pgs 432 - 435** ~~2.5.G.B~~, ~~2.9.G.B~~, ~~2.9.G.A~~, ~~G.1.3.1.1~~, ~~G.1.3.2.1~~
Lesson Essential Question(s): How are ratios and proportions used to find missing values? (A)	**Lesson Essential Question(s):** What are the properties of simiilar polygons? (A)	**Lesson Essential Question(s):** What methods can be used to prove triangles are similar? (A)
Vocabulary: ratio, proportion	**Vocabulary:** corresponding angles, corresponding sides, similar, scale factor	**Vocabulary:** AA, SAS, SSS

Concept:	Concept:
Theorems Using Proportions **Pages 446 - 448**	**Perimeters and Areas of Similar Figures** **Pages 454 - 456**
Lesson Essential Question(s): What theorems are used to find proportional relationships formed by parallel segments and angle bisectors? (A)	**Lesson Essential Question(s):** How do we use a similarity ratio to compare perimeters and areas of similar figures? (ET)
Vocabulary:	**Vocabulary:**

Topic: T9 Similarities and Ratios **Days:** 18

Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Additional Information:
manipulatives, calculators, rulers, scale drawings, maps

Attached Document(s):

Vocab Report for Topic: T9 Similarities and Ratios
Days: 18
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept:

Problem Solving with Ratios &Proportions

Pg 416 - 418

ratio -
proportion -

Concept:

Similar Polygons

Pgs 423 - 425

corresponding angles -
corresponding sides -
similar -
scale factor -

Concept:

Proving Triangles Similar

Pgs 432 - 435

AA -
SAS -
SSS -

Topic: Tc10 Right Triangles **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A -- Essential PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.5.G.B -- Important** COMMUNICATION - 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. **2.4.G.A -- Essential** REASONING - Write formal proofs (direct proofs, indirect proofs/ proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. **2.4.G.B -- Essential** CONNECTIONS - Use statements, converses, inverses, and contrapositives to construct valid arguments or to validate arguments relating to geometric theorems.	Right triangles have a broad range of relationships that lead to many applications and uses.	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.7 - Apply trigonometric ratios to solve problems involving right triangles.

Topic: Tc10 Right Triangles **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.9.G.A -- Essential DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. **2.10.G.B – Essential** TRIGONOMETRIC FUNCTIONS - Intentionally Blank **2.10.G.A -- Essential** RIGHT TRIANGLES CONCEPTS AND APPLICATIONS - Identify, create, and solve practical problems involving right triangles using the trigonometric ratios and the Pythagorean Theorem. Review of Radicals Pythagorean Theorem/ Converse Special Right Triangles Trigonometric Ratios Applications of Right Triangles 2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and		

Topic: Tc10 Right Triangles **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
explain how the problem was solved in grade appropriate contexts. 2.5.G.B - COMMUNICATION - 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. 2.4.G.A - REASONING - Write formal proofs (direct proofs, indirect proofs/proofs by contradiction, use of counter-examples, truth tables, etc.) to validate conjectures or arguments. 2.4.G.B - CONNECTIONS - Use statements, converses, inverses, and contrapositives to construct valid arguments or to validate arguments relating to geometric theorems. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for		

Topic: Tc10 Right Triangles **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
arguments related to geometric relations. 2.10.G.B - TRIGONOMETRIC FUNCTIONS - Intentionally Blank 2.10.G.A - RIGHT TRIANGLES CONCEPTS AND APPLICATIONS - Identify, create, and solve practical problems involving right triangles using the trigonometric ratios and the Pythagorean Theorem.		

Topic: Tc10 Right Triangles **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 6/2022

Topic: Tc10 Right Triangles

Days: 15

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Right triangles have a broad range of relationships that lead to many applications and uses.**

Unit Essential Question(s):

What are the special trigonometric relationships and how are they use to solve Real Life Situations/Problems?

