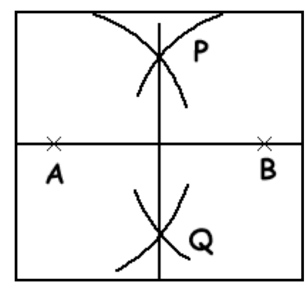
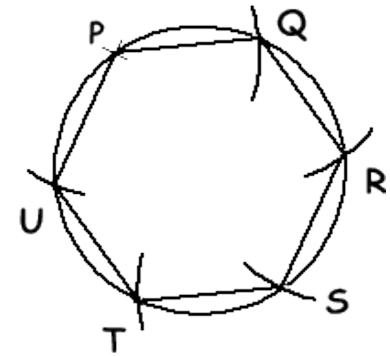
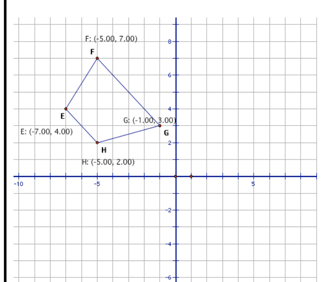
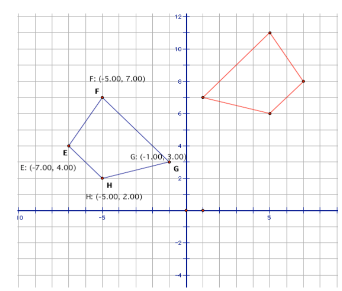
Geometry Curriculum Map

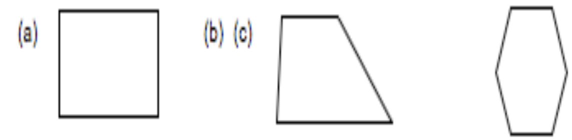
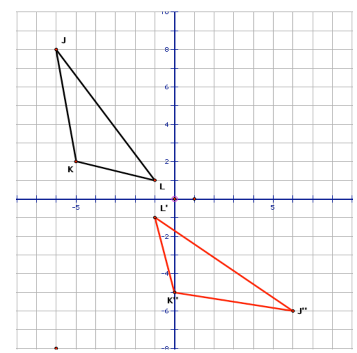
Time Period 1: Tools of Geometry: Definitions and Constructions, 20 blocks

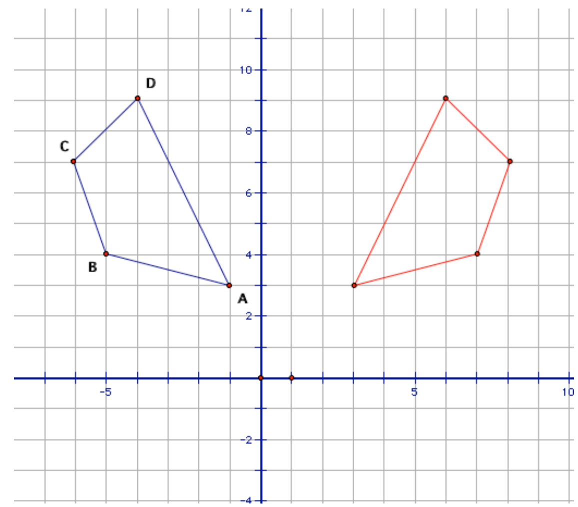
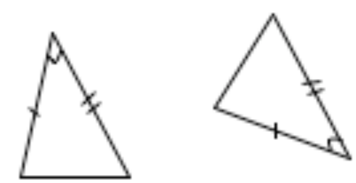
Standards:	Description	Explanation	Picture
G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Angle: A figure formed by two rays or line segments that meet at a common point Circle: The set of all points in a plane that are a fixed distance from a given point. Perpendicular line: Two lines are perpendicular if they intersect each other at a right angle (90°). Parallel Line: Two lines are parallel if they lie in the same plane and never intersect. Line segment: Part of a line containing two endpoints, and all the points between those two endpoints.	
5.G.4 9 MCAS	Classify two dimensional figures in a hierarchy based on properties	Classify a square as a rectangle and parallelogram, a rectangle as a parallelogram, an isosceles trapezoid as a trapezoid, a kite as a quadrilateral, etc.	
G-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*	Students may use geometric software to make geometric constructions. Examples: • Construct a triangle given the lengths of two sides and the measure of the angle between the two sides. • Construct the circumcenter of a given triangle .• Construct the perpendicular bisector of a line segment. See Picture	

