# In the Moment

## Conferring in the Elementary Math Classroom

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*To Mary Trinkle, Faith Kwon, and Ruby Dellamano*

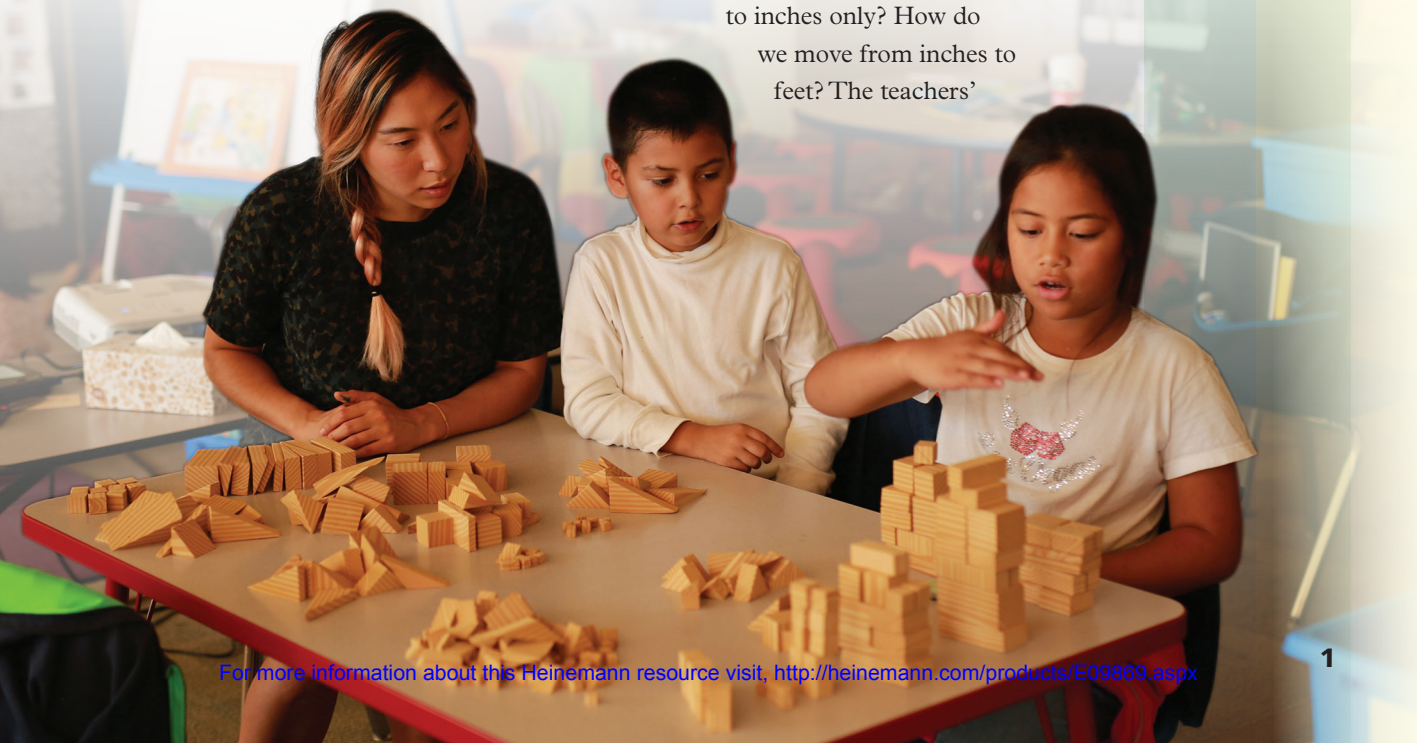
*Dedicated practitioners, fierce advocates, relentless learners*

