

CREATIVE SHAPES

Performance Standard 9A.B

Create a shape using four pattern blocks and perform a translation, a rotation and a reflection on the shape accordingly:

- *Mathematical knowledge:* Create a shape that is a unit (i.e., the blocks must touch at least one of the other blocks); accurately perform a translation, rotation and reflection of the original shape and identify which movement is an example of symmetry.
- *Strategic knowledge:* Manipulate the pattern blocks correctly to create the translation, rotation and reflection.
- *Explanation:* Explain completely and clearly what the movement of the original shape does to it and why one of the movements is an example of symmetry.

Procedures

1. *In order to demonstrate and apply geometric concepts involving points, lines, and planes (9A)*, students should experience sufficient learning opportunities to develop the following:
 - Perform translations (slides), reflections (flips), and rotations (turns) with concrete objects.
 - Create and complete shapes that have line symmetry.
2. Have students review and discuss the “Creative Shapes” task sheet and how the rubric will be used to evaluate their performance. This assessment can be given as a whole class task, but each student must complete the task independently.
3. Provide each student with a copy of the “Creative Shapes” task sheet and 5 blank sheets of paper. Read the directions on the task sheet to ensure that all students understand what they are supposed to do:
 - Create a shape that is a unit on the left side of the task sheet using 4 pattern blocks.
 - Record a translation, rotation, and a reflection on the shape separately on each of 3 blank sheets, explaining in words what the movement on the shape did to the original shape.
 - Identify which of the movements is an example of symmetry and explain why, and create another example of symmetry with the pattern block shapes to justify that explanation.
4. Evaluate each student’s performance using the rubric as follows and use the guide on the rubric to determine the performance level:
 - *Mathematical knowledge:* Check the accuracy of the movements of the original shape.
 - *Strategic knowledge:* Manipulations correctly and systematically performed.
 - *Explanation:* Assess the clarity and vocabulary of the explanation of what the movement of the shape did to the original shape; assess the clarity of the explanation of symmetry and the drawing of the other example of symmetry.

Examples of Student Work follow

Time Requirements

- 35 - 45 minutes, depending upon the level of fine motor skills

Resources

- Copies of “Creative Shapes” task sheet
- Pattern blocks, pattern-block shapes, and/or pattern-block stamps
- Mathematics Rubric

NAME _____ DATE _____

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You will need 5 pieces of paper to complete this task.

1. Page 1: Write ORIGINAL SHAPE at the top of this page. Create a shape using 4 Pattern Blocks. The original shape must be a 'unit', that is, the blocks must touch at least one of the other blocks.
2. Page 2: Write TRANSLATION at the top of this page. Perform a translation on the original shape and record it by tracing, gluing Pattern Block Shapes, or stamping the shape. Explain in words what the translation does to the original shape.
3. Page 3: Write ROTATION at the top of this page. Perform a rotation on the original shape and record it by tracing, gluing Pattern Block Shapes, or stamping the shape. Explain in words what the rotation does to the original shape.
4. Page 4: Write REFLECTION at the top of this page. Perform a reflection on the original shape and record it by tracing, gluing Pattern Block Shapes, or stamping the shape. Explain in words what the reflection does to the original shape.
5. Page 5: Write SYMMETRY at the top of this page. Which of the shapes you drew is an example of symmetry? Complete the following sentence and write it near the top of this page.

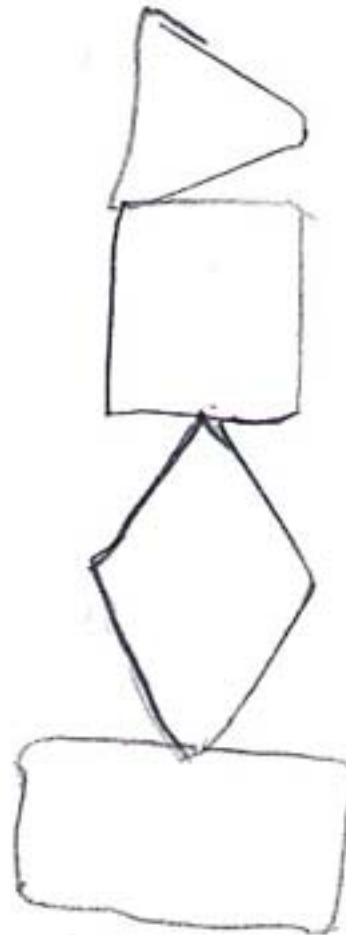
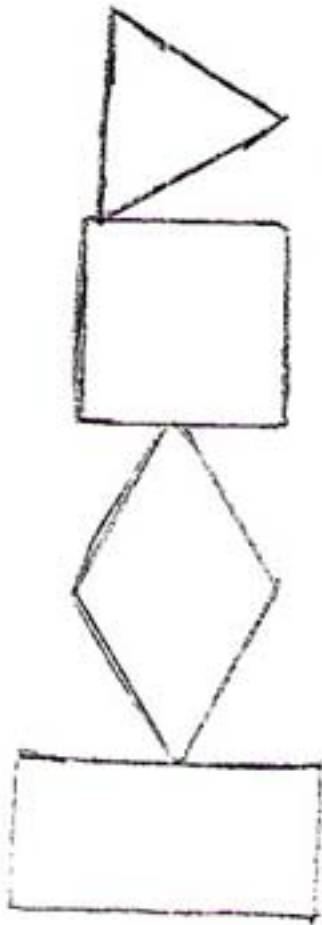
"The _____ of the original shape is an example of symmetry because _____."

