**Squares to Square Units**

*Adapted from North Carolina Department of Public Instruction*

**Student Objective:** “I can use square units to measure area and communicate how I found it.”

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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.  #4 Model with mathematics.  #5 Use appropriate tools strategically.  #6 Attend to precision. |

**Materials:**

Rulers

Tape and/or Glue

Scissors

Construction Paper

Bulletin Board Paper

Interactive Notebooks

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| G  **Engage Students with the Goal** | State and Rate  Objective: ““I can use square units to measure area and communicate how I found it.” Students rate themselves to the goal (1, 2, 3, 4). | Setting Objectives and Providing Feedback |
| A  **Access Prior**  **Knowledge** | *You will need to do the lesson “Lawn Service” before this lesson.*  Remind students of the lesson, “Sam’s Sneaker Squares.” Ask them what he used as his unit to measure area. Have students discuss and share what they remember. Ask students:  -Were Sam’s Sneaker Squares a standard unit of measure? Why or why not? --How did using sneaker squares to measure pose a problem in finding how much he should charge for the yards he mowed?  -Would there have been a better way to measure the area of the yard?  Say to the class: “Today, we will create standard units to use for measuring area.” | Cues, Questions, and Advance Organizers |
| N  **New Information** | Review measurement conversions for inches, feet, yards, centimeters, decimeters, and meters. List the measurements needed for the lesson on an anchor chart as students state them. Have students record the notes from the anchor chart in their interactive notebooks, if they are used.  12 in. = 1ft.  3 ft. = 1 yd.  10 cm = 1 dm  10 dm = 1 m  Review the meaning of a “square unit”- a square unit has the dimensions of that unit. For example, the dimensions of one square inch are 1 inch by 1 inch. Show students an example.  Add dimensions to create square units on the chart and in their notebooks as well.  1 square foot = 1 foot by 1 foot (12 inches by 12 inches)  1 square yard = 1 yard by 1 yard (3 feet by 3 feet)  1 square decimeter = 1 decimeter by 1 decimeter (10 centimeters by 10 centimeters)  1 square meter = 1 meter by 1 meter (10 decimeters by 10 decimeters) | Summarizing and Note-Taking |
| A  **Application** | Divide the class into 4 groups. Give each group a task to do:  Group A- create a square decimeter from square centimeters  Group B- create a square meter from square decimeters  Group C- create a square foot from square inches  Group D- create a square yard from square feet  Demonstrate how to use a ruler to measure a square cm and square in. Cut the units out.  Have students cut out each individual unit to build the first larger unit. Tell them to glue the smaller units to a sheet of construction paper. More copies can be made by measuring. Students need to label the units. If some students finish early, have them help other groups.  When students are finished, have them share what they discovered while doing the task. *(Some things students might share are that the groups drawing and cutting smaller units found it more difficult than the groups who had bigger units, which helps them reason about size. Reinforce the need to measure with standard units in comparison to the “sneaker squares” in a previous lesson.)*  Some questions to ask: -What was easy about the activity? What was difficult?  -Were you surprised by anything? Which units would have been appropriate for Sam to measure the area of the lawns?  Have groups use their new square units (square decimeters, square meters, square feet, and square yards) to measure objects or areas in the room. Encourage students to estimate first, then measure. | Cooperative Learning  Homework and Practice  Generating and Testing Hypotheses  Identifying Similarities and Differences  Providing Feedback |
| G  **Revisit the Goal** | As groups share what they measured and their findings, have them take notes in their interactive notebooks, if used. In their notebook, students should note objects that are about:  1 square decimeter, 1 square foot, 1 square yard, and 1 square meter  State and Rate  Objective: “I can use square units to measure area and communicate how I found it.” Students rate themselves to the goal (1, 2, 3, 4). | Setting Objectives and Providing Feedback  Summarizing and Note-Taking |

**Evaluation:**

**Formative**- As students are working, teachers should observe how students measure.

**Summative**- Students’ work can be collected as a summative assessment.

**Individual Differences:**

**Intervention**- Students will small motor difficulties may need to be assigned to the groups using larger units. **Extension**- Students should measure items with each of the constructed units.