*And to Viviana Espinosa, a principal who knows what matters*

# Contents

# 1 What Is a Math Conference?

Monica's and Sofia's fourth graders are buzzing, huddled together in twos and threes around tables, holding rulers and yardsticks against the wall, and darting in and out of the hallway to examine artifacts their teachers have placed there—index cards posted at the heights of real people. There are athletes on the wall, singers, and the school principal, and each height is labeled either in feet and inches, as we usually name a person's height, or in inches only, as your doctor might measure you at a checkup. The challenge Monica and Sofia have coplanned today for their fourth-grade classes is to work in groups to develop a strategy for moving between the two ways of expressing height. How do we change feet and inches to inches only? How do we move from inches to feet? The teachers'



emphasis is on the idea of developing a strategy, because their students can use the strategy across multiple situations, and the process of developing a strategy for this problem will support them when they encounter other unfamiliar problems, say with weight or volume. As the students work in the two adjacent classrooms, the teachers circulate. Each dips into conversation with pairs and trios to find out what the students are doing and find ways to support their thinking.

Midway through the kids' work time, Monica pulls up next to two partners who have been working on converting two heights—85 inches and 77 inches—into feet and inches. Here's how their interaction unfolds:

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**MONICA:** What did you two do over here?

**WYATT:** We did the multiples of 12—.

**LIANI** (*overlapping*)**:** We did 12.

**WYATT:** We did the multiples of 12, and then for 85 inches we got the closest is 84.

**LIANI:** Yeah, 84.

**WYATT:** And then, it was 7, so it's 7 foot out of, because the 12 inches is 1 foot—.

**LIANI** (*overlapping*)**:** Because the 12—.

**MONICA:** Mm-hmm.

**LIANI:** So we did the multiples of 12 and then we, that's 7—.

**MONICA:** Mm-hmm.

**LIANI:** So then 7, and then we added just 84 + 1 equals 85.

**MONICA:** Mm-hmm.

**LIANI:** So we just add 1 inch, so it's, it's 7 foot and 1 inch.

**MONICA:** Good job. That's really good. So you counted yours in multiples of 12.

**LIANI:** Mm-hmm.

**WYATT:** Just like we did the same thing for this one. And we did, and we just added the 5 inches to that, and added, and had 72 + 5, 77 inches.

**MONICA:** Good job. Really good job.

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Wyatt and Liani have revealed a lot of their thinking. They have developed a strategy that involves a lot of understanding of the task, of the relationship between inches and feet, and how multiples might be useful in this relationship. When Monica closes the interaction by saying that the students have done a good job, she's right—they have done some very interesting sense-making. And Monica has created a space for that thinking. Students don't offer the kinds of details Wyatt and Liani do—and certainly with so little prompting—unless they believe their reasoning is expected and valued. At the end of this conversation, Wyatt and Liani know they have done their job and done it well. But where do Wyatt and Liani go now? What has grown or changed about their thinking through this interaction? Are they poised to build on their work?

At about the same time next door, Sofia approaches Vanessa and Orlando. The two are hovering over the same paper, where they had been developing a method for converting 6 feet 5 inches into inches only, the opposite of what Wyatt and Liani were trying.

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**SOFIA:** OK. So what kind of ideas have you come up with?

**VANESSA:** First 'cause there's 12 inches in each foot, I would do, like, 6 feet times 12 inches in each foot would give you 72 inches. Then you add the leftover 5 inches and get 77 inches total.

**SOFIA:** OK. So, what made you think that? How did you know to do that?

**VANESSA:** I was thinking of equal groups of like 12 inches, equal groups of 12.

**SOFIA:** OK . . . and how come you just added 5 in there at the end?

**VANESSA:** Because it's 6 feet, 5 inches. 5 inches is not a foot, so you have to add that in. It's left over from the 6 feet.

**SOFIA:** OK. And how would you go and explain that to somebody else? Is there a way to draw a picture or explain it in a way for somebody else to understand?

