# DIALOGUE BOX 5

Halves of Squares

During the Classroom Routine in Session 2.1, students encountered *Quick Images* that involved dividing a circle in half. In Session 2.2 they revisit these ideas, with squares.

The teacher shows the first image, a square.

Teacher:	Who can describe what they saw?
Richard:	It had three, I mean four points and four lines.
Teacher:	Does anyone want to add to what Richard said?
Marta:	It was a square.
Teacher:	We could label that shape with the name *square*.

She reveals the square and counts the sides/vertices. Next she displays an image of a square with a horizontal line dividing it in half.
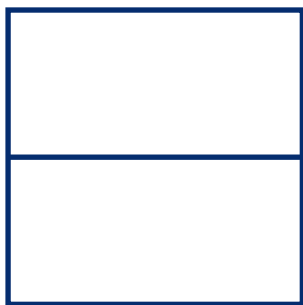
Teacher:	What did you see?
Carol:	A square with a line like going straight past the middle.
Teo:	It's a square with two rectangles in it.
Jacob:	It looks like two rectangles attached.
Tamika:	The square and the other one. If the square… if you draw a line through the first one, it'll be the same.

The teacher displays the two squares next to each other.
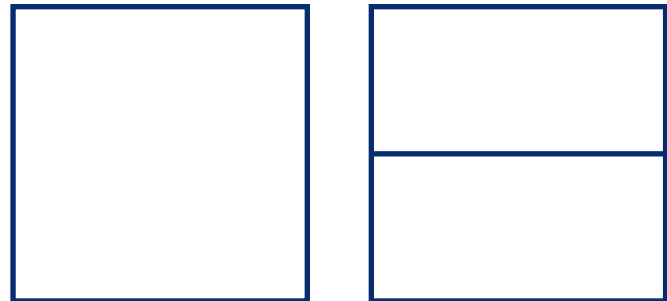
Teacher:	Does anyone want to add to that?
Chris:	It's just like yesterday when we made pizza; there's a line through the middle, except those were circles.
Teacher:	What made it the same as yesterday's image?
Chris:	The lines through the middle. Just like with the pizza, the lines through the middle make it half and half.
Teacher:	With a circle we put a line through the middle and it was half and half.
Chris:	The same half as the other one.
Teacher:	Two equal shares.

Next the teacher displays an image of a square with a vertical line dividing it in half.
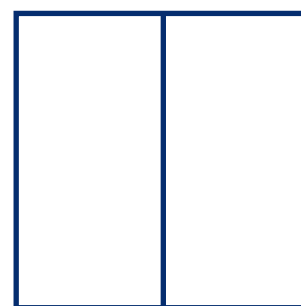
|	
Lyle:	It's the same one.
Teacher:	Lyle, can you describe what you saw?
Lyle:	I saw a square with a line through it but going [gesturing up and down], not across.
Libby:	Top to bottom.
Teacher:	What's the name of that?
Leah:	Vertically.
Teacher:	Does anyone want to add?
Bruce:	It's like the first one but flipped. (He holds his pencil horizontal to his desk, then rotates it so it's standing up vertically.)
Seth:	Yeah you just turn your book instead of drawing a new one and now you have this shape. (He demonstrates turning the journal he is using to record, making his work on the previous shape match the current image.)
Teacher:	Thumbs up if you agree with Bruce and Seth. (Most thumbs are up. The teacher reveals the shape.) What did it make?
Chris:	Halfs.
Paula:	Two halves.
William:	Half and half. It's like half of the square.
Teacher:	And what Seth and Bruce were saying is, here's the first image we did . . . and watch what happens if I turn it.
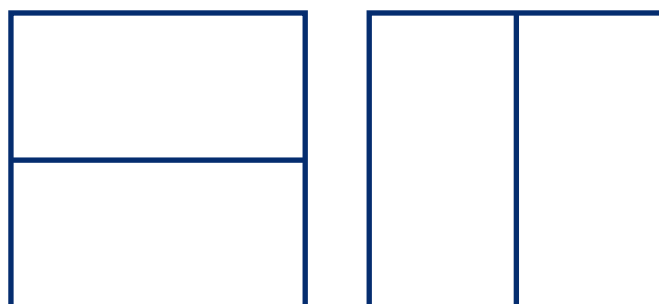
Next the teacher displays a square with a diagonal line cutting it in half (top right to bottom left). Some students reach for rulers that have been placed in the middle of their clusters of desks.
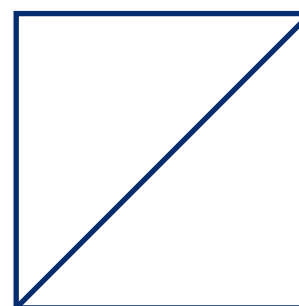
|	
Diego:	It's two um . . . [comes up and draws a square and then a diagonal].
Teacher:	What shape?
Diego:	A square. And then a line through it.
Teacher:	How would you describe this shape?
Keena:	It had two even groups.
Teacher:	Does anyone want to add to that?
Leah:	By putting the line, two even groups.
Carol:	Two even groups in triangle shapes. [She uses her fingers to make a triangle.] And the same on the other side.
Teacher:	Two even groups, and the same on both sides. What's the other word we've been using to describe this kind of picture?
Leah:	Half and half.