Create another example of symmetry on page 5 with the Pattern Block Shapes to justify your explanation.

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Create a shape on the left side of the vertical line using 4 Pattern Blocks. The shape must be a 'unit', that is, the blocks must touch at least one of the other blocks. Perform a translation, a rotation and a reflection on the shape and record it on the right side by tracing, gluing Pattern Block Shapes, or stamping the shape. Explain in words what the movement on the shape does to the shape.

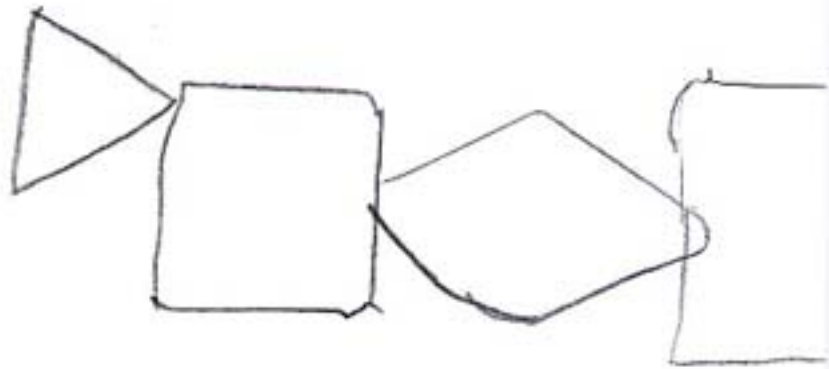
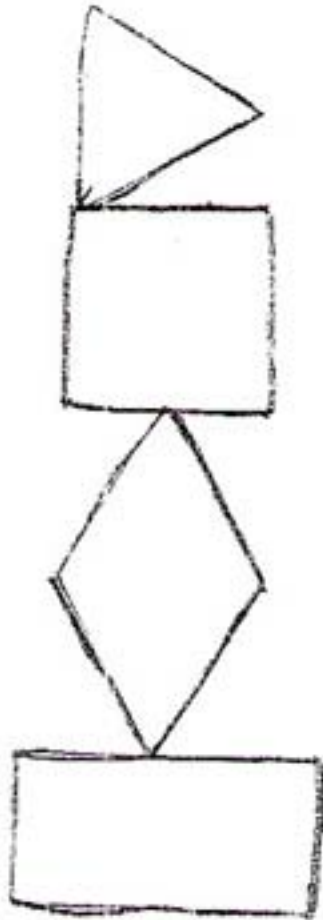
Translation



I slid it over.