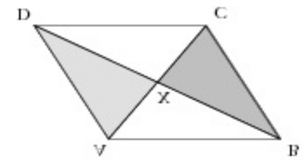
G-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	See Picture • Construct a regular hexagon inscribed in a circle. This construction can also be used to draw a 120° angle. 1. Keep your compasses to the same setting throughout this construction. 2. Draw a circle. 3. Mark a point, P, on the circle. 4. Put the point of your compasses on P and draw arcs to cut the circle at Q and U. 5. Put the point of your compasses on Q and draw an arc to cut the circle at R. 6. Repeat with the point of the compasses at R and S to draw arcs at S and T. 7. Join PQRSTU to form a regular hexagon. 8. Measure the lengths to check they are all equal, and the angles to check they are all 120 degrees.	

Time Period 2: Congruence and Transformations, 15 blocks

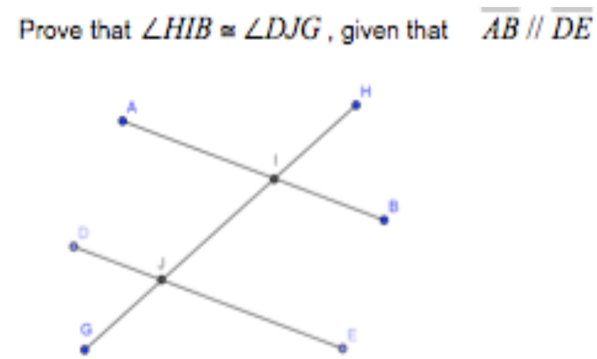
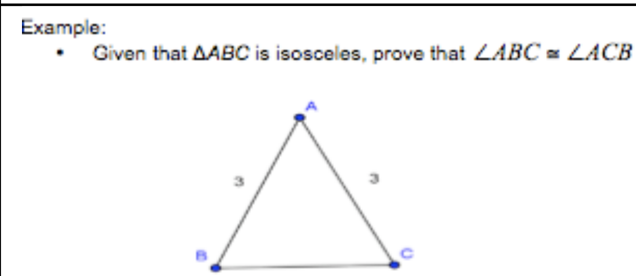
Standards	Description	Explanation	Picture
G-CO 2	Represent transformations in the plane using, e.g., transparencies and geometry software;describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g.,translation versus horizontal stretch).	Example: See Picture • The figure below is reflected across the y-axis and then shifted up by 4 units. Draw the transformed figure and label the new coordinates. See picture: What function can be used to describe these transformations in the coordinate plane? Solution: Function (-1x, y + 4)	 

G-CO 3	Given a rectangle, parallelogram, trapezoid, or regular polygon, and describe the rotations and reflections that carry it onto itself.	Students may use geometry software and/or manipulatives to model transformations. Example: See picture • For each of the following shapes, 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.	Students may use geometry software and/or manipulatives to model transformations. Students may observe patterns and develop definitions of rotations, reflections, and translations. A rotation is a movement of all points in a figure by the same angle measure in the same direction along a circular path around a fixed point.	
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.	Students may use geometry software and/or manipulatives to model transformations and demonstrate a sequence of transformations that will carry a given figure onto another. Example: See picture • For the diagram below, describe the sequence of transformations that was used to carry the black preimage on to the red image.	