Concept:	Concept:	Concept:
Review of Radicals (Radical Packet & pg 355) ~~2.5.G.B~~	**Pythagorean Theorem and its Converse (Pgs. 357-360)** ~~2.5.G.A~~, ~~2.4.G.A~~, ~~2.4.G.B~~, ~~2.9.G.A~~	**Special Right Triangles (Pgs. 366-369)** ~~2.5.G.A~~, ~~2.5.G.B~~, ~~2.9.G.A~~, ~~G.1.2.1.1~~, ~~G.1.2.1.3~~
Lesson Essential Question(s): How do you write a square root in simplest radical form? (A)	**Lesson Essential Question(s):** What can the Pythagorean Theorem tell us about a triangle? (A)	**Lesson Essential Question(s):** How do we determine the ratios of the sides in the two special right triangles? • 45-45-90 • 30-60-90 (A)
Vocabulary: radical, perfect square, square root, principle root	**Vocabulary:** legs, hypotenuse, converse, Pythagorean Theorem	**Vocabulary:** 30-60-90, 45-45-90

Concept:	Concept:
Trigonometric Ratios (Pg. 470-478) ~~2.10.G.B~~, ~~2.5.G.A~~	**Applications of Right Triangles (Pg. 439-441, 482-483)** ~~2.10.G.B~~, ~~2.5.G.A~~
Lesson Essential Question(s): How do we use the trigonometric ratios to solve right triangles? (A)	**Lesson Essential Question(s):** How do you use the trigonometric ratios and similar triangles to solve real-life application problems? (ET)
Vocabulary: sine, cosine, tangent, opposite, adjacent, hypotenuse	**Vocabulary:** Geometric Mean, Angle of Elevation, Angle of Depression

Topic: Tc10 Right Triangles **Days:** 18
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Additional Information:
rulers, manipulatives, calculators

Attached Document(s):

Vocab Report for Topic: Tc10 Right Triangles **Days:** 18
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Concept:

Review of Radicals (Radical Packet & pg 355)

radical -
perfect square -
square root -
principle root -

Concept: Pythagorean Theorem and its Converse (Pgs. 357-360)

legs -
hypotenuse -
converse -
Pythagorean Theorem -

Concept: Special Right Triangles(Pgs. 366-369)

30-60-90 -
45-45-90 -

Concept: Trigonometric Ratios (Pg. 470-478)

sine -
cosine -
tangent -
opposite -
adjacent -
hypotenuse -

Concept: Applications of Right Triangles (Pg. 439-441, 482-483)

Geometric Mean -
Angle of Elevation -
Angle of Depression -

Topic: Tc11 Circles
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.B -- Important COMMUNICATION - 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. **2.9.G.A -- Essential** DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. **2.8.G.B -- Essential** ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry. Terms Related to Circles Central and Inscribed Angles Properties of Arcs and Chords Properties of Tangents and Secants	Many relationships exist between a circle and its segments.	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.13 - Analyze relationships between two-dimensional and three-dimensional objects. CC.2.3.8.A.3 - Understand and apply the Pythagorean Theorem to solve problems. CC.2.3.8.A.2 - Understand and apply congruence, similarity, and geometric transformations using various tools.

Topic: Tc11 Circles
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
Segment Lengths of Intersecting Chords 2.5.G.B - COMMUNICATION - 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. 2.9.G.A - DEFINITIONS, PROPERTIES AND RELATIONS - Identify and use properties and relations of geometric figures; create justifications for arguments related to geometric relations. 2.8.G.B - ALGEBRAIC MANIPULATIONS - Use algebraic representations to solve problems using coordinate geometry.		

Topic: Tc11 Circles
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry- Pending Board Approval

Date: February 27, 2014 ET

Topic: Tc11 Circles

Days: 15

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Many relationships exist between a circle and its segments.**

Unit Essential Question(s): **What are the relationships between lines, segments, angles and circles?**

