	NJDOE MODEL CURRICULUM PROJECT		
CONTENT AREA: Mathematics	**Course: Geometry**	**UNIT #: 1**	**UNIT NAME: Congruence, Proof, and Construction**

#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
1	Use the undefined notion of a point, line, distance along a line and distance around a circular arc to develop definitions for angles, circles, parallel lines, perpendicular lines and line segments.	G.CO.1
2	Apply the definitions of angles, circles, parallel lines, perpendicular lines and line segments to describe rotations, reflections, and translations.	G.CO.1, G.CO.4
3	Develop and perform rigid transformations that include reflections, rotations, translations and dilations using geometric software, graph paper, tracing paper, and geometric tools and compare them to non-rigid transformations.	G.CO.2, G.CO.3, G.CO.4, G.CO.5
4	Use rigid transformations to determine, explain and prove congruence of geometric figures.	G.CO.6, G.CO.7, G.CO8
5	Create proofs of theorems involving lines, angles, triangles, and parallelograms.* (Please note G.CO.10 will be addressed again in unit2 and G.CO.11 will be addressed again in unit 4)	G.CO.9, G.CO.10, G.CO.11
6	Generate formal constructions with paper folding, geometric software and geometric tools to include, but not limited to, the construction of regular polygons inscribed in a circle.	**G.CO.12**, G.CO.13

*G.CO.9(Lines and Angles): *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*

*G.CO.10 (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.C0.11: (Parallelograms) - Theorems include: opposite sides are congruent, opposite angles are congruent, and the diagonals of a parallelogram bisect each other and conversely, rectangles are parallelograms with congruent diagonals. (Content included in unit 2, repeated to assess fluency.)

Major Content Supporting Content Additional Content *(Identified by PARCC Model Content Frameworks*).

Bold type indicates grade level fluency requirements. *(Identified by PARCC Model Content Frameworks).*

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Selected opportunities for connection to mathematical practices

1. **Make sense of problems and persevere in solving them.**
   SLO 5 Plan a pathway to prove theorems about lines, angles, triangles, and parallelograms.
2. **Reason abstractly and quantitatively.**
   SLO 4 Know and use properties of rigid transformations in proofs involving lines, angles, triangles, and parallelograms.
3. **Construct viable arguments and critique the reasoning of others.**
   SLO 5 Build a logical progression of statements to prove conjectures about lines, angles, triangles, and parallelograms.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. **Attend to precision.**
   SLO 1 Use precise language in the definitions of angles, circles, parallel lines, perpendicular lines and line segments.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

All of the content presented in this course has connections to the standards for mathematical practices.

Code #	Common Core State Standards
G.CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
G.CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
G.CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

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G.CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
G.CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
G.CO.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.
G.CO.7	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.
G.CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
G.CO.9	Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*
G.CO.10	Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*
G.CO.11	Prove theorems about parallelograms. *Theorems include: 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.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.*
G.CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

Major Content Supporting Content *(Identified by PARCC Model Content Frameworks*).

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