G-CO 6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	Rigid motions are at the foundation of the definition of congruence. Students reason from the basic properties of rigid motions (that they preserve distance and angle), which are assumed without proof. Rigid motions and their assumed properties can be used to establish the usual triangle congruence criteria, which can then be used to prove other theorems. A rigid motion is a transformation of points in space consisting of a sequence of one or more translations, reflections, and/or rotations. Rigid motions are assumed to preserve distances and angle measures. Example: See picture • Determine if the figures below are congruent, if so tell what rigid motions were used.	
G-CO 7	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	A rigid motion is a transformation of points in space consisting of a sequence of one or more translations, reflections, and/or rotations. Rigid motions are assumed to preserve distances and angle measures. Congruence of triangles: Two triangles are said to be congruent if one can be exactly superimposed on the other by a rigid motion, and the congruence theorems specify the conditions under which this can occur. Example: See picture • Are the following triangles congruent? Explain how you know.	

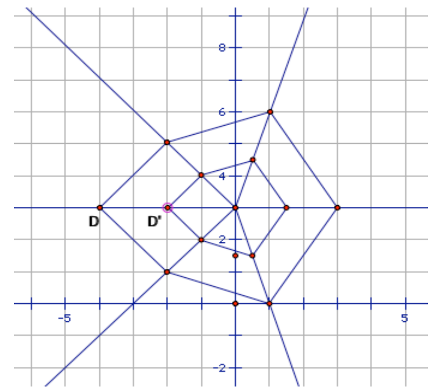
G-CO 8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	Example: • Decide whether there is enough information to prove that the two shaded triangles are congruent. Note, in the figure (picture), ABCD is a parallelogram.	

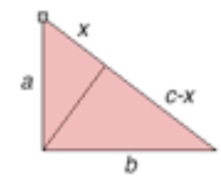
Time Period 3: Geometric Relationships & Properties, 15 blocks

Standards	Description	Explanation	Picture
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.	Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning) Students may use geometric simulations (computer software or graphing calculator) to explore theorems about lines and angles. See picture for example	
G-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; 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.	Students may use geometric simulations (computer software or graphing calculator) to explore theorems about triangles. See picture for example.	

8.G.5 MCAS	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.	*Prove the angle sum theorem see picture and have students solve for missing angles in triangles *Have students prove alternate interior angles are congruent, corresponding angles are congruent, etc. and use these facts to solve for missing angles	
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.	Students may use geometric simulations (computer software or graphing calculator) to explore theorems about parallelograms.	
MA.G-CO.11a	Prove Theorems about polygons. Theorems include: measures of interior and exterior angles, properties of inscribed polygons.	Students should know how to solve for the sum of interior and exterior angles of angle polygon: (n-2)180 and 360 degrees, respectively. Students should also be able to solve for one interior angle or one exterior angle in a regular polygon.	

