Building Mathematical Thinkers: Mini-Activities

Is That Triangle Possible?

Objective : 4th grade Geometry – Classify Triangles

Theoretical Foundation: Students create triangles to enhance their understanding of how they are classified. Fourth graders also use logical reasoning and visualization to predict which types of triangles are impossible and why.

Estimated Time: 30 minutes

Materials: 9 pipe-cleaners (3 long red, 3 medium-length blue, 3 short green) for each student or pair of students

Description:

1. On the board create a chart like this:

	Equilateral	Isosceles	Scalene
Acute			
Right			
Obtuse			

2. Distribute the pipe-cleaners and invite students to work with one pipe-cleaner of each length. The students should recognize that these will create a scalene triangle.
3. Direct the students to place the pipe-cleaners end-to-end to form a scalene triangle. Ask the students to try making scalene equilateral, scalene equilateral, and obtuse scalene triangles. You may assign certain students to try specific types of triangles, or you may want each student to try every type.
4. After students have worked with the scalene triangles ask them to share their discoveries. * Can you make an **acute** scalene triangle? YES Draw a picture or post an example in the box on the chart.
   * Can you make a **right** scalene triangle? YES Draw a picture or post an example in the box.
   * Can you make an **obtuse** scalene triangle? YES Draw a picture or post an example in the box.
   Allow time for discussion of whether or not these types of triangles are possible and why. See *Probing Questions* below.
5. Continue this process with isosceles triangles. Students use any 2 pipe-cleaners of the same length and any third pipe-cleaner of a different length.
6. Before moving on to equilateral triangles, note aloud to the class that every type tried so far has worked. Invite the class to predict whether this pattern will continue for equilateral triangles. Ask the students to support their opinion and allow time for them to discuss mathematically.
7. Finally have students work with three pipe-cleaners of the same length to create equilateral triangles. Be sure to discuss why equilateral triangles are so unique.

Differentiation Suggestions:

- At the beginning of the lesson have students create their own version of the chart on notebook paper or the teacher may pass out photocopies for them. Before the exploration with pipe-cleaners, have students write yes or no in each box to predict which types of triangles are possible. After making their predictions, students can explain their thinking to the class, a partner, or a small group.
- For additional support, students may need to work in partners

Probing Questions:

- How did you predict whether a certain triangle was possible?
- How did you determine which type of angles were in your triangles?
- Why are equilateral triangles limited to only acute angles?

Assessment:

- Listen as students justify their predictions and share their reasoning. Do they demonstrate a clear understanding of vocabulary? Are there any misconceptions? Do they demonstrate flexibility in their thinking?
- Monitor and observe as create the triangles. How much guidance do students need?