Concept: **Tangent Lines (Pgs.582-585)** 2.5.G.B	Concept: **Properties of Arcs &Chords (Pgs. 386-389, 590- 593)** 2.9.G.A, 2.8.G.B	Concept: **Circle Angle Types (Pgs.598-601, 607-608)** 2.5.G.B, 2.9.G.A, 2.8.G.B
Lesson Essential Question(s): How is the tangent of a circle related to the circle's radius at the point of tangency? (A)	Lesson Essential Question(s): What are the different properties of chords and arcs inside a circle and how are they related? (A)	Lesson Essential Question(s): How do I use the measures of intercepted arcs to find the measure of angles inside and outside of circles? (A)
Vocabulary: radius, diameter, chord, tangent, point of tangency, inscribed, circumscribed	Vocabulary: arc length, arc measure, minor arc, major arc, semicircle, chord	Vocabulary: insribed angle, central angle, intercepted arc, secant

Concept: **Segment Lengths (Pg. 609)** 2.8.G.B

Lesson Essential Question(s): How do you find the various lengths of segments found in a circle between chords, tangents, and secants? (A)

Vocabulary: intersection

Additional Information: manipulatives, geometric software, protractor, ruler, calculator

Attached Document(s):

Vocab Report for Topic: Tc11 Circles Days: 15
Subject(s): Math Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Tangent Lines (Pgs.582-585)

radius -
diameter -
chord -
tangent -
point of tangency, inscribed, circumscribed -

Concept: Properties of Arcs &Chords (Pgs. 386-389, 590- 593)

arc length -
arc measure -
minor arc -
major arc -
semicircle -
chord -

Concept: Circle Angle Types (Pgs.598-601, 607-608)

insribed angle, central angle, intercepted arc, secant -

Concept:

Segment Lengths (Pg. 609)

intersection -

Topic: Tc12 Area **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A -- Essential PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.5.G.B -- Important** COMMUNICATION - 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. **2.7.G.A -- Essential** CALCULATION OF PROBABILITIES - Use geometric figures and the concept of area to calculate probability. Perimeter Area of Triangles Area of Quadrilaterals Areas of Other Polygons Areas of Circles and Sectors	Area of geometric figures are determined by properties of the figures.	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.13 - Analyze relationships between two-dimensional and three-dimensional objects.

Topic: Tc12 Area **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A - PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.5.G.B - COMMUNICATION - 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. 2.7.G.A - CALCULATION OF PROBABILITIES - Use geometric figures and the concept of area to calculate probability.		

Topic: Tc12 Area **Days:** 15
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 6/2022

Topic: Tc12 Area

Days: 15

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **Area of geometric figures are determined by properties of the figures.**

Unit Essential Question(s): **How is the area of a triangle used to derive the area formulas of other polygons?**

Concept: **Perimeter (Pg 51 - 53)** 2.5.G.A, 2.5.G.B	Concept: **Area of Triangles (Pg 350-351)** 2.5.G.A	Concept: **Area of Quadrilaterals (Pg 348-349)** 2.5.G.A
Lesson Essential Question(s): What is perimeter and how is it determined for different geometric figures? (A)	Lesson Essential Question(s): What facts are needed to find the area of a triangle? (A)	Lesson Essential Question(s): In which quadrilaterals can triangles be used to determine a specific area formula? (ET)
Vocabulary: perimeter, circumference	Vocabulary: altitude, base, height	Vocabulary: diagonal

Concept: **Area of Other Polygons (Pg 373 -375, 380)** 2.5.G.A	Concept: **Area of Circles & Sectors (Pg. 396-397)** 2.5.G.A	Concept: **Geometric Probability (Pg 402 - 404)** 2.7.G.A, 2.5.G.B
Lesson Essential Question(s): What is a regular polygon and how do we find its area? (A) How can the area of any polygon be determined? (ET)	Lesson Essential Question(s): How is the area of a circle determined? (ET) What is the relationship between the area of a circle and a sector of that circle? (A)	Lesson Essential Question(s): How can I use segment length and area to model probabilies of events (ET)
Vocabulary: apothem, regular polygon	Vocabulary: sector	Vocabulary: geometric probability

Additional Information:

manipulatives, calculator

Attached Document(s):

Vocab Report for Topic: Tc12 Area
Days: 15
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Concept: Perimeter (Pg 51-53)

perimeter -
circumference -

Concept: Area of Triangles (Pg 350-351)

altitude -
base -
height -

Concept: Area of Quadrilaterals (Pg 348-349)

diagonal -

Concept: Area of Other Polygons (Pg 373 -375, 380)

apothem -
regular polygon -

Concept: Area of Circles & Sectors Pg 396-397)

sector -

Concept: Geometric Probability (Pg 402 - 404)

geometric probability - a model in which you let points or areas represent outcomes.