**ORLANDO:** I guess we could draw a picture . . . somehow. Like we, instead of—.

**VANESSA** (*interrupting*)**:** Oh, yeah, 6 circles with 12 inches in them . . . plus the remainder of 5.

**ORLANDO** (*overlapping*)**:** Yeah, yeah, that's what I was thinking! Yeah, you could do that to explain it!

**SOFIA:** Very interesting. I'm going to come back and check that out.

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These students also reveal a lot of their thinking, and they, too, have done a good job. But Sofia does not stop with uncovering Vanessa and Orlando's thinking. When Sofia asks, "Is there a way to draw a picture or explain it?" she pushes their thinking forward. We can imagine what Vanessa and Orlando will do next because of this conversation. This is a conference.

In this chapter, we will build a vision of what math conferences look and sound like by looking closely at some examples from real classrooms. How does a conference work? What do teachers think about? What do they say? We will then look at a general process for conferring that addresses these questions and helps us think about how teachers take an interaction and turn it into a conference. Let's start with Sofia.

## What Is a Math Conference?

A math conference uncovers and advances student thinking. Both Monica and Sofia uncover student thinking, but only Sofia advances it. This is a crucial distinction. A conference is not simply a venue for students to report on their thinking. A conference is a shared opportunity for teachers and students to learn together in the moment. Let's examine how Sofia, Vanessa, and Orlando accomplish this by revisiting their conference.

### Eliciting Information and Probing for More

Sofia starts her interaction with Vanessa and Orlando very much like Monica. She opens with a general question to *elicit* student thinking. Although it can often take several questions to elicit a full explanation from students, in this case Vanessa readily offers quite a lot of information about the process she and Orlando had developed to convert 6 feet 5 inches into inches only.

**SOFIA:** OK. So what kind of ideas have you come up with?

**VANESSA:** First 'cause there's 12 inches in each foot, I would do, like, 6 feet times 12 inches in each foot would give you 72 inches. Then you add the leftover 5 inches and get 77 inches total.

From this we can see that Vanessa is thinking about the number of inches in each foot and using multiplication to convert the feet into inches. Then she attends to the "leftover 5 inches" by adding them on. This is a generalizable process that makes mathematical sense. A teacher could be satisfied that these students understand and have achieved the content objective for the day. But in this case Sofia wants to know more about the reasoning that supports this process and how the pair arrived at this idea. Note that Monica did not do this in her conversation. Instead she closed the interaction with praise, and in doing so she missed the opportunity to deepen and extend student thinking the way Sofia does next.

**SOFIA:** OK. So, what made you think that? How did you know to do that?

**VANESSA:** I was thinking of equal groups of like 12 inches, equal groups of 12.

**SOFIA:** OK, and how come you just added 5 in there at the end?

**VANESSA:** Because it's 6 feet, 5 inches. 5 inches is not a foot, so you have to add that in. It's left over from the 6 feet.

What Sofia does here is *probing reasoning*. Probing gets beyond *what* students did and focuses attention on *why* they did it and *why* it makes sense. Vanessa had already given some reasoning, telling Sofia that there were 12 inches in each foot, but in this part of the interaction she expands on why multiplying and then adding makes sense. Multiplication makes sense because each foot is an equal group of 12 inches. But "5 inches is not a foot" and so cannot make another equal group; it must be added on at the end. By probing reasoning, Sofia has given Vanessa an opportunity to make additional connections in her justification. Sofia has also made more of Vanessa and Orlando's thinking visible so that as a teacher she can assess how the pair is making sense of the mathematics.

Not all conferences include probing reasoning. Whether or not teachers choose to probe depends on what students have already shared. In this case, Vanessa shared a lot about the process they had already developed and so Sofia decided to uncover the reasoning that was driving her process. In Chapter 3, we'll see instances where teachers made different choices based on what they were seeing in students' thinking and work, like choosing to focus on the collaboration between students or how to interpret the task.

