**Lawn Service**

**Task 6**

*Adapted from North Carolina Department of Public Instruction*

**Student Objective:** “I can determine the area of a rectangle by counting square units.”

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| **Common Core Standards to Measure** | **Mathematical Practices Addressed** |
| **3.MD.6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units)  | #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:**

Grid paper (inch or centimeter)

Colored pencils or crayons

Two dice

Book (optional): Sam’s Sneaker’s Squares. New York: Kane Press, Inc.

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| G**Engage Students with the Goal** | State and RateObjective: “I can determine the area of a rectangle by counting square units.” Students rate themselves to the goal (1, 2, 3, 4). | Setting Objectives and Providing Feedback |
| A**Access Prior****Knowledge** | Show students two pictures, one of McDonald’s and one of Chuck E. Cheese. Ask them which place they would rather go and play. They will come up with many ideas, but when someone suggests one because it is bigger, ask them, “how do you know it is bigger?” “How could you prove it is bigger?” Have them share their ideas with a partner.http://media-cdn.tripadvisor.com/media/photo-s/01/99/ef/36/spielhalle.jpghttp://farm4.static.flickr.com/3614/3607182527_a9f96912db.jpg  | Nonlinguistic RepresentationsIdentifying Similarities and Differences |
| N**New Information** | Tell students that they are going to think more deeply about how to prove something is bigger using measurement today. Start by reading the book Sam’s Sneaker’s Squares to the class and stop to discuss pgs. 18-19 and 25-27. Or, if you do not have the book give them this story scenario:*Sam wants to earn money for a Playstation 2. He starts a lawn service for his neighbors, offering to mow their yards to earn extra cash. He realizes that is takes him a longer time to mow Mr. Garcia’s yard than it does to mow Mrs. White’s lawn. He begins to ask himself if he should charge more to mow Mr. Garcia’ yard. Sam decides to measure the lawns, called “Sneaker Squares.” He counts the number of steps it takes to walk along the length and width of the yards. He discovers that Mr. Garcia’s yard is larger than Mrs. White’s yard, and charges him more to mow it.*Demonstrate how Sam counted his Sneaker Squares by walking heel to toe along the length of a wall or floor carpet. Write the dimensions of the yards on the board for discussion: Mr. Garcia- 18 x 20 steps, Mrs. White 20 x 10 steps. Ask students to help with the demonstration. Discuss how this proves Mr. Garcia’s yard is bigger, so Sam needs to charge more money. Also, discuss how you found the “area” of each lawn, introducing the formal vocabulary and record the different ways to find area on the board as students share them with the class. | Identifying Similarities and DifferencesNonlinguistic Representations |
| A**Application** | Separate students into pairs. Give them grid paper, colored pencils or crayons, and two dice. Tell them that they are starting a lawn service. They make $1 for each square unit they mow. Demonstrate rolling the dice and drawing a rectangle using the units that they roll using one color of crayon or colored pencil. *Students will add the numbers that are rolled to determine the dimensions. They will roll one time for the length finding the sum and another time for the width finding the sum.*After drawing each lawn, students should compute the amount of money they will earn for mowing the yard. Calculators are optional.The other partner then rolls, and completes the activity using a different color of crayon. Each partner repeats five times. Students will add their areas to find the total amount of money they made for the day and compare the amount to their partner’s to determine the winner. Whoever has the most money at the end of the activity “wins” the game. Walk around and note students whose strategies you would like to share.Allow students to share their earnings with the class. Discuss students’ strategies used to compute area. Some students may have used repeated addition, while others counted each square. Some may have even multiplied the dimensions to find the area. This activity reinforces the concept of building arrays and using them to find the area of a rectangle. **Some questions to pose:** What was your strategy to find the area?Why did you decide to use that strategy?Could another strategy work and still get the same answer?How are these strategies the same and different?  | Nonlinguistic RepresentationsHomework and PracticeCooperative LearningGenerating and Testing HypothesesProviding Feedback |
| 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 RateObjective: “I can determine the area of a rectangle by counting square units.” Students rate themselves to the goal (1, 2, 3, 4). | Setting Objectives and Providing FeedbackSummarizing and Note-Taking |

**Math Journal (Interactive notebooks)**

Have students write a statement of learning in their interactive notebooks/journals using words and pictures in relation to area. Have students share their entry with other students.

**Elaborate on the lesson:**

This lesson raises an important issue when measuring in standard vs. nonstandard units. Ask students, “Would Sam’s Sneaker Squares be the same as yours or mine, if he used his feet to measure?” “Why or why not?” “Would one yard still be bigger than the other?” Give students pretend dimension for a lawn. Choose two students demonstrate this problem.

How much would I earn if I mowed this part of the lawn? How much would \_\_\_\_\_\_ earn? Is there a problem with this method? How could you check your measurements? Do we need a standard unit of measure? Why or why not?

**Evaluation:**

**Formative**- Pose questions and observe them while working.

**Summative**- Use students’ grid sheets as an assessment.

**Plans for Individual Differences:**

**Intervention**- Have students use calculators who need extra support with computation and/or use one die to use smaller numbers in the activity.

**Extension-** Have students use tetrahedron dice and smaller grid paper to work with larger numbers.