Cyberarts Studio Academy

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(Geometry) Curriculum Calendar

Fall Semester

Dates	#Days	Unit Title/ Due Dates / Essential Questions / Instructional Objective	Core Content & NG Standards	Learning Target	Resources/Materials/ Assessments
Sep-Oct	19	UT:0 Foundations of Geometry DD: Unit Essential Question:	Core Content: • **CCSS.MATH.CONTENT.HSG.CO.A.1-5** (Congruence and proofs)	• I can describe a point • I can describe a line and its characteristics. • I can describe and represent a plane **I can understand and use geometric vocabulary and definitions.** • I can define points, lines, planes, segments, and rays.	Resources: Envision Textbook Assessment: Baseline Assessment Unit Assessment

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			• **CCSS.MATH.CONTENT.HSG.GPE.A.1-4** (Coordinate geometry) • **CCSS.MATH.CONTENT.HSG.C.A.1-3** (Circles) NG Standards:	• I can identify and describe parallel, perpendicular, and intersecting lines. **I can use logic and reasoning to justify geometric statements.** • I can explain the difference between inductive and deductive reasoning. • I can write and understand geometric proofs using postulates, theorems, and definitions. **I can identify and prove angle relationships.** • I can find and prove relationships between complementary, supplementary, vertical, and adjacent angles. • I can prove and apply properties of angles formed by parallel lines and a transversal. •	

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Oct-Nov	25-30 days	UT:1 Constructions and Rigid Transformations DD: Unit Essential Question: How do we understand rigid transformations in the light of constructions?	Core Content: NG Standards: GEO-G.CO.1 GEO-G.CO.2 GEO-G.CO.3 GEO-G.CO.4 GEO-G.CO.5 GEO-G.CO.9 GEO-G.CO.10 GEO-G.CO.12 GEO-G.CO.13 GEO-G.MG.3	Learning Targets: • I can create diagrams using a straightedge. • I know how to use a compass to construct a circle. • I can follow instructions to create a construction. • I can use precise mathematical language to describe a construction. • I can construct a perpendicular bisector. • I understand what is special about the set of points equidistant from two given points. • I can construct an equilateral triangle. • I can identify congruent segments in figures and explain why they are congruent. • I can construct a line that is perpendicular to a given line through a point on the line. • I can construct an angle bisector. • I can construct a parallel line through a given point. • I can construct a perpendicular line through a given point. • I can construct a square inscribed in a circle. • I can construct a square using a given segment for one of its sides. • I can use technology to help me construct specific diagrams. • I can construct perpendicular bisectors to help solve problems. • I can use my geometry knowledge to solve problems.	Resources: IM Curriculum Envision Textbook Assessment: Assessments: 3 Check Your Readiness - Pre-unit diagnostic Mid-unit assessment End-of-unit assessment

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Nov-Dec	14-19 days	UT: 2 Congruence DD: Unit Essential Question: How do we use the properties (features) of geometric figures to prove(show) congruence?	Core Content: NG Standards: Geo-G.CO.1 Geo-G.CO.5 Geo-G.CO.6 Geo-G.CO.7 Geo-G.CO.8 Geo-G.CO.9 Geo-G.CO.10 Geo-G.CO.11	• I can identify corresponding parts from a congruence statement. • I can use rigid transformations to explain why figures are congruent. • I can write a congruence statement. • I can explain why if all the corresponding sides and angles of two triangles are congruent, then the triangles are congruent. • I can write a proof that segments of the same length are congruent. • I can explain why the Side-Angle-Side Triangle Congruence Theorem works. • I can use the Side-Angle-Side Triangle Congruence Theorem in a proof. • I can critique an explanation of the Perpendicular Bisector Theorem. • I can explain why the Perpendicular Bisector Theorem is true. • I can explain why the Side-Side-Side Triangle Congruence Theorem works. • I can use the Side-Side-Side Triangle Congruence Theorem in a proof.	Resources: IM Curriculum Envision Textbook Assessment: Readiness Assessment Mid Unit Assessment End of Unit Assessment

