Public Schools of North Carolina

State Board of Education | Department of Public Instruction

This document is designed to help North Carolina educators teach the Common Core. NCDPI staff are continually updating and improving these tools to better serve teachers.

Geometry Curriculum Crosswalk

The following document is to be used to compare the 2003 North Carolina Mathematics Standard Course of Study for Geometry and the Common Core State Standards for Geometry.

As noted in the Common Core State Standards for Mathematics document, the high school standards specify the mathematics that all students should study in order to be college and career ready. Mathematics concepts that lay the foundation for more advanced courses are indicated by a plus (+). Specific modeling standards appear throughout the high school Common Core State Standards for Mathematics and are indicated by a star (★). The high school standards were developed in conceptual categories that portray a coherent view of high school mathematics that cross a number of course boundaries. These conceptual categories include:

- Number and Quantity
- Algebra
- Functions
- Modeling
- Geometry
- Statistics and Probability

To download the Common Core State Standards, please visit http://www.corestandards.org/the-standards.

Important Note: The current SCoS will continue to be the taught and tested standards in the 2010-11 and 2011-12 school years. We expect the new Common Core standards to be taught and assessed in schools for the first time in the 2012-13 school year. That said, we are providing resources now and over the next two-years so that schools and teachers can get a head start on internalizing and planning to teach the new standards.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	Cluster / Text of objective	Comments
Number and Operations	1.01	Use the trigonometric ratios to model and solve problems involving right triangles.	Similarity, Right Triangles & Trigonometry	G.SRT.6	**Define trigonometric ratios and solve problems involving right triangles** 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.	Similarity is not explicit in the 2003 NC SCOS.
				G.SRT.7	**Define trigonometric ratios and solve problems involving right triangles** Explain and use the relationship between the sine and cosine of complementary angles.	
				G.SRT.8	**Define trigonometric ratios and solve problems involving right triangles** Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*	
	1.02	Use length, area, and volume of geometric figures to solve problems. Include arc length, area of sectors of circles; lateral area, surface area, and volume of three-dimensional figures; and perimeter, area, and volume of composite figures.	Expressing Geometric Properties with Equations	G.GPE.7	**Use coordinates to prove simple geometric theorems algebraically** Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	

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			Geometric Measurement and Dimension	G.GMD.3	**Explain volume formulas and use them to solve problems** Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*	
			Modeling with Geometry	G.MG.2	**Apply geometric concepts in modeling situations** Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*	In the 2003 NC SCOS, area and volume were typically applied in context individually, not necessarily in the context of density. Density is not in the 2003 NC SCOS.
	1.03	Use length, area, and volume to model and solve problems involving probability.				Not addressed in the CCSS.
			Modeling with Geometry	G.MG.3	**Apply geometric concepts in modeling situations** 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).*	New to CCSS.
			Circles	G.C.5	**Find arc lengths and areas of sectors of circles** 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.	New to CCSS.
			etri c Pro pert	G.	**Translate between the geometric description and the equation for a conic section**	New to CCSS.

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					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.	
Geometry and Measurement	2.01	Use logic and deductive reasoning to draw conclusions.				These concepts are embedded in the CCSS in the mathematical practices.
	2.02	Apply properties, definitions, and theorems of angles and lines to solve problems and write proofs.	Congruence	G.CO.1	**Experiment with transformations in the plane** 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.	In the 2003 NC SCOS, circle and distance around a circular arc are not addressed in this standard.
				G.CO.9	**Prove geometric theorems** 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 angels are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*	
			Expressing Geometric Properties with Equations	G.GPE.5	**Use coordinates to prove simple geometric theorems algebraically** 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).	
	0.	Apply properties, definitions, and	g r u e	G	**Experiment with transformations in the plane**	The concept of circles is the

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		theorems of two-dimensional figures to solve problems and write proofs: a) Triangles. b) Quadrilaterals. c) Other polygons. d) Circles.			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.	only part of G.CO.1 that is represented in this particular 2003 NC SCOS standard. The others are represented in NC SCOS 2.02.
				G.CO.10	**Prove geometric theorems** 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.*	
				G.CO.11	**Prove geometric theorems** 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.*	
			Similarity, Right Triangles, and Trigonometry	G.SRT.4	**Prove theorems involving similarity** 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.*	Similarity is not explicit in the 2003 NC SCOS.
				G.SRT.5	**Prove theorems involving similarity** Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Congruence is not explicit in the 2003 NC SCOS.
			Circles	G.C.2	**Understand and apply theorems about circles** Identify and describe relationships among inscribed	

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					angels, 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.*	
			Expressing Geometric Properties with Equations	G.GPE.4	**Use coordinates to prove simple geometric theorems algebraically** 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, $\sqrt{3}$) lies on the circle centered a the origin and containing the point (0, 2).*	
				G.GPE.7	**Use coordinates to prove simple geometric theorems algebraically** Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	
	2.04	Develop and apply properties of solids to solve problems.	Geometric Measurement and Dimension	G.GMD.1	**Explain volume formulas and use them to solve problems** 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.*	The methods of dissection arguments, Cavalieri's principal, and informal limit arguments were not specified in the 2003 NC SCOS for this standard.
				G.G	**Explain volume formulas and use them to solve problems.**	