The teacher displays another square with a diagonal cutting it in half from the top left to the bottom right corner.
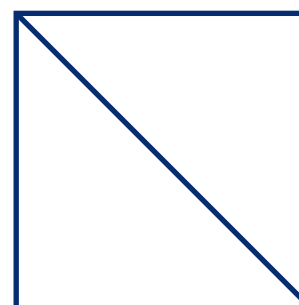
Tamika: I thought we already did that!

**Chris:** It's like she did it a different way.

Sacha: That's the same as the other but the line is like opposite.

Sacha comes up to draw.

Teacher: What's the first shape you're making?

Sacha: A square. [Sacha draws the previous image.] That was the first one I saw. [Then she draws the current image.]

The teacher displays an image of two squares, one with a diagonal cutting it in half from top right to bottom left and one with the diagonal from top left to bottom right.
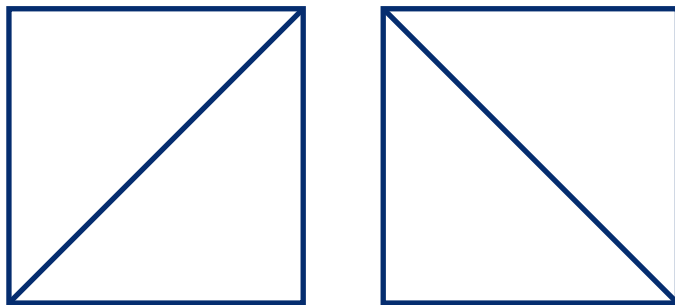
Teacher: What's different?

Sacha: It's the same, just turned up a different way.

Teacher: Rotated, we could say.

Chris: A square, and the line makes two equal triangles.

Seth: It's half and half again!

In this brief activity, students revisit the names and characteristics of 2-D shapes, and encounter and use vocabulary as they describe what they see and listen to their classmates (e.g., *horizontal, vertical, diagonal; flip, turn, rotate*). When it comes to ideas about fractions, students seem to understand that if a line goes through the center or middle of a shape, it cuts the shape into two halves. They name the shape of the halves, and note that the two parts are the same. The teacher is happy to see that students readily take the previous day's discussion of halves of circles and apply that to their thinking about squares (e.g., "It's just like yesterday when we made pizza."), and is interested in students' thinking about the relationship between images (e.g., "It's like the first one but flipped."). By identifying halves in the context of circles, squares, and rectangles, students attend to the definition of *half* rather than associate the term with a particular shape.