Jackson County Core Curriculum Collaborative (JC4)	
Geometry	
Standard	**Learning Targets in Student Friendly Language**
G.CO.1	I can define the following terms precisely in terms of point, line, distance along a line, and arc length: angle, circle, perpendicular line, parallel line, line segment.
	I can identify the undefined notions used in geometry (point, line, plane, distance) and describe their characteristics.
	I can describe the undefined terms: point, line, distance along a line, and distance around a circular arc.
	I can define the following terms accurately in terms of point, line, distance along a line, and arc length: angle, circle, arc, perpendicular line, parallel line, and line segment.
G.CO.2	I can represent transformations in the coordinate plane.
	I can describe transformations as functions with inputs and outputs.
	I can compare transformations that preserve congruence with those that do not.
	I can accurately describe transformations using "prime" notation and the terms pre-image and image.
	I can informally define translations, reflections, rotations and dilations.
	I can identify that translations, reflections and rotations preserve distance and angle, while dilations do not.
G.CO.3	I can describe the lines of symmetry in rectangles, parallelograms, trapezoids, and regular polygons in terms of the rotations and reflections that carry each shape onto itself.
	I can illustrate how a rectangle is mapped onto itself using transformations.
	I can illustrate how a parallelogram is mapped onto itself using transformations.
	I can illustrate how an isosceles trapezoid is mapped onto itself using transformations.
	I can illustrate how a regular polygon is mapped onto itself using transformations.
	I can calculate the number of lines of reflection and the degree of rotational symmetry of any regular polygon.
	I can develop generalizations for the symmetries held by various geometric shapes.
G.CO.4	I can develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
	I can develop definitions of rotations in terms of their properties.
	I can develop definitions of reflections in terms of their properties.
	I can develop definitions of translations in terms of their properties.
G.CO.5	I can apply rigid transformations to a geometric figure and can specify a sequence of transformations that will carry one figure onto another.
	I can rotate a given figure using graph paper, tracing paper, or geometry software.
	I can reflect a given figure, such as a triangle or quadrilateral, by using graph paper, tracing paper, or geometry software.
	I can translate a given figure using graph paper, tracing paper, or geometry software.
	Given two figures, I can determine a specific sequence of transformations that will carry one figure onto another.
G.CO.6	I can carry out rigid transformations on geometric figures to establish the definition of congruence in terms of rigid motions.
	I can transform a figure using a geometric description of a rigid motion.
	I can predict what effect a transformation will have on a figure.
	I can define congruent figures as figures that have a sequence of rigid motions that will map one figure onto the other.

	Given two figures, I can determine if they are congruent using properties of rigid motion.
G.CO.7	I can show that triangles are congruent if and only if their corresponding sides and angles are congruent.
	I can identify corresponding sides and corresponding angles of congruent triangles.
	I can explain, using rigid motions, why, in congruent triangles, corresponding parts must be congruent.
	I can explain, using rigid motions, that if two triangles have congruent corresponding parts, then the triangles must be congruent.
	I can use mathematical evidence to prove congruency using methods such as solving with the distance formula or coordinate graphing methods.
G.CO.8	I can prove the following triangle congruence theorems (ASA, SAS, SSS) using properties of rigid motion.
	I can find a sequence of rigid motions to demonstrate the Angle-Side-Angle Triangle Congruence criteria.
	I can find a sequence of rigid motions to demonstrate the Side-Angle-Side Triangle Congruence criteria.
	I can find a sequence of rigid motions to demonstrate the Side-Side-Side Triangle Congruence criteria.
	I can explain how the ASA, SAS, and SSS congruence criteria can be used to prove two triangles are congruent to each other.
G.CO.9	I can make and prove conjectures about situations involving lines and angles.
	I can identify and use the properties of congruence and equality (reflexive, symmetric, transitive) in my proofs.
	I can order statements based on the Law of Syllogism when constructing my proof.
	I can identify what can and cannot be assumed from geometric diagrams.
	I can use theorems, postulates, or definitions to prove vertical angles are congruent.
