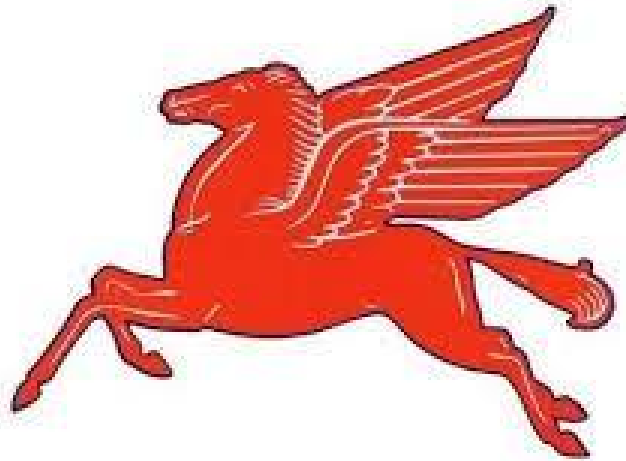# Curriculum Management System

PAULSBORO PUBLIC SCHOOLS

GEOMETRY Grade 9 - 12

MAY 2022

For adoption by all regular education programs
as specified and for adoption or adaptation by all

Special Education Programs in accordance with Board of Education Policy.

Table of Contents

Paulsboro Public Schools

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Mr. Robert Davis

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Mr. Paul Morina, Principal, grades 7-12

Paulsboro Public Schools

Mission Statement

The mission of the Paulsboro School District is to work with students, parents, educators, and community to develop excellence in education while preparing each student to be viable and productive citizens in society. Our goal is to develop the unique potential of the whole student by creating a challenging and diverse learning climate that prepares students for the 21st Century and is rich in tradition and pride.

GEOMETRY PACING CHART (2022-23)

BIG IDEA	# OF DAYS	Approx. DATES	COMMENTS
1 - Part 1 – Introduction to Geometry and Foundations of Geometry	12 10 plus 2 extra	9-7 through 9-24	2 days intro to foundational terms, symbols, drawing, labeling, reading diagrams 2 days for each of 3 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
1 – Part 2 – Reasoning and Proof	14 12 plus 2 extra	9-25 through 10-13	2 days for each of 5 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
2 – Parallel and Perpendicular Lines	12 10 plus 2 extra	10-14 through 10-31	2 days for each of 4 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
3 - Transformations	14 12 plus 2 extra	11-1 through 11-22	2 days for each of 5 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
4 - Triangle Congruence	16 14 plus 2 extra	11-28 through 12-19	2 days for each of 6 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
5 – Relationships in Triangles	14 12 plus 2 extra	12-20 through 1-18	2 days for each of 5 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
6 – Quadrilaterals and Other Polygons	16 14 plus 2 extra	1-19 through 2-9	2 days for each of 6 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
7 - Similarity	14	2-10	2 days for each of 5 lessons, 1 review day, 1 assessment day,

	12 plus 2 extra	through 3-2	2 re-teach or enrichment days
8 – Right Triangles and Trig	14 12 plus 2 extra	3-3 through 3-22	2 days for each of 5 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
9 – Coordinate Geometry	12 10 plus 2 extra	3-23 through 4-6	2 days for each of 4 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
10 - Circles	14 12 plus 2 extra	4-12 through 4-28	2 days for each of 5 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
11 – 2 and 3 Dimensional Models	12 10 plus 2 extra	5-1 through 5-16	2 days for each of 4 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days
12 - Probability	16 14 plus 2 extra	5-17 through 6-8	2 days for each of 6 lessons, 1 review day, 1 assessment day, 2 re-teach or enrichment days

Unit 1 (or MP 1)
Big Idea 1 – Part 1: Foundations of Geometry

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts
HSG.CO.A.1 HSG.CO.D.12 HSG.GPE.B.6 **Standards for Mathematical Practice:** MP.1, MP.2, MP.5, MP.7 **Cross Curricular Standards:**	**Lesson 1** - undefined terms, defined terms, distance on a line, segment length, angle measure, congruent segments, congruent angles, segment addition, angle addition **Lesson 2 –** copy a segment, copy and angle, construct a perpendicular bisector, construct an angle bisector **Lesson 3 –** find midpoint of a segment, find distance between points as length of a segment

