AUHSD Math 1

Unit 4

Problem Solving: Finding missing angle measures in figures

Day 1: See “Finding and Calculating Interior Angles” (This lesson will refer back to *The Greedy Triangle*.)

Big Idea: By breaking complex shapes into triangles (more simple pieces), the sum of the interior angles can be found. This works for regular and irregular shapes that are constructed of straight lines.

Begin by discussing what students know about triangles. It is essential that they know that a triangle has 180 degrees and that all triangles meet this criteria.

Reintroduce the idea of finding the shapeshifter’s secret formula using only triangles.

Using the worksheet, help students find triangles in each shape. In order to find the shapeshifter’s secret formula, the triangles may not overlap. If students want to use overlapping triangles, you can discuss whether or not the angles not touching the perimeter of the original shape should be incorporated into the final angle measurements.

(Students may have trouble using the worksheet due to the size of the shapes given. One idea is to enlarge the shapes and allow students some time to try and find triangles there, then translate the information to the worksheet when they have made a final decision.)

Note: Finding the “secret formula” or rule is not the standard for this lesson, but is interesting and may help students see the continuing pattern.

Days 2-3: See “Small World Missing Angles”

Big Idea: Students are able to use knowledge of parallel lines, triangles, complementary and supplementary angles to find related information in a picture/diagram.

The Imagineers at Disney are also mathematicians! They have used their knowledge of lines, polygons and triangles to create patterns on the face of "It's a Small World" at Disneyland.

Using the picture, you need to use your knowledge of intersecting lines, parallel lines, polygons and triangles to deduce the answers to the questions listed. You may not use a protractor but you may use a straight edge or ruler to help you extend or better see the lines.

Assume all lines that appear to be parallel, perpendicular or intersecting are; any slight differences are due to the perspective of the photographer.

Given		Question	Answer	How did you find your answer? Walk me through your reasoning process.
●	This is an isosceles triangle. The marked angle measures 70°.	■ What is the measure of this angle?		
●	This is an isosceles triangle. The marked angle measures 40°.	■ What is the measure of this angle?		
●	This angle measures 30°.	■ What is the measure of this angle?		
●	This is an isosceles triangle. The marked angle measures 30°.	■ What is the measure of this angle?		
●	This is an isosceles triangle. The marked angle measures 75°.	■ What is the measure of this angle?		
●	This angle measures 45°.	■ What is the measure of this angle?		
▲	This is an isosceles triangle. The marked angle measures 25°.	What are the measures of the other two angles of this triangle?		
▲	This is an equilateral triangle.	How big is each of the angles of this triangle?		
♥	This is a polygon.	What is the sum of the interior angles of this polygon?		
☺	BONUS QUESTION	What are the measurements of each of the angles in this triangle?		