**Task 5 - Comparing Rectangles II**

(This Task builds from “Finding Area with Geoboards” task 4)

*Adapted from North Carolina Department of Public Instruction*

**Student Objective:** “I can count square units to determine and compare the areas of rectangles.”

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| **Common Core Standards to Measure** | **Mathematical Practices Addressed** |
| **3.MD.5** Recognize area as an attribute of plane figures and understand concepts of area measurement.  a. A square with side length 1 unit, called “a unit square”, is said to have “one square unit” of area, and can be used to measure area.  b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.  **3.MD.6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).  **3.MD.7** Relate area to the operations of multiplication and addition. | #1: Make sense of problems and persevere in solving  them.  #3: Construct viable arguments and critique the  reasoning of others.  #7: Look for and make use of structure.  #8: Look for and express regularity in repeated  reasoning. |

**Materials:**

Comparing Rectangles – Square Units sheet (1 per student)

Square tiles (10-12 per student)

Inch rulers

Incomplete Rectangles sheet

White Boards/Markers

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| G  **Engage Students with the Goal** | State and Rate  Objective: “I can count square units to determine and compare the areas of rectangles.”  Students rate themselves to the goal (1, 2, 3, 4). | Setting Objectives and Providing Feedback |
| A  **Access Prior**  **Knowledge** | Show students the rectangles below and ask students:  *Which rectangle do you think covers the most area?*  *How could we figure out which ones takes up the most space (area)?*  *(This lesson is an extension of previous lessons. This engage portion reviews the lessons in which the students compared rectangles by overlapping and cutting the figures and introduces the concept for this lesson.)*  (Teacher Note: The top rectangle has an area of 8 square inches. The rectangle to the left has an area of 7 square inches.) | Nonlinguistic Representations  Generating and Testing Hypotheses |
| N  **New Information** | *(This lesson serves as an extension of previous lessons. This part reviews the lessons in which the students compared rectangles by overlapping and cutting the figures, as well as introducing the concept for this lesson.)*  Remind students of the rectangle comparisons that involved overlapping and cutting the rectangles to compare their areas.  Provide students with the “Rectangle Comparison – Square Units” sheets.  Have students predict which rectangles will be larger; A1 or A2, or, B1 or B2. Be sure students justify their reasoning with an explanation supporting the predictions.  Tell students that today they will compare the rectangles without cutting them out. *Students continue to explore the concept of using square units to cover the area of a rectangle.*  Distribute square tiles and rulers. Tell students: *Your task is to compare the rectangles by finding the area of each rectangle. You may work in pairs. You may use the square tiles and rulers to help you.*  Allow students time to determine the number of square units in each rectangle. As students work, note different strategies that students use in order to determine the areas and compare the rectangles. Students may:   * draw each of the units inside the rectangle * fill each rectangle with square tiles and count the number of tiles * use tiles to measure the dimensions of the rectangles * use the ruler to measure the dimensions of the rectangles and multiply them to find the areas * use other strategies   Share students’ strategies. *Sharing strategies allows students to become aware of different methods that may be helpful in finding the area of rectangles. Here, it is important for students to continue to make the connection between arrays they used for multiplication and the area of a rectangle. Students who need to count each square unit will be exposed to student thinking that includes repeated addition and multiplication through the sharing of strategies.*  Choose students to share their strategies with the class. Have students demonstrate their solutions in front of the class. Have other students who used the same strategies to comment on their own thinking as well. | Identifying Similarities and Differences  Generating and Testing Hypotheses |
| A  **Application** | In the Application part of the lesson, students predict the areas of rectangles using partial square units that are given to them. Students must first visualize the square units covering the rectangles, then use strategies to check their predictions. Students should focus on ensuring the square units are the same sizes and are counted or multiplied accurately.  ***This activity may also be used as an assessment.***  Distribute or display “Incomplete Rectangles” sheet.  Ask students to predict the number of square units that would cover rectangle A. Then, ask students to predict the number of square units that would cover rectangle B. Encourage students to demonstrate and share prediction strategies.  Allow students to solve the problems independently. When done, have students share and demonstrate their solution strategies and/or collect them for evaluation.  Exploring Area Online Practice  Connect to <http://www.shodor.org/interactivate/activities/AreaExplorer/>   1. Click on Show Outline. 2. Check the box to Only Draw Rectangular Shapes. 3. Allow students to find the area of the rectangle and write what they think it is in their interactive notebooks/journals. They may turn and talk to a partner before raising their hands to answer. 4. Type, or have a student type, the measurement in the box. 5. Click on Check Answer 6. Click on Draw New Shape. 7. Repeat until students seem to be able to correctly answer the questions consistently, or for 5 minutes. 8. Click on Draw New Shape.   Have students draw two of the shapes in their Math Journals/Interactive Notebooks and find the area. They should explain how they found the area of the rectangle using at least one complete sentence. | Generating and Testing Hypotheses  Providing Feedback  Summarizing and Note-Taking  Non linguistic Representations  Homework and Practice |
| G  **Revisit the Goal** | Have students write a statement of learning in their interactive notebooks/journals using words and pictures. Have students share their entry with other students.  State and Rate  Objective: “I can count square units to determine and compare the areas of rectangles.”  Students rate themselves to the goal (1, 2, 3, 4). | Setting Objectives and Providing Feedback  Summarizing and Note-Taking |

**Math Journal (Interactive notebooks)**

Have students draw the shapes in their Math Journals and find the area. They should explain how they found the area of the rectangle using at least one complete sentence.

**Evaluation of Students**

**Formative:** The teacher can ask questions during various phases of the lesson and make observations about students’ ability to find the area of shapes.

**Summative:** Student work samples from the Application part of the lesson can be collected as a summative assessment.

**Plans for Individual Differences**

**Intervention:** Provide support for the journal entry by completing an example on the board.

**Extension:** Challenge advanced students to complete and compare the areas of two different rectangles in their journal entries.

**Comparing Rectangles with Square Units**

**B2**

**B1**

**A2**

**A1**

**Incomplete Rectangles Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Rectangle B

Which rectangle covers a greater area? Justify your answer.

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Rectangle A

1. Estimate the number of square units that would cover Rectangle A.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square units

1. Find the number of square units that would cover Rectangle A.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square units

1. Estimate the number of square units that would cover Rectangle B.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square units

1. Find the number of square units that would cover Rectangle B.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ square units

1. Were your estimates close? Why or why not?

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1. Explain how you found the area of the two shapes.

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