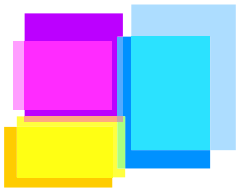
Practice task: Making Rectangles

Approximately 1 Day
Adapted from www.k-5mathteachingresources.com



STANDARDS FOR MATHEMATICAL CONTENT

MCC.2.G.2 Partition a rectangle into rows and columns of same-size squares to find the total number of them.

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

*****Mathematical Practices 1 and 6 should be evident in EVERY lesson*****

BACKGROUND KNOWLEDGE

(Information quoted from Van de Walle and Lovin, Teaching Student-Centered Mathematics: Grades K-3, read pages 234-238, and 252-8. Partial excerpt below.)
"It is important to understand that filling regions with units and counting does little to help students develop multiplicative formulas. Even when rectangles are filled with a grid of squares, students are more likely to count the squares than to relate the number of squares to the dimension of the rectangles."
Suggested formative task: Activity 8.12- Rectangle Compare- Square Units, page 237, *Teaching Student-Centered Mathematics, K-3*, VandeWalle and Lovin.
"The goal is not necessarily to develop an area formula but to apply students' developing concepts of multiplication to the area of rectangles. Not all students will use a multiplicative approach. Many will draw copies of rectangle s and attempt to draw in all the squares. However, it is likely that some will use their rulers to determine the number of squares that will fit along each side and, from that, use multiplication to determine the total area. By having students share their strategies, more students can be exposed to the use of multiplication."

ESSENTIAL QUESTIONS

- What strategies can I use to count the total number of squares in a rectangle?
- How are arrays and repeated addition related?

MATERIALS

- Square tiles
- "Making Rectangles" Student recording form

GROUPING

Partners

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

Working alongside a partner, students will build as many rectangles as possible using 12 square tiles. They should record their answers to the questions on the student recording form. Students create a drawing of each rectangle as well as record the number of columns and rows. Encourage discussion of rotation and dialogue about the number of rows and columns.

Student Directions for the Task:
1. Collect 12 square pattern blocks or colored tiles.
2. How many different rectangles can you make using your 12 squares?
3. Record each rectangle that you make.
4. How many rows did you make in each rectangle? How many squares were in each row?

After they have completed the task, bring students together for a class discussion. Ask the students to think about how they could use numbers to represent or describe their pictures/rectangles. Encourage them to talk about how many rows of a certain amount and how many columns of a certain amount they are seeing. Lead a discussion with a line of questions such as, "How many squares are used to create each rectangle? (12) How do you know? (by counting or that's how many we used for each one). If we used the same number of tiles for each rectangle why are there so many different looking rectangles? Why don't they all look the same? (we arranged the tiles in different numbers of rows or columns). If we wanted to write an addition sentence for each rectangle what would that look like? For instance, would 3+2+4 make sense for the 3 by 4 rectangle? Why not? (that is not what is in each row or column and those numbers don't add up/total 12). What do you notice about these addition sentences?

FORMATIVE ASSESSMENT QUESTIONS

- What strategies did you use to discover the rectangles?
- What is the difference between a row and a column?
- Did you notice any patterns?
- How did you organize your thinking?

- How do you think the number of square tiles affects the number of different rectangles you can create? What would happen if we used a different number of tiles? How about an odd number?

DIFFERENTIATION

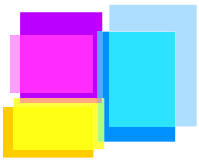
Extension

- Students can receive 24 or 36 squares, or an amount of their choice.

Intervention

- Start with a small number of tiles (4), and allow the student to create arrays for the smaller numbers, building understanding to a larger number of tiles. Allow for student exploration, and question along the way to determine whether student truly has an understanding of the concept of an array and what it represents (repeated addition).

Name: _____



Making Rectangles

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RECTANGLE	How many rows does your rectangle have?	How many columns does your rectangle have?