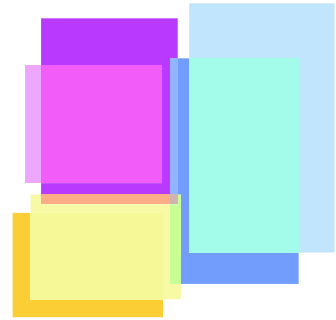# Algebra/Geometry Institute Summer 2008

# Area and Perimeter of Rectangles

**Faculty Name: Julie Williams**

**School: Winona Elementary**

**Grade Level:  4th – 5th**


1      Teaching objective(s) Geometry – Students will develop formulas to find the area and perimeter of rectangles.


2      Instructional Activities

1) Review what a rectangle is and explain that today they will learn to find the area of rectangles.  Review the difference between area and perimeter.  Area is length x width, and perimeter is 2 times the length plus 2 times the width (adding all four sides together).  Provide a transparency of the definitions and formulas (Attachment 1).

 2) Go over transparencies of sample problems on area (Attachment 2).

3)  Put the students into groups of 2-4, depending on the class size.  Make sure and put one advanced or gifted student in each group so that they can be a peer helper to others that may have problems.

 4) Pass out the color tiles and show the students how to make a rectangle. We will practice by making rectangles with areas of 18 square units, 12 square units, 15 square units, and 16 square units (Attachment 3).

 5) Students will have to use the color tiles to make a garden area of 30 square units.  The goal is to see how many different rectangular shapes can be made with an area of 30 square units.

 6) Then give the students a handout (Attachment 4) so that they can fill in their chart on the length and width of the rectangles they make.  They will have to justify their answers.

7) Before the class shares their answers, have them finish filling in their chart by giving the perimeter of the rectangles they formed using their color tiles.

 8)  Each group will present to the class one of their rectangles and explain how they got the area and perimeter.

 9) To extend the lesson, tell the students to make rectangles that have an area of 32 square units and to also find the perimeter.

 10) Students will also be given graph paper so they can shade in with their pencil some of the rectangles they form with the color tiles.

3       Materials and Resources
            * color tiles
            * overhead color tiles
            * paper and pencil
            * graph paper – www.freegraphpaper.com
            * handout – Garden
            * handout - Homework

            Resources:
*Navigating through Measurement in Grades 3-5. Principles and Standards for School*
            *Mathematics*, *Navigations Series*.   National Council of Teachers of Mathematics,
            2005.  Pg. 62-65.
Grober, Keith. *Mississippi MCT2 Gold Edition Coach, Grade 4*. Triumph Learning,
            2008,  Pgs. 179-183.

4       Assessment
            1) Use an oral assessment based on the activities done in groups in class and the
justifications done on the overhead by the groups.
            2) Handout (Attachment 5) can be given as reinforcement for homework.

Attachment 4

Garden

Student Name _____ Date _____

Imagine that you are creating a garden for your mother as a surprise.  Your total area for your garden must equal 30 square units and be a rectangle.  You may use your color tiles or graph paper.

Find out how many different ways you can create your garden.  List your answers in the table below.  List the length, width, area, and perimeter of each of your rectangles.

| Rectangle | Area (feet)$^2$ | Length (feet) | Width (feet) | Perimeter (feet) |
|-----------|-----------------|---------------|--------------|------------------|
| 1 | 30 | | | |
| 2 | 30 | | | |
| 3 | 30 | | | |
| 4 | 30 | | | |

Explain your answers for the chart above.

1.  In your own words, explain what area means?

2.  In your own words, explain what perimeter means?

3.  Do all of your rectangles with 30 feet as their area have the same perimeter?  Explain your answer.

# **Extend**

| Rectangle | Area (feet)$^2$ | Length (feet) | Width (feet) | Perimeter (feet) |
|-----------|-----------------|---------------|--------------|------------------|
| 1 | 32 | | | |
| 2 | 32 | | | |
| 3 | 32 | | | |
| 4 | 32 | | | |
| 5 | 32 | | | |
| 6 | 32 | | | |

Explain your answers.

Attachment 5

# Homework

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

Show all work for your answers.  ( Draw a picture)

1.  Calvin built a rectangular deck on his house.  The deck is 12 feet wide and 14 feet wide.  What is the area?

2.  Draw a figure that has a perimeter of 10 and an area of 6.

3.  Draw a figure that has a perimeter of 18 and an area of 20.

4. What is the area of the box below?  Each side is 7 feet in length.
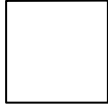
5. Shelia got new carpet in her living room.  It was 15 feet wide and 14 feet in length.  What was the area of her new carpet?

6. The area of Dr. Horton's lab is rectangular and has an area of 1500 square feet.  The width of the lab is 50 feet.  What is the length of her lab?

# <u>AREA</u>

What is it?
- The amount of space, measured in square units, inside a rectangle.

# <u>FORMULAS</u>

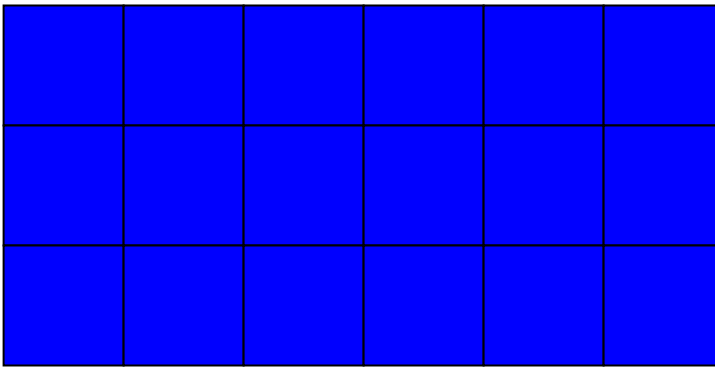To find the area of a rectangle, multiply the length times the width.

A= L $*$ W

To find the area of a square, multiply one side by the other side.

A = S $*$ S

Atttachment 2

1. What is the area of the shaded region?  A = L * W



2. If Anthony builds a fence for his horse with a length of 9 feet and a width of 8 feet, what will the area be?

Attachment 3

# <u>ACTIVITIY</u>

1. Using the color tiles, form a rectangle with an area of
   a. 18 square units
   b. 12 square units
   c. 15 square units
   d. 16 square units

2. Handout – "Garden"

3. Homework