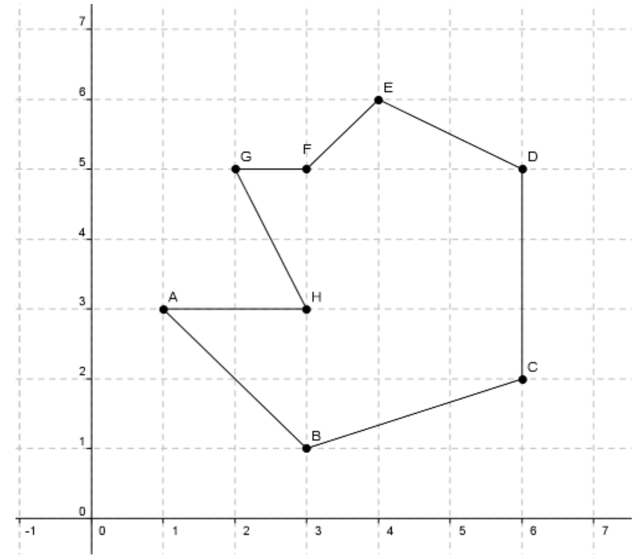
Time Period 4: Similarity, 10 blocks

Standards	Description	Explanation	Picture
G-SRT 1	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.	Students may use geometric simulation software to model transformations. Students may observe patterns and verify experimentally the properties of dilations. A dilation is a transformation that moves each point along the ray through the point emanating from a fixed center, and multiplies distances from the center by a common scale factor. Example: See picture • Draw a polygon. Pick a point and construct a dilation of the polygon with that point as the center. Identify the scale factor that you used.	
G-SRT 2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	A similarity transformation is a rigid motion followed by a dilation. Students may use geometric simulation software to model transformations and demonstrate a sequence of transformations to show congruence or similarity of figures. Example: See Picture • Are these two figures similar? Explain why or why not.	
G-SRT 3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	Example: • Are all right triangles similar to one another? How do you know?	

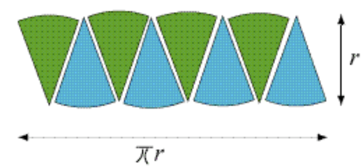
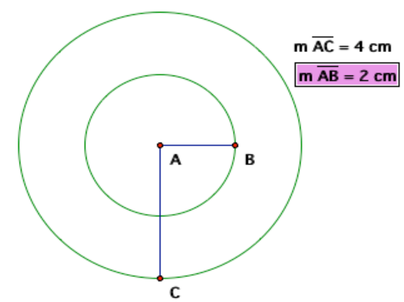
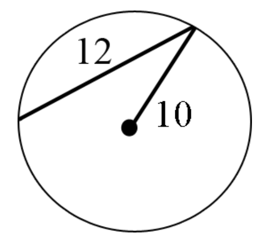
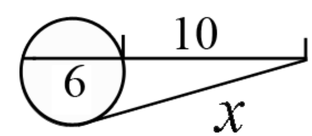
G-SRT 4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	Students may use geometric simulation software to model transformations and demonstrate a sequence of transformations to show congruence or similarity of figures. *Cut a triangle with a midsegment and show that both triangles are similar using AA • Prove that if two triangles are similar, then the ratio of corresponding altitudes is equal to the ratio of corresponding sides. • To prove the Pythagorean theorem using triangle similarity See picture We can cut a right triangle into two parts by dropping a perpendicular onto the hypotenuse. Since these triangles and the original one have the same angles, all three are similar. Therefore	 $\frac{x}{a}=\frac{a}{c},\ \frac{c-x}{b}=\frac{b}{c}$ $x=\frac{a^2}{c},\ c-x=\frac{b^2}{c}$ $x+(c-x)=c$ $\frac{a^2}{c}+\frac{b^2}{c}=c$ $a^2+b^2=c^2$
G-SRT 5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Students may use geometric simulation software to model transformations and demonstrate a sequence of transformations to show congruence or similarity of figures. Similarity criteria include SSS, SAS, and AA. Congruence criteria include SSS, SAS, ASA, AAS, and H-L.	

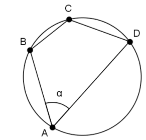
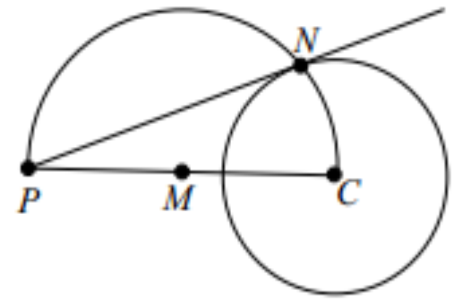
Time Period 5: Coordinate Geometry, 15 blocks

Standards	Description	Explanation	Picture
8.G.8 MCAS	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Have students discover the distance formula using the Pythagorean theorem on a coodinate grid. Have students apply the distance formula to find distances between coordinates	
G-GPE 4	Use coordinates to prove simple geometric theorems algebraically. 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).	Students may use geometric simulation software to model figures and prove simple geometric theorems. Examples: • Use slope and distance formula to verify the polygon formed by connecting the points (-3, -2), (5, 3), (9, 9), (1, 4) is a parallelogram. • 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).	Students may use a variety of different methods to construct a parallel or perpendicular line to a given line and calculate the slopes to compare the relationships. Example: • Find the equation of a line perpendicular to $3x + 5y = 15$ through the point (-3,2).	

