Algebra/Geometry Institute Summer 2002

Lesson 1

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School: Chambers Middle School

Grade Level: 8 Th.

1 Teaching Objective(s)

VB Distinguish between prime and composite numbers.

2 Instructional Activities

Put the students into groups of threes or fours at the beginning of class. Have the squares already cut out and bagged.
Review dividing whole numbers by putting the following examples on the board and have the students to work them out.
EX. 42/6, 24/3, 45/5, and 63/9

Then have the students explain what was done to solve the problems.
Explain that we are going to start a new concept that involves dividing whole numbers.
Use 8 color tiles on the overhead and have the students arrange the squares into a rectangle.
Explain that for this exercise a [1x8] is the same as a [8x1]

Ask the question; is there another way to arrange the **8** squares into a rectangle? Yes. Then have the students arrange the squares into all the possible ways it can be arranged. (There are 2 ways to arrange the **8** tiles into a rectangle. **[1x8], [2x4]**) Then use **3** tiles. How many rectangles can be formed with the **3** tiles? One. If the students have a hard time with this step then work another example. **EX. 4 – [1x4], [2x2], 5 - [1x5], 9 - [1x9] and [3x3]**
What we have done is to distinguish between prime and composite numbers. The number **8** is called a composite number because there is more than one way to arrange the squares into a rectangle and the 3 is a prime number because there is only one way to arrange the tiles into a rectangle. **[1x3]** *Remind them that a [1x3] is the same as a [3x1]*
Define **prime number**- a whole number greater than one with exactly 2 factors 1 and itself.
A **composite number** is a whole number greater than one with more than 2 factors.
Look back at the **8** tiles, what are the dimensions of the rectangles formed? (4*2), (8*1).
These dimensions are **factors**- a number is a factor of a second number if it divides into that number with no remainder, or two numbers multiplied together to form the *original* number. *[The number you are trying to factor.]*

Give the students several examples to work in their groups and write their dimensions.
Ex. 2, 7, 10, 24 [arrange the numbers into all the possible rectangles that can be formed]

Look at the examples and ask the students to explain what they have. Then have the students multiply the dimensions and show them that they get the original number. Which numbers have more than one rectangle? (**10** and **24**) These are composite numbers. Which numbers have only one rectangle? (**2** and **7**) These are prime numbers.
Give the students the handout and read the directions. The students will work the handout in groups and answer the questions. (10-15 min)

Have the students give the answers and show their examples.
Close by going over the definitions of prime and composite numbers and what a factor is, referring back to the **8** and **3** tiles.

3 Materials and Resources

Text- Prentice Hall, Middle Grades Math Course 3, 2001
Squares cut out- put at least 30 squares in each bag so the each group has a set. You may need to use colored paper to copy the squares on and then laminate them for longer use.
6-10 sandwich bags
Handout 1 - Is it prime? Or composite?
Handout 2 – Out line master for overhead, can also be used as transparency cutout for the overhead

4 Assessment

Check the students' rectangles as they work in groups.
Have the students check their own work as the class gives the answers.

5 Enrichment (Optional)

The students will create their own problems to model and check it with multiplication.

Name _____

Date _____

Is it prime? Or composite?

Look at the problems below. Write one rectangle for the prime # and two or more for a composite number. Then write the dimensions for each triangle. Tell whether the number is prime or composite?

Example 1. **4** □□□□ □□

□□

2*2 , 4*1

composite

2. **53**

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3. **67**

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4. **25**

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5. **23**

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6. **16**

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7. **39**

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8. **27**

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9. **21**

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10. **Explain the difference between prime and composite numbers.**

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