Eighth Grade Geometry with Statistics Honors Scope & Sequence

Quarter 1

Pre-Geometry Review - Approximately 2 Weeks

Topic	*Students will be able to…*
Solutions to Linear Equations	Determine the number of solutions to linear equations. (8.PAFR.2.2)
Scatter Plots	Construct scatter plots to show bivariate measurements of data and use repeated reasoning to determine the relationship between variables on a scatter plot. (8.DPSR.1, GS.DPSR.1.1)
Linear Associations in Bivariate Data	Use the line of best fit in scatter plots to show associations in bivariate data. (8.DPSR.1, GS.DPSR.1.2)
Square Roots and Cube Roots	Evaluate the square root of small perfect squares and the cube root of small perfect cubes. (8.PAFR.3.1)
Representing Rational Numbers in Decimal Form	Convert a repeating decimal into a rational number. (8.NR.1)
Comparing Rational and Irrational Numbers	Use rational approximations to compare and order real numbers. (8.PAFR.3.2, GS.NR.1)
Simplifying Radical Expressions	Use the Product Property of Radicals to simplify radical expressions and use repeated reasoning to determine whether a radical expression is in simplest form. (GS.NR.1.1)
Operations with Radical Expressions ● Adding ● Subtracting ● Multiplying ● **Dividing** (Will be new!)	Use the Product and Quotient Properties of Radicals and combine like terms to simplify radical expressions. (GS.NR.1.1)
Factoring	Enrichment
Completing the Square	Enrichment

Unit 12: Probability - Approximately 3 Weeks

Topic	*Students will be able to…*
Basic Set Theory	Describe categories of events as subsets of a sample space using unions, intersections, and complements. (GS.DPSR.3.1)
Sample Space, Tree Diagrams, Counting Outcomes	Determine the sample space for a compound event by using organized lists, tables, and tree diagrams. (8.DPSR.2.1)
Theoretical Probability and Experimental Probability	Calculate the probability of a given event. (8.DPSR.2)
Geometric Probability	Find the probability of an event by using lengths of segments and areas. (8.DPSR.2, GS.DPSR.3)
Compound Probability (Probability of Intersections)	Calculate the probability of a compound event. (8.DPSR.2.1, 8.DPSR.2.2, GS.DPSR.3.3)
Probability of Unions	Solve problems involving events that are and are not mutually exclusive. (GS.DPSR.3.2)
Conditional Probability	Analyze events as subsets of a sample space using conditional probability to explore their relationships. (GS.DPSR.3.1)
Two-Way Tables	Interpret the data in two-way tables to recognize patterns. (8.DPSR.1)
Combinations and Permutations	Enrichment

Unit 1: Tools of Geometry - Approximately 3 Weeks

Topic	*Students will be able to…*
The Geometric System	Analyze axiomatic systems and identify types of geometry. (8.MGSR.1, GS.MGSR.1)
Points, Lines, and Planes	Identify points, lines, planes, and their intersections in figures. (GS.MGSR.1, GS.MGSR.5, 8.MGSR.1)
Line Segments	Apply betweenness of points to calculate measures of line segments and apply the definition of congruent line segments to find missing values. (8.PAFR.2)
Distance	Apply the Pythagorean Theorem and the Distance Formula to find lengths of line segments. (8.MGSR.1.2, 8.MGSR.1.3, GS.NR.1)
Locating Points on a Number Line	Find points that partition directed line segments on number lines. (GS.NR.1)
Locating Points on a Coordinate Plane	Determine the coordinates of a point on a directed line segment that partitions the segment in a given ratio on the coordinate plane. (8.MGSR.3, GS.PAFR.3.2)
Midpoints and Bisectors	Find midpoints and bisect line segments. (GS.NR.1, 8.MGSR.3)

