**CONSTRUCT ARGUMENTS: LADYBUG COUNTING**

DELIA HAKIM: So today, we're going to gather information, gather data, by looking at ladybugs, and we're going to look at things that we can count and make a statistical portrait of a ladybug. We're going to make a prediction of how many antennas you think a ladybug's going to have. They got two.

HAKIM: I'm going to write the number that you just said here, and I want to know, why do you think? Um, I saw their two antennas.

CHRISTINE CONFER: The task was to explore the questions they had stated before, such as how many wings there are on a *mariquita,* how many legs there are on a ladybug, um, how many heads and how many mouths...

(students conversing)

I'm going to write my name first.

STUDENT: One, two, three, four, five, six.

CONFER: Six, okay. Is that what you saw?

HAKIM: We had a problem that was meaningful to the children. It came from their knowledge, from their questions, and they were trying to gather data, represent data, and construct their own understandings about that process, which is a messy process, but I think it's one of the most valuable skills that any of us need.

CONFER: While you're looking, let's see.

LINDA GOJAK: Often, lessons will offer opportunities for students to have mathematical conversations in the classroom. This is especially true when

kids come up with different answers. It's the perfect opportunity for the teacher to encourage mathematical arguments.

(students conversing in Spanish)

HAKIM: Okay, and how many antennas did you find?

STUDENT: Two.

HAKIM: Okay, and when I look up here, here's Tommy... *Yo tengo Tommy y Oswaldo,* and antennas, we put the numeral two, so that matches these two X's.

 Is this the most one?

HAKIM: That is the most one, right.

How many are there for the feet?

STUDENTS: Six.

HAKIM: And I see the numeral 6 that you put, so this six matches all these X's right there. And what did you get for the wings?

STUDENT: Um, there's four.

HAKIM: Uh-huh, *y aqui yo veo el numero cuatro y el cuarto X es aqui, puedemos contar.*

ALL: *Uno, dos, tres, cuatro.*

And that matches this.

GOJAK: Creating mathematical arguments involves having students make sense of their thinking first and then express their ideas to their classmates. The critiquing part involves having their classmates share their ideas or different answers and come to some kind of a consensus about what the appropriate solution might be. This can also include finding outside resources that support their thinking or their answers.

TEACHER and STUDENTS: Four, four, two, two.

Oh no, now what do we do? Are they all the same number?

STUDENTS: No.

CONFER: Javier has a question. Stand up here and ask the kids what your question is.

*Cuando las mariquitas, cuando ellos, las mariquitas cuando abran la alas, entonces sale uno, una the...* they *sale la otra, y* they *volan.*

HAKIM: Mm-hmm.

STUDENT: See, teacher, like right here.

CONFER: Okay, you stand right there and show the kids. John Paul has this idea, too, he wants to share.

STUDENT: They have four wings and they have six legs.