LESSON MAKER PRO

# Shape Steps

*Build growing and shrinking square patterns.*

**GRADE 3 · 3.A.1.3**

**3.A.1.3** "Explore and develop visual representations of increasing and decreasing geometric patterns and construct the next steps."

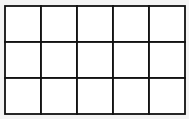
NAME _____ DATE _____

## LOOK FOR THE CHANGE

A row goes across, and a column goes up and down. In a pattern, the same change happens at each step. Make the change, then count the squares in the new step.

### WORKED EXAMPLE

Each step adds 2 full columns. Draw the next step. How many squares will it have?



1. Keep the 3 rows.
2. Add 2 columns: 5 + 2 = 7 columns.
3. Count 3 rows of 7: 21 squares.

**Answer: A 3-row, 7-column array with 21 squares.**

## PRACTICE 6 problems

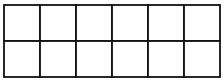
**1** Each step adds 1 full row. Draw the next two steps. How many squares are in each?



**ANSWER** _____

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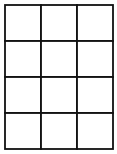
**2** Each step takes away 1 full column. Draw the next two steps. How many squares are in each?



**ANSWER** _____

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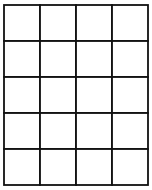
**3** Each step adds 2 full columns. Draw the next step and write its number of squares.



**ANSWER** _____

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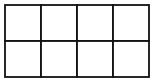
**4** Each step takes away 2 full rows. Draw the next step and write its number of squares.



**ANSWER** _____

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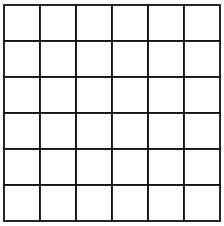
**5** Each step adds 2 full rows. Draw the next step and write its number of squares.



**ANSWER** _____

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**6** Each step takes away 2 full columns. Draw the next two steps. How many squares are in each?

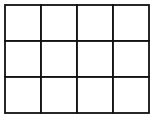


**ANSWER** _____

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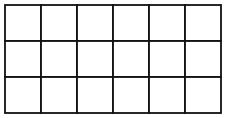
## APPLY IT Show your work

**1** Mina makes a tile picture for a game. This is today's picture. She adds 1 full row each day. Draw tomorrow's picture and tell how many tiles it has.



**ANSWER** _____

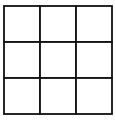
**2** A snack stand sets out juice boxes as shown. After each break, it sells 1 full column. Draw the boxes left after two breaks. How many are left?



**ANSWER** _____

## CHALLENGE One step up

This is Step 2. Each new step adds 1 row and 1 column. Draw Steps 3 and 4. How many squares are in each? Explain how you know.



WORK SPACE AND ANSWER

**ANSWER KEY**

# Shape Steps

**GRADE 3 · 3.A.1.3**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Each step adds 1 full row. Draw the next two steps. How many squares are in each? | **Next: 3 rows of 2, or 6 squares. Then: 4 rows of 2, or 8 squares.** |
| 2 | Each step takes away 1 full column. Draw the next two steps. How many squares are in each? | **Next: 2 rows of 5, or 10 squares. Then: 2 rows of 4, or 8 squares.** |
| 3 | Each step adds 2 full columns. Draw the next step and write its number of squares. | **4 rows of 5, or 20 squares.** |
| 4 | Each step takes away 2 full rows. Draw the next step and write its number of squares. | **3 rows of 4, or 12 squares.** |
| 5 | Each step adds 2 full rows. Draw the next step and write its number of squares. | **4 rows of 4, or 16 squares.** |
| 6 | Each step takes away 2 full columns. Draw the next two steps. How many squares are in each? | **Next: 6 rows of 4, or 24 squares. Then: 6 rows of 2, or 12 squares.** |

## PART 2 · APPLY IT

1. **4 rows of 4, or 16 tiles.** Adding one row changes 3 rows to 4 rows. Each row has 4 tiles, so the new picture has 16 tiles.
2. **3 rows of 4, or 12 juice boxes.** Two breaks remove two columns, leaving 4 columns. There are 3 boxes in each column, so 12 remain.

## CHALLENGE

**Step 3 is 4 rows of 4, or 16 squares. Step 4 is 5 rows of 5, or 25 squares. Each new step has one more row and one more column than the step before it.**

Accept arrays turned sideways when they show the correct numbers of rows and columns. For two-step problems, check both drawings and both counts.