## Pushing Forward: What Makes a Conference a Conference?

In these first few moments of the interaction, Sofia and her students have reached a shared understanding of the work in progress. But a look at their written work shows that little of the thinking they've shared is recorded. Now, instead of closing the interaction, the teacher uses what she has learned to push their thinking forward, beyond what they have already done. It is in the following moment that the interaction truly becomes a conference.

**SOFIA:** OK. And how would you go and explain that to somebody else? Is there a way to draw a picture or explain it in a way for somebody else to understand?

**ORLANDO:** I guess we could draw a picture . . . somehow. Like we, instead of—.

**VANESSA** *(interrupting)*: Oh, yeah, 6 circles with 12 inches in them . . . plus the remainder of 5.

**ORLANDO** *(overlapping)*: Yeah, yeah, that's what I was thinking! Yeah, you could do that to explain it!

**SOFIA:** Very interesting. I'm going to come back and check that out.

### WHAT IS A CONFERENCE?


In the following clip, Faith confers with two students who have been working on solving the following problem:

**My mom has 20 packs of 10 Halloween pencils and 4 loose ones. How many Halloween pencils does she have? How do you know?**

As you watch this conference, consider:

- How do the teacher and students work together to make thinking visible?
- How does the teacher nudge student thinking forward?

In this conference, Faith elicits student thinking with a series of questions, supporting her students in making their thinking visible. Faith asks the students to show her the model they have created and prompts them to connect that model back to the task. These moves help the students realize that their model of 2 sticks of 10 cubes doesn't match the story, and Faith nudges them to develop a new strategy to represent the mathematics and solve the problem.

Sofia pushes—she *nudges*—the students here to think about how they could extend their work. She actually offers them two ideas: explaining to others or representing their strategy using a drawing. In this case, Orlando takes up the idea of drawing a picture, though at first he isn't certain how. He and Vanessa work together—interrupting and talking on top of each other in their excitement—to craft a plan for how to turn their strategy into a picture. It's important to note that Sofia doesn't tell them *what* picture to draw. She simply suggests with her question that creating a picture could make their process clearer to someone else. The students figure out what kind of picture could accurately represent their thinking. Sofia makes encouraging sounds, and then finally closes this conference, not with

praise, but with the promise to return and see how their representation comes to life. In walking away, Sofia has a solid sense of what these two students understand and what they are going to do next, and all of it came from students' own thinking.

Sofia's nudge, which leads Vanessa and Orlando to represent their strategy with a picture, is what separates this interaction from Monica's. In a math conference, teachers always do two critical things:

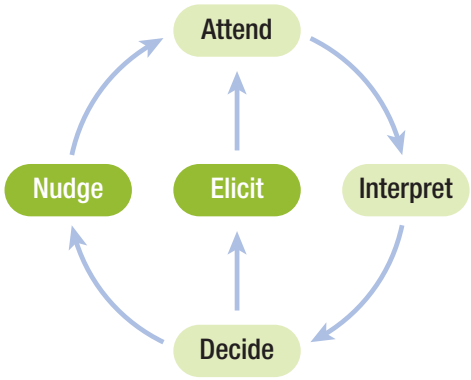
1. Elicit student thinking to make it visible.
2. Nudge student thinking or work forward.

Certainly, every conference is different, but these two elements are always present. In Monica's interaction with Wyatt and Liani, she focused solely on eliciting student thinking. She and her students worked together to make their thinking visible, which itself has value as an opportunity to articulate and explain. At the close of the interaction, however, the students' work has not been advanced, extended, or challenged. The focus of much of this book is learning how to elicit and nudge student thinking in the many ways students need from us when we confer.

These examples show us what a conference can look like, but there is quite a lot going on under the surface. Let's take a deeper look at the process of conferring and make the invisible parts public.