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Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
					Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*	
			Modeling with Geometry	G.MG.1	**Apply geometric concepts in modeling situations** Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder)*	
			Congruence	G.CO.6	**Understand congruence in terms of rigid motions** 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.	Congruence is in the 2003 NC SCOS; however, it is not explicit or in terms of rigid motion.
				G.CO.7	**Understand congruence in terms of rigid motions** Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	Congruence is in the 2003 NC SCOS; however, it is not explicit or in terms of rigid motion.
				G.CO.8	**Understand congruence in terms of rigid motions** Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	Congruence is in the 2003 NC SCOS; however, it is not explicit or in terms of rigid motion.
				G.CO.12	**Make geometric constructions** 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*	New to CCSS.

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					of a line segment; and constructing a line parallel to a given line through a point not on the line.	
				G.CO.13	**Make geometric constructions** Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	New to CCSS.
			Similarity, Right Triangles, and Trigonometry	G.SRT.9	**Apply trigonometry to general triangles** (+) Derive the formula $A = 1/2\ ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	New to CCSS.
			Similarity, Right Triangles, and Trigonometry	G.SRT.10	**Apply trigonometry to general triangles** (+) Prove the Laws of Sines and Cosines and use them to solve problems.	New to CCSS.
			Similarity, Right Triangles, and Trigonometry	G.SRT.11	**Apply trigonometry to general triangles** (+) 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).	New to CCSS.
			Circles	G.C.1	**Understand and apply theorems about circles** Prove that all circles are similar.	New to CCSS.
			Circles	G.C.3	**Understand and apply theorems about circles** Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	New to CCSS.
			Circles	G	**Understand and apply theorems about circles**	New to CCSS.

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					(+) Construct a tangent line from a point outside a given circle to the circle.	
			Expressing Geometric Properties with Equations	G.GPE.1	**Translate between the geometric description and the equation for a conic section** 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.	New to CCSS.
			Expressing Geometric Properties with Equations	G.GPE.2	**Translate between the geometric description and the equation for a conic section** Derive the equation of a parabola given a focus and directrix.	New to CCSS.
			Expressing Geometric Properties with Equations	G.GPE.6	**Use coordinates to prove simple geometric theorems algebraically** Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	New to CCSS.
			Geometric Measurement and Dimension	G.GMD.4	**Visualize relationships between two-dimensional and three- dimensional objects** Identify the shapes of two-dimensional cross-sections of three- dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	New to CCSS.
Data Analysis and Probability	3.01	Describe the transformation (translation, reflection, rotation, dilation) of polygons in the coordinate plane in simple algebraic terms.	Congruence	G.CO.2	**Experiment with transformations in the plane** 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).	The Common Core extends this concept by asking for more than a description of the transformation algebraically.

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				G.CO.3	**Experiment with transformations in the plane** Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	
				G.CO.4	**Experiment with transformations in the plane** Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	
				G.CO.5	**Experiment with transformations in the plane** Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure, e.g. graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	
			Similarity, Right Triangles, and Trigonometry	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.	

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					Understand similarity in terms of similarity transformations Verify experimentally the properties of dilations given by a center and a scale factor: b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	
				G.SRT.2	**Understand similarity in terms of similarity transformations** Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	
				GSRT.3	**Understand similarity in terms of similarity transformations.** Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	
	3.02	Use matrix operations (addition, subtraction, multiplication, scalar multiplication) to describe the transformation of polygons in the coordinate plane.				Moved to a fourth course in CCSS.
			Conditional Probability and the Rules of Probability	S.CP.1	**Understand independence and conditional probability and use them to interpret data** 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”).	New to CCSS.

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				S.CP.2	**Understand independence and conditional probability and use them to interpret data** 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.	New to CCSS.
				S.CP.3	**Understand independence and conditional probability and use them to interpret data** 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*.	New to CCSS.
				S.CP.4	**Understand independence and conditional probability and use them to interpret data** 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*.	New to CCSS.
				S.	**Understand independence and conditional probability and use them to interpret data**	New to CCSS.

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					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.*	
				S.CP.6	**Use the rules of probability to compute probabilities of compound events in a uniform probability model** 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.	New to CCSS.
				S.CP.7	**Use the rules of probability to compute probabilities of compound events in a uniform probability model** 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.	New to CCSS.
				S.CP.8	**Use the rules of probability to compute probabilities of compound events in a uniform probability model** (+) 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.	New to CCSS.
				S.CP.9	**Use the rules of probability to compute probabilities of compound events in a uniform probability model** (+) Use permutations and combinations to compute probabilities of compound events and solve problems.	New to CCSS.
			Probabilit y to Make	S.MD.6	**Use probability to evaluate outcomes of decisions** (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	New to CCSS. The expectation at this level is the application of the counting rules from middle school.

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				S.MD.7	**Use probability to evaluate outcomes of decisions** (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	New to CCSS. The expectation at this level is the application of the counting rules from middle school.