

Unit 2: Congruence

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

UNIT RATIONALE

In previous grades, students were asked to draw triangles based on given measurements. They also have prior experience with rigid motions: translations, reflections, and rotations and have used these to develop notions about what it means for two objects to be congruent. In this unit, students establish triangle congruence criteria, based on analyses of rigid motions and formal constructions. They will use triangle congruences as a familiar foundation for the development of formal proof. Students prove theorems - using a variety of formats - and solve problems about triangles, quadrilaterals, and other polygons. They apply reasoning to complete geometric constructions and explain why they work.

ESSENTIAL QUESTIONS

1. How does knowing that two shapes are congruence provide information about those shapes?
2. What methods can be used to prove the relationship between two figures?
3. How can math tools be effective in creating different shapes with specific properties?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

New Jersey (NJSL) - High School - Mathematics (2020)

MA.G-CO.B	Understand congruence in terms of rigid motions
MA.G-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.
MA.G-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.
MA.G-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

MA.G-CO.C	Prove geometric theorems
MA.G-CO.C.10	Prove theorems about triangles.

New Jersey (NJSL) - K-12 - Math Practice Standards (2020)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.8	Look for and express regularity in repeated reasoning.

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

9.3.12.AC.1	Use vocabulary, symbols and formulas common to architecture and construction.
9.3.12.AC.2	Use architecture and construction skills to create and manage a project.
9.3.12.AC-DES.3	Describe the requirements of the integral systems that impact the design of buildings.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.9-12.8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
CS.9-12.8.1.12.AP.5	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

PRE-ASSESSMENTS

Non-curricular tasks to identify student readiness in respect to problem solving.

Students will collaboratively solve real world tasks.

INSTRUCTIONAL PLAN

MODULE 1

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning to use given congruent polygons to identify corresponding angles or sides that are congruent
Student Learning Strategies	Interactive Notebooks Triangle Congruence Maze
Success Criteria	I can identify congruent angles in congruent polygons. I can identify congruent sides in congruent polygons. I can use third angle theorem to help show that a pair of angles in triangles are congruent.
Formative Assessment (drives instructional decisions)	Results of activities will determine changes in instruction
Activities and Resources	Interactive notebooks Congruence statements maze activity Task Cards (TPT) Envelope Activity for Triangle Proof Scramble Salt Challenge (Online)
Suggested Modifications	Students can work independently or

MODULE 2

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to use triangle congruence theorems SSS, SAS, ASA, and AAS so that we can describe how two triangles are congruent
Student Learning Strategies	Interactive Notebooks Congruence Task Cards (TPT)
Success Criteria	I can write a congruence statement I can determine if a transformation can be used to show that triangles are congruent. I can determine corresponding sides and angles of two triangles.

Formative Assessment (drives instructional decisions)	Results of activities will determine changes in instruction
Activities and Resources	Interactive Notebooks Congruence Task Cards (TPT) Triangle Congruence Worksheet - support
Suggested Modifications	Interactive Notebook pages may be filled in for students that were absent or need more support.

[Congruent Triangles Task Cards](#)

MODULE 3

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning to develop t-chart proofs so that we can prove that triangles are congruent.
Student Learning Strategies	Triangle proof scramble
Success Criteria	I can write a congruence statement I can determine if a transformation can be used to show that triangles are congruent. I can determine corresponding sides and angles of two triangles
Formative Assessment (drives instructional decisions)	
Activities and Resources	Triangle Proof Scramble Activity Peel and Stick Worksheets for Support Task Cards (TPT) Triangle Proofs
Suggested Modifications	Task cards can be modified to give more or less information as needed depending on the skill level of the student

MODULE 4

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning to construct models with geometric shapes so that we can determine which shapes create the most stable structures.
Student Learning Strategies	3-D Hexagon Salt challenge
Success Criteria	I can create a model with triangles I can create a model with rectangles I can create a model with various shapes
Formative Assessment (drives instructional decisions)	Results from the trials will be used to determine instruction
Activities and Resources	3D Hexagon Project (Online) Scales, toothpicks, marshmallows https://www.livinglifeandlearning.com/hexagon-marshmallow-stem-building-challenge.html
Suggested Modifications	The amount of pre-discussion about stability would result in less experimentation for the students. Consider the skill level of the students.

MODULE 5

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning to classify polygons so that we can find interior and exterior angle measures.
Student Learning Strategies	INB Foldable
Success Criteria	I can determine the sum of the interior angles of any polygon. I can determine the value of an exterior angle of a polygon. I can determine the value of an interior angle of a

	<p>polygon.</p>
<p>Formative Assessment (drives instructional decisions)</p>	<p>Base formative assessment on student responses to practice problems.</p>
<p>Activities and Resources</p>	<p>Foldable for INB on finding Interior and Exterior Angles</p>
<p>Suggested Modifications</p>	<p>Give additional support to students who need more help with algebra skills. Review steps for solving a linear equation.</p>

[Angles of a Polygon Foldable](#)

MODULE 6

<p>Student Learning Intentions (SLI) WALT: (We are learning to...)</p>	<p>We are learning the properties of parallelograms so that we can prove that a quadrilateral is a parallelogram.</p>
<p>Student Learning Strategies</p>	<p>INB Foldable</p>
<p>Success Criteria</p>	<p>I can solve for the opposite angle measures of a parallelogram.</p> <p>I can solve for the consecutive angle measures of a parallelogram.</p> <p>I can solve for the lengths of a diagonal of a parallelogram.</p> <p>I can solve for the side lengths of a parallelogram.</p>
<p>Formative Assessment (drives instructional decisions)</p>	<p>Base formative assessment on student answers to practice problems in the activity</p>
<p>Activities and Resources</p>	<p>INB Foldable</p>

Suggested Modifications	Give additional support to students that need help solving linear equations.
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[Parallelogram Properties - Foldable](#)

MODULE 7

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning to classify rectangles, rhombi, and squares so that we can apply property rules to determine angle/side measures.
Student Learning Strategies	INB
Success Criteria	<p>I can find side lengths of a rectangle, rhombus or square.</p> <p>I can find angle measures of a rectangle, rhombus or square.</p> <p>I can find diagonal lengths of a rectangle, rhombus or square.</p>
Formative Assessment (drives instructional decisions)	Base formative assessment on students responses to practice problems
Activities and Resources	INB Foldable
Suggested Modifications	Give additional support to students that struggle with solving linear equations.

[Rhombus Rectangle Square PowerPoint Point](#)

SUMMATIVE/END-OF-UNIT ASSESSMENTS

Interactive Portfolio Note book will be used for summative assessment

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

LA.K-12.NJSLSA.W4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
LA.K-12.NJSLSA.W7	Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.
LA.W.9-10.1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.