

Leaders in Mathematical Thinking

Nathalie Sinclair - Geometric Problem-solving

>> The teacher had been studying triangles with the students. And at the beginning of the class, she said, "You know, there are other shapes that we know about. But triangles have something really important. What do you think that could be?" And you know, the kids didn't really have any answers. But she set that up as like the overall big idea to think of. Then she had the students interact with some Web Sketches, where they had triangles and then different kinds of shapes, like a square, pentagon, hexagon, even a star. And they had to use the triangles to fill in those other shapes. And so, you know, there's a lot of spatial reasoning, because a lot of them started with this triangle. So if you only have two triangles to fill up a square, you're going to have to use a triangle that's not the prototypical one, so just that. But you can do it with three triangles, four triangles, then moving on to some more difficult shapes. And as the kids worked on that, they realized that actually, we don't need squares in our lives, because triangles are enough. If you have a triangle, you can always make a square. If you have a triangle, you can make a hexagon. So that was what sort of came out of it. But along the way, a lot of spatial reasoning was happening, a lot of awareness around the different types of triangles that you can have. So it's not that you're just doing spatial reasoning for the sake of spatial reasoning, but it's in the context of working on an important geometry problem. And then what the kids did was, they had to make a drawing that used only triangles. So a lot of them chose to make a house, so they had to think of, how am I going to do the chimney just out of triangles? How am I going to do the windows just out of triangles? How am I going to do the smoke just out of triangles? So they used spirals and things like that. So it's just seeing -- then you come to see the world in a little bit of a different way. And they're set up for later on. You know, triangulation is one of the most important computer techniques that we have for rendering images. And a lot of the animation studios use triangulation as one of their basic ideas, so they're set up, these kids, for working in that world. You know, in Minecraft, everything is made out of cubes. So in a 2D world, you can think everything is made out of triangles.