Explicit Teaching in Problem-based Mathematics
Do the Math

[MUSIC]

NARRATOR 1: Do the math.

NARRATOR 2: Do the problem or task in advance of a lesson to help you better notice and name your own understandings about the mathematics. Anticipate possible student responses to develop instructional readiness and the ability to be more responsive to the thinking of a wider range of learners.

BRENDA KRESS: Today our big idea is relating area and perimeter, and the students will be involved with a task where area stays the same but the perimeter is changing based on how they arrange the shape. The interesting thing about this task is there are actually 35 different arrangements you can make with the six tiles however there's only three perimeters. So there's only one perimeter of 10, and then there are multiple for 12 and 14.

Okay at your seat.

I anticipate that as the students start to create their arrangements they will notice that the area stays the same, however the perimeter will begin to change. I'm wondering if students will notice that these two arrangements are actually the same. So I'm wondering if they'll understand or notice that these are actually congruent by reflecting, translating, rotating.

Can you explain why you had it like that? 'Cause one of you said something interesting.

STUDENT 1: We said it was the same shape, but it was the reflection of the other shape.

BRENDA KRESS: And you actually did this on the carpet. You had it like this, does that match up?

CLASS: Yeah.

BRENDA KRESS: And then all of a sudden they went like that. So that to me was pretty interesting. Did anyone else do that? Did anyone else notice that on their figure?

STUDENT 2: We did ours like this, so we did it like this, so we did 1, 2, 3 so then it matched up and then if it matched up then it would have to be 10 perimeter.

BRENDA KRESS: It would have to be 10 perimeter. Now what have we learned? We learned that all congruent shapes have the same--help me out here? The same?

CLASS: Perimeter.

BRENDA KRESS: Perfect, all right and we even tested it out.

STUDENT 3: So I put two on the outside.

NARRATOR 2: By doing the math to anticipate likely student responses the teacher was better able to monitor learning in real time and to support students to notice mathematical ideas they might not otherwise have seen.

STUDENT 4: 8, 9, 10 oh it is only 10.