Explicit Teaching in Problem-based Mathematics
Students are Resources to One Another

NARRATOR 1: Students are resources to one another.

NARRATOR 2: Foster a learning culture in which students view themselves as resources to one another, provide strategies and organize for learning in ways that promote an active exchange of ideas, create and recreate dynamic and flexible groupings in which all students have opportunity to meaningfully participate, contribute, and learn from each other.

STUDENT 1: 12, 13, 14, 15, 16, 17, 18, 19, 20.

BRENDA KRESS: So when students are working with one another it's a great opportunity for them to uncover the math through different vocabulary they use, different strategies and often they come up with things that I would never even think of so it's neat to see what they uncover when they're working with each other.

So students will be working with one other friend and I've put them into pairs where they have about similar mathematical understanding in hoping that they can feed off of one another and both contribute to the actual task.

So I noticed this group wasn't using any tiles, instead they were just drawing the arrangements on their paper, but they were using--he was doing one, we were doing another. So I encouraged them to go grab some times to actually arrange them on the chart paper to encourage that dialogue and conversation between them in order to not get all the congruent figures to see that they're creating the arrangements together.

Using the actual tiles will allow them to test for congruence.

ALLISON BERSCHT: In our classroom we frequently use the visualize, verbalize, and verify strategy to support student learning. It's something that throughout the year we've been using through many different activities that we have been doing as a class. So often in an activity like this we first have students visualize what they see in their head to kind of paint a picture so students have a better idea of what they're doing before going directly to the building stage.

Your task is going to be creating a design by joining six square tiles so that all of the tiles are connected on one full side from one square to the other. The first strategy I want you to use is I want you to close your eyes and I want you to visualize what one hexomino would look like. Close your eyes. In your mind's eye what does it look like? What arrangement are the squares in? What sort of shape are you forming? What might your hexomino look like?

In the past we often had students get their materials, go right to it and find a way, but we're realizing that through using this strategy students first get to have an idea of it and then when we move onto verbalizing and sharing it with their partners they get to

then share their strategies with one another and practice saying their answers out loud and finding ways often with their partners throughout using gesturing and you see some of the students who might be showing how to reflect by showing with their hands one of the answers even in building a staircase. Having the student verbalize what that picture'd look like.

If you can open your eyes and I'd like you to take a moment, turn and talk to your partner. Do not touch your square tiles yet. See if you can describe to them using some math terms we've talked about what your hexomino is like, go.

STUDENT 2: Oh, we could also make, like a [INAUDIBLE] shape like this way, this way, this way, this way.

STUDENT 3: Yeah.

STUDENT 2: I agree with yours. So what'd you say, three down the middle?

STUDENT 4: Three down the middle and one goes [INAUDIBLE]

ALLISON BERSCHT: And finally as a last step moving onto verifying and actually allowing students to check their answer to see if it was correct.

All right, Eden, you were saying you had a 1x3 rectangle on the bottom?

EDEN: There was a 1x3 rectangle vertically on top of that on the right side on top so it looked kind of like a backwards L.

ALLISON BERSCHT: I like how you described that. Makes it a little bit easier for us to see in our mind when you describe it as another shape. So a backwards L.