G-GPE 6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	Examples: • Given A(3, 2) and B(6, 11), o Find the point that divides the line segment AB two-thirds of the way from A to B. The point two-thirds of the way from A to B has x-coordinate two-thirds of the way from 3 to 6 and y coordinate two-thirds of the way from 2 to 11. So, (5, 8) is the point that is two-thirds from point A to point B. o Find the midpoint of line segment AB.	
G-GPE 7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	This standard provides practice with the distance formula and its connection with the Pythagorean theorem. Students may use geometric simulation software to model figures. Example: See Picture • Find the area and perimeter for the figure	

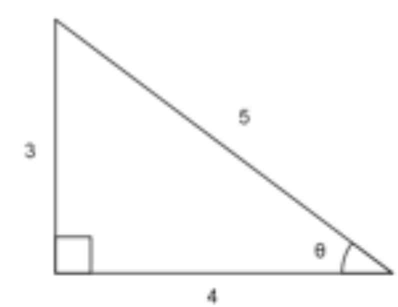
Time Period 6: Circles and Conics, 15 blocks

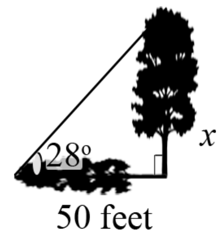
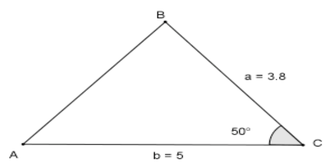
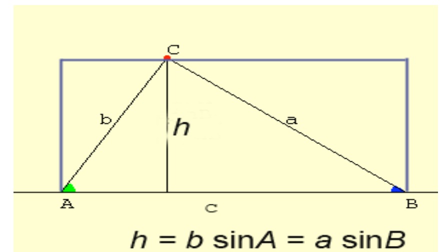
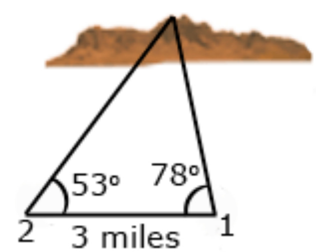
Standards	Description	Explanation	Picture
7.G.4 MCAS	Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	*Solve for area and circumference *Derive the area of a circle using the sector method See picture	
G-C 1	Prove that all circles are similar.	Students may use geometric simulation software to model transformations and demonstrate a sequence of transformations to show congruence or similarity of figures. Example:See picture • Draw or find examples of several different circles. In what ways are they related? How can you describe this relationship in terms of geometric ideas? Form a hypothesis and prove it.	
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.	• Given the circle below with radius of 10 and chord length of 12, find the distance from the chord to the center of the circle, See picture. • See picture. Find the unknown length in the picture below. *Solve for central and insribed angles *Use chord theorem and semi-circle theorem to solve for angles and missing lengths	 

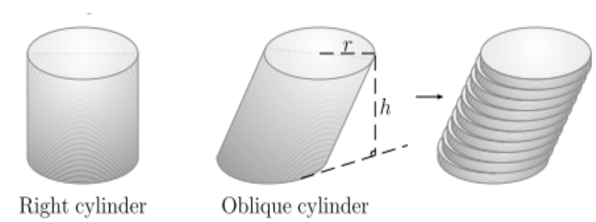
G-C 3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	Example: • Given an inscribed quadrilateral, prove that < B is supplementary to < D. See picture	
G-C 4	(+) Construct a tangent line from a point outside a given circle to the circle. Not tested in PARCC	Students may use geometric simulation software to make geometric constructions Example: Picture • To construct a tangent line to circle C: 1. Draw a point P outside of the circle. 2. Connect center of the circle C with point P and construct the perpendicular bisector of the segment. Label the point where the perpendicular bisector and the segment meet M. 3. With M as the center draw a half circle through P and C. 4. Construct a point at the intersection of the half circle and circle C, label this point N. 5. Draw a line through P and N, Line PN is the tangent to circle C.	
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.	Emphasize the similarity of all circles. Note that by similarity of sectors with the same central angles, arc lengths are proportional to the radius. Use this as a basis for introducing the radian as a unit of measure. It is not intended that it be applied to the development of circular trigonometry in this course. Students can use geometric simulation software to explore angle and radian measures and derive the formula for the area of a sector.	

