

Solar Cells, Panels and Arrays

Objective

Students will complete mathematical equations related to solar cells, panels and arrays.

Procedures

1. Explain to students that solar panels used to power homes and businesses are typically made from solar cells combined into modules that hold about 40 cells. A typical home will use about 10 to 20 solar panels to power the home. Many solar panels combined together to create one system is called a solar array.
2. Hand out the student worksheets included with this lesson. Students will answer the questions to complete the worksheets. Discuss the answers.

Oklahoma Academic Standards

GRADE 2

Numbers & Operations: 2.6

GRADE 3

Numbers & Operations:
2.1,6,7,8. Algebra: 2.1.
Geometry: 2.1,2

GRADE 4

Numbers & Operations: 1.1,3,5.
Algebra: 2.1,2. Geometry: 2.2,5

Name _____

Solar Panels

Solar panels used to power homes and businesses are typically made from solar cells combined into modules that hold about 40 cells.

Count the number of rows (up and down) on the solar panel above. The solar panel above has _____ rows of cells.

Count the number of columns (across) on the solar panel above. The solar panel above has _____ columns of cells. Write the multiplication problem that describes this solar panel.

_____ rows X _____ columns = 40 cells

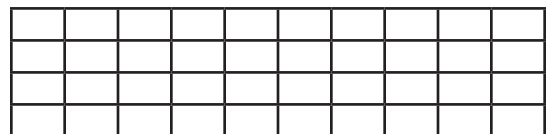
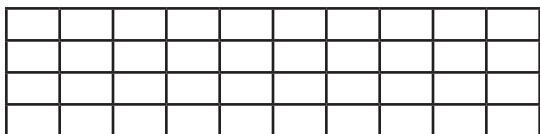
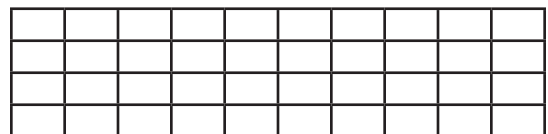
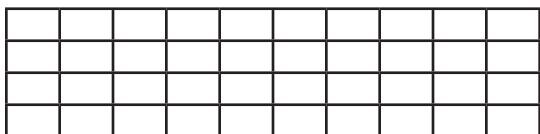
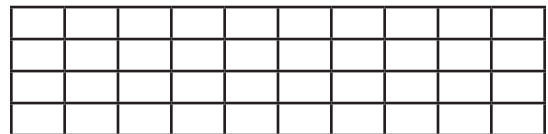
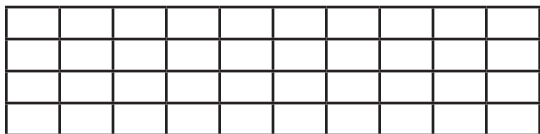
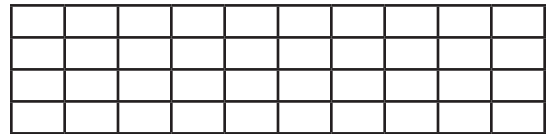
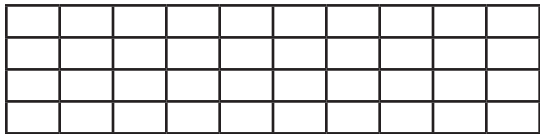
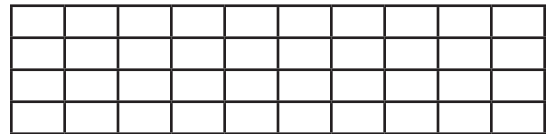
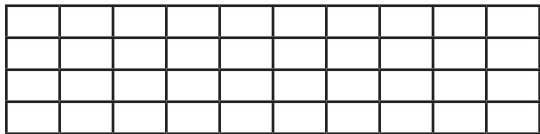
What other ways can you arrange the cells in a panel so the total is 40? Draw the panel below and write the multiplication problem.

Solar Arrays

A typical home will use about 10 to 20 solar panels to power the home. Many solar panels combined together to create one system is called a solar array.

If the solar array on the roof of a home has 10 solar panels with 40 cells in each panel, how many total cells are in the solar array? Write the mathematical equation.

How many solar panels in the solar array pictured below? Write a multiplication problem describing this solar array in the space below. On a separate sheet of paper, draw a different way to arrange this solar array. Write the multiplication problem for each of the new arrays.



Name _____

Solar Cells, Panels and Arrays



The dimensions of this side of the roof of this house are 20 feet X 10 feet. What is the area of this side of the roof? Show your equation.

The average size of a solar panel used in a rooftop solar installation is 65 inches by 39 inches. How many solar panels would fit on the roof? Show your equation.

The average house needs 4,000 watts. A typical solar panel produces around 265 watts of power. How many solar panels would it take to power an average house? Show your equation.

Would the number of solar panels that will fit on this side of the house above be enough to power the house?