

A TALK TOOLKIT: Companion Guide to PD Video

# ADDING TALK TO THE EQUATION

DISCUSSION AND DISCOVERY  
IN MATHEMATICS



LUCY WEST

TALK TOOLKIT

two hours of video;  
comprehensive Companion Guide *with*  
complete transcripts and commentary

# ADDING TALK TO THE EQUATION

DISCUSSION AND DISCOVERY  
IN MATHEMATICS



LUCY WEST

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# ACKNOWLEDGMENTS

*Adding Talk to the Equation: Discussion and Discovery in Mathematics* would not have been possible without the help and generosity of so many people. A video project is a complex and time-consuming endeavor. The skills, talents, and willingness of educators, publishers, videographers, video editors, text editors and designers, marketers, and on and on come into play during the publishing stages. This project has been a couple of years in the making and a remarkably enjoyable experience thanks to all the wonderful people I got to meet and work with on the journey from start to finish. My heartfelt thanks to every person who made this series possible. I appreciate the contributions of so many.

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This is my first project with Stenhouse, and I hope it is not my last! It is a remarkable feeling coming at the end of a project like this. Usually, I'm saying "Never again!" Though this project had so many details to attend to and took quite a bit of everyone's time, it was actually fun to do. That's because of Toby Gordon, editor extraordinaire. She held my hand every step of the way, made sure every detail was attended to, and worked to make sure that the Stenhouse team and I were in synch and understood one another's needs, goals, deadlines, and intentions. Thank you, Toby. I really could not have done this without you.

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My heart is filled with appreciation. Thank you all and thanks to everyone else whose names I may not have mentioned but who played a role in this project. May teachers everywhere enjoy and learn from what we have created.

# HOW TO USE THIS VIDEO AND GUIDE

## How the Guide Relates to the Videos

The purpose of the guide is to help you dive much more deeply into the video clips. I've included here an annotated transcript of each lesson. The annotations are essentially me thinking aloud about the interactions in the videos and the choices I made. They are meant to clarify, to stimulate, and to provoke the viewer's thinking.

The introductions and reflections in the guide differ slightly from the introductions and reflections in the video clips. You can either read the introductions and reflections, watch them on the videos, or both. Each version has something different to offer. The introductions and reflections weave the clips together.

We debated about including both unannotated and annotated transcripts in this guide but decided to save the planet. Transcripts are incredibly helpful for analyzing the video clips in depth and help us develop a lens for the nuances and subtleties in the classroom discussions. However, with annotated transcripts, the reader is tempted to read the annotations without thinking *first* about his or her perspective. I encourage you to cover up the annotations at the beginning and read only the transcript. *Before* you read my commentary, question the exchanges in the video—comb through the transcript, see whether you can name moves, wonder about the interactions, and cultivate your own opinions and ideas. When you read my commentary, you may not agree with my thinking, and that's wonderful. You can have a dialogue with others about the way you see things and the way I saw things. This process of dialogue promotes learning. That's what this video series is all about—the role of dialogue in learning. Dialogue is key to learning for students and for teachers—for anyone, for that matter.

## Deciding What Videos to Watch

The videos of grades-one-through-six classrooms are in a particular sequence. The sequence builds from examples of the beginning steps one can take to develop talk in classrooms to steps one can take further along the path. You can watch the clips in order and work your way through the video if you are interested in seeing the progression.

If you are new to developing talk in your class, you might find it beneficial to start at the beginning and work your way through, looking for similar threads in every class. What moves am I, or the teachers, making that seem to get the students thinking and talking? Even more important, what evidence is there that students are actually listening to and building on one another's ideas?

If you have been cultivating discourse in your class for some time, you may want to start with the last couple of clips of sixth-grade teachers, who have created a community in their classes in which students facilitate their own discussions. Ask yourself, *Is there anything in this clip that might inform and stretch my practice? How did these teachers get the classes to this point?* When your wonderings start to percolate, go to the third- and fourth-grade clips to view specific moves to add to your repertoire.

Another option is to view grade levels of interest. Each set of grade-level clips, including the introduction, the lesson clips, and reflections, can stand alone and be studied individually.

Notice that we jump from fifth-grade to first-grade to fourth-grade clips. Grade levels may be one way to approach this series; however, remember that the moves described are generic to any grade and any subject area.

## How to Work with the Clips as an Individual Teacher

You can get a lot out of the video if you enjoy studying teaching and like to comb through transcripts and then experiment with some of the moves in your own class—in other words, if you are a self-starter. You can make your choices about how to proceed based on the information I have shared and work with the series over time and at your own pace.

It would be most beneficial to work with a colleague. You can watch clips together in real time or separately, meet for an hour or talk via phone or Skype, and then use the transcripts and text in the guide for discussion. Most important, you can encourage each other to try small steps, such as one or all of the first three talk moves.

As you watch the clips, be sure to have a focus. A key question might be, *How is what this teacher is doing different from what I'm doing?* When we look through this lens, instead of through the lens that says *How is this teacher doing what I already do?*, we are more open to learning, to seeing nuance, and to being able to identify things we can try.

You can use the document we have included in Appendix B, Talk Moves for Classroom Discourse, as a tool to sharpen your lens for identifying and naming talk moves that you see in the video clips.

When we can identify and name moves, when we have an image of what they look and sound like in action, then we can try them on ourselves and practice them.

## How to Work with This Series in Small School Groups

I recommend working with the video clips in small study groups or as part of grade-level or faculty meetings in which people work in triads or quads. Preferably, devote three to four meetings to work your way through the series. If you have about an hour to work together, select one set of clips. You might start with the first- or fourth-grade clips, because they can be viewed and discussed in an hour. The fifth-grade clips are the longest; with this segment, you would likely need ninety minutes to two hours to really work through the clips and have a discussion.

Whoever facilitates and crafts the learning session should preview the clips and decide whether to show the introduction to the classroom clips. It is probably a good idea to show the introductions because they provide useful information about the lesson and give viewers a framework for the class, the teacher, and the lesson's goals.

You could decide then to show the classroom clip with or without a framing question. One approach is to simply say, "Let's watch this clip together and share what we noticed about the interactions between the teacher and the students and the student-to-student interactions. Please write down verbatim what the teacher said or did that you felt was effective in getting students to talk and listen to one another or what a student said that was evidence that he or she was listening and/or thinking. And then share observations with a partner or in a triad." Then have a whole-group discussion that asks, *What surprised you in the video? What surprised you about your partner's perspective? What did you value in the video? What did you question?*

It is often a powerful experience for people in a small group to realize that each person attended to different things or interpreted the same interaction differently. This helps us realize that our lenses are not aligned, and we might want to work toward developing a common lens.

If the group is more aligned and is used to working methodically with video together, then use the document we have provided in Appendix B, Talk Moves for Classroom Discourse, to develop the capacity to identify and name moves the teachers are making and as evidence that students are incorporating pivotal discussion moves. This approach works well when teachers view the video first and then take the transcript—not the annotated part—to see whether they can match moves from the talk document to the moves actually made in class. Next, read the transcript annotations to review my moves and my reasoning for those moves. This could lead to a discussion framed around questions such as, *How is what you are thinking different from what Lucy described? How was it similar?*

If you select a grade level with more than one classroom clip, you probably want to go through all of the above steps for each clip. If you want to start with a grade level that has just one classroom clip, then start with grade three or four.

Last, if you are going to spend time combing through these tapes and thinking together about teaching and discussions, then require each member of the group to publicly commit to trying something—maybe a turn and talk or a repeat back move—in their own classes before the next meeting. At the next meeting, start by asking people what they tried and what they experienced.

## How to Use This Series in Classes or Workshops

If I were facilitating a professional learning opportunity that lasted a day or teaching a course over a period of time, I'd play the introduction to the series clip as an overview for everyone. I would use that as a lead-in to facilitate a discussion on the role of discourse in learning. I might refer teachers to the Institute for Learning's *Accountable Talk Sourcebook* (Michaels et al. 2013), which is based on Lauren Resnick's work on principles of learning (2013). This sourcebook could act as the foundation for discussing talk in general and for features of accountable academic talk. Request that teachers read parts of the sourcebook before class or during the session. I would not assume that everyone present thought getting kids to do a lot of talking in class is a great idea. I'd raise the tension that every teacher faces—coverage verses depth and the constraints of time. How important is student discourse when you are trying to cover a lesson in the allotted time? If you know the discourse will slow you down, should you slow down or make sure you explain everything you had planned in your lesson?

Next, I might have people read Appendix B, *Talk Moves for Classroom Discourse*, as preparation for viewing the clips and then show one set of clips. For example, the set of fifth-grade clips, which highlight the early moves for establishing a safe, productive learning environment, are a good starting place and are first in the video sequence.

Each clip starts with an introduction, and almost all end with reflections. In between, there is a classroom clip. Play the introduction to provide a quick frame for the upcoming clip. Then play the lesson clip with or without a framing question. Stop after each classroom clip and have a discussion before showing the reflections for that clip. Reflections could be presented as follows: "Now that we know what we think and wonder about the clips we saw, let's tune in and see what Lucy thought about this episode."