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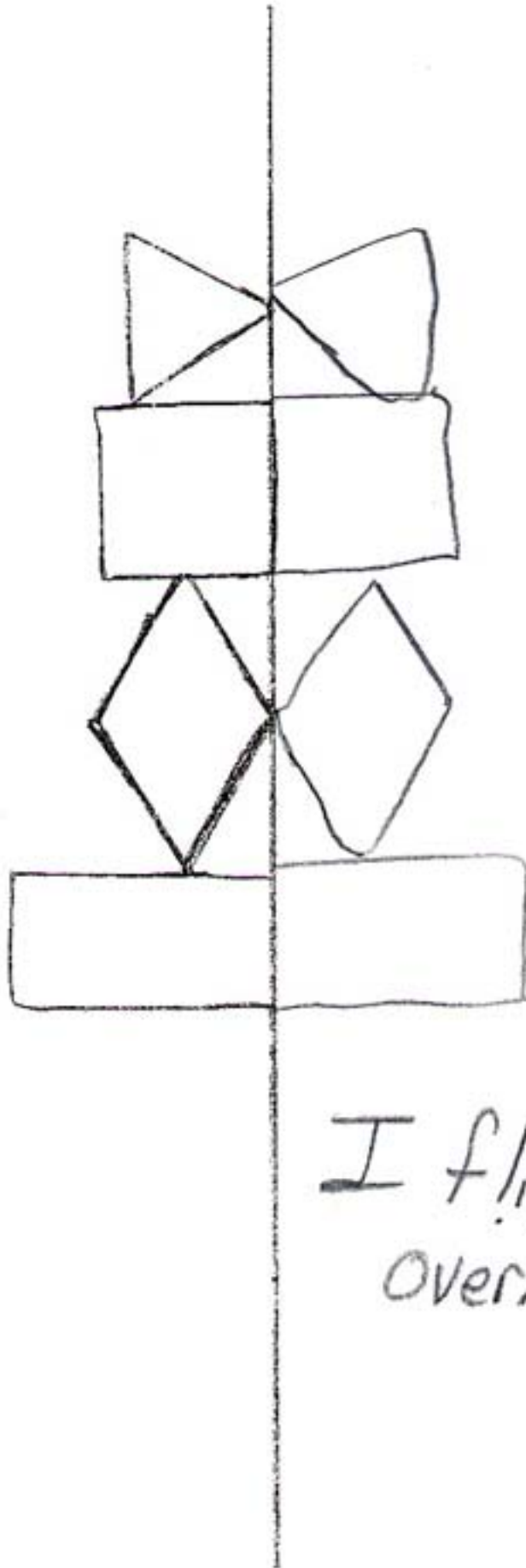
Rotation



I turned it
sideways.

