

# THE LAST BLOCK

GEOMETRY • LOGIC

- Spatial visualization
- Properties of geometric figures
- Game strategies

## Getting Ready

### What You'll Need

Pattern Blocks, 50 per pair, with no orange or tan blocks

*The Last Block* game board, page 93

Overhead Pattern Blocks/Overhead transparency of *The Last Block* game board (optional)

## Overview

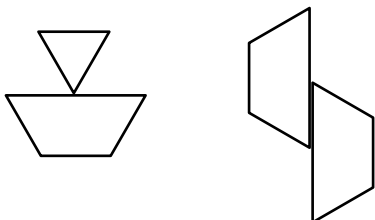
In this game for two or four players, children take turns placing Pattern Blocks on a hexagonal game board. The winner is the player who places the last block on the board. In this activity, children have the opportunity to:

- ◆ develop strategic and logical thinking
- ◆ explore spatial relationships
- ◆ recognize relationships among areas of different shapes



## The Activity

You may want to show one or more examples of moves that are not allowed.



## Introducing

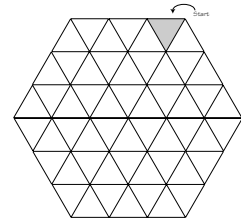
- ◆ Tell children that they will be playing a Pattern Block game called *The Last Block*.
- ◆ Distribute game boards to each pair of children and explain the game rules given in *On Their Own*.
- ◆ Emphasize that at least one side of each block placed on the board must touch one complete side of a block that is already on the game board.
- ◆ Demonstrate by playing a partial game of *The Last Block*, either by yourself or with a volunteer.

## On Their Own

### Play *The Last Block!*

Here are the rules.

1. This is a game for 2 or 4 players. The object is to be the player who places the last Pattern Block on *The Last Block* game board.
  2. The first player places a green triangle on the space marked "Start."
  3. Players take turns placing a Pattern Block on the board. At least 1 side of each new block must touch at least 1 complete side of a block that is already on the board.
  4. The player who covers the last open space wins.
- Play several games of *The Last Block*. Take turns going first.
  - Be ready to talk about good moves and bad moves.



## The Bigger Picture

### Thinking and Sharing

Invite children to talk about their games and describe some of the thinking they did.

Use prompts like these to promote class discussion:

- ◆ What kinds of things did you think about when planning your moves?
- ◆ Are there certain blocks you like to use at the beginning of the game? at the end? Why?
- ◆ Did you make any move that you then wanted to take back? Explain.
- ◆ What strategies did you discover to help you win and to keep your opponent from winning?

### Extending the Activity

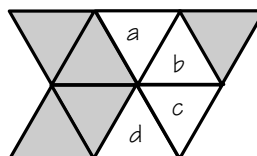
1. Have children play the game with this change in the rules: The player who covers the last space loses. Ask children to compare their strategy for this game with the strategy in the original game.
2. Have children design their own game boards. Invite children to exchange their game boards with others.
3. Have children choose 12 blocks to use before starting the game. After they have played the game several times, have partners discuss whether each person made good choices and why.

## Teacher Talk

### Where's the Mathematics?

When first playing *The Last Block*, many children will simply concentrate on covering the game board quickly by using larger blocks first and then using smaller blocks to cover the remaining spaces. Others may feel challenged to explore the different ways in which blocks can be placed on the game board. No matter what their approach, children have an opportunity to explore area relationships in an informal environment. Since the game board is made up of shapes congruent to the green triangle, children can see that the Pattern Blocks being used all relate in area to the green triangle; that is, the blue parallelogram is equivalent to two green triangles, the red trapezoid is equivalent to three green triangles, and the yellow hexagon is equivalent to six green triangles.

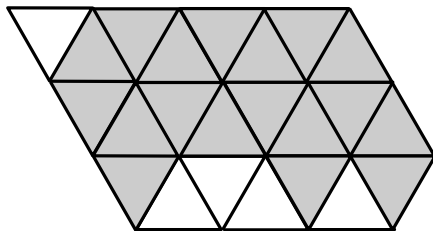
After playing several rounds, children will be able to begin to focus on winning strategies. They may come to realize that the winner will be the person who can analyze the remaining moves after most of the spaces on the game board have been covered. For example, below is a partial game board with four remaining spaces. There are two people playing, and it is Player 1's turn. Player 1 has a number of options from which to choose. If Player 1 places a green triangle on either a or d, there would remain a space the size of a red trapezoid, and Player 2 would win by placing the trapezoid. If Player 1 places a green triangle on b, Player 2 may place a green triangle on c or d, forcing two more plays. Player 2 may use a similar strategy if Player 1 places a green triangle on c. However, if Player 1 places a blue parallelogram on b and c, Player 2 would be forced to play a green triangle, leaving one last space to cover, and Player 1 would win.



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As the value of planning ahead becomes apparent, some children may decide that this is a good strategy: “When we get near the end of a game, I have to place the blocks so that there are an even number of possible moves left. That leaves one move for my opponent and one move for me, another move for my opponent and another move for me, and so on. Continuing this way, I will always get to place the last block and win.” This thinking can be adapted for cases in which there are four players, although it is far more difficult to carry out: “I must try to make sure that the number of possible moves remaining is a multiple of four.”

Below is another example of a partial game board with five remaining spaces, some adjacent, some not. There are two people playing, and it is Player 1’s turn. Player 1 must ensure that there are an even number of remaining moves after his or her move. One way to ensure a win is to place a red trapezoid; that leaves two nonadjacent spaces to be covered. Another way to win would be to place a green triangle over the middle of the uncovered trapezoid shape; that leaves four nonadjacent spaces to be covered. If, however, Player 1 were to place a blue parallelogram, that would leave an odd number of nonadjacent spaces (3), and Player 2 would win.



*The Last Block* requires children to use logical reasoning skills and strategic thinking to play well. As they test different strategies and plan ways to outwit their opponent, children develop thinking skills that will help them not only to become better game players but also to become more creative problem solvers.