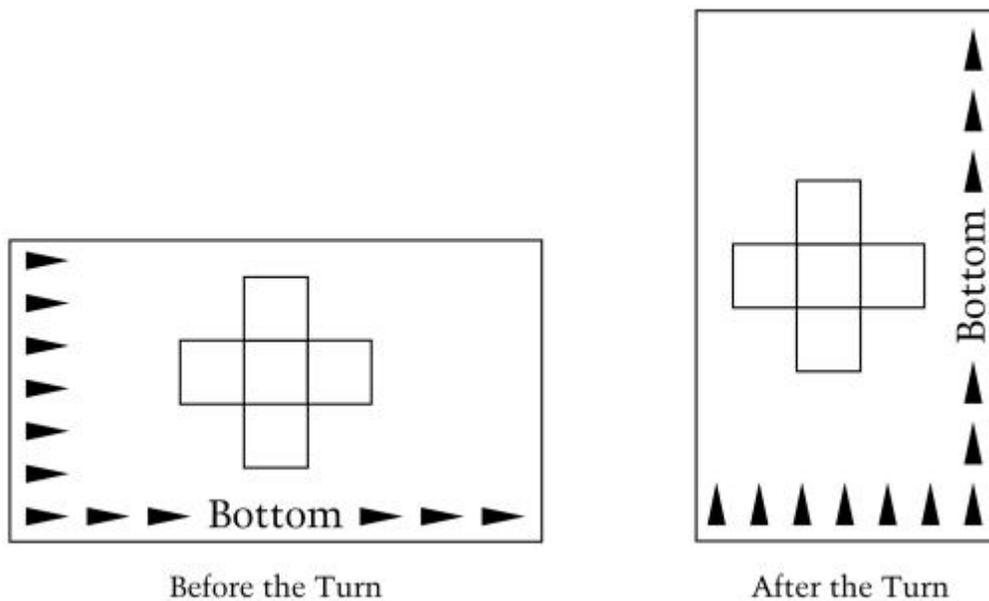


The following question refers to the additional materials you have been given. Please remove the materials from your packet and put them on your desk.



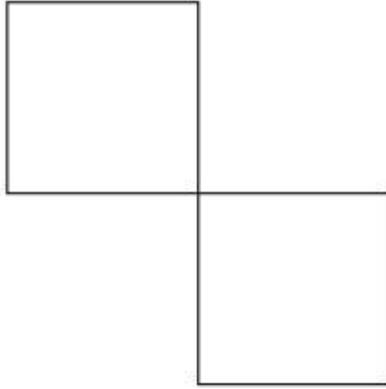
Five tiles are arranged on the work mat above to make a design. Then the work mat is turned. Notice that after the turn, the design looks the same as it did before the turn.

Place your work mat so that the word "Bottom" is closest to you. Place two tiles on the mat as shown on the next page.

Now add three new tiles to your design so that when you turn the work mat, the new design will look different from the design before the turn.

Draw your designs on the next two pages.

Draw your before design in the space below. Then draw your after design on the next page.



▶ ▶ ▶ Bottom ▶ ▶ ▶

Draw your after design in the space below.



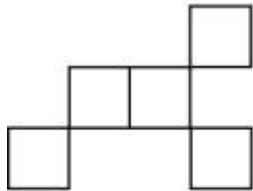
Bottom



Scoring Guide

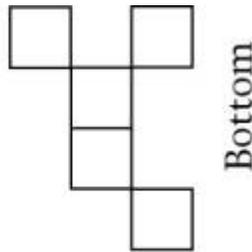
Solution:

One solution.



Bottom

Before the Turn



Bottom

After the Turn

Score & Description

Correct

Correct response – a design that is made up of 5 squares, including the 2 given, that looks different after it has been turned 90° . For a score of 3, both the before and after designs must be drawn correctly, and the design must have 5 squares and include the 2 given squares.

Partial

A design that meets all of the following criteria:

- Uses the 2 given squares
- Design contains a total of 5 squares
- Both “before” and “after” designs have same number of squares but the after design is drawn incorrectly

OR

A “before” design that uses the 2 given squares and at least one additional square (but not 3 additional squares) and a correct corresponding “after” design that looks different when turned.

Incorrect

Incorrect response (i.e., rotated; flipped; no rotation of 5 tile design; does not use the 2 original squares).