	Students are able to:	Learning Goals as Essential Questions:
Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2 **MODIFICATIONS:** *Advanced Learner:* STEM project Enrichment Suggestions per topic (enVision Geometry text or SavvasRealize.com) *Students with Disabilities (or struggling):* Reteach for Understanding Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com) *English Language Learners:* Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)	- Know definitions of lesson vocabulary - Draw, name, label, and identify geometric figures in a diagram - Use ruler, protractor, and properties of segments and angles to find their measures - Perform basic constructions - Use midpoint and distance formulas in the coordinate plane to solve problems	-What information can be learned from 2d and 3d diagrams about relationships of points, lines, and planes? -How are the properties of segments and angles used to determine their measure? -How can a straight edge and compass be used to make basic constructions? -How are the midpoint and length of a segment on the coordinate plane determined?
	Formative/Summative Assessments *DIAGNOSTIC: Readiness Assessment* *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	**Primary & Supplementary Resources** enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 1 (or MP 1)
Big Idea 1 - Part 2: Geometric Reasoning and Proof

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts

HSG.CO.C.9
HSG.CO.C.10
HSG.CO.C.11
HSG-CO.C.9

Standards for Mathematical Practice:
MP.1, MP.2, MP.3, MP.4, MP.6, MP.7, MP.8

Cross Curricular Standards:
Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3)
Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7
CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4)
CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2

MODIFICATIONS:
Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

Students with Disabilities (or struggling):
Reteach for Understanding
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

Lesson 1 – use inductive reasoning to extend a pattern OR make a conjecture, use a conjecture to make a prediction, find a counterexample to show a conjecture is false, test a conjecture
Lesson 2 – write and evaluate truth of conditional statement, converse, inverse, contrapositive, biconditional
Lesson 3 – use deductive reasoning to prove for the general case, Law of Detachment, Law of Syllogism
Lesson 4 – writing or completing proofs in different formats (two-column, paragraph, flow), vertical angles theorem, congruent complements theorem, congruent supplements theorem, right angles theorem, linear pair theorem
Lesson 5 – steps of indirect proof: assuming a conclusion is false, showing how it leads to a logical impossibility, results in a contradiction, and therefore proves the original conclusion must be true

Students are able to:	Learning Goals as Essential Questions:
- Use inductive reasoning to make conjectures about mathematical relationships - Write conditional statements, their converse, inverse, contrapositive, biconditional and determine their truth-values - Use deductive reasoning to draw conclusions - Use deductive reasoning to prove theorems - Use indirect reasoning to write proof by contradiction when direct reasoning seems difficult	- How is inductive reasoning used to recognize mathematical relationships? - How do "IF, THEN" statements describe mathematical relationships? - How is deductive reasoning different from inductive reasoning? - How is deductive reasoning used to prove a theorem? - What can you conclude when valid reasoning leads to a contradiction?
Formative/Summative Assessments	**Primary & Supplementary Resources**

DIAGNOSTIC: Readiness Assessment
FORMATIVE: Daily Warm-up/Exit Ticket,
Practice and Problem Solving
SUMMATIVE:
Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment

enVision Geometry 2018 (print textbook)
Savvas Realize Reader (online textbook)
Realize Reader (savvasrealize.com)