Next, give people the annotated transcript and invite them to dive even deeper into the talk moves. See whether they can match the moves named in Appendix B to anything that happened in the clip. Remind them *not to read the annotations* while doing this. They can always go back and read the annotations after they have attempted to connect the talk moves to the interactions. Move to another clip and repeat the process. When you slow down like this and really use each tool in the series, participants get a lot more out of it.

Because the fifth grade is the longest of the segments, you might find that it takes a whole class period or a couple of hours of the full-day session. If you are using this video for a course, you could assign people to watch the first-grade clip in preparation for the next class and study the transcript and so forth. Perhaps in your second class you'd work with the fourth-grade clip but only dedicate thirty to forty minutes to it, because people would now be familiar with the process and the tools.

Be clear about the purpose of showing the clips. If you are working with novice teachers, is your goal to give them images of effective instruction? Is your goal to get them to try the first three moves?

If you are working with coaches, lead teachers, or experienced teachers, is your goal to get them to use these clips with their colleagues and facilitate discussions at school? Is your goal to help lead teachers and/or coaches who coach or mentor teachers to be able to name the moves and be specific in their feedback to teachers who are learning to cultivate classroom discourse? Your purpose and audience should determine your focus and framing questions.

## What Not to Do

I do *not* recommend watching all the classroom clips in one sitting. Analysis and conversation stimulate learning. Inviting colleagues to really think about what is happening in the interactions and to share what they are thinking is the work. Listening for the differences in perception, highlighting those differences, and talking them through is what leads to a common understanding of what is meant by talk moves, student-to-student discourse, or slowing down to dive deeper. Often in education we use the same terms but have different images and understandings of those terms. Video helps us create a common image, and dialogue helps us shape a common language.

I advocate for rigorous academic discourse among adults about teaching and learning, what constitutes evidence, and the importance of getting students to converse in full sentences using precise language. I encourage educators to take a stand on these issues, but take a stand that leaves room for nuance, rethinking, and the possibility of changing that position with more information and dialogue. If you engage in these ways with colleagues, you can then teach students how to engage in rigorous academic discussion. This is the work of improving teaching and learning. It starts with us—the adults, the educators—learning to do more of what we want students to do.

# SERIES INTRODUCTION

For the past two decades, I have been studying classroom discourse with teachers, administrators, educational leaders, and researchers. The video in *Adding Talk to the Equation* is culled from dozens of hours of footage of classroom teaching that took place in Monroe Public Schools in Michigan, where I coach coaches and leaders. Teachers here are at various stages in their capacity to generate and manage rich mathematics conversations. This video series focuses on short examples from grades one to six.

The purpose of this series is twofold: (1) to provide examples of teaching and student discussions that key us into what to pay attention to when observing a class and (2) to provide examples of what to do if, as teachers, our goal is to find out what our students are thinking to guide our instruction. Classroom discussion provides a window into student understanding and is an ongoing form of informal assessment. When teachers listen well to their students and are willing to stay focused on learning rather than on getting through their lesson, more learning takes place. This shift from coverage to depth is the critical shift required in education today—despite the external pressures to cover the curriculum.

When a district or school begins to focus on a high-leverage set of behaviors—in this case, development of classroom discourse—teachers as well as students will be at different places and will take the journey at different paces. This is true of all learning. Although I am working in the classes in this video for the first time, in some cases the teachers have previous experience working closely with coaches in their schools on deepening discourse, or the school principal has already encouraged teachers to try the *talk moves* I introduced to district leaders, principals, and coaches in my previous sessions with them.

The fifth- and first-grade classes in these videos are more or less beginning the journey; these teachers preferred that I demonstrate talk moves so that they and their colleagues could see them in action with their own students. The third- and sixth-grade teachers had been working for about a year to cultivate classroom discourse and were more comfortable being videotaped in front of colleagues.

Over the years, I have learned to appreciate the complexity of teaching. Communication, particularly oral communication, plays a central role in teaching, even when teachers are aiming for student-centered, project-based,

or experiential learning. The more we understand the dynamics of communication, the more effective our teaching will be. Communication is also at the heart of living in a world with other human beings. Learning to communicate well is a life skill and one worth cultivating in every grade and in every subject area.

Informal communication is complex enough. When we add academics to the mix, we add another layer of complexity. Consider, for example, different levels of knowledge. If the speaker is more knowledgeable than the listener, then the issue of accessibility arises. Can the speaker state her understanding in a way that makes sense to the novice? If the speaker is less knowledgeable than the listener, then interpretation comes into play. Can the expert interpret what the speaker is trying to say and perhaps clarify or summarize the speaker's attempt at expressing her ideas? If there is a difference of opinion or two different answers being discussed, are the players listening with open minds, or are they interrupting or focusing on convincing the other without considering the relevance of their partner's perspective? So many dynamics are at play between two people. When there are twenty-five or thirty people involved, the dynamics are magnified, and the role of the facilitator is critical.

Learning to create an environment for respectful discussions is the first step in the process. Inviting every voice into the discussion and making it safe to state ideas—even half-baked ones—require time and patience that many harried teachers may not have. Facilitating in ways that keep the eager, verbal students engaged, while nudging the introverted, shier students to contribute, requires astute social awareness, a commitment to equity, and a belief that every student is capable and can understand the ideas at play. Faith in the process and continual attention to developing one's skills go a long way.

We chose these particular clips because we think they clearly illustrate specific, nameable, and learnable moves, or behaviors, that result in more and better student engagement. Classroom examples range from some early moves a teacher can make to assist students in learning to talk and listen to partners, stay focused during partner talk, and engage in whole-group discussion, to examples of more sophisticated moves. We also name the three basic talk moves—(1) *turn and talk*, (2) *say more about that*, and (3) *repeat back*—and show them in action in fifth and first grades to demonstrate that these moves are generic and work at any grade level and in any subject area.

In the third-grade example, you will see that these students are used to engaging in partner talk and have additional habits that increase student discourse. The fourth-grade segment shows my attempts to get reluctant students to participate in whole-group discussions. The sixth-grade segments highlight two teachers who work closely together, collaborate on the design of their lessons, share techniques, and have taken their classes to a level of

student talk without visible teacher facilitation during whole-group discussion time.

The annotated transcripts are designed as a window into my thinking—a kind of think-aloud. They describe the moves I, or the teachers, make to help you develop a lens for the nuance and complexity of this work. As in all teaching, there are missed opportunities, twenty-twenty hindsight reflections, and failed attempts. We did not edit these clips to show only the best but to give actual examples and then worked to weave together a story that illustrates ways teachers can develop their know-how and teach students to be truly respectful participants and learners. Learning to learn is the most important skill we can develop in our students and in ourselves. Everything else follows.

# GRADE 5: INTRODUCING BASIC TALK MOVES

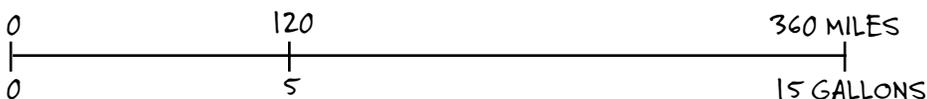
## Introduction to Fifth Grade

These video clips take place in a fifth-grade class. I have not worked with this teacher or class previously. My work in this Monroe, Michigan, school involves coaching the math coach a couple of times a year and engaging in a study lesson with teams of teachers from across the district's four elementary schools. Before the lesson, I met with the classroom teacher and her colleagues, and we worked through the lesson together. The video segment you will see is part of a mini-lesson filmed before the students were given a rich math problem to solve individually and in pairs.

The teacher's goal is to develop more student thinking and discussion, and that is what we agree to work on together. Improved academic discourse is a district-wide goal. Coaches and teachers have been taking steps to cultivate more student talk and to learn basic talk moves, such as *turn and talk* and *say more about that*. Teachers have implemented these moves to varying degrees. From my experience in this teacher's class, it appeared that the students were relatively new to listening carefully to one another and to building on one another's ideas.

We are working from a unit from the Contexts for Learning series entitled *Best Buys, Ratios, and Rates* (Jacob and Fosnot 2008a). The teacher and several of her colleagues are observing the lesson and taking notes based on the focus we set during our preconference—namely, how to generate and facilitate student discourse. I've asked the observers to *name the talk moves* I'm making by writing down examples of things I say that get students to talk and listen to one another. This is not an easy practice though a very worthwhile one to cultivate. Our goal is to develop a common lens for analyzing academic discourse. We crafted a mini-lesson designed to help students develop their capacity to reason mathematically, to articulate their own thinking, and to make sense of their classmates' thinking so that I could demonstrate several talk moves.

The teacher also wants to learn how to use mathematical models, such as the double number line.



We explored this model during the preconference when we did the math problem together. We worked with models that would be appropriate to use to make the mathematics accessible when discussing the problem. The teachers and I named the math—the big ideas—in the problem ourselves using an article called “Big Ideas and Understandings as the Foundation for Elementary and Middle School Mathematics” (Charles 2005). In this case, the ideas we selected from the article included the following:

- **Proportionality:** If two quantities vary proportionally, that relationship can be represented as a linear function.
- **Relationships:** In mathematical relationships, the value for one quantity depends on the value of the other quantity.
- **Ratio:** A ratio is a multiplicative comparison of quantities; there are different types of comparisons that can be represented as ratios.
- **Rates:** Rates are special types of ratios in which unlike quantities are compared.