	I can use theorems, postulates, or definitions to prove when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent, and same-side (consecutive) interior angles are supplementary.
	I can use theorems, postulates, or definitions to prove that points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
	I can examine and critique proofs produced by others.
	I can describe multiple formats for constructing proofs, such as narrative paragraphs, flow diagrams and two-column proofs.
G.CO.C.10	I can make and prove conjectures about situations involving triangles.
	I can use theorems, postulates, or definitions to prove the measures of interior angles of a triangle sum to 180 degrees.
	I can use theorems, postulates, or definitions to prove the base angles of isosceles triangles are congruent.
	I can use theorems, postulates, or definitions to prove the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length.
	I can use theorems, postulates, or definitions to prove the medians of a triangle meet at a point.
G.CO.C.11	I can make and prove conjectures about the properties of a parallelogram.
	I can use theorems, postulates, or definitions to prove opposite sides of a parallelogram are congruent.

	I can use theorems, postulates, or definitions to prove opposite angles of a parallelogram are congruent.
	I can use theorems, postulates, or definitions to prove the diagonals of a parallelogram bisect each other.
	I can use theorems, postulates, or definitions to prove that rectangles are parallelograms with congruent diagonals.
G.CO.C.12	I can make formal geometric constructions.
	I can identify the tools used in formal construction and explain how to use each.
	I can use tools and methods to precisely copy a segment.
	I can use tools and methods to precisely copy an angle.
	I can use tools and methods to precisely bisect a segment.
	I can use tools and methods to precisely bisect an angle.
	I can use tools and methods to precisely construct perpendicular lines, including the perpendicular bisector of a line segment.
	I can use tools and methods to precisely construct a line parallel to a given line through a point not on the line.
	I can prove that my constructions work as intended.
G.CO.C.13	I can construct regular polygons.
	I can define inscribed polygons.
	I can construct an equilateral triangle inscribed in a circle and justify the steps taken.
	I can construct a square inscribed in a circle and justify the steps taken.
	I can construct a regular hexagon inscribed in a circle and justify the steps taken.
G.SRT.1.a	I can explain what happens to line segments when you apply a dilation.
	I can describe accurate methods for carrying out dilations using different tools.
	I can verify that when a side passes through the center of dilation, the side and its image lie on the same line.
	I can verify that when a side does not lie on a line that passes through the center of dilation, it will be parallel to its corresponding segment in the image.
G.SRT.1.b	I can explain what happens to segment length when you apply a dilation.
	I can interpret the scale factor of a given dilation.
	I can verify that a side length of the image is equal to the product of the scale factor and the corresponding side length of the pre-image.
G.SRT.2	I can explain the similarity of two figures in terms of similarity transformations.
	I can define similarity as a composition of rigid motions followed by dilations in which angle measure is preserved and side length is proportional.
	I can describe similarity transformations as a sequence of rigid motions with a dilation.
	I can identify corresponding sides and corresponding angles of similar triangles.
	I can determine if two figures are similar by verifying that angle measure is preserved and corresponding sides are proportional.
	Given a geometric figure and a scale factor, I can dilate it, or change its size, using graph paper, tracing paper, or geometry software.
G.SRT.3	I can apply the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
	I can explain that the Angle-Angle similarity criterion is a sufficient condition for two triangles to be similar.
	I can use similarity transformations to show that the AA similarity criterion works for all triangles.

G.SRT.4	I can make and prove conjectures about situations involving similar triangles.
	I can use theorems, postulates, or definitions to prove a line parallel to one side of a triangle divides the other two proportionally.
	I can use theorems, postulates, or definitions to prove if a line divides two sides of a triangle proportionally, then it is parallel to the third side.
	I can use theorems, postulates, or definitions to prove the Pythagorean Theorem using triangle similarity.
G.SRT.5	I can solve problems and prove relationships in geometric figures using triangle congruence and similarity.
	I can prove geometric shapes are similar by using proportionality of sides and angle congruency.
	I can prove triangles are similar by using AA similarity criteria.
	I can prove triangles are congruent by using SSS congruency criteria.
	I can prove triangles are congruent by using SAS congruency criteria.