NOTE:

All squares must be counted unless some indicator (marked “open”– or numbered squares 1, 2, 3) is given

Correct - Student Response

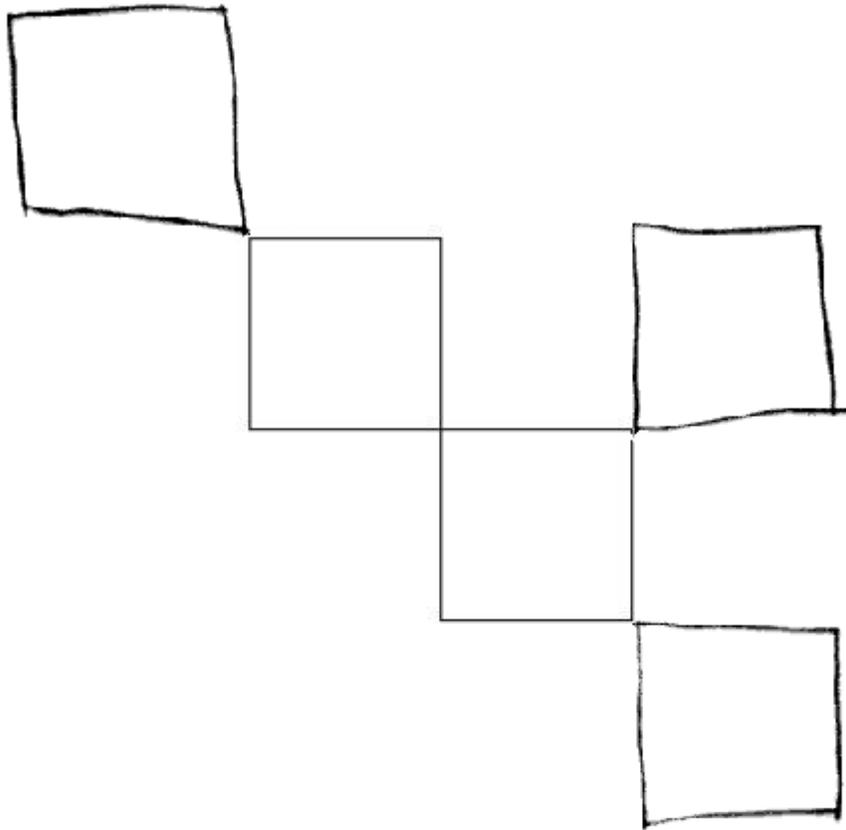
Five tiles are arranged on the work mat above to make a design. Then the work mat is turned. Notice that after the turn, the design looks the same as it did before the turn.

Place your work mat so that the word "Bottom" is closest to you. Place two tiles on the mat as shown on the next page.

Now add three new tiles to your design so that when you turn the work mat, the new design will look different from the design before the turn.

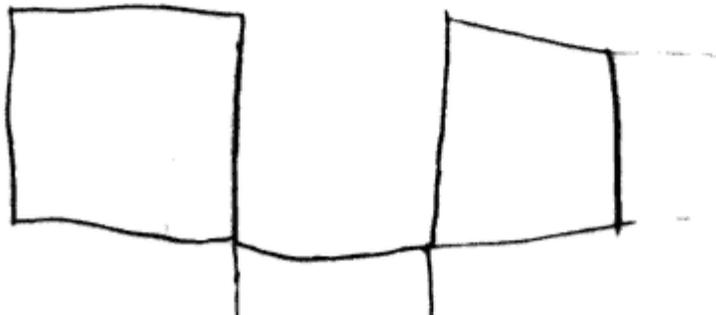
Draw your designs on the next two pages.

Draw your before design in the space below. Then draw your after design on the next page.



▶ ▶ ▶ Bottom ▶ ▶ ▶

Draw your after design in the space below.



Scorer Comments:

This response received full credit because the student correctly drew two designs that each contain five squares, including the two given squares, and it looks different when rotated 90 degrees.

Partial - Student Response

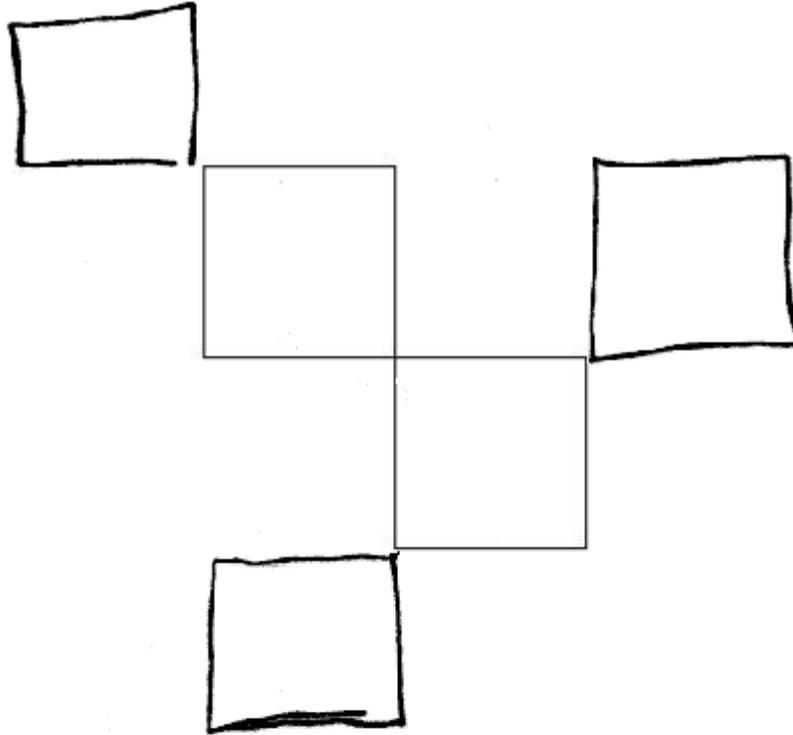
Five tiles are arranged on the work mat above to make a design. Then the work mat is turned. Notice that after the turn, the design looks the same as it did before the turn.