Unit 2: Angles and Geometric Figures - Approximately 2 Weeks

Topic	*Students will be able to…*
Angles and Congruence	Identify and use different kinds of angles. (8.MGSR.2)
Angle Relationships	Find measures of angles using complementary and supplementary angles and identify what can and cannot be assumed about angles in a diagram. (8.MGSR.2, 8.MGSR.3.2)
Constructions	
Two-Dimensional Figures	Find measures of two-dimensional figures. (GS.MGSR.1)
Area of Quadrilaterals	Find areas of quadrilaterals by deriving and using formulas. (GS.PAFR.3.2, GS.MGSR.1.1)
Area of Circles and Sectors	Find areas of circles and sectors by deriving and using formulas. (GS.PAFR.1.1, GS.PAFR.1.2)

Quarter 2

Unit 3: Logical Arguments and Line Relationships - Approximately 3 Weeks

Topic	*Students will be able to…*
Conjectures and Counterexamples	Analyze conjectures by using inductive reasoning and disprove conjectures by using counterexamples. (GS.MGSR.5)
Statements, Conditionals, and Biconditionals	Write and analyze compound statements by using logic. (GS.MGSR.5)
Deductive Reasoning	Apply the Laws of Detachment and Syllogism in deductive reasoning. (GS.MGSR.5)
Venn Diagrams	Enrichment
Writing Proofs	Analyze and construct viable arguments. (GS.MGSR.5)
Proving Segment Relationships	Prove theorems about line segments. (GS.MGSR.5)
Proving Angle Relationships	Prove theorems about angles. (GS.MGSR.5.1, 8.MGSR.2)
Parallel Lines and Transversals	Identify and use relationships between parallel lines and transversals. (GS.PAFR.2.2, 8.MGSR.2)
Slope and Equations of Lines	Classify lines as parallel, perpendicular, or neither by using slope criteria. (GS.PAFR.1, GS.PAFR.2.2, GS.PAFR.2.3, 8.PAFR.2.4, 8.PAFR.2.5, GS.PAFR.3.1)
Proving Lines Parallel	Identify and use parallel lines by using angle relationships. (8.PAFR.2.4, 8.PAFR.2.5, GS.MGSR.5.1)
Perpendiculars and Distance	Use perpendicular lines to find distance. (GS.MGSR.5.1, GS.MGSR.5.3, 8.MGSR.3)

Unit 4: Transformations and Symmetry - Approximately 3 Weeks

Topic	*Students will be able to…*

Reflections	Use rigid motions to reflect figures on the coordinate plane. (GS.MGSR.2.1, GS.MGSR.3.2)
Translations	Use rigid motions to translate figures on the coordinate plane. (GS.MGSR.2.1, GS.MGSR.3.2)
Rotations	Use rigid motions to rotate figures about points on the coordinate plane. (GS.MGSR.2.1, GS.MGSR.3.2)
Compositions of Transformations	Use two or more rigid motions to transform figures on the coordinate plane. (GS.MGSR.2.1, GS.MGSR.2.2, GS.MGSR.3.2)
Symmetry	Identify line and rotational symmetries in two-dimensional and three-dimensional figures. (GS.MGSR.3, GS.MGSR.3, GS.MGSR.3.1)

Unit 5: Triangles and Congruence - Approximately 3 Weeks

Topic	*Students will be able to…*
Angles of Triangles	Solve problems using the Triangle Angle-Sum and Exterior Angle Theorems. (8.MGSR.2)
Isosceles and Equilateral Triangles	Use triangle congruence to solve problems involving isosceles and equilateral triangles. (8.MGSR.2, GS.MGSR.5.1, GS.MGSR.5.2)
Congruent Triangles	Prove that triangles are congruent and use congruence statements to solve problems. (GS.MGSR.3.3)
Proving Triangles Congruent: SSS, SAS	Prove that triangles are congruent using SSS and SAS Congruence Postulates. (GS.MGSR.3.3)
Proving Triangles Congruent: ASA, AAS	Prove that triangles are congruent using the ASA Congruence Postulate or the AAS Congruence Theorem. (GS.MGSR.3.3)
Proving Right Triangles Congruent	Prove that right triangles are congruence using the LL, HA, LA, and HL Theorems of Right Triangle Congruence. (8.MGSR.1.4, GS.MGSR.6.2)
CPCTC	Prove that triangles are congruent and use congruence statements to solve problems. (GS.MGSR.3.3)
Triangles and Coordinate Proof	Write coordinate proofs using theorems of triangle congruence. (GS.PAFR.3, GS.MGSR.5)

