# Algebra/Geometry Institute Summer 2002

## Lesson Planning Guide

**Faculty Name: Carmelle M. Ellis**
**School: W. A. Higgins Jr. High**
**Grade Level: 7**

## 1 Teaching objective(s)

- **Students will evaluate expressions using order of operations.**

## 2 Instructional Activities

- **The teacher will open today's lesson by giving a situational problem:**

  **Use five 2's to make the number 1. You may use the symbols +, -, x, or / as well as parentheses. Answer: (2 x 2 + 2) / 2 – 2= 1**
  **6 / 2 – 2= 1**
  **3 – 2 = 1**

- **The teacher will introduce the term "order of operations" to the class. The teacher will ask the question, "what does the phrase, order of operation mean to you?" Then ask, "does this mean the order in which you will perform your problem or does this mean something else? "The teacher will have the students to compare the following:**

  **4 + (2 + 12) =**
  **4 + (2 x 12) =**
  **4 x (2 + 12) =**
  **(4 x 2) x 12 =**

  **The teacher will ask which expression(s) will the value change if the parentheses are dropped? Ans. 4 x (2 + 12)**
  **The teacher will ask under what conditions can parentheses always be omitted? Ans. Whenever only addition or only multiplication is involved.**
  **Adding parentheses will change the order in which you will find your solution.**

- **The teacher will write on the board the 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 give examples using the order of operation. The students will then be called on to ask any questions if they do not understand. The teacher will allow students to work problems on the board for enforcement.**

**Example 1: Evaluate (5+4) / 3**

**(5+4) / 3 = 9 / 3 Add 5 and 4 first since they are in parentheses.**
**= 3 Divide by 3.**

**Example 2: Evaluate 3(4 + 7) – 5 x 4**

**3(4 + 7) – 5 x 4 = 3(11) – 5 x 4 Add 4 and 7**
**= 33 – 5 x 4 Multiply 3 and 11**
**= 33 – 20 Multiply 5 and 4**
**= 13 Subtract 20 from 33**

- **The teacher will have students to come to the board and answer the following questions: Help students to remember the order by giving an acronym "Please excuse my dear Aunt Sally" (PEMDAS) Parentheses, exponentiation, multiplication, division, addition and subtraction.**

| **3 x 4(5 – 3)** | **(12 – 4) / 2** | **4(10 + 8) / 6** | **7 + 3(5 – 2)** | **24 / (7 – 3)** |
|---|---|---|---|---|
| **23** | **4** | **12** | **16** | **6** |

- **The teacher will hand out an independent practice to be completed by each student that will be graded and given back.**

## 3 Materials and Resources

Identify various materials and equipment needed for lesson activities. Provide complete references (include textbook and additional resources)

**Textbook-<u>Mathematics Applications and Connections</u> (Course 2)**
**Macmillan/McGraw-Hill Co. 1995 Pages 26-28**
**Pencil**
**Paper**
**Overhead projector**
**Markers (overhead)**

## 4 Assessment

- **The teacher will observe the students as they are working on independent practice.**
- **The teacher will allow students to continue working and take up the assignment later. The teacher will grade and return.**

## 5 Enrichment (Optional)

- **The teacher will play a game of "Order Me" with the students put into two groups. The teacher will give numbers and an answer to both groups and each team should quickly order themselves with the number and symbol cards given. The first group to ten wins the game. This will be counted for extra credit.**

**Name**_____ **Date**_____

**Independent Practice**

# Order of Operations

**Name the operation that should be done first.**

**1. 5 = 4 – 7** **2. 13(6 + 3)** **3. (4 – 2) / 6**

**4. 6 x 8 / 4** **5. 32 – 4 / 2** **6. 9 (4 + 2) / 3**

**Evaluate each expression.**

**7. 8 x 7 + 8 x 3** **8. (9 - 3) / 3**

**9. 8 – 6 + 3** **10. 18 / 3 x 6**

**11. 9 – 4 / 2 + 6** **12. 24 / (6 – 2)**

**13. 18 – (7 – 7)** **14. 32 / (8 – 4)**

**Make each sentence true by placing the parentheses where they belong.**

**15. 32 + 8 x 3 / 4 = 30** **16. 15 – 3 / 1 x 6 = 2**

**17. 18 / 3 + 3 – 2 = 1** **18. 16 – 8 / 4 + 10 = 12**

**19. 5 x 5 + 5 – 5 = 45** **20. 6 + 6 / 6 x 6 = 42**