By doing the problem independently and sharing our approaches and solutions, we were then able to predict student approaches and the probable range of understanding in the class.

We have selected specific moments from the mini-lesson that demonstrate the moves I want to highlight. We left out some of the clips because of time constraints and relevance. The first clip shows one way to get started when a class is new to the practice.

## **Seating Arrangements and Listening Expectations**

I asked the teacher to allow students to sit in a horseshoe format facing the board. This was a new arrangement for her and required us to move desks to make room for this meeting space format. It is essential for students to sit in a way that they can engage in authentic conversation. They need to see the person who is speaking, to look at the person when he or she is talking, and to listen attentively to restate what was said. You cannot agree with, disagree with, or build on what someone else is saying if you don't know what was said. This format also reduces distractions because there are no desks to hide behind or objects to fiddle with.

According to the teacher, a number of students did not participate during whole-group lessons. I did not make a note of which students the teacher was referring to because I wanted to see for myself whether I could get every student talking and listening in the one period—actually a half hour—I had to work with them. I find that once someone is labeled I can be influenced by the comment. Also, I have noticed that sometimes those students identified by a teacher as not talking actually participate when I'm teaching, to the sur-

prise of the teacher. That change in a student’s involvement indicates the possibility that my teaching techniques, which are learnable, result in improving student participation.

In this first clip, look for and listen to what I’m doing and saying to establish a learning environment. How do I make sure that every student is engaged?

**Coach:** The reason I had you sit the way that you are sitting is so that every person in this group can see every other person. Nobody’s back is to anybody else. So if you can’t see everybody else raise your hand. So, you, can you maybe move back? Yeah, you move up a little maybe, and he moves back a little then you should be able to see. Can you see everybody now?

**Group:** Yes.

**Coach:** Okay. Now, the reason I want you to sit like this is because I want you to listen very closely to whoever is speaking. And I want you to be able to listen so well that if I say, “Paul, what, what, what did...” What’s your name?

**Desean:** Desean.

**Coach:** “What did Desean just say?” You could actually repeat what he just said. That’s how closely you are listening. Is that clear?

**Group:** Yes.

*Seating arrangements matter. There is no time in life when we carry on meaningful conversations with the backs of people’s heads. If we want students to be able to engage in robust conversation, they need to be able to see and hear one another. Until these rudimentary conditions are met, very little conversation is taking place, except maybe for the student who is doing the talking and the teacher.*

*I have found that when I ask students to do something, like make sure you can see all your classmates, some of them don’t take me too seriously unless I insist they do so. I’m not saying they are deliberately disregarding my instruction so much as settling for less than I am willing to settle for. An amoeba shape has nooks and crannies and that means that some students still won’t be able to see all the other students; when you come close to a circular shape everyone can, in fact, see everyone else easily. That’s the point of sitting in a circle.*

*More important even than the seating arrangement when you are first starting to work on cultivating classroom discourse is the capacity to listen and restate. Often, students are not listening well to other students. They are often waiting their turn to speak or are relieved that they are not the one called on. The expectation that they will listen carefully to another student is often a new expectation and one that takes practice to develop. Actively listening is the hardest aspect of developing classroom discourse, and teachers need patience and persistence as they work toward the goal of robust academic conversations involving all students. Historically, students have been expected to listen to the teacher. Discourse followed a ping-pong pattern from teacher to student to teacher. The aim is to create a new pattern of discourse from*

*teacher to student to student to student, with the teacher essentially directing traffic or highlighting an idea rather than asking all the questions and explaining the answers.*

*Acknowledging that we might not hear or understand what someone says is worth stating because it makes it safe to say, "I didn't hear you. Could you please repeat what you said?" At the same time, it places responsibility on the listener to attend and be able to eventually restate. In addition, it lets students know that asking questions is not only legitimate, it is what successful learners do. It establishes another habit that will help students become engaging conversationalists. "I followed you up to the point when you said X, but lost you after that." Or "What did you mean when you said...?"*

*Emphasizing that we learn from and with one another and that the goal is to make sense—not necessarily to know the answer but to make meaning—is the major shift that needs to take place in most classroom conversations. We are valuing thinking, reasoning, and questioning, as opposed to following procedures and spewing forth answers to trivial questions at rapid speed.*

**Coach:** And, um, if you can't, if you don't remember what somebody said, or you didn't understand what was said, you can ask a question. You could ask the person to repeat it, but we are all going to practice this idea of listening to each other. Because the mathematics that you are doing right now is not so simple, and we are all going to be learning from each other. And we need to hear each other and make sense of what each other is saying. Does that make sense to you?

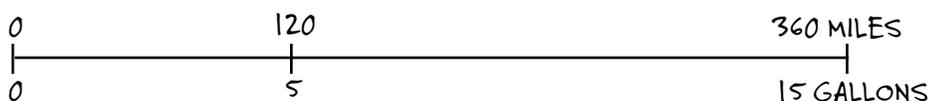
## First Turn and Talk

Over the years, I have come to discover that turn and talk (also known as think/pair/share, shoulder talk, buddy talk, or partner talk) is a versatile and useful move if your goal is to get students to make meaning of the lesson's content, to practice new vocabulary, to think about an idea under discussion, to talk through something they are preparing to share or write, to generate a list of questions, or to articulate prior knowledge. It is an easy-to-use but underused move in most classrooms. I use turn and talk as many as ten or twelve times in one lesson. It also ensures that at least 50 percent of the students are talking, which is more than the five or six that generally contribute during whole-class discussions. When facilitated regularly and with variations in format, turn and talk can be used to ensure that 100 percent of the students are talking at some point during the lesson.

Teachers may be afraid to use the turn and talk move because they are worried they will lose control of the class; they don't trust that students will actually talk about what they are being asked to discuss; they're worried students might say incorrect things to one another; or it will take too much time,

to name a few commonly expressed concerns. All of these concerns can be easily addressed, and the benefits of turn and talk far outweigh the potential pitfalls. However, one needs to learn how to facilitate and time these episodes so they are productive and keep the conversation building. (For more on turn and talk, see Appendix A, Turn and Talk: One Powerful Practice, So Many Uses.)

Before this clip was filmed, we had already established the context of the math problem: Some people were taking a 360-mile road trip in their automobile. The trip would take 15 gallons of gas to complete. Assuming the mileage per gallon remained steady, we wondered *how many miles would they have traveled on 5 gallons of gas?* A double number line on the smart board indicated the zero tick mark, the tick mark showing 360 miles above the line, and the 15 gallons below the line sharing the same tick mark.



After stating the question, I asked the students to turn and talk to one another to discuss their ideas.

**Coach:** So if you go—if you have 5 gallons of gas, how far can you travel? Turn to your neighbor and tell your neighbor.

[Students talk to one another.]

[Coach is waking around making sure each student is talking to a partner.]

**Coach:** Okay. Are you following? Does Haley—you are Haley, right? Does Haley know how far we can go? Why don't you talk to Haley and see if she understands? Do you know how far? Do you know how far? Everybody here know how far we are going? Do you? Alec doesn't know. You think you know? Talk to Alec. Alec...

*Because turn and talk is a relatively new practice in this math class, I want to make sure that every student is thinking and talking to a partner. To do so, I give them about ten to fifteen seconds to start talking to one another as I watch to see who is and isn't engaging in discussion. Then, I start walking around the circle, listening in to the conversations.*

*When I notice that some kids are not talking, are tuning out, or do not have a partner, I engage with those students until they have a partner and are talking. In other words, I am making sure that the students understand what is being asked of them, know how to talk to others, and are actually taking the actions called for. In so many classes, once a student has an answer, he thinks his job is over and is essentially waiting for the class to reconvene rather than sharing his thinking with another student. If a student doesn't know what to think or is lost, she will often wait silently and try to be invisible rather than asking a nearby classmate for help.*

*It is critical that students know how to behave during turn and talk, that they are expected to talk with a*

*partner, and that, if they do not understand something, this is their opportunity to safely ask a classmate to explain it to them. If they do understand, their own understanding will only deepen if they articulate their thinking to someone else. Everybody benefits from this move.*

**Alec:** I know how to find out with paper and pencil.

**Coach:** We don't want you to do it with paper and pencil. I want you to think about it. So turn to her. You are thinking about it.

*Alec says he can calculate the answer using paper and pencil, and I insist he think about it instead. My goal is to help him develop mental arithmetic—number sense. This is a very easy problem. All you have to do is notice that 5 gallons is  $\frac{1}{3}$  of 15 gallons and then divide 360 miles by 3 to get the answer. The numbers are very friendly and easy to compute. We are working with a ratio—a multiplicative relationship. This is one of the key ideas being developed in middle school. No need to find unit price here. It is highly likely that Alec would complicate the problem by calculating unit price and then multiplying by 5—the usual method for solving this type of problem. It is a perfectly good way to do the problem, but it is not the only way, and in this case, it may mean that students are more procedural than relational in their thinking. My hope is to nudge Alec into thinking more relationally rather than procedurally and to have more than one way to approach problems. I'm basing this on my experience with the teachers in the presession who were, for the most part, thinking procedurally and therefore teaching procedurally.*

**Coach:** [Continuing to make the rounds during turn and talk.] Okay. You got an idea? Yes? Yes, yes, yes. Okay. How about you, my friend? Are you clear? Do you know how far we need to travel? Do you know? Okay, so you need to keep thinking. Do you have an idea?