	I can prove triangles are congruent by using ASA congruency criteria.
	I can use triangle congruence and triangle similarity to solve problems, such as indirect measures, missing sides/angle measures, and side splitting problems.
	I can use congruency and similarity theorems for triangles to prove relationships in geometric figures.
G.SRT.6	I can explain how to derive the trigonometric ratios for acute angles.
	Given right triangles of different sizes but with one acute angle of the same measure, I can explain how similarity can be used to show the ratios of sides will always stay the same.
	I can define the sine, cosine, and tangent of an acute angle as a ratio of sides in a right triangle.
	Given a right traingle, I can write the trigonemetric ratios for sine, cosine, and tangent for the two acute angles.
G.SRT.7	I can explain the relationship between the sine and cosine of complementary angles.
	Given the sine of one acute angle in a right triangle, I can compute the cosine of the other acute angle.
	Given the cosine of one acute angle in a right triangle, I can compute the sine of the other acute angle.
G.SRT.8	I can solve right triangle problems using trigonometric ratios and the Pythagorean Theorem.
	I can use the Pythagorean Theorem and/or trigonometric ratios to solve for missing segment lengths and angle measures in right triangles.
	I can represent an applied problem using right triangles, when appropriate.
	I can apply the relevant trigonometric ratio to a contextual problem.
	I can use the inverse trigonometric functions to find missing angle measures.
	I can solve a right triangle by finding the measures of all missing side lengths and angle measures.
G.SRT.9+	I can derive an area formula for triangles that use SAS parameters.
	I can use the traditional triangle area formula and the sine function to derive the equivalent formula A = 1/2*a*b*sin C.
	I can use the formula, A = 1/2*a*b*sin C, to find the area of a triangle given two sides and an included angle.
G.SRT.10+	I can prove the Laws of Sines and Cosines and apply them to problems.
	I can prove the Laws of Sines and Cosines.
	I can apply the Laws of Sines and Cosines to problems.
G.SRT.11+	I can apply the Law of Sines and Cosines to problems involving unknown measures in triangles.

	I can apply the Law of Sines to find unknown side lengths and unknown angle measures in right and non-right triangles.
	I can apply the Law of Cosines to find unknown side lengths and unknown angle measures in right and non-right triangles.
	I can represent real-world problems with diagrams of triangles and use them to solve for unknown quantities.
G.C.1	I can prove that all circles are similar.
	I can explain how any two circles are related by a dilation and possibly a translation.
G.C.2	I can identify and describe relationships among inscribed angles, radii, and chords.
	I can identify central angles, inscribed angles and circumscribed angles.
	I can identify radii, diameters, chords and tangents.
	I can define: diameter, radii, chord, inscribed angle, circumscribed angle, tangent, central angle.
	I can explain the relationship between inscribed, circumscribed and central angles.
	I can describe the relationship between a central angle and the arc it intercepts.
	I can describe the relationship between an inscribed angle and the arc it intercepts.
	I can describe the relationship between a circumscribed angle and the arc it intercepts.
	I can explain that inscribed angles on a diameter are right angles.
	I can show, through slope calculation in the coordinate plane, the radius of a circle is perpendicular to the tangent at a point.
G.C.3	I can construct the inscribed and circumscribed circles of a triangle and prove properties of angles for a quadrilateral inscribed in a circle.
	I can explain how to find the incenter and circumcenter of a triangle.
	I can use the incenter and circumcenter to construct the incircle and circumcircle of a triangle.
	I can prove that opposite angles of a quadrilateral inscribed in a circle are supplementary.
G.C.4+	I can construct a tangent line from a point outside a given circle to the circle.
	I can define and identify a tangent line.
	I can construct a tangent line from a point outside a given circle to the circle using properties about circles and right triangles.
G.C.5	I can define radian measure and derive the formula for the area of a sector.
	I can define radian measure of an angle as the ratio of an arc length to its radius.
	I can calculate a radian measure when given an arc length and its radius.
	I can convert degrees to radians.
	I can define a sector of a circle.
	I can derive a formula for the area of a sector by taking the proportion of the area of the whole circle.