Linkit NJSLS BM Geometry Form A,B,C

UNIT 1 (or MP1)
Big Idea 2: Parallel and Perpendicular Lines

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts
HSG.CO.A.1 HSG.CO.C.9 HSG.CO.C.10 HSG.MG.A.1 HSG.MG.A.3 HSG.GPE.B.5 **Standards for Mathematical Practice:** MP.1, MP.2, MP.3, MP.4, MP. 7, MP.8 **Cross Curricular Standards:** Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2	**Lesson 1 –** identify transversal angle pairs, prove transversal angle pairs are congruent or supplementary when lines are parallel, corresponding angles theorem, alternate interior angles theorem, alternate exterior angles theorem, same side interior angles theorem **Lesson 2 –** prove lines are parallel when transversal angle pairs are congruent or supplementary (corresponding angles converse, alternate interior angles converse, alternate exterior angles converse, same side interior angles converse), transitivity of parallel lines, lines perpendicular to same line are parallel **Lesson 3 –** triangle angle sum theorem, triangle exterior angle theorem, only one parallel line theorem, only one perpendicular line theorem **Lesson 4 –** parallel lines have equal slopes, vertical lines are parallel, perpendicular lines have opposite reciprocal slopes, graphing and writing equations of parallel and perpendicular lines

Students are able to:	Learning Goals as Essential Questions:

MODIFICATIONS:

Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

Students with Disabilities (or struggling):
Reteach for Understanding
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

English Language Learners:
Speaking, Reading, Writing suggestions
per topic
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
(enVision Geometry text or
SavvasRealize.com)

- Determine the types of angles created when lines are intersected by a transversal AND determine the measures of the angles created when parallel lines are intersected by a transversal
- Use transversal angle relationships to determine if lines are parallel
- Solve problems using the measures of the interior and exterior angles of a triangle
- Use slope to solve problems about parallel and perpendicular lines

- What angle relationships are created when parallel lines are intersected by a transversal?
- What angle relationships can be used to prove two lines are parallel when intersected by a transversal?
- What is true about the interior and exterior angle measures of a triangle?
- How do the slopes of parallel lines compare? How do the slopes of perpendicular lines compare?

Formative/Summative Assessments	Primary & Supplementary Resources
DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 2 (or MP 2)
Big Idea 3: Transformations

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts:
HSG.CO.A.2 HSG.CO.A.3 HSG.CO.A.4 HSG.CO.A.5	**Lesson 1 –** reflection across a line of reflection (an axis or any line in the coordinate **plane)** **Lesson 2 -** composition of rigid motions, translation in the coordinate plane

HSG.CO.B.6
Standards for Mathematical Practice:
MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7

Cross Curricular Standards:
Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3)
Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7
CT & PS – 9.4.12.(CT.1-2), (IML..5), (TL.4)
CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2

MODIFICATIONS:
Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or SavvasRealize.com)
Students with Disabilities (or struggling):
Reteach for Understanding
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
Suggestions per topic
(enVision Geometry text or SavvasRealize.com)
English Language Learners:
Speaking, Reading, Writing suggestions per topic
Mathematical Literacy and Vocabulary
Additional Practice

Lesson 3 - rotation in the coordinate plane, also rotation as a composition of reflections
Lesson 4 - identify rigid motions as congruence transformations, glide reflection, a composition of rigid motions is a rigid motion, any rigid motion can be a composition of reflections
Lesson 5 - identify transformations for symmetry, identify lines of symmetry and rotational symmetry

Students are able to:	Learning Goals as Essential Questions:
- Draw and describe a reflection of a figure across a line of reflection - Draw and describe a translation of a figure in the coordinate plane - Draw and describe the rotation of a figure about a point for a given angle of rotation in the coordinate plan - Identify rigid motions used to transform 2 dimensional shapes -Identify different types of symmetry in 2 dimensional figures	- How are the properties of reflection used to transform a figure? - What are the properties of a translation? - What are the properties that identify a rotation? -How can rigid motions be classified? -How can you tell whether a figure is symmetric?

Formative/Summative Assessments	Primary & Supplementary Resources
DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

Virtual Nerd Tutorial
(enVision Geometry text or
SavvasRealize.com)

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UNIT 2 (or MP 2)
Big Idea 4: Triangle Congruence