## The Conferring Process

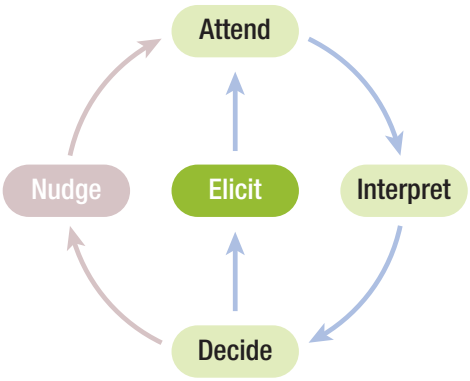
Learning how to confer is difficult because, even though we ask students to make their thinking visible, teachers' thinking often remains invisible. If we listened in on a conference, we could hear the teacher eliciting student thinking and nudging that thinking forward. But what is that teacher thinking about? When a teacher approaches students at work, she immediately engages in a particular kind of thinking called *noticing* (Jacobs, Lamb, and Philipp 2010). Noticing involves *attending* to things that seem important, *interpreting* those details to give them meaning, and then *deciding how to respond*. In the following sections, we'll examine how thinking is connected to the conversation we can hear in each stage.




The conferring process, beginning with attending. The lighter cells are ways teachers think while conferring, and the darker green cells are actions teachers take.

## Building an Interpretation of Student Thinking

Conferring is built on learning what students are doing and how they are thinking. In the first stage of a math conference, the teacher looks, listens, and asks with the goal of building an interpretation of student thinking at this moment. Throughout this stage the teacher is pondering a series of guiding questions:




- What do students understand or misunderstand?
- What are students trying?
- What are they struggling with and why?
- Where are they in their process?

### Attend

In the first moments of a math conference, the teacher does a number of things to begin to gather information. She very likely looks at the physical work students are doing, including written work and manipulatives and how they are moving or gesturing. She listens to what they are saying to each other or muttering to themselves. The teacher begins to pick out details that may be important to helping her understand what the students are doing and how they are making sense. She might attend to the particular way a child is counting cubes, the numbers the child has written on his paper, or who seems to be making decisions in the partnership. This is *attending.*

### Elicit

Often, when we as teachers come in midstream, simply watching and listening doesn't provide enough clues for us to fully understand what has come before. So, we decide to ask questions. We elicit student thinking to give us more details to attend to. Most often teachers will start eliciting with a generic question that invites student to share their thinking, as both Monica and Sofia did. These moves can be as simple as "What are you trying?" or "What are you working on?" or "Tell me what you're doing?" These kinds of questions, when asked routinely, set the expectation that students explain their thinking and their process.

Even with this expectation, students often struggle to put words to their thinking. When students are struggling to articulate or offer partial explanations, teachers must ask follow-up elicitation questions to get a fuller picture of what students are working on. For instance, the teacher might ask, "You

said you added 15 and 7. Where did those numbers come from?" or "What did you do next?" Teachers might also probe student thinking at this stage to learn how much children understand about why their process works, as Sofia did.

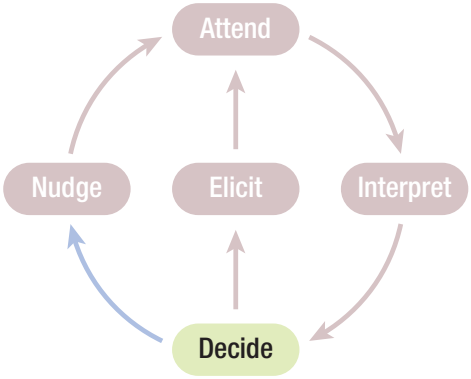
### Interpret

The teacher begins to assemble all of these details from looking, listening, and asking into an interpretation of student thinking. A solid interpretation is grounded in evidence, in all the details the teacher has collected. The teacher might test her interpretation with some questions or by revoicing what she thinks she's heard from the student. In this way the teacher weaves between attending to, eliciting, and interpreting student thinking until she feels she has an interpretation that makes sense with all the evidence. An interpretation typically includes what the children understand and do not yet understand, what the children are trying, and what the children are struggling with.