	I can calculate the area of a sector using radians and degrees.
G.GPE.1	I can derive the equation of a circle and use it to find its center and radius.
	I can derive the equation of a circle of given center and radius using the Pythagorean Theorem.
	I can identify the center and radius of a circle given its equation.
	I can write an equation for a circle given its center and radius.
G.GPE.2	I can derive the equation of a parabola given a focus and directrix.
	I can define a parabola as a set of points in a plane that are equidistant from a point (called the focus) and a line (called the directrix).
	I can use the distance formula to find the distance from a point on the parabola to the directrix and to the focus.

	I can use the distance from a point to the directrix and the distance from the same point to the focus to derive the equation of the parabola.
	I can identify the focus and directrix of a parabola when given its equation.
G.GPE.4	I can prove geometric theorems algebraically by using coordinate points.
	I can represent the vertices of a figure on the coordinate plane and label it.
	I can use coordinates and the right tools to prove or disprove a claim about a figure.
	I can use slope to determine if sides are parallel, intersecting, or perpendicular.
	I can use the distance formula to determine if sides are congruent or to decide if a point is inside, outside or on a circle.
	I can use the midpoint formula or the distance formula to decide if a side has been bisected.
G.GPE.5	I can prove the slope criteria for parallel and perpendicular lines and use that information in problems.
	I can determine if lines are parallel or perpendicular based on their slope (equal or opposite reciprocal).
	I can write an equation for a line that is parallel or perpendicular to a given line that passes through a given point.
	I can prove the slope criteria for parallel and perpendicular lines.
G.GPE.6	I can determine the coordinates of the point on a line segment that divides the segment into a given ratio.
	I can determine the coordinates of the point on a line segment that divides the segment into a given ratio.
	I can use dilations to find the coordinates of a point that divide a directed segment in a given ratio.
G.GPE.7	I can use coordinates to compute the perimeters and areas of polygons on the coordinate plane.
	I can use the coordinates of the vertices of a polygon graphed in the coordinate plane and use the distance formula to compute the perimeter.
	I can use the coordinates of the vertices of triangles and rectangles graphed in the coordinate plane to compute area.
	I can decompose more complex figures into familiar shapes that are easier to work with.
G.GMD.1	I can explain why these formulas work: the formula for the circumference of a circle; the area formula for a circle; the volume formulas of a cylinder, pyramid, and cone.
	I can explain the relationship between variables in formulas for circumference of a circle.
	I can use algebra to demonstrate that since pi is the ratio of a circle's circumference to its diameter, d, that the formula for a circle's circumference must be C = pi * d.
	I can explain the relationship between variables in formulas for the area of a circle.
	I can use a limit argument with regular polygons to develop the area of a circle.
	I can use Cavalieri's principle to explain why the formulas for the volme of a cylinder, pyramid, and cone work.
G.GMD.3	I can apply formulas for cylinders, pyramids, cones, and spheres to multiple problems.
	I can calculate the volume of a cylinder and use the volume formula to solve problems.
	I can calculate the volume of a pyramid and use the volume formula to solve problems.
	I can calculate the volume of a cone and use the volume formula to solve problems.
	I can calculate the volume of a sphere and use the volume formula to solve problems.
G.GMD.4	I can visualize relationships between two-dimensional and three-dimensional objects.
	I can determine the two-dimensional cross-section of a three-dimensional object.
	I can determine the three-dimensional object generated by rotating a two-dimensional object.

G.MG.1	I can describe real-world objects using the measures and properties of geometric shapes.
	I can draw a geometric representation as a model of a real-life object and solve for unknown values using the geometric objects properties.
	I can make connections from geometric shapes to real-world objects such as showing a tree trunk as a cylinder.
	I can apply my knowledge of geometric measurements and properties to draw conclusions about real-world problems.
G.MG.2	I can explain how density relates to area and volume and apply it to multiple situations.
	I can apply area and volume to situations involving density.
	I can explain what compound units are, such as mass per unit of volume.
G.MG.3	I can apply geometric methods to solve design problems.