**Student:** Kind of.

**Coach:** Kind of? What is your "kind of" idea? Do you have an idea?

**Student:** No.

**Coach:** You two need to talk to each other. He has a "kind of" idea, but you have no idea, so talk to

*Comments like "You helping him think about it?" begin to give a very clear message that we are all in*

each other. You helping him think about it? How about you two?

**Students:** We know.

**Coach:** You think you know? What about you? You have an idea? You have an idea? Sort of? You have an idea? Good. You do. Okay. All right. So come on back. Give me your attention back.

*this together, and we are expected to help one another make meaning and succeed. Students come to realize that the teacher believes they can succeed and works to help them do so.*

*The word idea is used instead of answer to keep the emphasis on thinking, not on right answers.*

## Getting Students to Take a Stand and to Share Their Thinking

One way to get students to take a stand is to use thumb signals. This can serve as a quick informal assessment and can set the class up nicely for a mathematical argument. However, if the thumb signal technique is not facilitated well, the information can be misleading.

Thumb signals are common in many classes around the country. Many teachers say “Thumbs-up if you agree,” pause, and then say “Thumbs down if you disagree.” If you use thumb signals in this manner, it is highly likely that students will follow the lead of the students they believe to be “smart” rather than say what they really think. To eliminate this tendency, I have found that, if you give the directions fully first and then ask for thumbs-up or thumbs-down on the count of 3, you get a lot less copycatting. In addition, I’ve added the thumbs-sideways signal to give students the opportunity to say “I am not sure.” Not knowing is an important part of the learning process, and giving students permission to say they do not know goes a long way in building a robust learning community. The willingness to admit we don’t know opens the door to the possibility of learning.

When you ask for one of three thumb signals simultaneously—up if you agree, down if you disagree, and sideways if you are unsure—you get a quick picture of the range of thinking in the class. If you then praise the students who are unsure and set them up to be the decision makers, the ones their classmates need to convince, you are now positioning every student to have a role to play in an authentic mathematical discussion. Whether one agrees or disagrees, the job will be to try to convince one’s classmates using logic, examples, or reasoning and to articulate one’s ideas in ways that other students can make sense. Those who are unsure will need to listen, question, restate, and form an opinion based on the information shared. These are the seeds of mathematical argumentation—of moving toward “proof,” if you will. These are the practices emphasized in the math standards.

**Coach:** If you think you know, if you think you have an idea what the answer is, what number I would put up here, then you are going to put your thumb up. If you don't know, you are going to put your thumb down. And if you sort of know, you are going to put your thumb sideways. Ready? One, two, three, go! Good, we got some "sort of knows." Anybody don't know? We've got a lot of "sort of knows" [pointing to student]. You have a "don't know." You have a "sort of know" and a "don't know." Okay good. "Don't know." All right. So somebody who knows, I want you to explain it. And the people whose thumbs were sideways or down, I am going to call on you after he explains it, so you can explain it to the group. So pay attention. Got that?

**Coach:** You think you got it now? All right. I am going to start with you, because you weren't so sure.

**Evan:** I wanted to figure out how many miles one gallon is, so I just kind of went 360 divided by 15 equals 24.

**Coach:** [writing on board] 360 divided by 15 and you said that equals 24. Okay.

**Evan:** I chose a random number of 20 and I realized I was four 15s short.

*Three-part thumb signals shared simultaneously give the teacher a quick, informal survey of the range of perspectives and nudge students to take a stand or to admit they are uncertain. In this case, there were a few students who hadn't come up with a solution at all, so rather than agree or disagree, I wanted to know who thought they had an answer and who had none, allowing those who were less confident in their answers to indicate that by the sideways thumb signal.*

*Validating the "sort of" and "don't know" signals eliminates the shame in not knowing and helps students come to see that not knowing is part of the journey to knowing.*

*Just saying you don't know, however, is not enough. You have to get to the place as a learner in which you believe you can learn or understand the ideas under discussion. The teacher's actions will either nurture that belief or thwart it. By letting the students who were unsure know they are expected to follow the conversation and would be asked to explain what was being said, they were on alert to listen.*

*In this instance, I chose to select a boy, Evan, who had not been sure of his thinking during the turn and talk, but claimed he was sure now, to start the conversation. This is risky, because I didn't know what he was thinking, and in fact, he provided an answer that was not the easiest to follow and not the one I was hoping for. He looked for the unit mileage of a gallon of gas—a more procedural approach, but a valid one, and a procedure that the kids had been exposed to.*

*Normally, I would preselect the student I wanted to start the conversation. I listen in to the various partner conversations, without intervening, to determine who to call on. I'd be listening for a student who said something that I thought would give all students access to the ideas. Because this was my first time working with this class and because many of them did not engage in the turn and talk without prompting, I was busy engaging them rather than listening in.*

**Coach:** Okay, slow down. You, you are doing some really interesting stuff [squats down in the middle of the group]. Everybody look at him. Start again. You are listening to him to see if you can follow what he did, okay? [Indicating a student sitting beside Evan.] You are going to listen, because I am going to ask you to repeat.

**Evan:** So, I started with 20. And 20 times 15 equals 300. Then I realized that 4 times 15 is 60. So 300 plus 60 is 360. So I knew then 20 plus 4, and I got 24. So that means one gallon equals 24 miles.

**Coach:** How many people followed what he just said? Raise your hand if you followed what he just said? Some of you. Some of you, so I am going to have some of you repeat it. Somebody, who, you can repeat and explain what he just said?

**Student boy:** No.

**Coach:** Now hold on [pointing to student with raised hand]. Go ahead.

**Student girl:** What he did was, he took 15, which were the gallons, and he divided it by how many miles there were and he got 24. So then he...

**Coach:** Wait, wait, wait. Fifteen is, oh yeah, got it, okay. The miles is 360, right? So he took 360, this is the miles, divided by the, the gallons of gas, right, and he got 24 what?

**Student girl:** Twenty-four...gallons, blah, miles.

**Coach:** Miles, 24 miles. Okay. How many people are following so far?

**Teacher:** Per gallon.

**Coach:** Per gallon, okay. Thank you very much. Per gallon. So it's 24 miles per gallon. Right? Okay.

*Teaching is a complex act and facilitating talk is not simple. However, even when a student says something other than what you were hoping for, it is possible to ensure that everyone is at least listening and maybe even following.*

*Notice what happened. I listened to him, noticed many of the kids were not following, and realized there was going to be a lot to follow. Therefore, I stopped him, "Slow down," and refocused the class, "Everybody look at him." I asked him to start again and made sure his classmates were attending.*

*I was not surprised that when he finished speaking only a few students could follow what he was saying, even though I had written the number sentences on the board as he was speaking. (This is a critical move because it gives students who are having difficulty following the auditory description a visual on which to ground the conversation.)*

*Once his classmate started to explain, I continued to refine the writing on the board by labeling every number in the original expressions or equations he had offered.*

*Getting a student to restate what another student says is critical and one of the least practiced moves in math classes. Restating ensures that more students are following the conversation, it holds everyone to the standard of listening to make meaning, and it generally results in better understanding. However, it slows down the conversation, and it feels very unnatural at first, because in everyday conversation we rarely paraphrase what our partner is saying before agreeing, disagreeing, or changing the subject.*

## Using Turn and Talk to Ensure That Students Are Following Each Other's Thinking

The idea at play—find the miles per gallon and then multiply by 5 to get the actual miles driven on 5 gallons—is a procedure the students had been exposed to but do not seem to be following. I can tell many of the students are not really clear on what Evan did and why. This is typical of what happens when the mathematics instruction tends to be procedural rather than sense making. Because we have now heard the explanation twice, and I have labeled every number on the board, it is another perfect opportunity for turn and talk. Many teachers would explain to the students what was just said rather than let them try to make sense of it. When we explain for students, we may actually inhibit their motivation to make meaning for themselves and cultivate the very dependency on us we want to avoid. The goal of turn and talk is for students to take seriously the idea of listening to and making sense of their classmates' ideas and to engage in a bit of productive struggle as they do so.

Allowing students to wade through confusing information builds stamina. I also followed with a clarifying summary, which provides some scaffolding. Listen for the confusion, and note that I call on Haley to explain the ideas at play. I provide her with a bit more scaffolding, knowing that this is not easy for her. However, she sticks with it and shines in a way that she generally does not during whole-group discussions.

**Coach:** My goodness, that's a little confusing.

**Evan:** And then you have 24 times 5, which is, 20 times 5 is 100 and 4 times 5 is, uh, 20 so that's 120.

**Coach:** Okay. Here's your job. Are you following this?

**Student boy:** I got what he did. I just don't know why he did it that way.

**Coach:** Okay, we'll come back to the why to do it a different way, but here's your job. I want you to explain to your neighbor exactly what he did, and every number on that board. Make sure your neighbor understands what he did so that we are all understanding what his process was. What did he do?