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				• I can use the Side-Side-Side, Angle-Side-Angle, and Side-Angle-Side Triangle Congruence Theorems in proofs. • I can critique a proof about quadrilaterals. • I can prove theorems about quadrilaterals. • I can prove theorems about the diagonals of a parallelogram. • I can critique a proof about constructions. • I can explain why constructions work.	
Dec-Jan	16-24 days	UT: 3 Similarity DD: Unit Essential Question: How do we use the properties (features) of geometric figures to	Core Content: NG Standards: Geo-G.CO.2 Geo-G.CO.10 Geo-G.SRT.1 Geo-G.SRT.1a Geo-G.SRT.1b Geo-G.SRT.2 Geo-G.SRT.3 Geo-G.SRT.4 Geo-G.SRT.5 Geo-G.SRT.5a	• I can dilate a figure given a scale factor and a center. • I can calculate the lengths of parts of a scaled drawing. • I know that when figures are dilated by a scale factor of k. • I can explain what happens to lines and angles in a dilation. • I can explain why the segment connecting the midpoints of two sides of a triangle is parallel to the third side and half the length of the third side. • I can write similarity statements. • I know the definition of similarity.	Resources: IM Curriculum Envision Textbook Assessment: Readiness Assessment Mid Unit Assessment End of Unit Assessment

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		prove(show) similarity?	Geo-G.SRT.5b Geo-G.SRT. Geo-G.C.1 Geo-G.MG.3	• I know the relationships between corresponding sides and angles in similar triangles. • I can write proofs using the definition of similarity. • I can explain why the Angle-Angle Triangle Similarity Theorem works. • I can explain why the Side-Angle-Side and Side-Side-Side Triangle Similarity Theorems work. • I can explain why a segment parallel to one side of a triangle divides the other sides proportionally. • I can find scale factors and use them to solve problems. • I know the relationships between corresponding sides and angles in similar triangles. • I can find scale factors and use them to solve problems.	

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Jan-Feb	14-17 Days	UT: 4 Right Triangle Trigonometry DD: Unit Essential Question: How can we use trigonometric ratios and pythagorean theorem to solve real world problems?	Core Content: NG Standards: Geo-G.SRT.5 Geo-G.SRT.5a Geo-G.SRT.6 Geo-G.SRT.7 Geo-G.SRT.8 Geo-G.GMD.1 Geo-G.GMD.3 AI-N.Q.3 MP.1 MP.2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	• I can explain why one acute angle in a right triangle determines all the ratios of the side lengths. • I can determine the side lengths of triangles with angles measuring 45, 45, and 90 degrees. • I can determine the side lengths of triangles with angles measuring 30, 60, and 90 degrees. • I can build a table of ratios of side lengths of right triangles. • I can use a table of ratios of side lengths of right triangles to estimate unknown angle measures. • I can use a table of ratios of side lengths of right triangles to estimate unknown side lengths. • I can use cosine, sine, and tangent to find side lengths of right triangles. • I can use cosine, sine, and tangent to find the height of an object. • I can explain why • $\sin(\theta)=\cos(90-\theta)$. • I can prove a theorem about the squares of trigonometric ratios. • I can use arccosine, arcsine, and arctangent to find angle measures in right triangles.	Resources IM Curriculum Envision Textbook Assessments: Readiness Assessment Mid Unit Assessment End of Unit Assessment

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Feb-Mar	19-24 Days	UT: 5 DD: Solid Geometry Unit Essential Question: How are geometric relationships in 2D extended to 3D? How can we represent a 3D figure on a 2D surface,	Core Content: NG Standards: Geo-G.GMD.1 Geo-G.GMD.3 Geo-G.GMD.4 AI-A.SSE.1.a AI-A.CED.2. AI-F.IF.7.b. AI-N.Q.1 Geo-G.SRT.8. MP.1 MP2 MP.3 MP.4 MP.5 MP.6 MP.7 MP.8	• I can draw the two-dimensional shape that creates a particular three-dimensional solid when rotated using a given axis. • I can identify the three-dimensional solid created by rotating a two-dimensional figure, using a linear axis. • I know that a pyramid's cross-sections are dilations of its base, with scale factors ranging from 0 to 1. • I know that when figures are dilated by a scale factor of k • their areas are multiplied by k^2 • I can use square root graphs and do calculations to interpret the relationships between scale factors and areas. • I know that when a solid is dilated by a scale factor of k • its surface area is multiplied by k^2 • and its volume is multiplied by k^3 • I can create and describe graphs that show relationships between volumes and scale factors. • I can work backward from a volume or surface area scaling to find a scale factor.	Resources: IM Curriculum Envision Textbook Assessment: Readiness Assessment Mid Unit Assessment End of Unit Assessment

		and what is the main difference between them?		• I can calculate scale factors for lengths, surface areas, and volumes if I'm given any one of the three factors. • I can calculate volumes of solids that are composed of cylinders. • I can explain how finding the volume of a prism relates to finding the volume of a cylinder. • I know that if two solids have equal-area cross-sections at all heights, they have the same volumes. • I can calculate volumes of right and oblique prisms and cylinders and figures composed of prisms and cylinders. • I can explain the relationships between pyramids, cones, prisms, and cylinders. • I can explain why the volume formula for pyramids and cones is • $V=\frac{1}{3}Bh$ • I can calculate volumes of pyramids and cones. • I can work backward from a given volume to find possible dimensions of a pyramid or cone. • I can use the Pythagorean Theorem and trigonometry to help calculate volumes of prisms, cylinders, cones, and pyramids, including solids of rotation.	

