Inequalities in Triangles – Lesson Plan

Overview:
Students will use pasta to create models of triangles and non-triangles and investigate the relationship between the longest side of the triangle and the sum of the other two sides of the triangle. In addition, students will measure the sides and angles of a scalene triangle and investigate the relationship between the location of the largest angle and largest side in a triangle.

Goals/Objectives:

Students will be able to:
* Investigate the relationship between the largest side and the sum of the remaining sides in a triangle.
* Investigate the relationship between the largest side and the largest angle in the triangle.
* Use the triangle inequality to solve problems involving triangles.
* Use the inequality for sides and angles in a triangle to solve problems involving triangles.

Time Required: 1 period

Materials: Long, thin pasta (such as spaghetti or linguine), Rulers, Protractors

Skills/Knowledge Gained by Learners:
1. Analyze properties and determine attributes of two- and three-dimensional objects.
2. Explore relationships (including congruence and similarity) among classes of two- and three-dimensional geometric objects, make and test conjectures about them, and solve problems involving them
3. Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools.

Procedure: During this lesson, students will engage in activity where they will investigate relationships of sides and angles in a triangle. While students are engaging in the activity, the teacher's role will be that of facilitator. When students complete the activity, the teacher will use the questions on the activity sheet to lead discussion about the important concepts. The lesson flows well when students begin with the activity for the triangle inequality and move to the activity for the inequalities for sides and angles of a triangle. Provide students with the Triangle Inequality activity sheet, a ruler, and 8-10 pieces of thin pasta. Students should work individually on the first five questions on the activity sheet, and they should work with a partner on the last three questions.

Closure: (How to draw the project to a close) Conclude the lesson by asking students to describe both the triangle inequality and the inequalities for sides and angles of a triangle using words and symbols.

For example:
* The sum of the measures of any pair of sides in a triangle will always be greater than the measure of the remaining side. [s + m > l]
* The longest side of a triangle will always be opposite the greatest angle of the triangle, and the shortest side will always be opposite the smallest angle.

Assessment:
Two sides of a triangle are 6 cm and 10 cm long. Determine a range of possible measures for the third side of the triangle. [4 cm < x < 16 cm]
Given that <CDB = 65°, <CBD = 72°, <ADB = 34°, and m?A = 87°, list the segments in the diagram in order from longest to shortest.