*Acknowledging that what we have been trying to make meaning of is not easy and may be confusing creates safety and helps students to notice that confusion is often part of learning.*

*Once the explanation is fully expressed and the number sentences are on the board with every number labeled, it is time for students to make meaning. Turn and talk is used again here; however, this time the emphasis is on making sure "your neighbor understands," which emphasizes the responsibility we have toward one another as learners—accountability to the community—one of the three pillars of accountable talk (Resnick 2013). Also, the attention to the visual is emphasized to assist students in grounding the conversation.*

**Coach:** Evan said, I am interested in knowing how far I could go if I only had 1 gallon. So I am going to put that over here [places mark on number line]. He has 1 gallon of gas. He can go 24, and eventually he figures out by multiplying how far he can go with 1 gallon, how far he could go with 5 gallons. And he thinks he can go 120, 120 miles [writing on double number line]. Now, somebody said, “Well, I don’t have to go through all that. I figured it out a different way,” right? So [points to students] you want to tell us girls, what did you do?

*After the turn and talk, I decide to summarize what has been said and mark it on the double number line. In this instance, I chose not to have another student restate and instead restated the ideas myself, to clarify and keep the lesson moving. The method that was shared, though a valid method, was not the goal of the lesson, so I didn’t want to spend too much time on it. I wanted to see whether anyone was thinking relationally, so I asked for another solution.*

*The girls I call on used the method I was hoping someone would use, and we now go through the process again. I write on the board what they are saying, and label the numbers as they are coming up. So much of the time, we as teachers do not push for precision when speaking about the numbers in a problem, and many students get lost during the conversation, not really understanding what each of the numbers mean. What each number stands for gets confusing when multiplying or dividing—gallons, miles, miles per gallon are three different things. It’s not just about labeling. It is about sense making, one of the main practices emphasized in the Common Core. Speaking in full sentences and using mathematical language help students develop their oral and writing capacity alongside their mathematical understanding.*

**Taylor:** What I did, or what we did in our, we did 360 divided by 3...

*Taylor’s thinking is very different from Kevin’s thinking. So the process of repeating and listening is engaged in once again.*

**Coach:** ...360 divided by 3, and what did you get?

**Taylor:** One hundred twenty.

**Coach:** ...equals 120 what?

**Taylor:** ...miles.

**Coach:** Miles. This is a hundred. I can travel a hundred, now why did you divide it by 3? There’s a 5 here. I don’t see any 3?

**Taylor:** Because, like Abel said earlier, it's a third. So we go one-third and then, I don't want to say [the answer] and then two-thirds.

**Coach:** So if I went one-third of the way, it would take me five gallons, and I would travel 120 miles. That's what you are saying? How many people are following what she's saying? Are you following this? Are you, Haley? Can you say it? What she, what's she saying?

**Haley:** She started off first by dividing...

**Coach:** Three hundred sixty.

**Haley:** ...360 divided by 3...

**Coach:** [nods yes] which equals...? [points to calculation on board]

**Haley:** One hundred twenty miles.

**Coach:** [points to number line on board]

**Haley:** So 360...

**Coach:** She knows that, that she's traveled how far on this road to 360? [points to one-third]

**Haley:** One-third.

**Coach:** Yeah. She's traveled one-third of the way. And how many gallons of gas did she use, my friend? [points at student]

**Student boy:** Five.

**Coach:** Five gallons. So the, the difference here is he's trying to figure out what, how many miles do I go with 1 gallon? Multiply that times 5. She's saying, if I divide my mileage, because I know I've gone a third of the way. If I divide my mileage by 3, I know how far I went. Two different ways of thinking about it.

*This time, rather than turn and talk, however, I call on a student, Haley, who I am not sure is following, to help her make meaning.*

*I nod, point, and scaffold with words along the way to help her articulate her thinking as she struggles to say what the numbers mean. This exchange takes patience and builds her stamina and confidence. Haley rarely engages in whole-group discussions.*

*Toward the end of the exchange, I pull in another student I notice is drifting, by saying: "And how many gallons of gas did she use, my friend?" And he jumps right back into the conversation when he answers 5. Some people are concerned that the more confident students will shut down if we slow down and wait for someone who has difficulty expressing himself or herself. Haley's classmates need to develop the patience and compassion to allow Haley to think and struggle with articulation.*

*Last, I summarize again comparing the two models. With this move, I aimed at pulling the conversation together for those students who need to hear the ideas articulated succinctly. The students have now heard each approach at least three times, and it appears that just about all of them are following the conversation. It usually takes about three repetitions, sometimes combined with a stop and jot, before most students are clear about the ideas under discussion.*

## Cultivating a Learning Community

This next clip comes a bit later in the mini-lesson after students have thought about how far the car would have traveled on 10 gallons of gas; they’re now wondering how many gallons of gas the car would need to travel 600 miles. At some point along the way, we asked the students to *stop and jot* their ideas and to continue to use *turn and talk*, *how’d you get that*, and *repeat back* moves to keep the conversation moving. We were just about at the end of the thirty minutes, and the conversations during turn and talk and the capacity to listen and repeat what someone had said had noticeably improved. Just about every student had contributed in some way during the whole-group discussions. It was time for us to wrap up the mini-lesson so that students had time to work on a challenging problem from the unit that would stretch their thinking.

As you watch the clip, observe how I handled a student who wanted to share his idea immediately after Caitlyn shared hers and ways I worked to make sure that students identified as “drifters” stayed focused. See whether you can spot and name the moves I make to ensure everyone is listening, ready to restate, and establishing the protocols at the heart of cultivating a learning community capable of engaging in robust academic discourse.

**Coach:** So, my friend, see if you can figure out what Caitlyn did. Caitlyn, explain it. Everybody is looking at Caitlyn. Put your papers and pencils on the floor. Look at Caitlyn. She’s speaking. You need to be able to repeat what she says. Caitlyn, go.

**Caitlyn:** [speaks very low] I knew that...

**Coach:** Can you hear her?

**Group:** No.

**Coach:** Speak to them.

**Caitlyn:** I knew that 360 and 240 were 600 and where it says 10 was 240, so I just added 10 plus 15 and got 25.

**Coach:** How many people followed what she just said? [Writes on board.] How many people followed what she just said? Just a few. Just a few. So, you followed? Explain what she just said?

*Reminding everyone to look at Caitlyn, requesting they put down papers and pens, look at her, and listen, signaled to the class that what we were doing now was important and required their attention. Reminders during the lesson are sometimes needed and doing so at moments when you want to highlight an idea is beneficial.*

*When Caitlyn begins speaking, I can barely hear her, and I’m standing right near her. The next thing I want to help kids to do is learn to speak up and eventually to get the listeners to signal for someone to speak up when they can’t hear. Notice that I do not repeat what Caitlyn says but ask her to repeat it. If I repeat it for her, then she’s not learning to speak up—she’s learning to depend on me to do it for her.*

*“How many people followed what she just said?” is leading to the repeat back move. As happened earlier, just a few hands went up.*

**Student boy 1:** Oh, I was raising my hand to ask if I could share my answer?

**Coach:** You can but you've got to listen to her. So your job is to understand her idea first, and then see about how your two [ideas] are connected. Okay? So did you hear what she said?

**Student boy 1:** Didn't understand it.

**Coach:** You didn't understand it, so hang in there. Who did understand what she said and can explain? You understood? Come on, tell us!

**Student boy 2:** She took 600 and subtracted it by 360.

**Coach:** She took 300, and said I know that 360 plus...

**Student boy 2:** ...240...

**Coach:** ...equal...

**Student boy 2:** ...600.

**Coach:** Are you following that? She noticed that this and this added together gave her 600. Are you following? Okay, and then what happened?

**Student boy 2:** She took 10 plus 15.

**Coach:** Then she noticed that, that, if you had 10 gallons and 15 gallons, you would need 25 gallons. How many people are following that? You following it? Okay, explain it back and then tell us your way and we'll compare the two.

**Student boy 1:** She noticed that 240 plus 360 equals 600.

**Coach:** Right.

**Student boy 1:** And she knows that 10 plus 15 equals 25.

*When I asked a boy if he followed, he wanted to share his answer. This indicates that he wasn't listening to Caitlyn; rather, he was waiting for his turn to speak. This is typical of the nature of classroom discourse.*

*I do not want to discourage him from sharing his thinking, and I want him to listen to and make meaning of other people's thinking. I state that goal and then ask if he heard Caitlyn. I then ask him to "hang in there," knowing I will definitely come back to him.*

*First we are going to be sure that everyone heard and understands what Caitlyn said. Her thinking is relational, and she is using number sense. It is worth grounding ourselves in it prior to adding another idea. Too often teachers just collect ideas and, more often than not, only a few kids are attending to the various ideas—many are not hearing them or are waiting for their turn to share. This dynamic is not conducive to learning, to working collaboratively, or to being able to compare and contrast solutions to begin to move toward efficiency.*

*When asking "Are you following?" I am directly looking at students I have by now determined have difficulty following and checking in with them along the way. If I have any doubt they are following or notice they are drifting, the move at least brings their attention back to the conversation.*

*I am summarizing and clarifying what the boy is saying partly because I need to bring the conversation to a close and get back to the boy I asked to "hang on."*

*He now can explain what she did, which is still a prerequisite for him sharing his idea.*

**Coach:** Gallons, right? And you get that? Makes sense? Does it work? Does anybody disagree with this? Anybody—what about you, my friend [pointing to student]? Right here, Austin. You follow what she said? Can you explain it?