Topic: Tc13 Surface Area and Volume
Days: 10
Subject(s): Math
Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
2.5.G.A – Essential PROBLEM SOLVING - Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. **2.5.G.B – Important** COMMUNICATION - 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. Surface Nets and Polyhedrons Surface Area and Volume of Prisms and Cylinders Surface Area and Volume of Pyramids and Cones Surface Area and Volume of a Sphere Ratios of Area and Volume 2.5.G.A - PROBLEM SOLVING - Develop a	The surface area and volume of solids are determined by their properties.	CC.2.3.HS.A.13 - Analyze relationships between two-dimensional and three-dimensional objects. 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 volume of cylinders, cones, and spheres to solve realworld 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.

Topic: Tc13 Surface Area and Volume **Days:** 10
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Know:	Understand:	Do:
plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts. 2.5.G.B - COMMUNICATION - 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.		

Topic: Tc13 Surface Area and Volume **Days:** 10
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Common Assessments on what students should know and do in this unit:

Curriculum: CCSD CURRICULUM

PENNSYLVANIA

Course: Geometry

Date: 6/2022

Topic: Tc13 Surface Area and Volume

Days: 10

Subject(s): Math

Grade(s): 7th, 8th, 9th, 10th, 11th, 12th

Key Learning: **The surface area and volume of solids are determined by their properties.**

Unit Essential Question(s): **What area formulas can be used to derive surface areas and volumes of solids?**

Concept: **Ratios of Area & Volume (Pg 566-568)** 2.5.G.A	**Concept:** **Surface Nets & Polyhedra (Pg. 512-513)** 2.5.G.B	**Concept:** **Surface Area and Volume of Prisms & Cylinders** **Pg 528-531 (surface area)** **Pg. 544-547 (volume)** 2.5.G.A
Lesson Essential Question(s): How can you determine the algebraic relationships between perimeters, areas, and volumes of similar solids? (A)	**Lesson Essential Question(s):** How can you derive the formulas for a pyramid and a cone? (A)	**Lesson Essential Question(s):** What is the difference between a prism and a pyramid; a cone and a cylinder? (A)
Vocabulary:	**Vocabulary:** cube, edges, base, vertices, face, polyhedron, net	**Vocabulary:** lateral area, surface area, volume, Prism, Cylinder

Topic: Tc13 Surface Area and Volume **Days:** 10
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Concept:	**Concept:**
Surface Area and Volume of Pyramids & Cones **Pg 537- 540 (surface area)** **Pg 551-554 (volume)** 2.5.G.A	**Surface Area &Volume of a Sphere** **(Pg 558 - 560)** 2.5.G.A
Lesson Essential Question(s): How is the base of a prism or cylinder used to determine its surface area and volume? (A)	**Lesson Essential Question(s):** What information is needed to find the surface area and volume of a sphere? (A)
Vocabulary: slant height, Pyramid, Cone	**Vocabulary:** Sphere

Additional Information:
manipulatives, geometric software, protractor, ruler, calculator

Attached Document(s):

Vocab Report for Topic: Tc13 Surface Area and Volume **Days:** 10
Subject(s): Math **Grade(s):** 7th, 8th, 9th, 10th, 11th, 12th

Concept: Surface Nets & Polyhedra (Pg. 512-513)

cube -
edges -
base -
vertices -
face -
polyhedron -
net -

Concept:

Surface Area and Volume of Prisms & Cylinders

Pg 528-531 (surface area)

Pg. 544-547 (volume)
lateral area -
surface area -
volume -
Prism -
Cylinder -

Concept:

Surface Area and Volume of Pyramids & Cones

Pg 537- 540 (surface area)

Pg 551-554 (volume)
slant height -
Pyramid -
Cone -

Concept:

Surface Area &Volume of a Sphere

(Pg 558 - 560)

Sphere -