UbD: Geometry - Congruence

<table>
<tr><td>Time Frame: 15 Lessons</td><td>Unit 2: Congruence</td><td>Course Name: Geometry</td></tr>
<tr><td colspan="3">Stage 1: Desired Results</td></tr>
<tr><td>Established Goal(s)</td><td colspan="2">Transferable Skills</td></tr>
<tr><td rowspan="3">Standards Addressed:

HSG-CO.A.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.
HSG-CO.A.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.
HSG-CO.B.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.
HSG-CO.B.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.
HSG-CO.B.8 Explain how the criteria for triangle congruence (ASA, SAS, and</td><td colspan="2">Students will be able to independently use their learning to...

● experiment with transformations in the plane.
● understand congruence in terms of rigid motions.
● prove geometric theorems.
● make geometric constructions.
● apply mathematical knowledge, skill, and reasoning to solve real-world problems.
● develop clear and effective communication.
● increase self-direction.
● develop creative and practical problem-solving.
● develop informed and integrative thinking.</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td><u>Understandings</u>
Students will understand that...
● congruence in terms of rigid motions.
● they can prove geometric theorems using rigid transformations.
● math is a continuum, Algebra is needed for Geometry, and math concepts will build on themselves as we develop our mathematical understandings.</td><td><u>Essential Questions</u>
● What connections exist between transformations and dilations and congruence and similarity?
● How does proving theorems extend your understanding of Geometry?</td></tr>
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	Acquisition	
SSS) follow from the definition of congruence in terms of rigid motions. **HSG-CO.C.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. **HSG-CO.C.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. **HSG-CO.C.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. **HSG-MG.A.3** Apply geometric methods to solve design problems **HSN-Q.A.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	*Students will know...* ● how to identify corresponding parts from a congruence statement. ● how to use rigid transformations to figure out if figures are congruent. ● how to write a congruence statement. ● how to use rigid transformations to explain why figures are congruent. ● how to explain why if all the corresponding sides and angles are congruent then the triangles are congruent. ● how to write conjectures about what I need to know to prove two triangles are congruent. ● I can write a proof that segments of the same length are congruent. ● why the Side-Angle-Side Triangle Congruence Theorem works. ● how to use Side-Angle-Side Triangle Congruence Theorem in a proof. ● why the Angle-Side-Angle Triangle Congruence Theorem works. ● how to use Angle-Side-Angle Triangle Congruence Theorem in a proof. ● how to critique an explanation of the perpendicular bisector theorem. ● how to demonstrate or explain why the Perpendicular Bisector Theorem is true. ● know how to explain the SSS Triangle Congruence theorem works. ● how to use the SSS Triangle Congruence Theorem in a proof. ● how to use SAS, ASA, AAS, SSS SSS Triangle Congruence Theorems in a proof. ● how to write conjectures about quadrilaterals. ● that the Side-Side-Angle theorem does not guarantee congruency and be able to explain why. ● how to critique a proof about quadrilaterals. ● how to prove theorems about quadrilaterals. ● how to rewrite conjectures so it is specific enough to prove. ● how to prove theorems about the diagonals in parallelograms. ● how to critique a proof about constructions. ● how to explain why constructions work. ● how to use rigid transformations to prove quadrilaterals are congruent. ● how to write conjectures about quadrilateral congruence. ● how to define and correctly use the glossary terms: corresponding, auxiliary line, parallelogram, converse, rectangle and rhombus.	*Students will be able to...* ● identify congruent parts of triangles. ● explain why congruent parts of congruent triangles are congruent. ● explain how SAS, ASA, AAS, SSS can be used to show congruent triangles. ● develop precise language when explaining or proving theorems or concepts. ● prove the Perpendicular Bisector Thoerem. ● use triangle congruency theorems in proofs. ● use triangle congruency theorems in developing proof about quadrilaterals. ● use triangle congruency theorems in developing proof about parallelograms. ● use constructions and write proofs about triangles and quadrilaterals. ● use rigid transformations to demonstrate congruency. ● understand and define specific vocabulary that help develop concepts and understandings. ● define and use geometry-specific vocabulary words that were introduced in this unit. Mathematical Practices: ● make sense of problems and persevere in solving them. ● reason abstractly and quantitatively. ● construct viable arguments and critique the reasoning of others. ● model with mathematics. ● use appropriate tools strategically. ● attend to precision. ● look for and make use of structure. ● look for and express regularity in repeated reasoning.