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Reflection



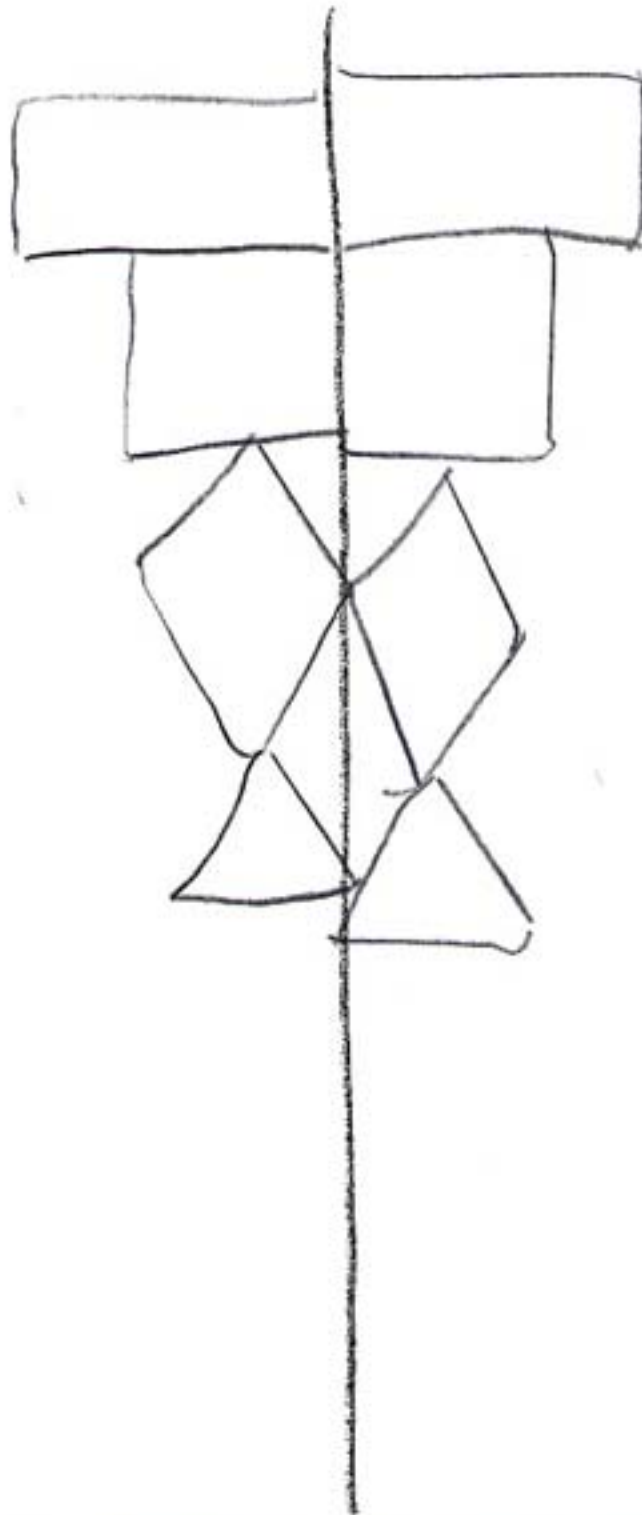
*I flipped it
over.*

Which of the movements that you made show an example of symmetry? Translation Reflection Rotation

How do you know?

They both look like a mirror.

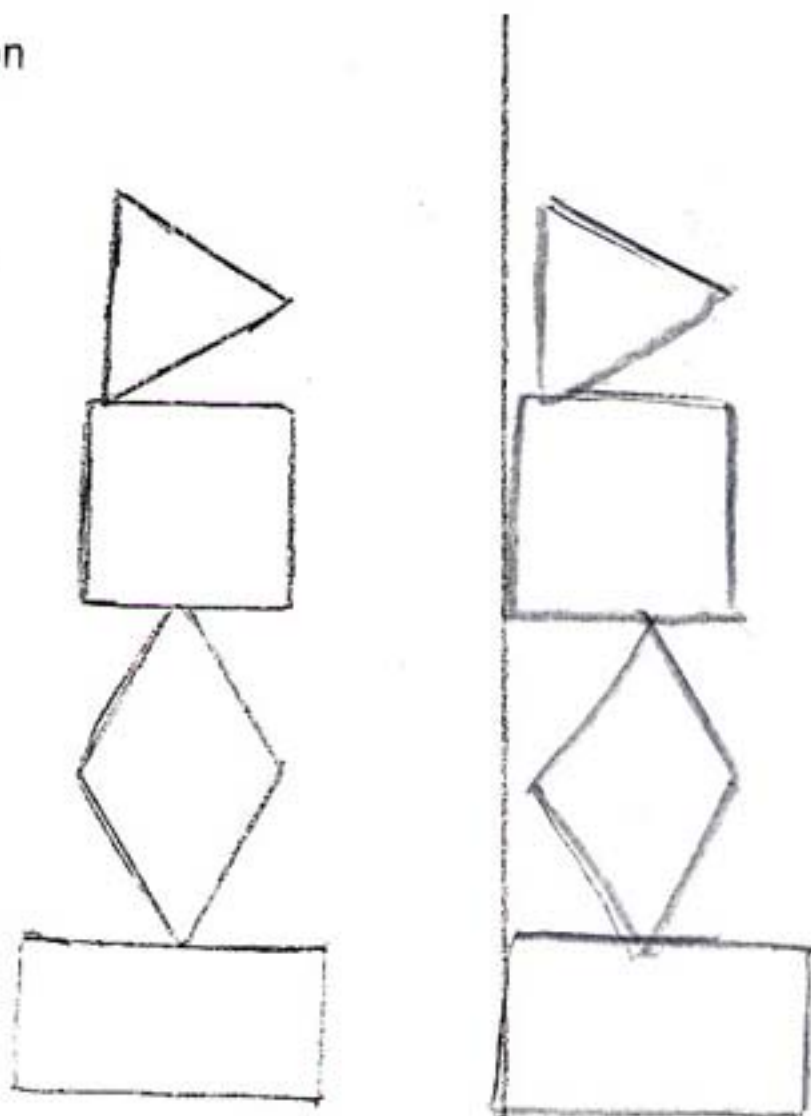
Create another example of symmetry with the Pattern Block Shapes.



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Create a shape on the left side of the vertical line using 4 Pattern Blocks. The shape must be a 'unit', that is, the blocks must touch at least one of the other blocks. Perform a translation, a rotation and a reflection on the shape and record it on the right side by tracing, gluing Pattern Block Shapes, or stamping the shape. Explain in words what the movement on the shape does to the shape.

