

# Algebra/Geometry Institute Summer 2003

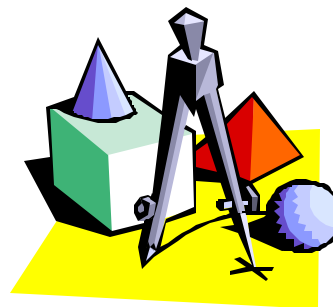
## Lesson Plan #3

**Faculty Name:** Polyneise Redd

**School:** Oakhurst Junior High

**City:** Clarksdale, MS

**Grade Level:** 7<sup>th</sup> Grade Mathematics



### 1. Teaching objective(s)

Students will be able to evaluate expressions using order of operations.

### 2. Instructional Activities

- ◆ The teacher will start the lesson by asking students to use exactly five 3's to make the number 3.
- ◆ The teacher will instruct students that they may use the following symbols:  $+$ ,  $-$ ,  $\times$ ,  $\div$ , and parentheses.
- ◆ The teacher will observe students, ask for responses, and write several solutions on the overhead projector.
- ◆ The teacher will ask all students to write an expository paragraph. The teacher will explain to students that an expository paragraph is a paragraph where steps are given to explain, solve, or describe a process.

For example: To bake a cake, I will follow these six steps.

1. Set the oven on  $350^{\circ}$
  2. Mix all the ingredients together
  3. Pour the batter in a cake pan
  4. Bake for about 30 – 45 minutes
  5. Take the cake out of the oven and allow it to cool for about 10 minutes
  6. Add frosting and serve
- ◆ The teacher will give students about 10 minutes to write their paragraphs.
  - ◆ The teacher will allow several students to read their paragraphs.

- ◆ After listening to the students' paragraphs, the teacher will ask students, "Does order matter?" Why or Why not?
- ◆ The teacher will place a transparency on the overhead projector that defines "Order of Operations."

### Order of Operations

1. Do all operations within grouping symbols first.
2. Do multiplication and division from left to right.
3. Do addition and subtraction from left to right.

- ◆ The teacher will explain to students that if division should come before multiplication in a problem, then they should continue to simplify from left to right. This means that they should divide first, then multiply.
- ◆ The teacher will also inform students that this is true for addition and subtraction.
- ◆ The teacher will place several examples on the overhead projector, assist students, and wait for responses.

Example 1:

$$7 \bullet 4 + 6 \bullet 1$$

- ◆ The teacher will ask for a volunteer to give the steps orally.

$$7 \bullet 4 + 6 \bullet 1$$

$$28 + 6 \bullet 1$$

$$28 + 6$$

$$34$$

1). Multiply 7 and 4

2). Multiply 6 and 1

3). Add 28 and 6

- ◆ The teacher will ask, "Are there any questions?" The teacher will answer any questions.

Example 2:

$$10 \div (5 - 3) + 6$$

- ◆ The teacher will ask for a volunteer to give the steps orally.

$$10 \div (5 - 3) + 6$$

$$10 \div 2 + 6$$

$$5 + 6$$

$$11$$

1). Subtract 3 from 5

2). Divide 10 by 2

3). Add 5 and 6

◆ Example 3:  
 $12(6 - 4) - 3 \cdot 2$

- ◆ The teacher will ask for a volunteer to give the steps orally.

$$12(6 - 4) - 3 \cdot 2$$

$$12(2) - 3 \cdot 2$$

$$24 - 3 \cdot 2$$

$$24 - 6$$

$$18$$

1). Subtract 4 from 6

2). Multiply 12 and 2

3). Multiply 3 and 2

4). Subtract 24 and 6

- ◆ The teacher will give the students the most commonly used acronym to help them to remember order of operations.

“Please **E**xcuse **M**y **D**ear **A**unt **S**ally”

(This acronym means to complete parentheses first, exponents, multiplication and division from left to right, and addition and subtraction from left to right.)

- ◆ The teacher will write the following problems on the overhead projector, observe students' work, and answer any questions.

a.  $4 \cdot 3 + 6$

b.  $8 \div 2 + 6 \div 3$

c.  $4(3 + 2)$

d.  $2(12 \div 6 + 2) - 2$

e.  $8 + 2 \cdot \div 3 - 4$

f.  $7(2 + 1) + 3(4 + 1)$

g.  $8 \div 4 \cdot 2 - 4$

h.  $9(3 + 6) \div 3$

- ◆ The teacher will close the lesson by giving each student an index card. Each student will be instructed to come up with their own acronym for order of operations.

### 3. Materials and Resources

- Textbook: Mathematics/Applications and Connections. Glencoe: Macmillan/McGraw-Hill, Publishing Company (1995). Pages 24 – 26.
- Pencil
- Paper
- Overhead Projector
- Markers
- Index Cards

### 4. Assessment

- Teacher Observation
- Oral and Written response