HPISD Curriculum: Geometry

Title	Estimated Duration	6 Weeks					
Unit 5: Congruent Triangles	2 weeks	1	**2**	3	4	5	6

Unit Overview

Analyze geometric relationships in order to make and verify conjectures involving triangles. Apply the concept of congruence to justify properties of figures and solve problems.

Enduring Understandings

The student will understand that:

- There exists a range of lengths for the third side of a triangle given the lengths of two sides.
- The Pythagorean Converse is used to classify a triangle by its side lengths.
- Deductive reasoning is involved when using the properties of triangles to find measures of interior and exterior angles.
- There is a process for developing a proof for congruent triangles.
- There exist multiple ways to prove triangles congruent and conclusions can be made from these triangles.
- Geometric proofs are directly related to everyday logical rationalizations.
- The properties of isosceles triangles can be used in proofs and to find measurements.

Concepts	Guiding/Essential Questions
• Classification • Congruency	• For triangles, what combinations of classification by sides and classification by angles are not possible? • What is the sum of the measures of the exterior angles of a triangle? • What are cases in which two triangles are only sometimes congruent? • How would a theorem be stated by writing the Isosceles Triangle Theorem and its converse as a biconditional? • What would be included in a proof that an equiangular triangle is also an equilateral triangle?

Learning Targets

- Students will analyze geometric relationships in order to make and verify conjectures.
- Students will apply logical reasoning to justify and prove mathematical statements.
- Students will apply the concept of congruence to justify properties of figures and solve problems.

Formative Assessments	Summative Assessments
homework, quizzes	test

TEKS: Readiness Standards	TEKS: Related Supporting Standards
G2.B Make conjectures about angles, lines, polygons~~, circles, and three-dimensional figures~~ and determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, ~~transformational,~~ or axiomatic. **G.10B** Justify and apply triangle congruence Relationships.	**G.1A** Develop an awareness of the structure of a mathematical system, connecting definitions, postulates, logical reasoning, and theorems. **G.3E** Use deductive reasoning to prove a statement. **G.9B** Formulate and test conjectures about the properties and attributes of polygons and their component parts based on explorations and ~~concrete models.~~ **G.10A** Use congruence transformations to make conjectures and justify properties o geometric figures including figures represent on a coordinate plane.

Processes and Skills: What students should be able to DO	Facts: What students should KNOW
• Determine whether a triangle exists by using the Triangle Inequality Theorem. • Classify a triangle by its angles by using the Pythagorean Converse. • Apply the theorems related to the sides and angles of a triangle. • Prove triangles congruent. • Use congruent triangles in an axiomatic system. • Understand and use the properties of isosceles triangles.	• SSS, SAS, AAS, HLR Theorems and ASA Postulate • CPCTC • Isosceles Triangle Theorem and Converse

Topics

Triangle Inequality Theorem
Pythagorean Theorem and Converse
Exterior Angle Theorem
Angle Sum Theorem
Right Angle Theorem
Identify Congruent Triangles by SSS, SAS, ASA, AAS, HLR
Proofs with Congruent Triangles
Corresponding Parts of Congruent Triangles
Properties of Isosceles and Equilateral Triangles
Proofs with CPCTC and Isosceles/Equilateral Triangles

Language of Instruction

Acute Triangle
Angle Sum Theorem
Angle-Angle-Side (AAS) Congruence Postulate
Angle-Side-Angle (ASA) Congruence Postulate
Ascending Angle and Side Theorem and Converse
Base Angles
Congruence Transformation
Corresponding Parts of Congruent Triangles are Congruent (CPCTC)
Equiangular Triangle
Equilateral Triangle
Exterior Angle
Exterior Angle Theorem
Hypotenuse-Leg (HLR) Congruence Theorem for Right Triangles
Included Side
Isosceles Triangle
Isosceles Triangle Theorem and Converse
Obtuse Triangle
Parallel Postulate
Pythagorean Theorem and Converse
Pythagorean Triples
Remote Interior Angles
Right Angle Theorem
Right Triangle
Scalene Triangle
Side-Angle-Side (SAS) Congruence Postulate
Side-Side-Side (SSS) Congruence Postulate
Triangle Inequality Theorem
Vertex Angle

State Assessment Connections

National Assessment Connections

Resources

Glencoe: Geometry
4.2, 4.3, 4.4, 4.5, 4.6, 5.2, 5.4, 8.2