## Deciding How to Nudge

No matter where students are in their thinking, there are many ideas they understand and many they do not yet understand. They may also have particular struggles, like ideas they are actively trying to make sense of, explanations they are trying to articulate, or representations they are trying to construct. They may also be struggling with each other, with negotiation and authority. Once the teacher has a picture of this landscape, it is time to decide how to respond and that decision includes two things:

- What should I focus students' attention on to help them grow?
- What should I say to accomplish this?



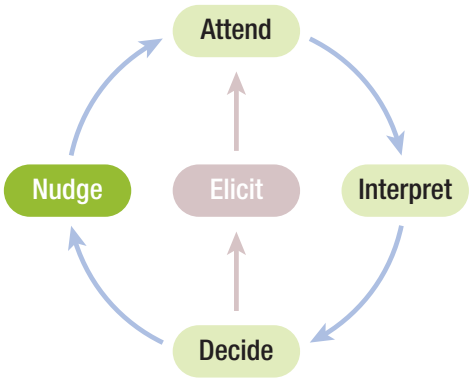

We know from the transcript of Sofia's conference that she decided to focus students' attention on how they might communicate or represent their thinking for someone else to understand. She did this with two questions that we will look at more closely in the next section. In contrast, if Monica decided how to respond instructionally to her students, it was not in that moment. Her students also could have grown the way they represented their strategy, but by walking

away, Monica missed the opportunity to focus students on engaging in this mathematical practice.

Certainly, representing mathematical thinking is not the only possible focus for a conference, and Sofia's questions are not the only way to get there. Deciding what to focus on and how is challenging work. We will dig deeply into these decisions in Chapter 4, when we look at types of nudges and the various moves teachers can use to nudge student thinking. Before we get there, we need to understand how a nudge works.

## Nudging . . . and Listening Again

Nudging is what teachers do to push student thinking forward. It is not the same as telling or modeling, which we might more commonly do in a literacy conference. Instead, a nudge points students in a productive direction and creates space for them to grow. The nudge has four critical features:




1. Nudges are initiated by the teacher to advance students' mathematical thinking, engagement in mathematical practice, or collaboration.
2. Nudges are responsive to elicited student thinking.
3. Nudges are taken up by students.
4. Nudges maintain student ownership and sense-making.

Let's examine each of these features by looking again at the nudge from Sofia's conference with Vanessa and Orlando (the full transcript of this conference can be found on page 3).

All four features of a nudge can be seen in this nudge from Sofia's conference with Vanessa and Orlando.

**SOFIA:** OK. And how would you go and explain that to somebody else? Is there a way to draw a picture or explain it in a way for somebody else to understand?

**ORLANDO:** I guess we could draw a picture . . . somehow. Like we, instead of—.

**VANESSA** *(interrupting)*: Oh, yeah, 6 circles with 12 inches in them . . . plus the remainder of 5.

**ORLANDO** *(overlapping)*: Yeah, yeah, that's what I was thinking! Yeah, you could do that to explain it!

**SOFIA:** Very interesting. I'm going to come back and check that out.

## Initiated by the Teacher

The teacher selects what she believes is the most productive focus for the conference. The nudge might focus on advancing students' mathematical thinking by supporting their conceptual understanding or helping them to develop a strategy for tackling a task. The nudge might focus on supporting students' engagement in mathematical practices, particularly in communicating, justifying, representing, or modeling thinking. Finally, the nudge might focus on building students' capacity to collaborate effectively by supporting their negotiation and communication with each other. Each of these is a meaningful, rich focus for a conference, going beyond whether the work is merely complete or correct.

The teacher initiates the nudge by pivoting the conference to focus on one of these areas. Sofia accomplishes this by shifting from asking questions about what Vanessa and Orlando have already done to asking them two questions about what they might do next. In this case, Sofia offers two possible directions, both of which center on promoting the students' engagement in mathematical practices: communication and representation.

