

Pattern Block Fill-Ins

Math Topics: Shapes, counting, addition

Materials: 21st Century Pattern Blocks, Upscale Pattern Blocks, or classic pattern block with orange squares and tan rhombuses removed, fill-ins, pencil and paper

How many blocks does it take to fill in the shape?

Why we love Pattern Block Fill-Ins

This activity differentiates beautifully, since anyone can begin filling in shapes with pattern blocks, and because there are so many additional challenges that students can explore beyond the initial one. Counting the blocks can be quite challenging, since students need to keep good track of where they started and which blocks they've already counted. Questions of how to use the most or fewest number of blocks to fill in a shape (and how to prove it!) can be quite subtle.

The Launch

Show one of the fill-ins—the hexagon, say—and take guesses on how many blocks it will take to fill it in. Then fill it in, and demonstrate how to count the blocks and write in how many you used. Then ask whether you should try to use fewer blocks or more blocks when you fill it in a second time.

Prompts and Questions

- How many blocks did you use to fill in that shape?
- Show me how you counted.
- Do you think you could fill it in with more/less than last time?
- What's the fewest number of blocks you could use?
- What's the greatest number of blocks you could use?

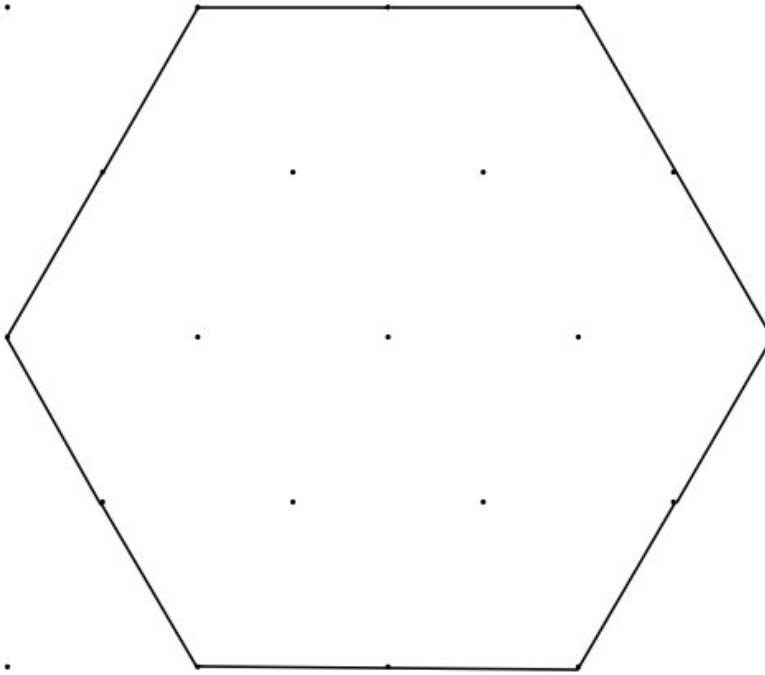
The Wrap

Discuss which numbers of blocks students used to fill in the shapes. What was the largest number students used? What was the smallest? Could they have done even larger/smaller?