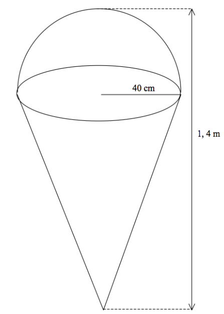
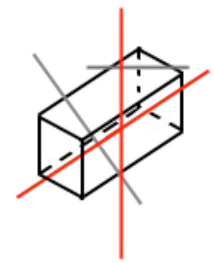
G-GPE 1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	The standard form of a circle is $(x-h)^2 + (y-k)^2 = r^2$, where the center is (h,k) with a radius of r. Examples: • Write an equation for a circle with a radius of 2 units and center at (1, 3). • Write an equation for a circle given that the endpoints of the diameter are (-2, 7) and (4, -8). • Find the center and radius of the circle $4x2 + 4y2 - 4x + 2y – 1 = 0$.	

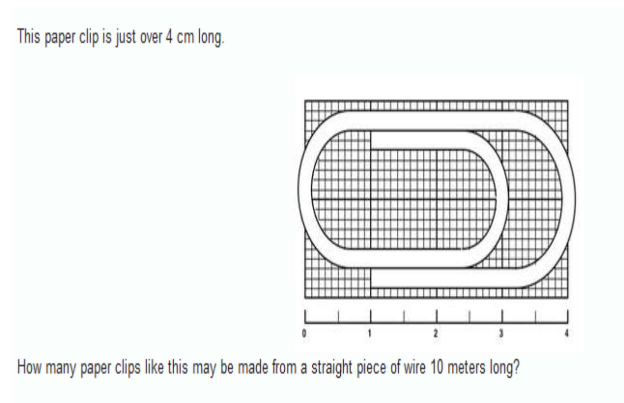
Time Period 7: Right Triangles, 15 blocks

Standards	**Description**	**Explanation**	**Picture**
G-SRT 6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	Students should know and understand trig formulas. In addition, students may use applets to explore the range of values of the trigonometric ratios as θ ranges from 0 to 90 degrees. Include cosecant, secant, and cotangent	
G-SRT 7	Explain and use the relationship between the sine and cosine of complementary angles.	Geometric simulation software, applets, and graphing calculators can be used to explore the relationship between sine and cosine. Example: Picture • Find the sine and cosine of angle θ in the triangle below. What do you notice?	

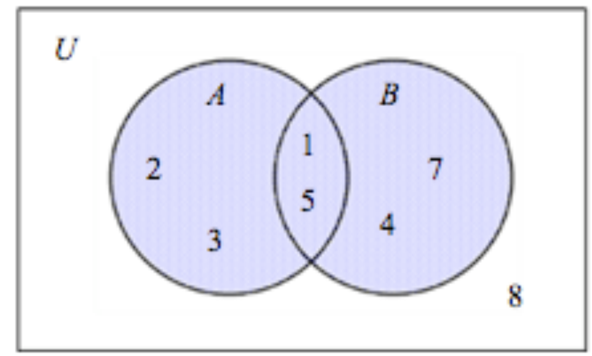
G-SRT 8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*	Students may use graphing calculators or programs, tables, spreadsheets, or computer algebra systems to solve right triangle problems.Example: Picture • Find the height of a tree to the nearest tenth if the angle of elevation of the sun is 28° and the shadow of the tree is 50 ft	
G-SRT 9	(+) Derive the formula A = .5ab sin(C) for the area of a triangle by drawing an altitude to the opposite side. 	Example: Picture for proof of theorem Find the area of the following triangle. Generalize by finding the area in terms of the side and angle labels instead of using the values.	A = 1/2bh, and here the height is asinB (using trig we found this) and the base is c, so the total formula is A = 1/2absinC 
G-SRT 10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.	Prove and apply both theorems. Law of Sines: $\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$. Law of Cosines: $c^2 = a^2 + b^2 - 2ab\cos(C)$.	
G-SRT 11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	Example: Picture • Tara wants to fix the location of a mountain by taking measurements from two positions 3 miles apart. From the first position, the angle between the mountain and the second position is 78 degrees. From the second position, the angle between the mountain and the first position is 5 degreeso. How can Tara determine the distance of the mountain from each position and what is the distance from each position?	

