

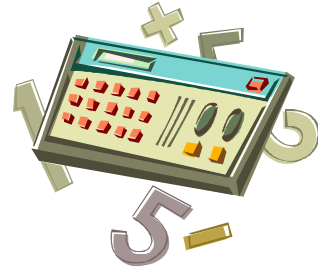
Algebra/Geometry Institute Summer 2004

Lesson Plan 3

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School: H.M. Nailor Elementary, Cleveland, MS

Grade Level: 6th Grade




1 Teaching objective: The students will model and write the prime factorization of a number using exponential notation (10b).

2 Instructional Activities

- Ⓢ The teacher will (TTW) remind the students that factors are the numbers that are multiplied together to give a product. Prime numbers are numbers that have only two factors, one and itself, whereas composite numbers are numbers that have more than two factors.
- Ⓢ TTW inform the students that they are going to be working with numbers that have many factors and we want to discover what they are.
- Ⓢ TTW tell the students there is a way to determine this and it is by creating a tree shaped figure, a factor tree, with the factors branching out.
- Ⓢ TTW tell the students that the last factors in the factor tree must be primes.
- Ⓢ TTW have the students' sing "Oh Factor Tree" to the tune of "Oh Christmas Tree".
- Ⓢ TTW show and explain how to factor fifty using the factor tree.

$$\begin{array}{c} 50 \\ \wedge \\ 2 \cdot 25 \\ / \quad \wedge \\ 2 \cdot 5 \cdot 5 \end{array}$$

- Ⓢ TTW tell the students that the prime factorization of a number is the product of its prime factors (ex. $2 \cdot 5 \cdot 5$). If you have a number listed more than once you can write it only once, but with a small number at the top of it called the exponent. Since five is listed twice you will write it once, but with a small two at the top of it to indicate that it was listed twice (ex. 5^2).
- Ⓢ TTW also tell the students that when you write the prime factorization of a number and you use exponents, $2 \cdot 5^2$, it is called the exponential notation.
- Ⓢ TTW have the students' factor thirty using the factor tree.
- Ⓢ TTW give the students ample time to complete this problem.
- Ⓢ TTW ask one student to come to the board and explain what he/she has and how he/she got his/her answer.
- Ⓢ TTW ask if there are any questions about factoring a number out and writing it in exponential notation.
- Ⓢ TTW give the students the following problems to work before moving on to the next activity.

- 1) 15
 - 2) 40
 - 3) 60
 - 4) 100
 - 5) 35
- Ⓢ TTW walk around the room and monitor the students' understanding of the activity.
 - Ⓢ TTW review the answers to the five problems and answer any questions.
 - Ⓢ TTW tell the students that they are going to play bingo using the following problems. The students will find the prime factorization of each number and write the prime factorization in exponential form.
 - 1) 24
 - 2) 36
 - 3) 90
 - 4) 144
 - 5) 141
 - 6) 48
 - 7) 56
 - 8) 39
 - 9) 120
 - 10) 76
 - Ⓢ TTW allow ample time for the students to complete the problems.
 - Ⓢ TTW have each student draw a bingo board on their paper and then choose nine out of the ten answers to write on the bingo board. 
 - Ⓢ TTW give each student nine two color counters to use for marking the answer called out.
 - Ⓢ TTW call out the exponential notations and the students will place the counters on the answer called out.
 - Ⓢ TTW will walk around and monitor the students' understanding.
 - Ⓢ TTW continue until someone has gotten three in a row.
 - Ⓢ TTW call out the answers to all the problems worked and answer any questions.

3 Materials and Resources

- Ⓢ “Oh Factor Tree” song
- Ⓢ Paper
- Ⓢ Pencil
- Ⓢ Two color counters
- Ⓢ Bingo board on paper

“Oh Factor Tree” has an unknown origin, but if you would like the lyrics you can contact me at my school.

Fennell, F., Mundy, J., Ginsburg, H., Greenes, C., Murphy, S., Tate, W. (2001). Mathematics: The Path To Math Success. (pp. 152-154). Silver Burdett Ginn, Inc.

4 **Assessment:** The teacher will assess the students' understanding of the activity through journal writing. The writing prompt will be "I Learned Today..." and the paragraph must be at least half a page long. The teacher will look for the following key words in the paragraph:

- Ⓢ prime factorization
- Ⓢ exponential notation
- Ⓢ factor tree
- Ⓢ prime numbers