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Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts:
HSG.CO.A.5 HSG.CO.B.6 HSG.CO.B.7 HSG.CO.B.8 HSG.CO.C.10 HSG.SRT.B.5 **Standards for Mathematical Practice:** MP.1, MP.2, MP. 3, MP.5, MP.6, MP.7, MP.8 **Cross Curricular Standards:** Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2 **MODIFICATIONS:** *Advanced Learner:* STEM project Enrichment Suggestions per topic (enVision Geometry text or SavvasRealize.com)	**Lesson 1 –** understand congruence, identify congruent figures, determine and apply congruence, write congruence statements **Lesson 2 –** apply properties of isosceles triangles and equilateral triangles to find unknown angle measure and side length **Lesson 3 –** determine triangle congruence by Side-Side-Side or Side-Angle-Side, determine corresponding parts of congruent triangles are congruent **Lesson 4 -** determine triangle congruence by Angle-Side-Angle or Angle-Angle-Side **Lesson 5 –** determine right triangle congruence by HL **Lesson 6 –** determine congruence for overlapping triangles

Students are able to:	Learning Goals as Essential Questions:
- Use a composition of rigid motions to show two objects are congruent - Apply theorems about isosceles and equilateral triangles to solve problems - Use SSS and SAS to determine whether triangles are congruent - Use ASA and AAS to determine whether triangles are congruent - Use HL to determine right triangles are congruent - Use properties of parallel lines, reflexivity, and corresponding	-What is the relationship between rigid motion and congruence? - How are the side lengths and angle measures related in isosceles and equilateral triangles? - How are SSS and SAS used to prove triangles are congruent? - How are ASA and AAS used to prove triangles are congruent? - What minimum criteria are needed to determine right triangles are congruent?

	angles to show overlapping triangles are congruent	- Which theorems can be used to show overlapping triangles are congruent?
 Reteach for Understanding Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com) *English Language Learners:* Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)	**Formative/Summative Assessments** *DIAGNOSTIC: Readiness Assessment* *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	**Primary & Supplementary Resources** enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 2 (or MP 2)
Big Idea 5: Segment Relationships in Triangles

Standards for Mathematical Content:	**Critical Knowledge and Skills as Concepts:**
HSG.CO.C.9 HSG.CO.C.10 HSG.C.A.3 HSG.SRT.B.5 **Standards for Mathematical Practice:** MP.1, MP.2, MP.3, MP.4, MP.7 **Cross Curricular Standards:** Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4)	**Lesson 1 –** perpendicular bisector theorem and its converse, angle bisector theorem and its converse, equidistant points **Lesson 2 –** concurrency of perpendicular bisectors, circumcenter, circumscribed triangle, concurrency of angle bisectors, incenter, inscribed triangle **Lesson 3 –** concurrency of triangle medians, centroid as the center of mass of a triangle, concurrency of altitudes of a triangle, orthocenter **Lesson 4 –** the largest angle of a triangle theorem and its converse, triangle inequality theorem, the longest side of a triangle theorem and its converse **Lesson 5 –** the hinge theorem and its converse
	Students are able to: / **Learning Goal as Essential Questions:**

CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2

MODIFICATIONS:
Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)
Students with Disabilities (or struggling):
Reteach for Understanding
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)
English Language Learners:
Speaking, Reading, Writing suggestions per topic
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
(enVision Geometry text or
SavvasRealize.com)

- Use properties of perpendicular and angle bisectors to solve problems
- Use triangle bisectors and centers to solve problems
- Use properties of triangle medians and triangle altitudes and their concurrencies to solve problems
- Use theorems to compare the sides and angles of a triangle
- Compare a pair of third sides of two triangles when the other two sides and included angles are congruent

- What is the relationship between a segment and its perpendicular bisector AND between an angle and its bisector?
- What are the properties of perpendicular bisectors and angle bisectors in triangles?
- What are the properties of medians and altitudes of a triangle?
- What are the relationships between the sides and angles of any triangle?
- What is the relationship between two triangles' third sides when the other two sides and included angles are congruent?