Time Period 8: Volume, 10 blocks			
Standards	**Description**	**Explanation**	**Picture**
7.G.3 MCAS	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	* Have students visualize the various figures made when taking a cross section of 3d figures	
7.G.6 MCAS	Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	*Students should be able to differentiate between a surface area and volume word problem and solve.	
7.G.MA.7 MCA	Solve real-world and mathematical problems involving the surface area of spheres.	*Students should be able to apply the surface area formula of a sphere to real world problems	
G-GMD 1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	Cavalieri's principle is if two solids have the same height and the same cross-sectional area at every level, then they have the same volume. • Prove that the right cylinder and the oblique cylinder have the same volume Picture	
G-GMD2	Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures. (+) Not in PARCC	*Explain why many volume formulas are the area of the base times the height. Derive the sphere volume formula using an applet. Desribe the relationship between the volume of a cyclinder and the volume of a cone.	

G-GMD 3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	Missing measures can include but are not limited to slant height, altitude, height, diagonal of a prism, edge length, and radius. Example: • Determine the volume of the figure .Picture	
G-GMD 4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	Students may use geometric simulation software to model figures and create cross sectional views. Example:Picture • Identify the shape of the vertical, horizontal, and other cross sections of a cylinder. • Identify the shape of the vertical, horizontal, and other cross sections of a rectangular prism.	
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).*	Example: • A cylinder can model a tree trunk or a human torso. • How can you model objects in your classroom as geometric shapes?	

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).*	Example: • Tucson has about one million people within approximately 195 square miles. What is Tucson's population density?	
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).*	*Students should be able to minimize surface area and maximize volume as a good business tool • Design an object or structure to satisfy physical constraints or minimize cost • Work with typographic grid systems based on ratios. Examples Picture	
MA.4.	Use dimensional analysis for unit conversions to confirm that expressions and equations make sense.	*Students should make sure all units are uniform *Students can find the area of a room in square feet and convert it to square yards	

Time Period 9: Statistics, 15 blocks

Standards	Description	Explanation	Picture
S-CP 1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	Build on work with two-way tables from S-ID.5 to develop understanding of conditional probability and independence. Intersection: The intersection of two sets A and B is the set of elements that are common to both set A and set B. It is denoted by A ∩ B and is read 'A intersect B'. • A ∩ B in the diagram below is {1, 5} • this means: BOTH/AND. See Picture Union: The union of two sets A and B is the set of elements that are in A or in B or in both. It is denoted by A B and is read 'A union B'. • A B in the diagram is {1, 2, 3, 4, 5, 7} • this means: EITHER/OR/ANY • could be both Complement: The complement of the set A B is the set of elements that are members of the universal set U but are not in A B. It is denoted by (A B)'. (A B)' in the diagram is {8}	
S-CP 2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	. Two events, A and B, are independent if the probability of them occurring together is the product of the probabilities, P(A)•P(B). Event A doesn't affect the probability of event B occurring. Example: • What is the probability of getting tails on a coin flip and then rolling a 3 on a standard 6-sided die?	

