

Richmond Public Schools
Curriculum Framework
Geometry

Strand: Triangles		
G.6	The student, given information in the form of a figure or statement, will prove two triangles are congruent.	
G.4	The student will construct and justify the constructions of	
	e) the bisector of a given angle;	
	f) an angle congruent to a given angle;	
Suggested Pacing	Cognitive Demand	
Second Nine Weeks	G.6	G.4e-f
5 instructional days (including assessment)	Apply	Create
Spiraling Down Standards	Spiraling Up Standards	
<p>6.9 The student will determine congruence of segments, angles, and polygons.</p> <p>7.5 The student will solve problems, including practical problems, involving the relationship between corresponding sides and corresponding angles of similar quadrilaterals and triangles.</p>	N/A	
Essential Questions	Common Misconceptions	
<p>What are congruent triangles? <i>Congruent triangles are triangles that have corresponding parts (matching parts) that have equal measures.</i> <i>CPCTC – Corresponding Parts of Congruent Triangles are Congruent</i></p>	<ul style="list-style-type: none"> • When students have to write congruency statements they can get the vertices mixed up when proven triangles are congruent by SSS postulate. Asking the students to mark the corresponding angles before writing the congruency statement can help. • Students may get ASA and AAS confused. Emphasize that the side in ASA is the included side and must be in between the two angles. 	

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<p>What are one-to-one correspondences that prove triangles congruent? <i>One-to-one correspondences that prove triangles are congruent are SSS, SAS, ASA, AAS, and HL.</i></p>	<ul style="list-style-type: none"> Students may think that AAA can be used to prove triangles are congruent. By drawing different size equilateral triangles, you can show students that the triangles have AAA, but they are different sizes which disproves that they are congruent. In right triangles, HL can be confused with SSA, which does not prove triangles congruent.
<p>Understanding the Standard</p>	<p>Essential Knowledge and Skills</p>
<p>G.6</p> <ul style="list-style-type: none"> Deductive or inductive reasoning is used in mathematical proofs. In this course, deductive reasoning and logic are used in direct proofs. Direct proofs are presented in different formats (typically two-column or paragraph) and employ definitions, postulates, theorems, and algebraic justifications including coordinate methods, Congruence has practical applications in a variety of areas, including art, architecture, and the sciences. Congruence does not depend on the position of the triangles. Congruent triangles are a result of rigid isomorphic transformations. Concepts of logic can demonstrate congruence or similarity. Congruent figures are also similar, but similar figures are not necessarily congruent. Corresponding parts of congruent triangles are congruent. Two triangles can be proven congruent using the following criterion: 	<p>G.6 The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to</p> <ul style="list-style-type: none"> Prove two triangles congruent given relationships among angles and sides of triangles expressed numerically or algebraically. Prove two triangles congruent given representations in the coordinate plane and using coordinate methods (distance formula and slope formula). Use direct proofs to prove two triangles congruent. <p>G.4e,f The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to</p> <ul style="list-style-type: none"> Construct and justify the constructions of <ul style="list-style-type: none"> the bisector of a given angle; (e) an angle congruent to a given angle; (f)

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Side-Angle-Side (SAS);
Side-Side-Side (SSS);
Angle-Angle-Side (AAS); and
Angle-Side-Angle (ASA)

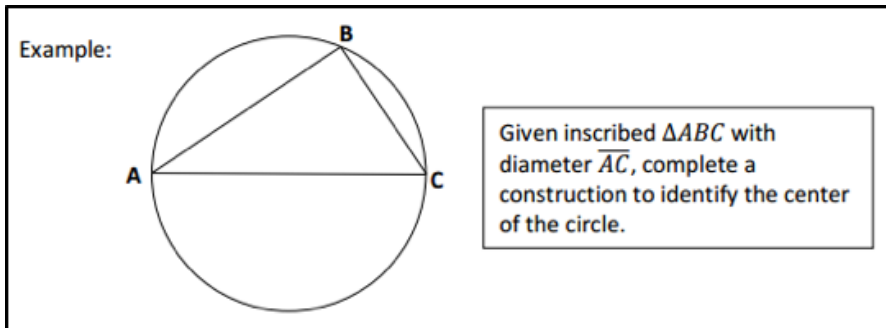
- Two right triangles can be proven congruent using the criteria Hypotenuse-Leg (HL).
- Triangle congruency can be explored using geometric constructions such as an angle congruent to a given angle or a line segment congruent to a given line segment.
- The construction for the bisector of a given angle can be justified using congruent triangles.
- The construction for an angle congruent to a given angle can be justified using congruent triangles.
- The construction of the perpendicular to a given line from a point on the line can be justified using congruent triangles.
- The construction of the perpendicular to a given line from a point not on the line can be justified using congruent triangles.