Formative/Summative Assessments	**Primary & Supplementary Resources**
DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 2 (or MP 2)
Big Idea 6: Quadrilaterals and Other Polygons

Standards for Mathematical Content:
HSG.SRT.B.5
HSG.CO.C.11

Standards for Mathematical Practice:
MP.1, MP.3, MP.4, MP.5, MP.6, MP.7

Cross Curricular Standards:
Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3)
Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7
CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4)
CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2

MODIFICATIONS:
Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

Students with Disabilities (or struggling):
Reteach for Understanding
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

English Language Learners:

Critical Knowledge and Skills as Concepts:

Lesson 1 – polygon interior angle sum theorem, polygon exterior angle sum theorem

Lesson 2 – diagonals of a kite are perpendicular, isosceles trapezoid properties, diagonals of an isosceles trapezoid are congruent, trapezoid midsegment theorem

Lesson 3 – opposite sides of a parallelogram are congruent, a parallelogram has supplementary consecutive angles and congruent opposite angles, a parallelogram has diagonals that bisect each other

Lesson 4 – quadrilaterals that are parallelograms have: two pairs of congruent opposite sides, angles that are supplementary to both of their consecutive angles, two pairs of congruent opposite angles, two pairs of congruent parallel sides

Lesson 5 - a rhombus has diagonals that are perpendicular bisectors of each other and bisect a pair of opposite angles, a rectangle and a square have congruent diagonals

Lesson 6 – rhombi have perpendicular diagonals, rhombi have diagonals that bisect opposite angles, rectangles have congruent diagonals

Students are able to:	Learning Goals as Essential Questions:
- Find the sum of the measures of a polygon's interior and exterior angles - Use triangle congruence to understand kites and trapezoids - Use the properties of parallel lines, diagonals, and triangles to investigate parallelograms - Use properties of sides, angles, and diagonals to identify a parallelogram	- How does the number of sides of a convex polygon relate to sums of the measures of its interior and exterior angles? - How are diagonals and angle measures related in kites and trapezoids? - What are the relationships of the sides, angles, and diagonals of a parallelogram? - Which properties determine a quadrilateral is a parallelogram?

Speaking, Reading, Writing suggestions per topic
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
(enVision Geometry text or SavvasRealize.com)

- Use properties of rhombuses, rectangles, and squares to solve problems
- Identify rhombuses, rectangles, and squares by the characteristics of their diagonals

- What properties of rhombuses, rectangles, and squares differentiate them from other parallelograms?
- Which properties of diagonals of parallelograms help you classify them?

Formative/Summative Assessments	Primary & Supplementary Resources
DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 3 (or MP 3)
Big Idea 7: Similarity

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts:
HSG.C.A.1 HSG.CO.A.2 HSG.CO.A.5 HSG.CO.C.10 HSG.SRT.B.4 HSG.SRT.B.5 HSG.SRT.A.3 **Standards for Mathematical Practice:**	**Lesson 1 –** perform dilations figures, analyze dilations, determine the scale factor of dilation, dilate from center at origin or not at origin, use dilation to find length and area **Lesson 2 –** describe and graph a composition of a rigid motion and dilation, find similarity transformations, determine similarity **Lesson 3 –** use AA triangle similarity theorem, use SSS triangle similarity theorem, use SAS triangle similarity theorem, find length and solve problems using triangle similarity theorems **Lesson 4 –** identify similar triangles formed by an altitude, find missing lengths within right triangles, relate altitude to geometric

MP.1, MP.2, MP.3, MP.4, MP.5, MP.7, MP.8

Cross Curricular Standards:
Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3)
Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7
CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4)
CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2

MODIFICATIONS:
Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or SavvasRealize.com)

Students with Disabilities (or struggling):
Reteach for Understanding
Mathematical Literacy and Vocabulary
Additional Practice
Virtual Nerd Tutorial
Suggestions per topic
(enVision Geometry text or SavvasRealize.com)

English Language Learners:
Speaking, Reading, Writing suggestions per topic
Mathematical Literacy and Vocabulary
Additional Practice

mean, relate side lengths to geometric mean, apply geometric mean theorems to find distance and solve problems
Lesson 5 – find segment length using triangle side splitter theorem and its corollary, triangle midsegment theorem, triangle angle bisector theorem