**Austin:** Um, uh, if, if you add, um, uh, um, 2, 240 and 360, um, you'll get 600...

**Coach:** ...miles.

**Austin:** ...miles and, um, so that's, um, 10, 15...

**Coach:** ...gallons...

**Austin:** ...gallons, um, you, uh...

**Coach:** ...you need how many?

**Austin:** ...add them together, and you get 25.

**Coach:** ...what?

**Austin:** Oh! Gallons.

**Coach:** Beautiful.

*After he explains Caitlyn's idea, I check in with Austin to make sure he's with us, and he explains the numbers.*

*I do go back to the boy who wanted to share and give him an opportunity to do so; however, that is later in the clip and we chose to end the clip with Austin.*

## Giving Feedback

Feedback that specifies what students do well is a great way to get more of what we want! Jim Knight, author of *Instructional Coaching* (2007) and a researcher at Kansas University, told me he had been looking at how often teachers gave kids positive versus negative feedback. In other words, how often are we correcting students, telling them what they are doing wrong, versus helping them notice what they are doing right and building on it. In many classes Knight observed, about eight out of ten comments point out what's wrong rather than highlight what is working. In this brief clip, I take the time to let students know the progress I saw. Notice I don't just say "Good job" or "You're really amazing," but rather I name specific behaviors, which can help cultivate a growth mind-set.

**Coach:** You guys are amazing. You did really good listening. You [pointing at student] hung in there so long until you like became totally able to talk about it. You [pointing at student] moved from not

*One boy who had been unable to come up with an idea at the beginning of class was confidently explaining the idea someone else had shared by the end of the session.*

understanding, to being, like figuring out a very sophisticated thing. You [pointing at student] hung in there. If you stopped playing with your belt, you'd probably even get more information going on. All of you. You spoke up. You spoke; you explained your thinking. Really good work. Really good work.

*The boy who thought about miles per gallon had at first been at a loss, but then mentally figured out a solution that made sense, was pretty powerful, and required mental calculations.*

*The student who was now playing with his belt was clearly a kid who had trouble attending, but he did attend through big chunks of the lesson, and when I pointed to the fact that he was playing with his belt, I did so with a smile and some humor in my voice. I'm not sure how he heard it. I hope he heard the "You can do it" message I was intending to communicate.*

*Highlighting students who spoke up and shared indicates to students I value them and encourages others to share the next time.*

## Reflections

The purpose of these clips is to highlight the importance of starting the journey toward rigorous academic discourse. This is accomplished by

- articulating clear, high expectations for listening to one another to the degree that we can actually paraphrase what was said;
- naming and cultivating the behaviors involved in think/pair/share interactions;
- learning to speak loud enough for others to hear and letting speakers know when we can't hear them;
- establishing norms for turn and talk;
- creating a learning environment, including seating arrangements, in which participants can see one another, look directly at the speaker, and see the board where visuals are used to ground the conversation; and
- cultivating caring, compassionate interactions that develop stamina and a willingness to persevere through confusion and not knowing to understanding.

Work consistently on these areas, and you will be pleasantly surprised at what students can do. Math conversations will become robust and interesting, and more and more students will enjoy and contribute to the discussions.

# GRADE 1: BASIC TALK MOVES WITH YOUNG CHILDREN

## Introduction to First Grade

Powerful teaching moves work at just about any grade level and in any content area. Teachers who allow students to talk to one another during a literacy class may not consider using the same technique in a math class. Similarly, teachers who watch a video of a fifth-grade class, but teach earlier or later grades, often think that the same techniques would not apply at their grade levels. I have successfully used these techniques at every grade level, from primary through high school, and in all subject areas. Please keep this in mind as you watch the various clips. Maybe ask yourself, *How might this apply to the grade and subject I teach?*

In this first-grade class, students grapple with place value. Place value is complex, and many first graders have difficulty understanding that the same symbols mean different things, depending on where they are positioned in a number. The value of a digit depends on its place. In fact, when I assess older students who struggle in mathematics, a large part of their confusion is often rooted in a partial understanding of how our number system works. It takes about two to three years to master place values when the concept is taught well, gelling around third or fourth grade. When the subject is not taught well, repercussions of not understanding the number system reverberate through middle and high school, as students attempt to build their understanding on a faulty foundation.

We are going to watch four short clips in a first-grade class in which the teacher has been using the three basic talk moves: (1) *turn and talk*, (2) *tell me more about that*, and (3) *who can say back what was just said?* In the first clip, we are using a number line, Unifix cubes, and a chart with three columns to help students gain access to beginning ideas in place value. We are working with these three representations or models to connect the dots among them. Often students seem to understand an idea when using one model but not when using another.

Number of Ten Sticks	Number of Cubes	Total
1	0	10

The teacher, several of her colleagues, and I met prior to the lesson to discuss the kinds of difficulties students were having, the models the teacher was using, and the lesson she was preparing from *Investigations in Number, Data, and Space* (Pearson Scott Foresman TERC 2012a, 2012b), the curriculum materials used in the district. We thought that helping the students make a connection between the number line, the Unifix cubes, and the table would illustrate that one group of 10 could be represented as 1 ten stick with 0 loose cubes, as well as one jump from 0 to 10 on the number line. We also wanted the chart to show that the 1 in the numeral 10 actually stands for one group of 10 as well as a total of 10 units of 1.

In the last clip, we work with the number 32. Devantae is a student who initially had difficulty understanding the chart and the meaning of the numbers, but in the last clip, he explains the meaning of 32 using the Unifix cubes. What is interesting when working with students in real time is how a change in manipulatives or representation can show the fragility of their understanding. Sometimes, when we use just one material or representation over and over again, students can tell us what we want to hear, and we mistakenly believe their answers mean they understand the concept, when in fact what they have learned is how to regurgitate what we have shown them.

### First Turn and Talk

As you watch the first clip, notice how the turn and talk move resembles the move in the fifth-grade clips. This is not the first time students have been asked to turn and talk, but they don't all do so. As in the fifth-grade clips, I check in with various students to make sure they are talking to someone and trying to make sense of the number line. I spend time with a pair of students who seem lost. I want to ensure that the student who was not participating gains access to the conversation. In this example, the teacher is having similar exchanges with students near her. The teacher has asked me to demonstrate the moves; however, she is nearby so she can participate in the lesson as appropriate.

**Coach:** I could show that I have 1 ten stick. [Showing a jump of 10 from 0 on the number line.] And I landed on what number?

**Group:** Ten.

**Coach:** Ten. So I could say this much is 10.  
Everybody following me so far?

**Group:** Yes...

*Just because there are a chorus of yeses doesn't mean that students are actually following the demonstration. Explaining the visual to a partner increases the likelihood that students make meaning of the manipulative or visuals used.*

**Coach:** Okay. Turn to your neighbor and explain this and explain this [pointing at board]. Make sure your neighbor understands this [pointing at student]. Could you turn to these two people and make a triad? Make a triple? Do you two talk to each other? [Pauses, walks to student.] Are you following this? Did you follow this? Okay. Now, you are explaining it to her? Okay, good [going to another student]. How are you doing over here? Are you following?

**Coach:** What's your name?

**Keyshaun:** Keyshaun.

**Coach:** Keyshaun, are you following this? Do you know how much this is?

**Keyshaun:** It's 10.

**Coach:** It's one group of 10, right? One stick. Yes? That has 10 cubes. Where do you, where do you see this up there? Do you see where it is? Where is it? Is it over here [walking to board]?

[Keyshaun indicates the last column.] This one? Yeah, that's this. Okay, what does the zero mean? Tell her. Yeah, there you go, tell her. And what does this number mean [going to another student]? Are you following this? Makes sense to you? All right. One group of 10. All right, we all back together?