## Responsive to Elicited Student Thinking

The nudge depends on all the information gathered and interpreted in the first part of the conference. We cannot know what the focus of the nudge will be before we confer; it depends entirely on what we learn when we elicit student thinking at the beginning of the conference. This is the essence of responsive instruction and what makes planning for conferences challenging.

In our example, through all of the elicited and probed thinking, the students demonstrated a solid conceptual understanding of the strategy they had developed. But although their oral explanation was complete, they had scant written evidence. Sofia nudged them to capture their thinking so that it could be shared and understood by others. She could not have known this particular nudge would advance their thinking before she had the opportunity to hear that thinking.

## Taken Up by Students

Students play a critical role in the conference. Teachers initiate the nudge, but for it to be successful, students must take it up. Consider how this happens with Sofia, Vanessa, and Orlando. Sofia offers the students two ideas for how they could focus on mathematical practices, through explanation or through representation. Orlando takes up the idea of representing their thinking through a drawing and chooses *not* to take up the notion of explaining. Indeed, explanation never comes up again. Once Orlando takes up drawing, he and Vanessa work together to shape that idea, and we can see in their overlapping speech that this is an idea that now belongs to them.

At this point in the conference the teacher must attend closely to how students respond to determine if they are taking up the nudge and making it their own. Sofia's conference would have ended very differently if Orlando had simply said, "I guess," and conversation stopped. The nudge is a shared project of the teacher and the students, and we cannot know if the nudge has been effective until we see how students respond.

## Maintain Student Ownership and Sense-Making

The nudge is not direct instruction and it is not modeling. Students must construct their own meaning as they engage in mathematics. The nudge must strike a balance between pointing students down a productive pathway and not holding their hands as they attempt to walk down it. Notice that Sofia asks her students if they could draw a picture, but at no point does she indicate what kind of picture it should be. The nature of the picture comes entirely from the students. They could have created any number of pictures, by, say, using a number line, or drawing rulers, tally marks, or cubes. But we know that the picture that made the most sense to Vanessa and Orlando used circles with the numeral 12 inside to represent the inches in each foot, because this is the representation they created for themselves. They continued to own their work and make sense of the mathematics, and Sofia got to learn something more about their thinking by seeing how they made sense through a representation. The key to achieving this kind of continued ownership and sense-making is a truly open-ended question, one where any number of productive answers are possible and students have authentic choices.

There is much more to be said about how to confer with students, and in the coming chapters we will investigate the stages in the conferring process more closely. In Chapter 3, we will drill down into the cycle that surrounds eliciting and interpreting student thinking. In Chapter 4, we will expand on the nudge by looking at five specific types of nudges and teacher moves you

can use to nudge student thinking forward. But first, let's take a moment to consider how conferring fits into your classroom and how you can set the stage for successful conferring. This is the focus of Chapter 2.

## COMMON QUESTION

### How long should a conference take?

The time it takes to confer varies quite a bit. It can take as little as one minute if students offer their thinking readily, the nudge is clear, and students take it up quickly. Sofia's conference took less than ninety seconds. Some conferences, however, require lots of back-and-forth as students make meaning out of the task, explain thinking, work out ideas, or negotiate. In these cases, conferring can take as long as ten minutes. Most conferences, however, fall in between, taking approximately three to five minutes. You can learn a lot about what students are thinking in just a few minutes, and if you choose the right kind of nudge, this last part of the conference can take just a fraction of a minute.

## REFLECTING ON YOUR OWN PRACTICE

In this chapter we've examined examples of conferences and one example of an interaction that is not yet a conference. Take a moment to reflect on your own practice of talking with students while they work.

- In what ways do math conferences sound like your interactions with students during work time? In what ways are they different?
- When and how do you currently elicit and probe student thinking?
- What time do you have in your math structures for conferring, or how could you make time?
- What aspects of your own interactions with students during math would you like to grow?