Students are able to:	Learning Goals as Essential Questions:
- Dilate figures and identify characteristics of dilations - Determine whether figures are similar - Use dilation and rigid motion to establish triangle similarity theorems - Use similarity and the geometric mean to solve problems involving right triangles - Find the lengths of segments using proportional relationships in triangles resulting from parallel lines	- How does dilation affect the side lengths and angle measures of a figure? - What is the relationship between a preimage and an image resulting from a similarity transformation? - How can the angles and sides of two triangles be used to determine their similarity? - In a right triangle, what is the relationship between the altitude to the hypotenuse, triangle similarity, and the geometric mean? - When parallel lines intersect two transversals, what are the relationships between the lengths of the segments formed?
Formative/Summative Assessments	**Primary & Supplementary Resources**
DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook)

Virtual Nerd Tutorial
(enVision Geometry text or
SavvasRealize.com)

*Topic Assessment, Performance
Assessment, Benchmark Assessment,
Mid-Course Assessment, End of Course
Assessment*

Realize Reader
(savvasrealize.com)

Linkit NJSLS BM Geometry
Form A,B,C

UNIT 3 (or MP 3)
Big Idea 8: Right Triangles and Trigonometry

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts:
HSG.SRT.B.4 HSG.SRT.C.6 HSG.SRT.C.7 HSG.SRT.C.8 HSG.SRT.D.9 HSG.SRT.D.10 HSG.SRT.D.11	**Lesson 1 –** use the Pythagorean Theorem and its converse to find side length or classify triangles, use properties of special right triangles 45-45-90 and 30-60-90 to find side length **Lesson 2 –** analyze and write trigonometric ratios, use tangent, sine, and cosine to find side length, use inverse trig ratios to find angle measure **Lesson 3 –** use law of sines to find side length and angle measure **Lesson 4 -** use law of cosines to find side length and angle measure **Lesson 5 –** analyze angle of elevation and angle of depression, use trigonometric ratios to solve real world problems such as height of a tower, length of a wire

Standards for Mathematical Practice:
MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7

Cross Curricular Standards:
Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3)
Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7
CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4)
CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2

MODIFICATIONS:
Advanced Learner:
STEM project
Enrichment
Suggestions per topic
(enVision Geometry text or
SavvasRealize.com)

Students are able to:	Learning Goals as Essential Questions:
- Prove the Pythagorean Theorem using similarity and establish the relationships in special right triangles - Use trigonometric ratios to find side lengths and angle measures of right triangles - Use the law of sines to find unknown measures in acute or obtuse triangles	- How are similarity in right triangles and the Pythagorean Theorem related? - How do trigonometric ratios relate angle measures to side lengths of right triangles? - How can the law of sines be used to find side length and angle measure?

Reteach for Understanding Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com) *English Language Learners:* Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)	- Use the law of cosines to find unknown measures in acute or obtuse triangles - Use trigonometry to solve real world problems	- How can the law of cosines be used to find side length and angle measure? - How can trigonometry be used to solve real world mathematical problems?

Formative/Summative Assessments	**Primary & Supplementary Resources**
DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 3 (or MP 3)
Big Idea 9: Coordinate Geometry

Standards for Mathematical Content:	**Critical Knowledge and Skills as Concepts:**
HSG.GPE.B.4 HSG.GPE.B.7 HSG.CO.C.10 HSG.CO.A.1 HSG.GPE.A.1 HSG.GPE.A.2 **Standards for Mathematical Practice:** MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8 **Cross Curricular Standards:**	Lesson 1 – connect algebra and geometry through coordinates, classify a triangle and quadrilateral in the coordinate plane, find perimeter and area of a figure in the coordinate plane Lesson 2 – plan and write a coordinate proof, use coordinate proofs to solve problems Lesson 3 – derive and write the equation of a circle, determine if a point is on a circle, graph a circle from its equation, use the equation and graph of a circle to solve problems Lesson 4 – explore the graph of a parabola, derive and write the equation of a parabola, apply the equation of a parabola

Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2 **MODIFICATIONS:** *Advanced Learner:* STEM project Enrichment Suggestions per topic (enVision Geometry text or SavvasRealize.com) *Students with Disabilities (or struggling):* Reteach for Understanding Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com) *English Language Learners:* Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)	**Students are able to:**	**Learning Goals as Essential Questions:**
	- Use the coordinate plane to analyze geometric figures - Prove geometric theorems using algebra in the coordinate plane - Use the equations and graphs of circles to solve problems - Use the equations and graphs of parabolas to solve problems	- How are properties of geometric figures represented in the coordinate plane? - How can geometric relationships be proven algebraically in the coordinate plane? - How is the equation of a circle determined in the coordinate plane? - How does the geometric description of a parabola relate to its equation?
	Formative/Summative Assessments	**Primary & Supplementary Resources**
	DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 4 (or MP 4)
Big Idea 10: Circles

Standards for Mathematical Content:	Critical Knowledge and Skills as Concepts:	
HSG.CO.A.1 HSG.CO.D.13 HSG.C.B.2 HSG.C.B.5 HSG.C.A.2 HSG.C.A.4(+) **Standards for Mathematical Practice:** MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7 **Cross Curricular Standards:** Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2	Lesson 1 – relate central angles to arc measures, relate arc length to circumference, relate sector area to circle area, solve problems, involving circles Lesson 2 – construct and understand lines tangent to a circle, use tangent line perpendicular to a radius theorem and congruent tangent segments from common external point theorem Lesson 3 – congruent chords (in congruent circles or same circles) will create congruent central angles and congruent intercepted arcs, chords equidistant to the center of a circle are congruent, a diameter perpendicular to a chord bisects the chord, construct a regular hexagon in a circle Lesson 4 – an inscribed angle is half the measure of its intercepted arc theorem, two inscribed angles intercepting the same arc are congruent corollary Lesson 5 – intersecting secant line angle measure theorem, intersecting tangent line angle measure theorem, intersecting chord segment length theorem, use segment relationships in circles to solve problems	
	Students are able to:	**Learning Goals as Essential Questions:**
MODIFICATIONS: *Advanced Learner:* STEM project Enrichment Suggestions per topic (enVision Geometry text or SavvasRealize.com) *Students with Disabilities (or struggling):* Reteach for Understanding Mathematical Literacy and Vocabulary Additional Practice	- Find arc length and sector area of a circle to solve problems - Use properties of tangent lines to solve problems - Relate the length of a chord to its central angle and the arc it intercepts - Use the relationships between angles and arcs in circles to find their measures - Use angle measures and segment lengths formed by intersecting lines and circles to solve problems	- How are arc length and sector area related to circumference and area of a circle? - How is a tangent line related to a radius of a circle at its point of tangency? - How are chords related to their central angles and intercepted arcs? - How is the measure of an inscribed angle related to its intercepted arc?

		- How are the measures of angles, arcs, and segments made by intersecting secant lines related?
English Language Learners: Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)	**Formative/Summative Assessments**	**Primary & Supplementary Resources**
	DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

Note: "Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com)" appears at the top left of the table above the English Language Learners section.

UNIT 4 (or MP 4)
Big Idea 11: 2 and 3 Dimensional Models

Standards for Mathematical Content:	**Critical Knowledge and Skills as Concepts:**	
HSG.GMD.B.4 HSG.GMD.A.1 HSG.GMD.A.2 HSG.GMD.A.2(+) HSG.GMD.A.3 HSG.MG.A.1 HSG.MG.A.2 **Standards for Mathematical Practice:** MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7 **Cross Curricular Standards:**	Lesson 1 – develop and apply Euler's formula for polyhedra (F+V=E+2), describe and draw a cross-section of a polyhedron, rotate a polygon to form a three-dimensional figure Lesson 2 – develop and apply Cavalieri's principle of prism volume, find volumes of prisms and cylinders and use it to solve problems, determine whether volume or surface area best describes size Lesson 3 – apply Cavalieri's principle of volume to pyramids and cones, find volume of pyramids and cones to solve problems, find the volume of composite figures Lesson 4 – explore and find volume of a sphere, apply volume of a sphere to solve problems, find volume of composite figures	
	Students are able to:	**Learning Goals as Essential Questions:**

Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2 **MODIFICATIONS:** *Advanced Learner:* STEM project Enrichment Suggestions per topic (enVision Geometry text or SavvasRealize.com)	- Identify three dimensional figures and their relationships with polygons to solve problems - Use the properties of prisms and cylinders to calculate their volumes - Use the volumes of right and oblique pyramids and cones to solve problems - Calculate the volume of a sphere and solve problems involving the volumes of spheres	- How are three dimensional figures and polygons related? - How does the volume of a prism or cylinder relate to a cross section parallel to its base? -How are the formulas for volume of a pyramid and volume of a cone alike? - How does the volume of a sphere relate to the volumes of other solids?
Students with Disabilities (or struggling): Reteach for Understanding Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com) *English Language Learners:* Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)	**Formative/Summative Assessments**	**Primary & Supplementary Resources**
	DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C

UNIT 4 (or MP 4) Big Idea 12: Probability

Standards for Mathematical Content:	**Critical Knowledge and Skills as Concepts:**

HSS.CP.A.1 HSS.CP.A.2 HSS.CP.A.3 HSS.CP.A.5 HSS.CP.B.6 HSS.CP.B.7 HSS.CP.B.9(+) HSS.MD.A.1(+) HSS.MD.A.2 HSS.MD.A.3(+) HSS.MD.B.5.A HSS.MD.B.5.B HSS.MD.B.6(+) HSS.MD.B.7(+) **Standards for Mathematical Practice:** MP.1, MP.2, MP.3, MP.4, MP.6, MP.7 **Cross Curricular Standards:** Science – HS-ETS1-4, HSN-(Q.A.1), (Q.A.3) Lit – NJSLSA.(R10), (L9-10.6), RST.9-10.7 CT & PS – 9.4.12.(CT.1-2), (IML.5), (TL.4) CS & DT – 8.1.2.AP.4, 8.2.8ED.3, 8.2.12.ED.2 **MODIFICATIONS:** *Advanced Learner:* STEM project Enrichment Suggestions per topic (enVision Geometry text or SavvasRealize.com) *Students with Disabilities (or struggling):* Reteach for Understanding	Lesson 1 – probability of mutually exclusive events, probability of non-mutually exclusive events, find independent events Lesson 2 – conditional probability and independent events, apply conditional probability formula, use conditional probability to make a decision Lesson 3 – use fundamental counting principle, find number of permutations, find number of combinations, use permutations and combinations to find probabilities Lesson 4 – develop a theoretical probability distribution, develop an experimental probability, explore binomial experiments, use binomial probability formula Lesson 5 – evaluate and apply expected value, find expected payoff, use expected value to evaluate strategies, use binomial probability to find expected value Lesson 6 – use probability to make fair decisions, determine whether a decision is fair or unfair, make a decision based on expected value, use binomial distributions to make decisions

Students are able to:	**Learning Goals as Essential Questions:**
- Use relationships between events to find probability - Find the probability of an event given that another event has occurred - Use permutations and combinations to find number of the outcomes in a probability experiment - Define probability distributions to represent experiments and solve problems - Calculate, interpret, and apply expected value - Use probability to make decisions	- How does describing events as mutually exclusive or independent affect how probability is found? - How are conditional probability and independence related in experiments? - How are permutations and combinations useful when finding probabilities? - What does a probability distribution tell you about an experiment?

Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial Suggestions per topic (enVision Geometry text or SavvasRealize.com) *English Language Learners:* Speaking, Reading, Writing suggestions per topic Mathematical Literacy and Vocabulary Additional Practice Virtual Nerd Tutorial (enVision Geometry text or SavvasRealize.com)		- What does expected value tell you about situations involving probability? - How can you use probability to make decisions?
	Formative/Summative Assessments	**Primary & Supplementary Resources**
	DIAGNOSTIC: Readiness Assessment *FORMATIVE: Daily Warm-up/Exit Ticket,* *Practice and Problem Solving* *SUMMATIVE:* *Topic Assessment, Performance Assessment, Benchmark Assessment, Mid-Course Assessment, End of Course Assessment*	enVision Geometry 2018 (print textbook) Savvas Realize Reader (online textbook) Realize Reader (savvasrealize.com) Linkit NJSLS BM Geometry Form A,B,C