*Giving the instruction "Make sure your neighbor understands" sends the message that we are all in this together, and we need to assist one another as learners. It also helps to create "accountability to community," one of Lauren Resnick's (2013) three pillars of accountable talk. (The other two are accountability to rigorous thinking and accountability to accurate knowledge.) It also suggests that some students may not understand and that is okay.*

*The "Did you follow this?" and "Are you explaining?" moves are directed at individual students to make sure they are indeed talking to one another and doing their best to make sense. Young students are sometimes more easily distracted than older ones; therefore, working to make sure they are staying tuned in and have an access point to the discussion is critical to developing their stamina and language development.*

*Keyshaun is a student who didn't seem to be following, so I worked briefly with him during the turn and talk. Brevity matters if you choose to engage with a pair of students during turn and talk. One of the pitfalls of facilitating a turn and talk is that you get sucked into helping a pair of students and lose the rest of the class because they are done exchanging ideas.*

*With Keyshaun, I'm working to help him make connections across the models—the chart and the ten stick in particular—and coming to discover that understanding the chart is not so easy for some of the students. This type of "informal assessment" guides my pacing and focus. I now know making meaning of the chart is something to come back to.*

## The Importance of Slowing Down

This next clip takes a couple of minutes and shows an example of working to make sure students can explain one another's ideas, make sense of the chart, and begin to build stamina for sustained interactions. We focus on Devantae in these clips to show his progression through the lesson. My hunch is many viewers might think that taking the time to slow down and stay with Devantae throughout these exchanges risks losing the rest of the class. Although that might be true, part of the work is teaching the rest of the class to stay focused and to assist one another in understanding. Devantae is probably not the only student not following the conversation. If he doesn't understand, there are probably several others who don't understand. By staying with Devantae and having another student explain the ideas under discussion, all students get to hear the explanation again and are more likely to make sense of the discussion. We also cultivate patience—a rare virtue in our fast-paced, get-through-the-lesson world.

**Coach:** Devantae, could you explain this to us? Do you get it?

**Devantae:** No [inaudible].

**Coach:** Okay, do you have a question?

**Devantae:** No [inaudible].

**Coach:** All right, we are going to help you get this, okay. Who thinks they could help Devantae? Devantae, you are going to listen really carefully so that after someone explains it, you could explain it. All right? Everybody is looking at Devantae and whoever's going to speak.

*Early on in the meeting, it was easy for me to see which students were distractible and which students were not fully following the discussion. Because I am interested in making sure all students are participating and trust that every student can learn the mathematics at hand, I often zero in on students I'm concerned about. I want them to develop a growth mind-set—effort-based learning—a try-again mentality, the stamina to stay with something until they understand, and the capacity to ask questions when they don't.*

*Asking Devantae if he has a question is probably a new interaction for him, because much of the time, we teachers tend to start explaining rather than inquiring. The ability to ask a question, rather than regurgitating what was said, is a higher-order skill. When we get lost, we need to be able to identify what we do understand and what we don't. This takes practice and is something to focus on once the more basic talking and listening skills are mastered.*

*As in the fifth grade, I instruct Devantae and the whole class to look at the speaker and listen well enough to be able to restate what he or she said. I'm making my expectations clear, signaling that something important is about to be discussed, and nudging everyone to focus.*

**Coach:** So who wants to try and explain this to Devantae? Who has not said anything so far? You think you could explain it to Devantae?

**Student:** No [inaudible].

**Coach:** Not yet? What about you?

**Student:** [shakes her head no]

**Coach:** No? Who could explain it?

**Teacher:** I think they are being shy.

**Coach:** I know. [Referring to the students who have their hands up.] Everybody has already spoken. 1, 2, 3 have already spoken. I am looking for somebody who hasn't said anything.

[Student volunteers (inaudible).]

**Coach:** You said something. [Turns to students who do not have their hands up. Selects two students.] How about one of you two? Could you explain it?

[Student indicates yes (offscreen).]

**Coach:** All right. Could you explain to Devantae? Devantae, you are listening and anybody else who doesn't understand, you are listening, because I am going to ask you to explain it. All right? So explain to Devantae, what does this chart mean? Go ahead. [Student asked to explain is quiet and hesitates.] You know this, this sign means number. Number of what [holding a stick of 10 Unifix cubes up]?

**Student:** Ten stick [inaudible].

*In most classrooms, the same few students do most or all of the talking, except for the turn and talk opportunities. The same pattern is showing up in this discussion. I am conscious of bringing more voices into the conversation. I want to maintain safety, so the students don't clam up any further, and I want students who don't raise their hands to participate. I try to invite those without their hands raised to speak. Eventually, I want to have classes in which we don't raise hands and anyone can be called on at any time and that environment still feels safe and friendly. I find this to be a balancing act because, at the same time, I do not want to discourage enthusiastic students from contributing to the conversation.*

*There are several adults observing this class plus two video cameras. I have worked with this teacher before, and I know that she is working on these moves and has reported that her class is usually quite talkative, so it stands to reason that they may be quiet because of the videotaping. This means the students are behaving more like students at the beginning of the process of building a learning community.*

*Often when students indicate they don't understand, we explain it to them. This keeps all of the other students passive and encourages them to tune out. It also keeps us in the position of sage on the stage and perpetuates the notion that teachers talk and students listen. When we ask a student to explain, we start to change that dynamic. We find ways to put into practice the research that clearly shows that the person who is doing the explaining is the one who is deepening their own understanding (Alexander 2008).*

*Because students are not always confident, especially when they don't volunteer, we generally need to scaffold in a way that helps them be successful. We have to be careful and not over-scaffold; otherwise, students will not learn to speak in full sentences and use mathematical language. Even though I explained the chart as I was creating it, many students do not understand it. These young students are developing language and just learning*

**Coach:** A ten stick. So we are going to call this a ten stick. Devantae, are you with us? So what are we calling this?

**Devantae:** Ten...

**Coach:** A ten stick, right. So here's the number of ten sticks. [Pointing to the first column on the chart labeled *# of Ten Sticks*.] How many, how many ten sticks do I have in my hand right now [holding up the object and looking at Devantae]?

**Devantae:** One.

**Coach:** One. So where do you see that on this chart?

**Devantae:** [points to the chart]

**Coach:** Right there. So I am going to draw a little picture next to it so you can see. That's my ten stick, okay. That's what that means. [Referring back to the student who is explaining.] Keep going. Tell us what the rest of this means. [Looking at Devantae.] Are you listening? [Back to explainer.] Go ahead. [Student hesitates.]

[wait time]

**Coach:** [pointing to second column on the chart] Number of . . . you know what that word is . . . ? [Student shakes her head no.]

**Coach:** Cubes. These are cubes [holding up a cube]. Number of cubes, right? And how many cubes do I have in my hands [showing empty hands to class]?

**Student:** Zero...

**Coach:** Zero. See that, Devantae, I don't have any of those little cubes in my hand. I just have a ten stick, but no [single] cubes. Where's the zero, where does that, where does that show up over here?

**Devantae:** Right in the middle.

*to read; therefore, making meaning of the chart is not a simple task. Connecting the model—a ten stick—to the symbols on the chart needs to be explicit—a step often skipped or at least rushed through. Assuming students know what they are looking at because it is clear to us can lead us to believe students are following when they are not.*

*The second step is to keep Devantae's attention and keep the rest of the class engaged as I assist the student who is explaining. Teaching is a complex act. It is rare that we are successful at all three aspects of the exchange.*

*I am not sure, in watching the tape, that I gave the student enough time to think. At the time, my guess was she couldn't read the heading of the column in the middle (Number of Cubes). I happened to be right in this instance, but that doesn't mean wait time isn't important.*

*I just give her the word because I don't want to lose momentum. (Students are used to calling the Unifix cubes blocks, which I'm figuring out as I go—so cubes seems to be a new term for some of them.) I am continually illustrating with cubes what we are discussing. Connecting the cubes to the numbers on the chart is the goal. I insert the word column when Devantae says "in the middle." This is one way to infuse precise, mathematical language into the conversation and, according to Johnston (2004), a surefire way to get kids using the language organically.*

**Coach:** In the middle column. I am going to give you that word, *column* [writes it on board]. In the middle column is the zero. So what do you think this number means [pointing to the first column which has the digit one]?

*Note that when I used the word column, I also wrote it on the board. This is a critical move—writing the language you want students to use as it comes up in the conversation. I organically introduced the words cubes and column at different points during the lesson (words the students may have heard before) and wrote them on the board. One issue I was having in this class is that there was not enough board space. This is one of my biggest pet peeves. Too many teachers are trying to teach math on chart paper or small whiteboards. We need lots of board space to keep a neat, uncluttered footprint of the lesson visible for students to refer to during the lesson. The more the models, language, and charts are visible, the more we can increase understanding and ground the dialogue.*

*In watching the tape, I wish I had been even more precise in my language. Saying “loose” or “individual” or “leftover” cubes when I referred to the numbers in the middle column of the chart may have helped students distinguish between what I meant by a ten stick and when we didn’t have enough cubes to make another equivalent stick. Calling the ten stick both a ten stick and a group of ten might have also been helpful.*

*Some viewers may think I’m overly specific and my pacing way too slow. Maybe it is a bit slow; on the other hand, the bigger issue, in most classes, from what I can see, is that we are skimming the surface of the mathematics at play and moving at a clip that leaves several students behind.*

**Devantae:** Ten things.

**Coach:** What? [no answer]

**Coach:** You are right; say it again.

**Devantae:** It’s 10 things.

**Coach:** It’s 10; it’s 10 things. I have 10 things pushed together into one stick, right. So there it is, 10. [Points to the number 10 in the third column where the number 10 is written on the chart.] I have 10 things pushed together. Anybody else

*Devantae is not confident. I thought he said “Ten things,” but I wasn’t sure, so I asked him to speak up: “What?” I then encouraged him by telling him he was right. I usually steer away from telling students whether they are right or wrong, as I want them to reason through their thinking and discern for themselves whether they are correct. However, when students are unsure and struggling, I find that telling them they are right or on the right track is one way to keep them in the game.*

*Even repeating what a student says is something I try to avoid. Yet there are times when repeating and*

not understand? Who, are you understanding this? Everybody? Yes? So, if I called on you, you could explain it? How about you, my friend [pointing to student], are you following this? This makes sense? Okay, good.

