

Hexagons (Version I)

Hexagons promotes the exploration of equivalence and decomposing and composing numbers by allowing children to cover equivalent combinations on their boards, instead of just matching the visual image shown. What is covered must be justified as being equivalent to the quick image. Because the objective is to cover the entire board, there is a built-in incentive to think about a variety of equivalent expressions.

Directions for Playing

Children play Hexagons in pairs. Play begins with the deck of quick image cards stacked face down. Each player has a hexagon game board (Appendix R). Players take turns drawing a card and showing it as a quick image while they count 1, 2, 3. The card is then turned facedown again. Players share their strategies for how they know the quantity of dots, which is then checked with the image. Players then cover equivalent amounts on their game boards with hexagon pattern blocks. This total can be represented in different ways. For example, if the quick image shows 6, players can use a hexagon to cover the exact image, or any other arrangements of 6, or find and combine images that total 6. All moves must be justified. The game ends when all the game boards are completely filled.

Noting the Mathematical Landscape: Openings and Possibilities

As you walk around supporting children as they play, take note of their strategies for figuring out how many dots are in the quick image and how many dots are in each image on their boards. Do they count the dots by ones, or use the way the dots are structured in the image to figure out how many? If the latter, what are their strategies? Do they adjust their strategies as the images change? Do they use landmark strategies such as doubles, doubles plus or minus, and compensation? Do they isolate a group of dots on an image and use these groups to skip-count? How do children use the quick image to cover their boards? Do they simply match the

Materials Needed

Hexagon game board (Appendix R)—one per child

Quick image cards (single hexagon cutouts from Appendix R)—one set per pair of children

Hexagon pattern blocks

visual, or do they easily decompose and compose numbers as needed to cover as many hexagons as possible? If they are only matching the image, are they puzzled by other kinds of strategies? Listen for children's puzzlement over different strategies because it can be used as a focus of discussion in a math congress to support development.



Playing Hexagons (Version I)

Noah: OK, here's our first one. 1, 2, 3.
(Shows the image to the count of 3 and then covers it.)

Marco: It's 5. I know it. I saw 2 and 3. That's 5.

Noah: I saw 1 and 4. Yep. That's 5. *(They both look again at the image and show each other the groups they saw to justify that it is 5.)* OK, so what can you cover on your board? I've got that one on mine. See...it's the same.

Marco: I can cover 3 hexagons! I need 3 yellow hexagons.

Noah: How did you do that?

Marco: I have 5 like you. But I also have 1 and over here I have 4. So I covered those, too. Because $1 + 4 = 5$.

Toni (the teacher): Oh, that's good thinking, isn't it, Noah? I wonder, can you do that on your board, too?

Marco: You can...you have a 3 and 2.

Noah: Yeah. Hey, thanks!

Toni: Can you convince me, Noah, that 3 and 2 makes 5? How do you know Marco is right?

Noah: *(Shows the 2 and 3 on the dot quick image card.)* See. But it's still 5. We're finding a lot of ways.

Toni: You sure are! Soon you'll have both boards covered!

Author's Notes

Small amounts like two and three can be subitized—seen as a whole without needing to count. Quick images are based on this natural ability.

Because ideas about equivalence and part-whole relations can arise, these kinds of conversations are critical to support children's thinking and development.

Play is collaborative. The goal is to cover both boards.

Children must justify their thinking.

