Shade and Sort

Decide when rows times columns gives the shaded area.

3.GM.2.2 "Analyze why length and width are multiplied to find the area of a rectangle by decomposing the rectangle into one unit by one unit squares and viewing these as rows and columns to determine the area."

NAME _____ DATE _____

FULL GRID

Every square is shaded. Multiply the number of rows by the squares in each row to find the shaded area.

There are 2 rows of 5 shaded squares. The shaded area is $2 \times 5 = 10$ square units.



PART GRID

At least one square is blank. Multiplying all the rows by all the columns counts blank squares too, so it does not give the shaded area.

One square is blank, so the shaded area is 7 square units, not 2×4 square units.



1 SORT

8 items

For each figure, circle FULL or PART, then pick two figures and explain how you knew where each belongs.

1.

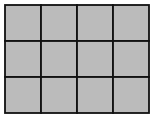


Figure 1

FULL PART

2.

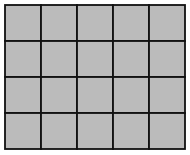


Figure 2

FULL PART

3.

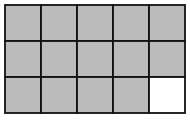


Figure 3

FULL PART

4.

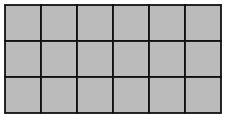


Figure 4

FULL PART

5.

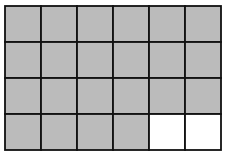


Figure 5

FULL PART

6.

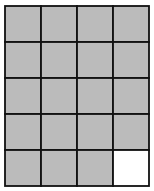


Figure 6

FULL PART

7.

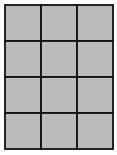


Figure 7

FULL PART

8.

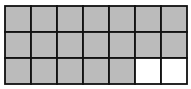


Figure 8

FULL PART

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new example of each category. For each example, give the number of rows, squares in each row, and shaded squares.

FULL _____

PART _____

CHALLENGE

A grid has 5 rows of 6 squares, but 2 squares are blank. Find the shaded area and explain why 5 × 6 alone does not give it.

ANSWER KEY

Shade and Sort

GRADE 3 · 3.GM.2.2

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (array)	**FULL**	All 12 squares are shaded, so 3 × 4 gives the shaded area.
2	Figure 2 (array)	**FULL**	All 20 squares are shaded, so 4 × 5 gives the shaded area.
3	Figure 3 (array)	**PART**	One square is blank, so 3 × 5 counts more than the 14 shaded squares.
4	Figure 4 (array)	**FULL**	All 18 squares are shaded, so 3 × 6 gives the shaded area.
5	Figure 5 (array)	**PART**	Two squares are blank, so 4 × 6 counts more than the 22 shaded squares.
6	Figure 6 (array)	**PART**	One square is blank, so 5 × 4 counts more than the 19 shaded squares.
7	Figure 7 (array)	**FULL**	All 12 squares are shaded, so 4 × 3 gives the shaded area.
8	Figure 8 (array)	**PART**	Two squares are blank, so 3 × 7 counts more than the 19 shaded squares.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **FULL**: 4 rows, 7 squares in each row, 28 shaded squares.
- **PART**: 4 rows, 7 squares in each row, 27 shaded squares.

Challenge: The shaded area is 28 square units. The product 5 × 6 = 30 counts the 2 blank squares, so 30 − 2 = 28.

For Part 2, accept explanations that connect FULL to complete shaded rows or PART to blank squares counted by the product. Each chosen figure needs its own explanation.