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Mar-May	18-23 Days	UT: 6 Coordinate Geometry DD: Unit Essential Question: How can we use a coordinate system to represent, analyze, interpret and solve geometric problems?	Core Content: NG Standards: Geo-G.GMD.1 Geo-G.GMD.2 Geo-G.GMD.3 Geo-G.GMD.5 Geo-G.SRT.5 Geo-G.SRT.5.a AI-A.SSE.2. AI-A.SSE.3. Geo-G.GPE.4. Geo-G.GPE.5. Geo-G.GPE.5a. Geo-G.GPE.5b. Geo-G.GPE.5c.	• I can reflect, rotate, and translate figures in the coordinate plane. • I can use coordinates to prove that triangles are congruent. • I can use coordinate transformation notation to take points in the plane as inputs and give other points as outputs. • I can determine whether a transformation produces congruent or similar images (or neither). • I can derive an equation for a circle in the coordinate plane. • I understand how squared binomials relate to the equation of a circle. • I can complete the square to find the center and radius of a circle. • I know that a parabola is the set of points equidistant from a given point and line. • I can derive an equation for a parabola in the coordinate plane given a focus and a directrix. • I can use the definition of slope to write the equation for a line in point-slope form.	Resources: IM Curriculum Envision Textbook Assessment: Readiness Assessment Mid Unit Assessment End of Unit Assessment

				• I can prove that the slopes of parallel lines are equal. • I can use slopes of parallel lines to solve problems. • I can prove that the slopes of perpendicular lines are opposite reciprocals. • I can use slopes of perpendicular lines to solve problems. • I can gather information about a line and write its equation. • I can use a graph to find the intersection points of a line and a circle. • I can use coordinates of figures to prove geometric theorems. • I can calculate the coordinates of a point on a line segment that partitions the segment in a given ratio. • I can determine the point where the medians of a triangle intersect. • I can determine the point where the altitudes of a triangle intersect.	

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May-Jun	13-19	UT: 7 Circle DD: Unit Essential Question: How does the relationship between a circle's circumference, diameter, and radius allow us to measure its area and solve real world problems?	Core Content: NG Standards: Geo-G.CO.9. Geo-G.CO.10. Geo-G.SRT.5a Geo-G.SRT.5b Geo-G.SRT.8 Geo-G.C.2a Geo-G.C.2b Geo-G.C.5 G.GMD.1 G.MG.3	• I know what chords, arcs, and central angles are. • I can use the relationship between central and inscribed angles to calculate angle measures and prove geometric theorems. • I know that an inscribed angle is half the measure of the central angle that defines the same arc. • I can use the relationship between tangent lines and radii to calculate angle measures and prove geometric theorems. • I know that a line tangent to a circle is perpendicular to the radius drawn to the point of tangency. • I can prove a theorem about opposite angles in quadrilaterals inscribed in circles. • I can construct the circumscribed circle of a triangle. • I can explain why the perpendicular bisectors of a triangle's sides meet at a single point.	Resources: IM Curriculum Envision Textbook Assessment: Readiness Assessment Mid Unit Assessment End of Unit Assessment

				• I can calculate lengths of arcs and areas of sectors in circles. • I can gather information about a sector to draw conclusions about the entire circle. • I know that when a circle is dilated, some ratios, like the ratio of the circumference to the diameter, stay constant. • I know that the radian measure of an angle whose vertex is the center of a circle is the ratio of the length of the arc defined by the angle to the circle's radius. • I understand the relative sizes of angles measured in radians. • I can calculate the area of a sector whose central angle measure is given in radians. • I know that the radian measure of an angle can be thought of as the slope of the line $l=\theta \cdot r$ • I can explain why the angle bisectors of a triangle meet at a single point. • I know any point on an angle bisector is equidistant from the rays that form the angle. • I can construct the inscribed circle of a triangle.	

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