Unit B - *Triangles*

Overview

This unit focuses on triangle classifications and proving triangles congruent. Properties of triangles are applied to proofs so that students have experienced with the proof process. Proofs can be differentiated to students as they develop skill in the process by using word banks, missing statements or reasons, or cut-up proofs where student must re-order steps to establish sequence. Students will be extended to create 5-10 step proofs without assistance by the end of the unit. Segments that can be drawn in a triangle and their properties are explored.

21st Century Capacities: Analyzing

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS	*Transfer:*
MP 1 Make sense of problems and persevere in solving them MP3 Construct viable arguments and critique the reasoning of others MP7 Look for and make use of structure	*Students will be able to independently use their learning in new situations to...* 1. Draw conclusions about graphs, shapes, equations, or objects. 2. Make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. (Analyzing) 3. Justify reasoning using clear and appropriate mathematical language.

Meaning:

CCSS.MATH.CONTENT.HSG.CO.B.6	UNDERSTANDINGS: *Students will understand that:*	ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*
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. CCSS.MATH.CONTENT.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.	1. Effective problem solvers work to make sense of the problem before trying to solve it 2. Mathematicians compare the effectiveness of various arguments, by analyzing and critiquing solution pathways. 3. Mathematicians analyze characteristics and properties of geometric shapes to develop mathematical arguments about geometric relationships.	A. What strategies can I use to solve the problem? B. What do I need to support my answer? C. How does classifying bring clarity? D. What makes these shapes the same? Different?

Acquisition:		
CCSS.MATH.CONTENT.HSG.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. CCSS.MATH.CONTENT.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.*	*Students will know…* 1. The sum of the angles in a triangle is 180 degrees 2. The shorter two sides of a triangle must together be longer than the longest side 3. The five ways to prove triangles congruent 4. The perpendicular bisector theorem 5. The five segments that can be drawn in a triangle, their points of intersections, and properties associated with each segment 6. Properties of isosceles triangles 7. Longest side is opposite largest angle, etc 8. Reflexive property 9. Transitive property 10. Substitution property 11. Corresponding parts of congruent triangles are congruent 12. How to calculate slope, and how to find the slope of parallel and perpendicular lines 13. That the exterior angle is greater than either remote interior and equal to the sum of the remote interiors 14. Vocabulary: obtuse, acute, right, equiangular, altitude, median, midline, isosceles, scalene, equilateral, CPCTC, included/non-included sides and angles, PBT, exterior angle	*Students will be skilled at…* 1. Classifying triangles by angle and by side (isosceles, acute, etc.) 2. Classifying a triangle on the coordinate plane 3. On the coordinate plane, is the triangle right or not right (use slope) 4. Writing a complete formal proof 5. Using isosceles theorems - if sides then angles and vice versa, altitude is median is perpendicular bisector is angle bisector 6. Using the Perpendicular Bisector Theorem PBT (by construction?)