Geometry Unit 4: Topic 4
Updated Nov. 2021

Marking Period	Unit Title	Recommended Instructional Days
2	Triangle Congruence	18-20

Domain:		Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit
NJSLS Strand: *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.* *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.* *G.CO.B.8: Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow the definition of congruence in terms of rigid motions.* *G.CO.C.10: Prove theorems about triangles.* *G.SRT.B.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.*	*Progress Indicator:* *Tests ● Quizzes ● Practice problems for homework ● Online textbook ● Worksheets ● IXL ● Leveled assessments*	**Essential Questions:** 1. **How are the side lengths and angle measures related in isosceles triangles and equilateral triangles?** 2. **How are SAS and SSS used to show that two triangles are congruent?** 3. **How are ASA and AAS used to show that two triangles are congruent?** 4. **What minimum criteria are needed to show that right triangles are congruent?** 5. **Which theorems can be used to prove that two overlapping triangles are congruent?** **Activity Description:** ● **Isosceles and Equilateral Triangles** ● **Proving and Applying the SAS and SSS Congruence Criteria** ● **Proving and Applying the ASA and AAS Congruence Criteria** ● **Congruence in Right Triangles** ● **Congruence in Overlapping Triangles**

Example Tasks:

Task 1:

Find the perimeter of △ABC.
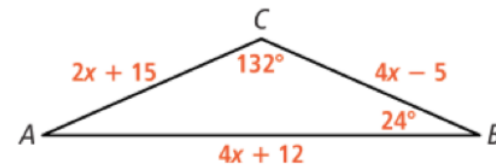
Answer:

Find $m\angle A$.

$$m\angle A + m\angle B + m\angle C = 180$$
$$m\angle A + 24 + 132 = 180$$
$$m\angle A = 24$$

△ABC is isosceles, so $AB = BC$. Solve for x.

$$2x + 15 = 4x - 5$$
$$x = 10$$

Use the value of x to determine AB, BC, and AC.

$$AB = 52 \quad BC = 35 \quad AC = 35$$

$$\text{perimeter} = 52 + 35 + 35 = 122$$

Task 2:

2. In the figure shown, how can you prove that $\triangle GHI \cong \triangle JHI$? Justify each step using the given reasons.

Given: H is the midpoint of $\overline{GJ}$.
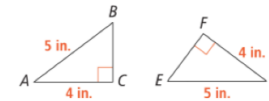
Prove: $\triangle GHI \cong \triangle JHI$

Definition of midpoint	SSS	Given
Reflexive Property of Congruence	Given	

Statement	Reason
1. H is the midpoint of $\overline{GJ}$.	1. _____
2. $\overline{GH} \cong \overline{JH}$	2. _____
3. $\overline{HI} \cong \overline{HI}$	3. _____
4. $\overline{GI} \cong \overline{JI}$	4. _____
5. $\triangle GHI \cong \triangle JHI$	5. _____

Answer: 1. Given, 2. Definition of midpoint, 3. Reflexive Property of Congruence, 4. Given, 5. SSS

Task 3:

Seth and Jae wrote the following explanations of why the two triangles are congruent.

Seth

There are two pairs of congruent sides, $\overline{AB} \cong \overline{DE}$ and $\overline{AC} \cong \overline{DF}$, and a pair of congruent right angles, $\angle C \cong \angle F$. So $\triangle ABC \cong \triangle DEF$ by SSA.

Jae

The lengths of $\overline{BC}$ and $\overline{EF}$ are 3 in., since these are 3-4-5 right triangles. There are three pairs of congruent sides, $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, and $\overline{BC} \cong \overline{EF}$. So $\triangle ABC \cong \triangle DEF$ by SSS.

A. Do you think either student is correct? Explain.

B. Communicate Precisely Describe when you can state that two right triangles are congruent if you are only given two pairs of congruent sides and a right angle in each triangle.

Sample Answers:

A. Although Seth's conclusion is correct, he used invalid criteria to show that triangles are congruent. Jae's conclusion is correct and uses valid justifications.

B. Any time you are given two right triangles with pairs of congruent sides, you can find the lengths of the third sides using the Pythagorean Theorem and show that the triangles are congruent by SSS.

Interdisciplinary Connections:
Topic 4 Project, enVision STEM: Design a Bridge. Textbook page 148 and online
Career Readiness, Life Literacies and Key Skills **Content: Engineering.**
NJSLS#: G.MG.A.1, G.MG.A.3
(Next Generation Science Standards ETS1-2, ETS1-4)

Spot Light On:
Daniel Tamment - English essayist, novelist, poet, translator, and savant. Tamment can speak 11 languages, perform a multitude of mathematics calculations in his head, and can recite the number pi to 22,514 places.

Mathematics Practices
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reason of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Social and Emotional Learning: *Competencies*	Social and Emotional Learning: *Sub-Competencies*

Self- awareness Social Awareness Self- Management Relationship Skills Responsible Decision-Making	Recognizing the importance of self-confidence in handling daily tasks and challenges. Demonstrate an awareness of the expectations for social interactions in a variety of ways. Demonstrate an understanding of the need for mutual respect when viewpoints differ. Recognize the skills needed to establish and achieve personal and educational goals. Utilize positive communication and social skills to interact effectively with others. Develop, implement, and model effective problem solving and critical thinking skills.		

Assessments (Formative) *To show evidence of meeting the standard/s, students will successfully engage within:*	Assessments (Summative) *To show evidence of meeting the standard/s, students will successfully complete:*
Formative Assessments: ● Entry and Exit Slips ● Quizzes ● Self Assessments	**Benchmarks:** ● Chapter Tests ● Projects **Summative Assessments:** ● District Assessments ● Midterms ● Standardized Tests

Differentiated Student Access to Content: Teaching and Learning *Resources/Materials*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
● Textbooks websites ● Achieve the core ● Khan Academy	● Skill building worksheets ● Math Manipulatives	● Dictionary for native languages ● Videos in their native	● Leveled Assessments ● Enrichment worksheets

| Desmos
IXL | | language. | |

| **Supplemental Resources** | | | |

Technology:
- **Chromebooks, Graphing Calculators, Online math manipulatives**

Other:
- **Zoom and Google Meets, Google Classroom, Interactive Textbooks, Private Tutoring**

Differentiated Student Access to Content: **Recommended *Strategies & Techniques***			
Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
• **Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat**	• **Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.**	• **Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.**	• **Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related**

NJSLS CAREER READINESS,	**Disciplinary Concept: Creativity and Innovation**	
	Core Ideas:	With a growth mindset, failure is an important part of success

LIFE LITERACIES & KEY SKILLS	*Performance Expectation/s:*	9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
	Career Readiness, Life Literacies, & Key Skills Practices	
	Act as a responsible and contributing community member and employee. Attend to financial well-being. Consider the environmental, social and economic impacts of decisions. Demonstrate creativity and innovation. Utilize critical thinking to make sense of problems and persevere in solving them. Model integrity, ethical leadership and effective management. Plan education and career paths aligned to personal goals. Use technology to enhance productivity, increase collaboration and communicate effectively. Work productively in teams while using cultural/global competence.	

New Jersey Legislative Statutes and Administrative Code
(place an "X" before each law/statute if/when present within the curriculum map)

	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	X	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*		Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*