	I can create a visual representation of a design problem.
	I can solve design problems using a geometric model.
	I can use geometry to model real-world situations in order to design solutions to real-world problems.
	I can justify the decisions made to demonstrate that the resulting design addresses the contexts.
S.CP.1	I can describe subsets of a sample space.
	I can define event and sample space.
	I can establish events as subsets of a sample space.
	I can relate Venn diagrams and frequency tables to set notations and probabilistic models.
	I can find the complement of a subset.
	I can find the union and intersection of two or more sets.
S.CP.2	I can determine whether two events are independent based on their probability.
	I can define and identify independent events.
	I can explain and provide an example to illustrate that for two independent events, the probability of the events occurring together is the product of the probability of each event.
	I can verify if two events are independent by checking if P(A and B) = P(A)*P(B).
S.CP.3	I can explain the conditional probability of A given B.
	I can define dependent events and conditional probability.
	I can explain that conditional probability is the probability of an event A occurring given the occurrence of some other event B and is denoted P(A|B).
	I can use the formula P(A|B) = P(A and B)/P(B) to calculate the probability of event A occurring if B already has occurred.
	I can explain why P(A|B) = P(A) holds if A and B are independent sets.
S.CP.4	I can construct and interpret two-way frequency tables of data when two categories are associated with each object and use the table as a sample space to decide if events are independent and to approximate conditional probabilities.
	I can construct a two-way frequency table for the data that I collected.
	I can calculate a conditional probability.
	I can interpret marginal and conditional probabilities in the context of a problem.
	I can decide if two events are independent or dependent using independent probabilities.
	I can interpret the association of different events by comparing conditional probabilities.
S.CP.5	I can distinguish between conditional probability and independence in everyday language and everyday situations.
	I can identify whether a scenario represents a dependent or independent set of events, and calculate/explain the probability in the context of the problem.

	I can illustrate the concept of conditional probability using everyday examples of dependent events.
	I can illustrate the concept of independence using everyday examples of independent events.
	I can use conditional probability to make decisions and justify claims of relationships to contextual situations.
S.CP.6	I can determine the conditional probability of two events and interpret the solution within a given context.
	I can calculate the probability of the intersection of two events.
	I can use the formula P(A|B) = P(A and B)/P(B) to calculate the probability of event A occurring if B already has occurred.
	I can interpret probability based on the context of the given problem.
S.CP.7	I can calculate the probability P(A or B) by using the Addition Rule.
	I can apply the Addition Rule to determine the probability of the union of two events using the formula P(A or B) = P(A) + P(B) - P(A and B).
	I can interpret the probability of unions and intersections based on the context of the given problem.
S.CP.8+	I can calculate the probability of compound events and interpret the solution in context.
	I can apply the general Multiplication Rule to calculate the probability of the intersection of two events using the formula P(A and B) = P(A)P(B|A) = P(B)P(A|B).
	I can use tree diagrams to help in clarification and calculation of specific probabilities.
	I can interpret conditional probability based on the context of the given problem.
S.CP.9+	I can calculate the probabilities of compound events using permutations and combinations.
	I can connect ideas from the fundamental counting principles to deduce rules for permutations and combinations.
	I can explain the difference between permutations and combinations.
	I can distinguish between situations that require permutations and those that require combinations.
	I can apply the permutation and combination formulas to determine the number of outcomes in an event.
	I can compute probabilities of compound events.
S.MD.6+	I can evaluate the fairness of a decision using probabilities.
	I can make arguments for fair decisions based on random number generation.
	I can use probability to create a method for making a fair decision.
	I can use probability to analyze the results of a process and decide if it resulted in a fair decision.
S.MD.7+	I can analyze decisions and strategies by using probabilities.
	I can analyze data to determine whether or not the best decision was made.
	I can analyze available strategies, recommend a strategy, and defend my choice with probability concepts.
	I can justify and critique arguments based on probability.
Key:	
Yellow Highlight = Critical Area	
Blue Font Color = Long Term Learning Goal	
Black Font Color = Short Term (possibly daily) learning target WITHOUT condition and criteria.	