

Covering an Airplane (or Shuttle)

5 E's Lesson Plan

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Objective: Participants will:

- Cover and measure an area using a set of given shapes for the least amount of cost
- To collect, organize, and interpret data
- To construct a bar graph
- To use a standard unit of measure for area.

Standards: Science and Technology, Measurement, Problem Solving, Number Sense

ENGAGE	Show a model of the Space Shuttle. Discuss the importance of the Shuttle tiles. Discuss the role of mathematics in the development of a new aircraft or spacecraft (an example would be a new type of Shuttle.) Discuss the definition of “area”. Tell the participants that NASA has a challenge for the participants. The challenge will be to figure out the area of the Shuttle by using heat resistant tiles with a standard unit of measure and to do it for the least amount of cost.
EXPLORE	Given the individual cost of the different types of tiles to be used, participants pretend to be NASA engineers by covering the surface area of a “Shuttle”. The participants may only use one sheet of tiles. Large tiles represent 4 square inches at \$9.00 per tile. Rectangles are 2 square inches at \$ 12.00 per tile. Small tiles are 1 square inch at \$16.00 per tile, and triangles are 1/2 square inch at \$20 per tile. Have students come up with their own strategies to find the area and the cost. Have participants create a bar graph that shows the number of each type of tile used. Have participants write what they discovered.
EXPLAIN	Have students share their covered shuttle, their strategies, and what they discovered in figuring out the area and the cost. Explain that not everyone covered the shuttle for the same amount of cost, however, everyone reached approximately the same answer as to the area of the covered area.

ELABORATE	Help participants create a simple line plot for the number of square inches to cover a “Shuttle”.
EVALUATE	Participants will show a finished “Shuttle” project and bar graph. They will summarize their activities and findings in a written paragraph.