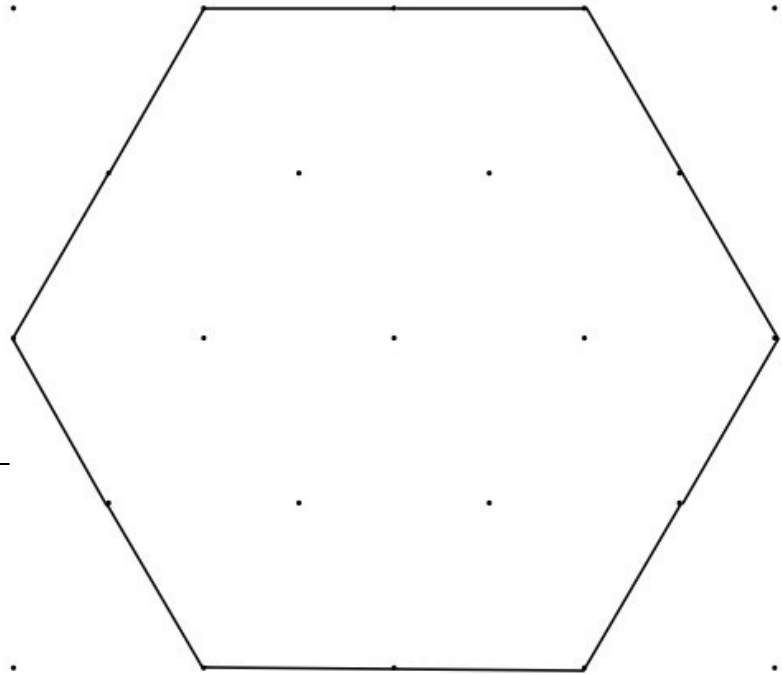
Tips for the classroom

1. For some students, filling in the shapes without gaps will be a sufficient challenge.
2. Another way to downlevel this activity is to have students cover a small pattern block hexagon with other shapes. How many blocks does it take?
3. **IMPORTANT:** all these shapes cannot be done with the tan rhombus or the orange square. Remove these from your pattern blocks, or tell students that they won't be able to use them. Upscale or 21st Century Pattern Blocks will work without adaptation.

