Square Cover Detectives

Decide whether each covering fills a rectangle exactly.

MA.3.GR.2.1 "Explore area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps. Find areas of rectangles by counting unit squares."

NAME _____ DATE _____

COVERS COMPLETELY

A covering fills every part of the rectangle with unit squares. The squares do not leave gaps or lie on top of each other.

A 7-by-2 patio plan is filled with 14 matching tiles, each in a different place.

DOES NOT COVER COMPLETELY

This covering has a gap, an overlap, or the wrong number of unit squares for the rectangle.

A 4-by-4 game board has two cards in one box.

1 SORT

8 items

Circle the tag for each item, then choose two items and explain how you knew each covering does or does not fill the rectangle.

1.	A 4-by-2 rectangle is filled with 8 unit squares, one in each space.	COVERS	DOES NOT
2.	A 3-by-3 rectangle has 8 unit squares. One space is empty.	COVERS	DOES NOT
3.	A 5-by-2 rectangle has 10 unit squares, but two are placed on the same spot.	COVERS	DOES NOT
4.	A 6-by-1 rectangle has 6 unit squares in one full row.	COVERS	DOES NOT
5.	A 3-by-4 rectangle is filled with 12 unit squares. There are no gaps or overlaps.	COVERS	DOES NOT
6.	A 2-by-5 rectangle has 9 unit squares, so one inside space is not covered.	COVERS	DOES NOT
7.	A 2-by-4 rectangle is covered by 8 unit squares. Every space has one square.	COVERS	DOES NOT
8.	A 1-by-7 rectangle has 7 unit squares placed side by side, with no gaps.	COVERS	DOES NOT

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 for COVERS and one new example for DOES NOT.

COVERS _____

DOES NOT _____

CHALLENGE

Draw a 4-by-5 rectangle. Cover it with unit squares without gaps or overlaps. How many unit squares do you use?

ANSWER KEY

Square Cover Detectives

GRADE 3 · MA.3.GR.2.1

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	A 4-by-2 rectangle is filled with 8 unit squares, one in each space.	**COVERS**	Eight squares fill all 8 spaces once.
2	A 3-by-3 rectangle has 8 unit squares. One space is empty.	**DOES NOT**	A 3-by-3 rectangle needs 9 squares, so there is a gap.
3	A 5-by-2 rectangle has 10 unit squares, but two are placed on the same spot.	**DOES NOT**	Overlapping squares do not make a complete covering.
4	A 6-by-1 rectangle has 6 unit squares in one full row.	**COVERS**	Six squares fill the 6 spaces in the row.
5	A 3-by-4 rectangle is filled with 12 unit squares. There are no gaps or overlaps.	**COVERS**	Twelve squares fill all spaces exactly once.
6	A 2-by-5 rectangle has 9 unit squares, so one inside space is not covered.	**DOES NOT**	A 2-by-5 rectangle needs 10 squares.
7	A 2-by-4 rectangle is covered by 8 unit squares. Every space has one square.	**COVERS**	All 8 spaces are covered once.
8	A 1-by-7 rectangle has 7 unit squares placed side by side, with no gaps.	**COVERS**	Seven squares fill the 7 spaces in one row.

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)

- **COVERS**: A 7-by-3 rectangle has 21 unit squares, with no gaps or overlaps.
- **DOES NOT**: A 4-by-4 rectangle has 15 unit squares because one space is empty.

Challenge: 20 unit squares.

Sort key: 1 COVERS, 2 DOES NOT, 3 DOES NOT, 4 COVERS, 5 COVERS, 6 DOES NOT, 7 COVERS, 8 COVERS. A complete covering must have the correct number of unit squares, with no gaps or overlaps.