Place your work mat so that the word "Bottom" is closest to you. Place two tiles on the mat as shown on the next page.

Now add three new tiles to your design so that when you turn the work mat, the new design will look different from the design before the turn.

Draw your designs on the next two pages.

Draw your before design in the space below. Then draw your after design on the next page.



▶▶▶ Bottom ▶▶▶

Draw your after design in the space below.



Scorer Comments:

This response received partial credit because the student correctly drew two designs that each contain five squares, including the two given squares, but the second design is not drawn correctly after being rotated 90 degrees.

Incorrect - Student Response

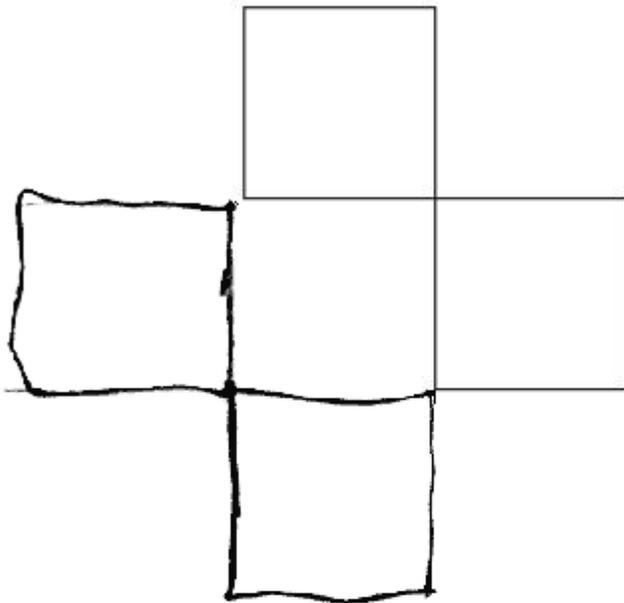
Five tiles are arranged on the work mat above to make a design. Then the work mat is turned. Notice that after the turn, the design looks the same as it did before the turn.

Place your work mat so that the word "Bottom" is closest to you. Place two tiles on the mat as shown on the next page.

Now add three new tiles to your design so that when you turn the work mat, the new design will look different from the design before the turn.

Draw your designs on the next two pages.

Draw your before design in the space below. Then draw your after design on the next page.



▶ ▶ ▶ Bottom ▶ ▶ ▶

Draw your after design in the space below.

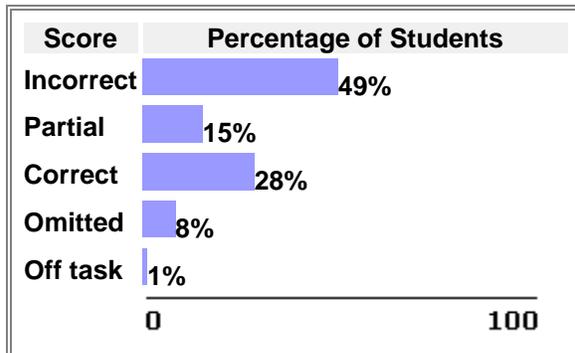
N



Scorer Comments:

This response received no credit because the design the student gave is just a repeat of the given example.

2005 National Performance Results



Note:

- These results are for public and nonpublic school students.
- Percentages may not add to 100 due to rounding.

Mathematical Content Area: *Geometry* (Sub content classification:)
Mathematical Complexity: *Moderate Complexity*

Mathematical Content Area

Geometry

This content area focuses on identification of geometric shapes into transformations and combinations of those shapes. By grade 4, students are expected to be familiar with simple plane figures such as lines, circles, triangles, and rectangles, as well as solid figures such as cubes, spheres, and cylinders. They are also expected to be able to recognize examples of parallel and perpendicular lines. As students move to middle school and beyond, increased understanding should deepen of two- and three-dimensional figures, especially parallelism, perpendicularity, angle relations in polygons, congruence, similarity, and the Pythagorean theorem. Students at all grades are expected to show knowledge of symmetry and transformations of shapes and to identify images resulting from flips, rotations, or turns. Justifications and reasoning in both formal and informal settings are expected at grades 8 and 12.

Mathematical Complexity

Moderate Complexity

Items in the moderate-complexity category involve more flexibility of thinking and choice among alternatives than do those in the low-complexity category. They require a response that goes beyond the habitual, is not specified, and ordinarily has more than a single step. The student is expected to decide what to do, using informal methods of reasoning and problem-solving strategies, and to bring together skill and knowledge from various domains.

Description	Grade	Type	Difficulty
Construct a figure using tiles	8th	Short Constructed Response	Hard