<table>
<tr>
<td>S-CP 3</td>
<td>Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.</td>
<td>Example:
• A drawer contains 13 blue socks and 13 red socks. If you choose two socks from the drawer in the dark, what is the probability that the second sock will be blue, given that the first was blue?</td>
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<td>S-CP 4</td>
<td>Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.</td>
<td>Students may use spreadsheets, graphing calculators, and simulations to create frequency tables and conduct analyses to determine if events are independent or determine approximate conditional probabilities.

Example:
• Collect data from a random sample of students in your school on their favorite subject among math, science, history and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.
• A two-way frequency table (see picture) is shown below displaying the relationship between age and baldness. We took a sample of 100 male subjects and determined who is or is not bald. We also recorded the age of the male subjects by categories.What is the probability that a man from the sample is bald, given that he is under 45?</td>
<td>
<table>
<tr><th colspan="4">Two-way Frequency Table</th></tr>
<tr><td>Bald</td><td colspan="2">Age</td><td>Total</td></tr>
<tr><td></td><td>Younger than 45</td><td>45 or older</td><td></td></tr>
<tr><td>No</td><td>35</td><td>11</td><td>46</td></tr>
<tr><td>Yes</td><td>24</td><td>30</td><td>54</td></tr>
<tr><td>Total</td><td>59</td><td>41</td><td>100</td></tr>
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S-CP 5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer. Use the rules of probability to compute probabilities of compound events in a uniform probability model.	Examples: • What is the probability of drawing a heart from a standard deck of cards on a second draw, given that a heart was drawn on the first draw and not replaced? Are these events independent or dependent? • At Johnson School, the probability that a student takes computer science and French is 0.062. The probability that a student takes computer science is 0.43. What is the probability that a student takes French given that the student is taking computer science?	
S-CP 6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	Students could use graphing calculators, simulations, or applets to model probability experiments and interpret the outcomes. Example: • A teacher gave her class two quizzes. 30% of the class passed both quizzes and 60% of the class passed the first quiz. What percent of those who passed the first quiz also passed the second quiz?	
S-CP 7	Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.	Students could use graphing calculators, simulations, or applets to model probability experiments and interpret the outcomes. Example: • In a math class of 32 students, 18 are boys and 14 are girls. On a unit test, 5 boys and 7 girls made an A grade. If a student is chosen at random from the class, what is the probability of choosing a girl or an A student?	

S-CP 8	(+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.	Students could use graphing calculators, simulations, or applets to model probability experiments and interpret the outcomes. Example: • In a certain town, all of the children eat either peanut butter sandwiches or cheese sandwiches for lunch. 4/9 of the boys prefer cheese and 1/4 of the girls prefer peanut butter. 3/5 of the children are boys. What is the probability that a child chosen at random will be a girl who prefers peanut butter?	
S-CP 9	(+) Use permutations and combinations to compute probabilities of compound events and solve problems. «	Students may use calculators or computers to determine sample spaces and probabilities. Example: • You and two friends go to the grocery store and you each buy a soda. If there are five different kinds of soda, and each of you is equally likely to buy each variety, what is the probability that no one buys the same kind?	
S-MD 6	(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator). «	Example: • There are 80 freshmen at a high school that want to participate in a free throw contest during halftime at the next basketball game. There will only be time for five students to participate. Besides numbering students and pulling a number from a hat, in what other way(s) can the five students be chosen fairly?	

S-MD 7	(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	Students may use graphing calculators or programs, spreadsheets, or computer algebra systems to model and interpret parameters in linear, quadratic or exponential functions. Example: • Suppose that a blood test indicates the presence of a particular disease 97% of the time when the disease is actually present. The same test gives false positive results 0.25% of the time. Suppose that one percent of the population actually has the disease. If our blood test is positive, how likely is it that we actually have the disease?	

Exam Title	Units Covered
Q1 Exam:	Tools of Geometry, Congruence and Transformations
Midterm Exam:	Geometric Relationships and Properties, Similarity
Q3 Exam:	Coordinate Geometery, Circles
Q4 Exam:	Right Triangles, Volume, Statistics