

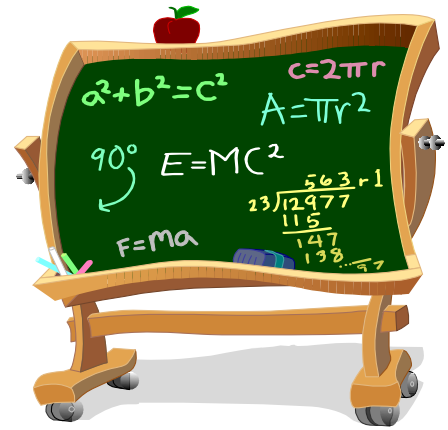
# Algebra/Geometry Institute Summer 2004

## Lesson Plan 3

Faculty Name: Laura Clark

School: Gentry High School, Indianola, Mississippi

Grade Level: 7<sup>th</sup> - 8<sup>th</sup>



### 1 Teaching objective(s)

The students will explore geometric patterns and relationships. More specifically, the students will discover the Triangle Inequality Theorem.

### 2 Instructional Activities

Open the lesson with the following activity:

#### “Discovering the Triangle Inequality Theorem”

- Pass out 5 straws to each student. (1 - 2 in.; 1 - 3 in.; 1 - 4 in.; 1 - 5 in.; 1 - 7 in.; and 1 - 8 in. Each length needs to be a different color.)
- Write on the overhead the length of each color.
- Ask them to form a triangle with the 4 in., 5 in., and the 8 in. “Is it possible?” **Yes.**
- Pass a Data Sheet to each student and have them record their answers in it. (See attached) Make a transparency of the Data Sheet and put on the overhead.
- Ask them if the following lengths would form a triangle. (Allow time for students to work at their desk.)
  - 2 in, 3 in and 5in **No**
  - 3 in, 4 in, and 8 in **No**
  - 2 in, 4 in, and 5 in **Yes**
  - 4 in, 5 in and 7 in **Yes**
  - Have the students make some up on their own and test to see if the lengths would work.
- Once everyone is finished, discuss their answers. (Fill in the table for the overhead.)
- Have the students look at their chart. Ask them if they agree with the following statement: “For three line segments to be the sides of a triangle, there must be a specific relationship among their lengths.” **Yes, there is a relationship.**
- Ask, “Does anyone see a relationship or pattern?” (Give the students time to figure it out.)

- Once they have discovered the relationship, have them complete the statement: In a triangle, the sum of the lengths of any two sides must be \_\_\_\_\_ the length of the third side. **Greater than**
- Could it be less than? **No, because if the third side was less than the sum of the other two sides, it would be shorter. Therefore, it would not be long enough to connect with the other two sides. (See example of 3 in, 4 in, and 8 in.)**
- Could it be equal to? **No, because if the third side was equal to the sum of the other two sides, it would be the same length. Therefore, it would not make a triangle. (See example of 2 in, 3 in, and 5 in.)**
- Tell them that this statement is the Triangle Inequality Theorem.
- Note: Be sure the students understand that they must check each of the lengths. For example use 3 in, 4 in, and 8 in. Three plus 8 *is greater than* 4, but 3 plus 4 *is less than* 8 which makes it **not a triangle**.  
**(20-30 minutes)**

Variations:

You can also use strips of paper, popsicle sticks (craft sticks), or pipe cleaners instead of straws. Note: Just be sure whatever item you decide to use will be long enough to make the various lengths.

Call on students to come to the board. Have them use the Triangle Inequality Theorem to tell whether the line segments can or cannot be a triangle. Have them explain their answers.

- 3 m, 4 m, and 1 m                      **Cannot**
  - 24 in, 13, in, and 5 in                **Cannot**
  - 5 yd, 13 yd, and 10 yd                **Can**
  - 12 ft, 3 ft, and 11 ft                    **Can**
  - 9.81 m, 16 m, and 6.19 m            **Cannot**
  - 2.5 cm, 2.5 cm and 2.5 cm           **Can**
  - 6 mm, 4mm, and 9mm                 **Can**
- (15 – 20 minutes)**

### 3 Materials and Resources

Overhead

Markers/Chalk

Straws (2 in, 3 in, 4 in, 5 in, 7 in, and 8 in. Each length needs to be a different color.)

Data Sheets for each student

Overhead Data Sheet

Textbook: Littell, McDougal and Houghton Mifflin; Mathematical Connections: A Bridge to Algebra and Geometry; Copyright 1997.

## 4 Assessment

- As the students are working on their tables, the teacher will walk around the room and observe the students. He/she will be looking for: students working and students understanding the concept.
- Have the students write a journal entry on today's activity. The following is an example of an entry: "Tell what you learned from today's activity. Did you enjoy the activity? Explain why or why not."  
**(10 –15 minutes)**
- The concept covered will be on the chapter test.

Name: \_\_\_\_\_

## Data Sheet

Lengths	Will it form a triangle?	
	Yes	No
4 in, 5 in, and 8 in		
2 in, 3 in, and 5 in		
3 in, 4 in, and 8 in		
2 in, 4 in, and 5 in		
4 in, 5 in, and 7 in		

**What relationship do you see in the lengths of the sides and whether it would form a triangle?**

**Write a rule that would apply to determining if any set of lengths would form a triangle.**