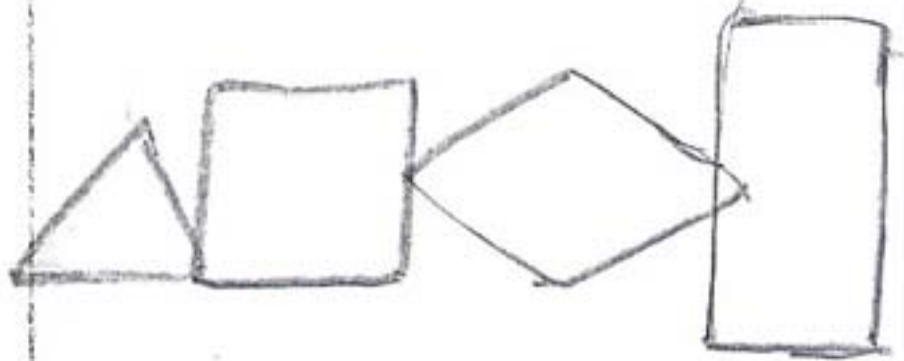
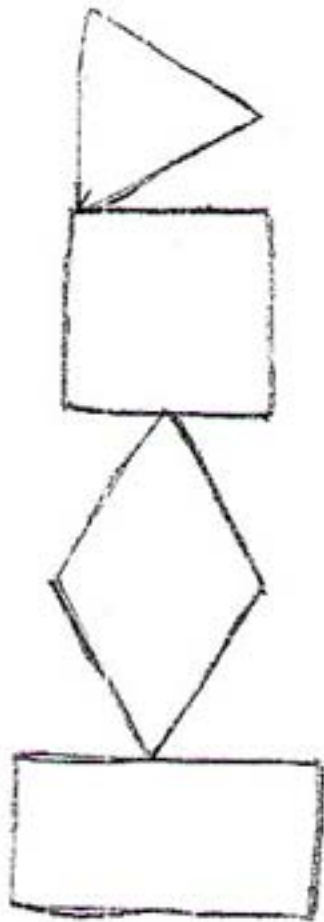
Translation



I slid it over.

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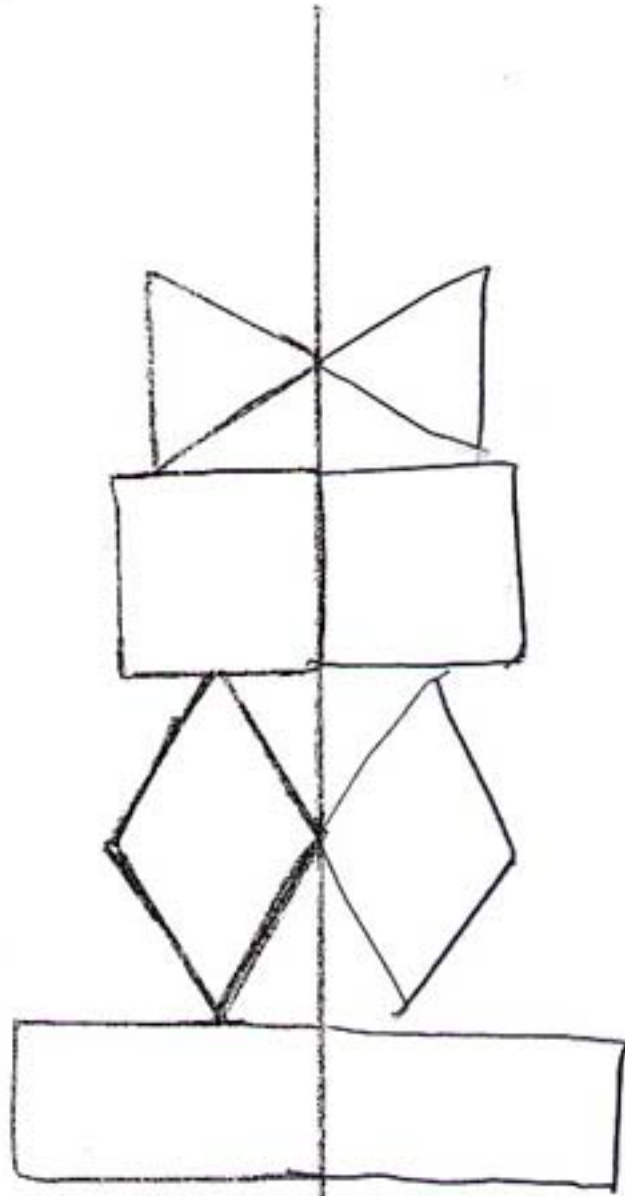
Rotation



I turned it sideways,

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Reflection



I flipped it over.

Which of the movements that you made show an example of symmetry? Translation Reflection Rotation

How do you know?

They both flip over

Create another example of symmetry with the Pattern Block Shapes.

