PERFORMANCE TASK: WATCH OUR GARDEN GROW!

STANDARDS FOR MATHEMATICAL CONTENT:

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

MCC.3.OA.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.19

Represent and interpret data.

MCC.3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

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.

MCC.3.MD.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

MCC.3.MD.7. Relate area to the operations of multiplication and addition.

a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
b. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
c. Use tiling to show, in a concrete case, that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

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.

ESSENTIAL QUESTION

- How can area, bar graphs, and multi-step problems be utilized in real-life situations?

MATERIALS

- Inch/centimeter grid paper
- "Watching Our Garden Grow" task sheet

GROUPING

Independent task,

TASK DESCRIPTION, DEVELOPMENT AND DISCUSSION

The students in this culminating task will design a garden and plot different dimensions of area for different flowers while later incorporating the information into a bar graph being sure the y-axis is any interval excluding one. The students will then create one and two-step questions about their garden.

Comments

The teacher will need to point out to the students that each square unit will contain one seed in the garden which will represent one flower. The flowers should be grouped into rectangular plots.

Task Directions

The students could be shown a picture of a flower garden with an assortment of flowers in one garden. Then present the students with the following task:

You want to surprise your mom by planting a flower garden for the Spring. You have measured a plot of land in the backyard that measures 100 square feet. You want to make sure that you plant five of your mom's favorite flowers. Each square unit in the garden will contain one seed.

- First, design a garden with five different flowers being sure to not exceed 100 square feet. Each flower type should be grouped together.

- Create a bar graph showing the amount of each type of flower you will plant in the garden being sure to make the y-axis any interval of choice excluding one.
- Create 4 questions about your graph. Make sure at least one of them requires more than one operation.

FORMATIVE ASSESSMENT QUESTIONS

- What might your garden look like?
- How did you decide on the area needed to plant each vegetable?
- Is there another way that you could design your garden?
- What's the connection between your garden and the bar graph?
- How was the garden able to generate questions about the bar graph?
- How would the commutative property change the look of your garden?
- How could the distributive property be applied to plant an additional flower type?

DIFFERENTIATION

Extension

- Have students use colored pencils and on their grid paper, decompose one of the five flower areas and write the equation using the distributive property.

Intervention

- The teacher could give the students manipulatives to use so they could arrange and "see" the flower patterns more clearly.

Name_____Date_____

WATCH OUR GARDEN GROW

You want to surprise your mom by planting a flower garden for Spring. You have measured a plot of land in the backyard that measures 100 square feet. You want to make sure that you plant five of your mom's favorite flowers. Each square unit in the garden will contain one seed.

- First, design a garden with five different flowers being sure not to exceed 100 square feet. Each flower type should be grouped together.
- Create a bar graph showing the amount of each type of flower you will plant in the garden being sure to make the y-axis any interval of choice excluding one.
- Create 4 questions about your graph. Make sure at least one of them requires more than one operation.