Covering Shapes with Unit Squares

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A complete cover leaves no gaps and puts no two tiles on top of each other. Each tile covers 1 square unit. Find how many cells the whole shape has, then subtract the cells already covered. Stacking tiles does not cover extra surface.

Worked example

The shaded cells each have one unit-square tile. How many more tiles finish the cover without gaps or overlaps?

1. The surface has $4 \times 1 = 4$ unit-square spaces; 2 are already covered.

2. Cover every empty space once: $4 - 2 = 2$ additional tiles.

Answer: 2 more tiles.

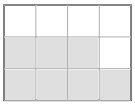


Shaded = one covering tile

Practice Problems

Show your thinking.

1. The shaded cells each have one unit-square tile. How many more tiles finish the cover without gaps or overlaps?



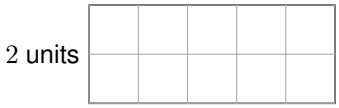
Shaded = one covering tile

2. Cover this 3-by-2 rectangle with unit squares. Draw the tile boundaries. How many tiles do you use?

2 units

3 units

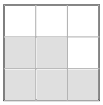
3. A helper puts 9 unit tiles on this 5-by-2 surface, with no overlaps. Can it be fully covered?



2 units

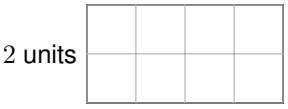
5 units

4. The shaded cells each have one unit-square tile. How many more tiles finish the cover without gaps or overlaps?



Shaded = one covering tile

5. 8 unit tiles are placed on a 4-by-2 mat. Two tiles are stacked in one cell and one cell is empty. Is the mat fully covered?



2 units

4 units

6. Cover this 3-by-4 rectangle with unit squares. Draw the tile boundaries. How many tiles do you use?

4 units

3 units

Answer Key

1. 5 more tiles.
2. 6 tiles; 2 rows of 3.
3. No; one unit-square gap remains.
4. 4 more tiles.
5. No; move the top stacked tile to the empty cell.
6. 12 tiles; 4 rows of 3.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The surface has $4 \times 3 = 12$ unit-square spaces; 7 are already covered.

2. Cover every empty space once: $12 - 7 = 5$ additional tiles.

Problem 2

1. Divide each row into 3 one-unit cells and make 2 rows.

2. Use $2 \times 3 = 6$ tiles, one per cell; no cell is empty or covered twice.

Problem 3

1. The surface has $5 \times 2 = 10$ square units.

2. $10 - 9 = 1$ space is unfilled. A complete cover needs one tile in every space.

Problem 4

1. The surface has $3 \times 3 = 9$ unit-square spaces; 5 are already covered.

2. Cover every empty space once: $9 - 5 = 4$ additional tiles.

Problem 5

1. There are 8 tiles, but the stack covers only one space, leaving $8 - 1 = 7$ different cells covered.

2. Moving the extra stacked tile fills the one gap: $7 + 1 = 8$ cells covered once.

Problem 6

1. Divide each row into 3 one-unit cells and make 4 rows.

2. Use $4 \times 3 = 12$ tiles, one per cell; no cell is empty or covered twice.

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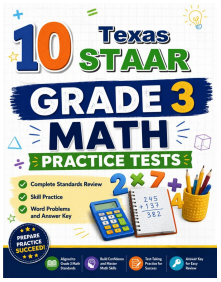

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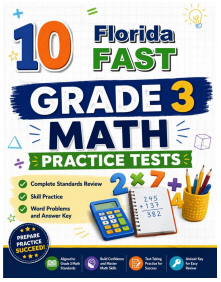

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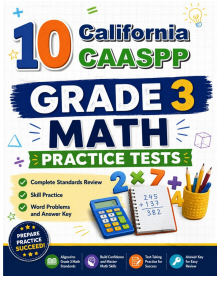

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