G.4ef

- Construction techniques are used to solve practical problems in engineering, architectural design, and building construction.
- Construction techniques include using a straightedge and compass, paper folding, and dynamic geometry software.
- Geometric constructions assist in justifying, verifying, and visually reinforcing geometric relationships.

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- There are multiple methods to most geometric constructions. Students would benefit from experiences with more than one method and should be able to justify each step of geometric constructions.
- Individual steps of constructions can be justified using angle relationships, properties of quadrilaterals, congruent triangles, and/or circles.
 - The constructions for the bisector of a given angle and an angle congruent to a given angle can be justified using the properties of quadrilaterals or congruent triangles.
- Constructions can be completed within the context of complex figures.



Vocabulary			Instructional Activities Organized by Learning Objective
AAS Theorem	ASA Postulate	SAS Postulate	Virginia Department of Education <ul style="list-style-type: none"> • Congruent Triangles Textbook <ul style="list-style-type: none"> • <i>Geometry</i>, ©2012, Price, et al, McGraw-Hill School Education Group page(s) 39, 253-270 and 273-282, 321.
SSS Postulate	HL Postulate	Definition	
Theorem	Postulate	Corresponding Parts	
Deductive Proof	Coordinate Methods	Algebraic Method	

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Assessment	
<p>1. PowerSchool Assessment G.6 (E:2A1B4J) G.4e (E:29J6Z3) G.4f (E:11NNXV)</p> <p>2. Mulligan Checkpoint G.6 Mulligan Checkpoint G.6 Mulligan Checkpoint G.4</p> <p>3. Formative Assessments (paper) G.6 FA G.4 e,f FA</p> <p>4. Cumulative Assessment #5 (SOLs G.1, G.2, G.3, G.4a-g, G.5, G.6, G.12) Cumulative Assessment #5</p>	<p>Notes and Homework</p> <ul style="list-style-type: none">● G.6 Notes and Keys● G.4e,f Notes and Keys● G.6 Homework and Keys <p>Resources</p> <ul style="list-style-type: none">● Print<ul style="list-style-type: none">○ Coach book, Virginia edition Lesson 15 page(s) 122-130● Technology<ul style="list-style-type: none">○ Gizmos<ul style="list-style-type: none">▪ Congruence in Right Triangles▪ Proving Congruent Triangles○ Geogebra<ul style="list-style-type: none">▪ Congruent Triangles Activities○ Youtube Videos<ul style="list-style-type: none">▪ Practice with Proofs (Mashup Math)▪ Practice Proofs with Isosceles Triangles (Mashup Math)▪ 5 Triangle Congruence Theorems (Mashup Math)▪ ASA vs. AAS (Mashup Math)▪ Why SSA does not work! (Mashup Math)▪ Angle Bisector Construction▪ Copy an Angle Construction○ Quizizz Practice<ul style="list-style-type: none">▪ G.6 Congruent Triangles Practice▪ G.6 Congruent Triangles (Algebra) Practice

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	<ul style="list-style-type: none"> ▪ G.6 Congruent Triangles (Methods) Practice ▪ G.6 Congruent Triangles (Proofs) Practice ▪ G.6 Congruent Triangles (Coordinate proof) Practice ▪ G.4e Angle Bisector Construction Practice ▪ G.4f Congruent Angle Construction Practice <p>Instructional Activities</p> <ul style="list-style-type: none"> ● Sample Stations Activity ● Sample 2 Stations Activity ● Sample Task Cards to use in stations ● Congruent Triangle Sort Venn diagram Activity ● Venn diagram Template for Activity ● 2-column proof practice(congruent triangle 1-4 only)
Cross-Curricular Connections	Tiered Interventions
<p>Real World: In the real world, congruent triangles are used in construction when we need to reinforce structures so that they are strong and stable, and do not bend or buckle in strong winds or when under load.</p> <p>Real World Problems and Congruent Triangles</p> <p>Congruent Triangles LOGO Project</p>	<p>Tier 3: Recall and Reproduction</p> <p>Vocabulary Have students study flashcards, create their own flashcards, play a matching game or test themselves on Quizlet. Congruent Triangles Flashcards on Quizlet</p> <p>Have students create a Reasons list for proving triangles congruent. Reasons List</p> <p>Some students might need a guide or hints when completing formal proofs. Important Facts about Proving Triangles Congruent Proving Triangles Congruent Cheat Sheet</p>

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	<p>Tier 2: Basic Skills and Concepts Drill and Practice Construction e,f Drills Congruent Triangle Drills SOL Practice Problems for Congruent Triangles</p> <p>It may be helpful to create enlarged proofs on project display boards that students can practice in stations around the room. Print out statements and reasons onto cardstock paper. Then laminate. Then use sticky velcro strips that students can easily pull on and off to complete the proofs on the board,</p> <p>Tier 1: Strategic Thinking and Reasoning Application Congruent Triangles Discovery Lab</p>
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