Wyoming Department of Education Required Virtual Education Course Syllabus

Sheridan County School District # 1

Program Name	Sheridan County School District #1 Virtual School	Content Area	MA
Course ID	AC02079	Grade Level	10 - 12
Course Name	Geometry-SE	# of Credits	1
SCED Code	02079	Curriculum Type	Acellus

COURSE DESCRIPTION

Designed for special education, Acellus Geometry-SE teaches students the basic principles of Euclidian Geometry including points, lines, angles, surfaces, and solids. Geometry-SE is recommended for students in grades 9-12 who have completed Acellus Algebra-SE, to ensure that these students have a strong foundation upon which to build. Course topics include: Points, Segments, Length, Pythagorean Theorem, Rays, Angles, Planes, Congruency, Logic Reasoning (truth tables), Transformations, Postulates and Theorems of Geometry, Geometric Proofs, Complement and Supplement, Properties of Triangles, Special Triangles (30-60-90 and 45-45-90), Polygons, Polyhedron, Euler's Formula, Similar Figures, Trigonometric Ratios, Properties of Circles, Arc, Arc Length, Chords, and Sectors, Surface Area, Volume. This course is based on NCTM standards.

STANDARD #	BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
N.Q.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*
G.CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
G.CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
G.CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself
G.CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
G.CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
G.CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
G.CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
G.CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
G.CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.
G.CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
G.SRT.1	Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
G.SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.

G.SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
G.C.1	Prove that all circles are similar.
G.C.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
G.C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
G.GPE.4	For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).
G.GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
G.GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.
G.GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*
G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*
G.MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*
G.MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*
G.MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*

SCOPE AND SEQUENCE		
UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
Unit 1 – Tools of Geometry	N.Q.1, G.CO.1, G.GPE.4, G.GPE.6, G.GPE.7	In this unit students learn about nets and perspective drawings, points, lines, and planes. They also learn about measuring segments and angles, angle pairs, basic construction, the coordinate plane, perimeter, circumference, and area.
Unit 2 – Reasoning and Proof	G.CO.9, G.CO.10, G.CO.11	In this unit students learn about inductive reasoning and conditional statements. They also learn about biconditionals, deductive reasoning, and proofs.

Unit 3 – Parallel and Perpendicular Lines	G.CO.1, G.CO.9, G.CO.10, G.GPE.5, G.MG.3	In this unit students learn about transversals, parallel lines, proving parallel lines, parallel and perpendicular, and angle sum theorem. They also learn about more constructions, equations of lines, and slopes of parallel and perpendicular lines.
Unit 4 – Congruent Triangles	G.CO.10, G.CO.12, G.CO.13, G.SRT.5	In this unit students learn about congruent figures, SSS and SAS, ASA and SAA, and corresponding parts. They also learn about isosceles and equilateral, right triangles, and overlapping triangles.
Unit 5 – Polygons	G.CO.11, G.SRT.5, G.GPE.4, G.GPE.7	In this unit students learn about polygon angle sums, parallelograms, proving a parallelogram, rhombuses, rectangles, and squares. They also learn about proving special parallelograms, trapezoids and kites, polygons and coordinates, and using coordinates in proofs.
Unit 6 – Similarity	G.SRT.4, G.SRT.5, G.GPE.5, G.MG.1	In this unit students learn about ratios and proportions, similar polygons, and proving triangles similar. They also learn about similarity in right triangles, proportions in similar triangles, the Pythagorean Theorem and special right triangles.
Unit 7 – Transformations	G.CO.2, G.CO.3, G.CO.4, G.CO.5, G.CO.8, G.SRT.1	In this unit students learn about translations, reflections, rotations, and compositions. They also learn about congruence transformations, dilations, and similarity transformations.
Unit 8 – Area	G.CO.1, G.CO.13, G.C.1, G.C.2, G.C.5, G.GPE.7, G.MG.1	In this unit students learn about areas of paralelograms, triangles, regular polygons, circles, sectors, and perimeters and areas of similar figures.
Unit 9 – Surface Area and Volume	G.GMD.3, G.MG.1, G.MG.2	In this unit students learn about polyhedra. They also learn about surface areas and volumes of prisms, cylinders, pyramids, spheres, and similar solids, as well as volumes of cones.