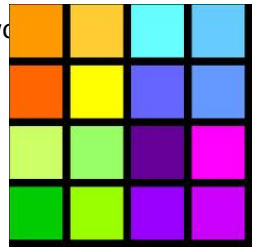

CONSTRUCTING TASK: ***THE SAME BUT DIFFERENT***

STANDARDS FOR MATHEMATICAL CONTENT

MCC.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.

MCC3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

STANDARDS FOR MATHEMATICA L 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.

BACKGROUND KNOWLEDGE AND MISCONCEPTIONS

As the teacher, your objective in the beginning is to develop the idea that area is a measure of covering. Do not introduce formulas. Simply have the students fill the shapes and count the units. Be sure to include estimation before measuring (this is significantly more difficult than for length), use approximate language, and relate precision to the size of the units in the same manner as with length (Van de Walle, page 237).

Area and perimeter (the distance around a region) are continually a source of confusion for students. Perhaps it is because both involve measuring length or because students are taught formulas for both concepts and tend to get formulas confused. Whatever the reason, expect that students even in the fifth and sixth grades will confuse these two ideas.

ESSENTIAL QUESTIONS

- What is area?
- Why are square units commonly associated with finding area?
- How does knowing the area of a square or rectangle relate to knowing different multiplication facts?
- Can one area measurement of a rectangle produce different dimension (factor) measurements?

- Also, can the same area measurement produce different size rectangles? (Ex. 24 sq.units can produce a rectangle that is a 3 X 8, 4 X 6, 1 X24, 2 X 12)
- Do different dimensions with the same area cover the same amount of space? (Ex. Is a 3 X8 the same area as a 1 X 24?)
- After covering each plane figure, what types of math could be used to determine how many squares were needed for covering?

MATERIALS

- Post-it notes
- one-inch tiles (color tiles)
- math journal/learning logs

GROUPING

Partner

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

In this task, students will create different area models for a given product.

Comments

The teacher will begin this lesson with a review of what is area. The teacher will then go back and reiterate how the classroom and our homes cover a certain amount of area. The students will be asked to look around the classroom. She will ask the students what 2 dimensional geometric plane figures do they see represented on the ceiling, walls, and floor. They should respond squares and rectangles. Allow time for the students to discuss other places that they've seen these two dimensional plane figures represented. **The teacher will explain that area is measured in square units. Square units are the standard measurement for area**. The class should have a discussion about why do they think these two figures are used most often and not triangles, trapezoids, or circles when building.

Task:

Tell the students that they will be placed into groups of two, and give each group a container of tiles or post-its. A number will be determined by the teacher and the students are to arrange the number of tiles or post-its into the shape of a rectangle. They can do it in whatever manner they chose. The only requirement is there can be **NO GAPS or OVERLAPPING**! The sides of each tile or post-it must TOUCH with NO SPACES! The teacher will need to call out numbers with more than two factors so there can be different representations. Ex. 12 can create a 2 X 6, 1 X12, 3 X 4. Once completed, tell each group to walk around the room and observe each other's rectangles. Tell students to focus on another one in particular that is not like the one they designed. Following this, they will write a reflection in their math journal about how theirs is similar yet different to another student's. The students should then have a discussion about their math findings. The teacher should offer more opportunities to explore by calling out more numbers and have the students walk and compare and contrast their area design with their peers. During this time, **the teacher needs to be sure to reinforce that the rectangle is covering a**

certain amount of space using square units. He/ She can even relate it back to their homes and tiles on the bathroom walls, kitchen counters, ceiling tiles, etc. The connection must be made so that the students can see relevance. This will begin to set students up for area's relationship to multiplication. Meaning, one number (product) can have different dimensions (factors) but the value is still the same.

The teacher will have the students think back to the tangram lesson and write a response to the following question:

- What is the relationship between the tangram activity and the activity just completed?

FORMATIVE ASSESSMENT QUESTION

- What did you notice about the area of your figure and your neighbor's?
- How was your figure the same as your neighbor's?
- How is your figure related to the tiles on the floor or ceiling?

DIFFERENTIATION

Extension

- As a set-up for the next day's lesson, the teacher can have the students write in their journals ideas or strategies that can be used to find the area of a rectangle without having to count the number of tiles one-by-one. Some of the students could have figured out that they are skip- counting in two directions.

Intervention

- Using this task as a direct instruction strategy in small groups will provide support for students who struggle with these concepts and will enable them to develop the ability to describe their thinking.