The Hexagon

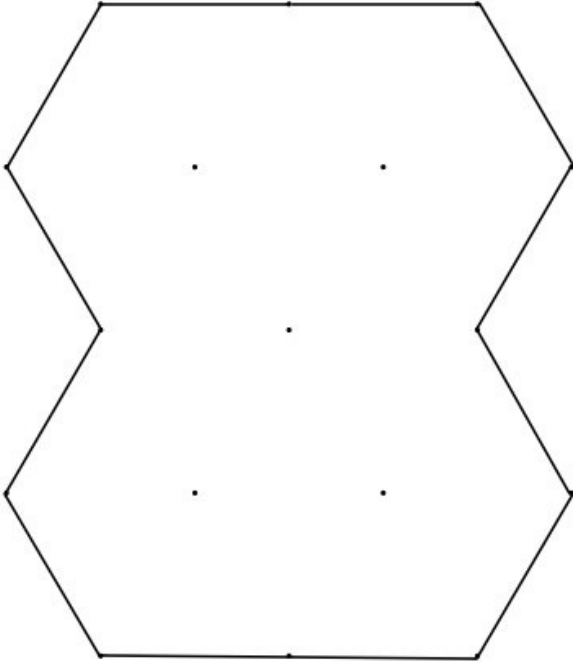


Blocks Used



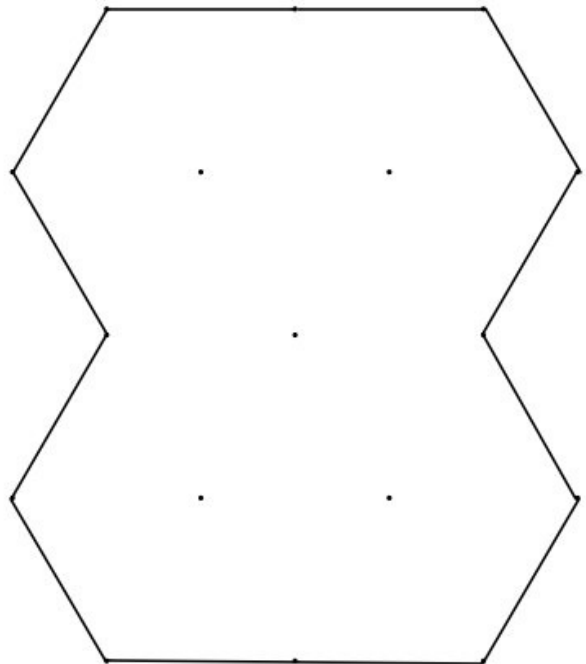
Blocks Used

The Penguin

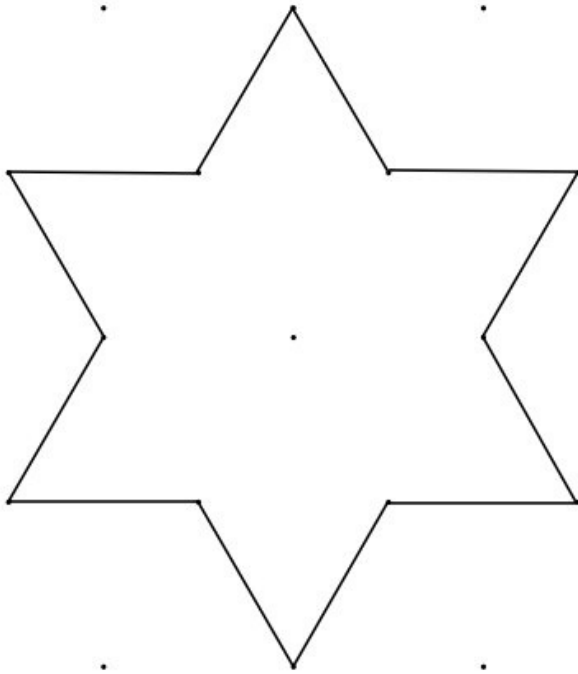


Blocks Used

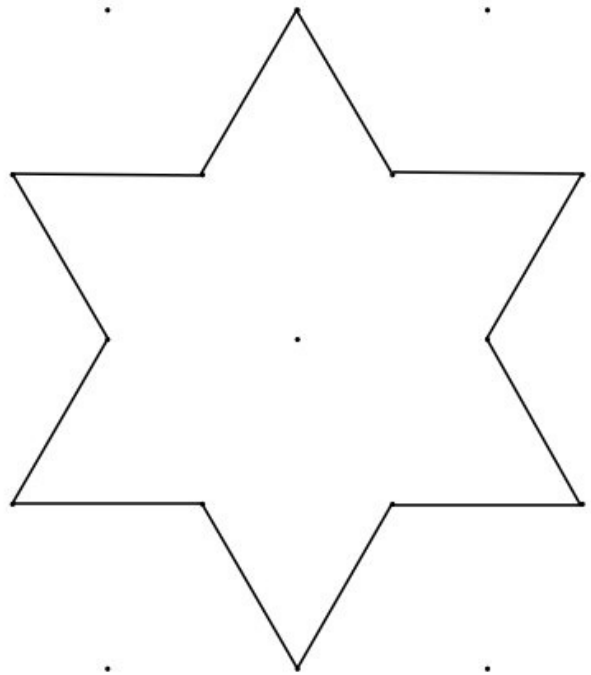
Blocks Used



The Star

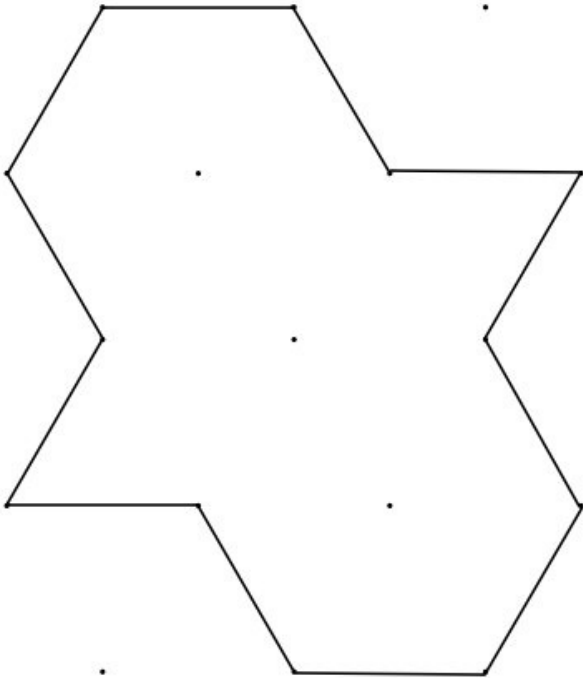


Blocks Used

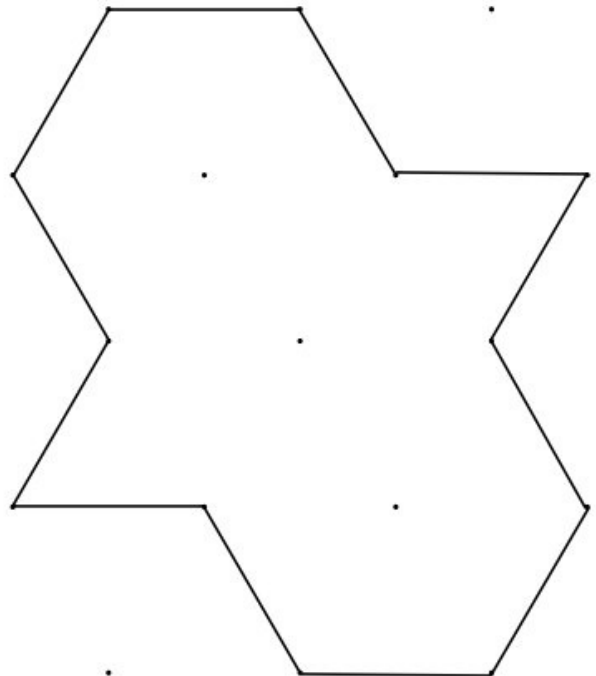


Blocks Used

The Spaceship



Blocks Used



Blocks Used