Quarter 3

Unit 6: Relationships in Triangles - Approximately 3 Weeks

Topic	*Students will be able to…*
Perpendicular Bisectors of Segments	Prove theorems and solve problems using perpendicular bisectors of line segments. (GS.PAFR.2.3, 8.MGSR.2)
Angle Bisectors	Solve problems using angle bisectors in triangles. (8.MGSR.2, GS.MGSR.5.2)

Medians and Altitudes of Triangles	Analyze and describe the relationships between medians and centroids of a triangle. (8.MGSR.2, GS.MGSR.5.2)
Inequalities in One Triangle	Solve problems using inequalities in the angle in a triangle. (8.MGSR.2, GS.MGSR.5.2)
The Triangle Inequality	Use the Triangle Inequality Theorem to solve problems. (8.MGSR.2, GS.MGSR.5.2)
Inequalities in Two Triangles	Use the Hinge Theorem and its converse to solve problems with inequalities in two triangles. (GS.MGSR.5.2)

Unit 7: Quadrilaterals - Approximately 3 Weeks

Topic	*Students will be able to…*
Angles of Polygons	
Parallelograms	
Tests for Parallelograms	
Rectangles	
Rhombi and Squares	
Trapezoids and Kites	Enrichment

Unit 8: Similarity - Approximately 3 Weeks

Topic	*Students will be able to…*
Dilations	
Similar Polygons	
Similar Triangles: AA SImilarity	
Similar Triangles: SSS and SAS Similarity	
Triangle Proportionality	
Parts of Similar Triangles	

Quarter 4

Unit 9: Right Triangles and Trigometry - Approximately 3 Weeks

Topic	*Students will be able to…*
Geometric Mean	
Pythagorean Theorem and Its Converse	

Special Right Triangles	
Trigonometry	
Applying Trigonometry	
The Law of Sines	
The Law of Cosines	

Unit 10: Circles - Approximately 3 Weeks

Topic	*Students will be able to…*
Circles and Circumference	
Measuring Angles and Arcs	
Arcs and Chords	
Inscribed Angles	
Tangents	
Tangents, Secants, and Angle Measurements	
Equations of Circles ● with Completing the Square (Enrichment)	

Unit 11: Measurement - Approximately 2 Weeks

Topic	*Students will be able to…*
Areas of Regular Polygons	Find the area of regular polygons by deriving and using formulas. (GS.MGSR.1, GS.MGSR.1.1)
Surface Area	Find surface area of prisms, cylinders, pyramids, cones, spheres, and composites of these shapes by deriving and using formulas. (GS.PAFR.2.1)
Cross Sections and Solids of Revolution	Determine cross sections of three-dimensional figures. (GS.MGSR.1.1, GS.MGSR.1.2, GS.MGSR.1.3)
Volume of Prisms and Cylinders	Find volumes of prisms and cylinders by deriving and using formulas. (GS.PAFR.1.2, GS.PAFR.2.1)
Volume of Pyramids and Cones	Find volumes of pyramids and cones by deriving and using formulas. (GS.PAFR.1.2, GS.PAFR.2.1)

Volume and Surface Area of Spheres	Find surface area and volume of spheres by deriving and using formulas. (GS.PAFR.1.2, GS.PAFR.2.1)
Applying Similarity to Solid Figures	Find measures of similar figures and solids by using scale factors. (8.MGSR.1)
Effects of Changing a Dimension	Enrichment
Density	Enrichment

+ Enrichment topics will be explored as time allows.