*elaborating are worth doing, especially if you are putting an idea in a full sentence or inserting math language (which I didn't really do here).*

## Listening to Kids

In this clip, we work with the number 32 and continue to check for understanding. We have worked with several other numbers between the last clip and this one as well as with other students before coming back to Devantae. In this clip, we will have evidence that Devantae is still having trouble understanding the chart, which again indicates to me that other students are probably in the same predicament. In this clip, we also meet Chantelle, a student who clearly understands the meaning of the chart and has a hunch about what may be difficult for some of her classmates to understand. She introduces the word *value* to the conversation and gives me a clue as to how I might provide access to more students. This is an example of how we are all in the soup together and how a student with more advanced understanding can assist her classmates and even the teacher. Chantelle does not appear to be bored. She is engaged and thinking about both mathematics and learning. Sometimes we worry about meeting the needs of a range of learners without realizing that there are many dimensions to learning, and sometimes that range is actually an asset.

**Coach:** Devantae, how many sticks of 10 do I have?

**Devantae:** Three.

**Coach:** Sweetie, what column and what number should I put in the column? Is it the [pointing at chart] first column, the second column, or the third column?

**Devantae:** Third.

**Coach:** So you want me to put the number 3 over here? [Even though he is incorrect, coach writes the digit 3 in the third column labeled *Total Number of Cubes*]. Okay. So this, this number here, means I have three groups of 10? What do the rest of you think? You agree with him that this means three groups of 10?

*We are now working with the number 32. We have worked on the number line and with the Unifix cubes to represent 32. Several students have spoken, and we've had additional turn and talk opportunities.*

*We are now going to fill in the place value chart, and I return to Devantae to informally assess whether he now understands what to write and where to write it in the chart.*

*What Devantae seems to understand is that 3 ten sticks equals 30 as represented by the Unifix cubes. He does not seem able to connect the manipulatives to the symbols on the chart. This is a predictable phase in the development of children's understanding of place value. The quantity 32 may still be thought of as 32 single cubes, even though*

**Chantelle:** I am guessing why most people said 30 is because the value of, um, the 3 sticks is 30.

**Coach:** Whoa! Did you hear what she said? Did you? What did she say? Want to hear it again? It was so exciting. You've got to listen to this, okay?

**Samuel:** Absolutely.

**Coach:** And how about you my friend, you...? Is he not feeling well?

**Teacher:** No. Scotty, head up!

**Coach:** Scotty, you with us? [Back to Chantelle.] You got to say that again. Everybody look at my, what's your name...?

**Chantelle:** Chantelle.

**Coach:** Everyone look at Chantelle. She's saying something very important, and we are going to try and figure out what it is.

**Chantelle:** I am guessing why everybody is saying 30 is because the 3, the 3 tens, the value of 3 tens is 30.

**Coach:** What does that mean? The value of 3 tens is 30? What does that mean?

**Chantelle:** It means, how much...

*they are organized in ten sticks and leftover cubes. However, the symbols of 3, representing the number of ten sticks versus the number 30 or 32 where the 3 is now part of the total number 32, is confusing. My questioning, or attempts at clarifying, may also be problematic. I do not, however, just tell Devantae he's wrong or give him the right answers, though it is very tempting. I want to see whether he can make sense of the chart, and I am aware of the other children. Some look as baffled as Devantae, while others, such as Chantelle, are capable of explaining the chart and making connections among all three representations—the number line, the chart, and the Unifix cubes.*

*Chantelle's comment is quite sophisticated. She is not only interpreting what the number means, but what her classmates are thinking and why. She speaks in a complete sentence and expresses a conjecture about why this is difficult. I'm really impressed, and I'm hoping that the other students will be able to learn from her, because my way of explaining doesn't seem to be working for some of them. Even though I'm working hard on getting the kids to talk and to listen and make sense of this, I'm cognizant that place value is difficult for six-year-old children to grasp and do not expect that most of them will walk away from this lesson with solid understanding. I know that it will take many more conversations, activities, models, and so forth before every student is able to express themselves like Chantelle. This points out again the complexity of student-based responsive teaching as well as the abstract nature of mathematics.*

**Coach:** Devantae, could you, could you scoot over and let Devantae in there, because he, he's kind of out of the circle here. Can you scoot over a little bit? Move back a little bit; let him in. Move back a little bit, sweetie. Move back, move back, this little girl. Could you move back, Brooklyn, sweetie. [To Devantae.] Okay, now you are part of the game, right? So now, she's going to explain what Chantelle is telling us. See if you follow it. Go ahead.

**Amariana:** It means that, um, it's the part of the, the value means how much numbers it is.

**Coach:** How many cubes there are all together? How many of these little cubes [holding up cube and sticks] are in all these sticks all together. Right? That's what value means. How many people are following now? Are you following what we are talking about? So where is that 30 coming from? What does that mean?

**Student:** Thirty.

**Coach:** Thirty what?

**Student 2:** Blocks...

**Coach:** Thirty cubes. I am going to write the word *cubes* up here—30 cubes, and you are calling them blocks, that's okay. But 30 cubes, right, make up how many ten sticks? One...

**Student 2:** Three.

**Coach:** Cool. So, my friend Devantae, where does this 30 go in this chart? Where does this show that I have [holding up sticks], the value of all these things are 30, 30 cubes.

**Devantae:** [shrugs]

*Devantae appears to be a student that requires a great deal of patience and reminders. Once again, I work to bring him into the conversation. Maintaining a circle and not letting students drift back into positions in which they can disappear or become distracted is critical. I'm always checking the group and reestablishing the norms as needed.*

*There is evidence that this class is used to trying to make sense of mathematics and one another's thinking, because even though we have been on the rug for about twenty-five minutes, for the most part, they are still engaged and very few of them are getting fidgety. It appears to me that they have been developing stamina and listening skills.*

*I go through the usual process of having another student explain what Chantelle said.*

*I check for understanding again by asking how many people are following and zooming in on a student who may not be. I ask him to explain—giving us a third opportunity to make meaning. Notice that my questions are always around meaning, not just answers.*

*As mentioned earlier, I write the word cubes on the board to infuse more mathematical language and to connect cubes to blocks, commenting that the use of the term blocks is also okay. Language develops naturally within conversations grounded in contexts or visuals.*

*Once again I return to Devantae. (Remember there have been many segments of this lesson you haven't seen, so it is not the case that I'm just talking with Devantae over and over at the exclusion of other children.)*

**Coach:** Everybody turn to your neighbor. Where do I put the 30, and where do I put the 3? Devantae, I want to see you talking to the people around you.

*It is my intention to begin to build the habits of attentive, confident learners, with Devantae and with any student who may have difficulty. Teaching students how to attend, how to persevere, how to ask questions, how to engage, is a big part of our job as teachers. Many of our students do not know how to learn. Learning to learn is more important than learning place value today.*

*Using turn and talk, I reinforce the expectation that Devantae can do this and encourage him to engage with his classmates.*

## Students Seeing Themselves as Learners

The last clip we will share is exciting to me because Devantae volunteers to explain the number 32. To me, this was evidence that I had not pushed him too hard. My returning to him several times during class seemed to have had the intended impact. Perhaps he started to see himself as a learner, capable of making meaning of the math, and a contributing member of the class community. Even though Devantae still may not understand the place value chart (which in the future I would label very differently), he was confident in describing the Unifix cube model, which is a good start.

Notice that before Devantae speaks I'm working with another student who is also having some difficulty expressing the meaning of the number 32 in terms of tens and ones. This is typical and will take many opportunities, varieties of experiences, and some maturation for all children to fully understand. Conversation allows us, as educators, to keep listening to students' thinking to determine which game, activity, mini-lesson, model, or question might assist in developing further understanding.

**Coach:** What number do you think is here?  
[Indicating a place value mat on the floor showing 3 ten sticks in the tens column and two Unifix cubes in the ones column.]

**Student boy:** Thirty-two...

**Coach:** The number 32. So can you tell me about the number 32? What do you notice about the number 32? How many ten sticks are there? Look over here. How many ten sticks are there?

*I always try to work with a visual. In this case, Unifix cubes are placed on a tens chart that has a place for ten sticks, loose cubes, and a total. It is similar to the chart displayed in the earlier clips, but it is more pictorial in that there is a picture of each model (10, 1, number) at the top. This helps ground the conversation. Talking is often too hard for students to follow.*

*Start with a question you sincerely do not know the answer to. I don't know what number this student thinks is represented. I do know what number I think is represented. If he gave me the wrong answer, I*

**Student boy:** Thirty-two.

**Coach:** Thirty-two cubes all together, right. There's 32 cubes all together. That's a number. How many ten sticks do I have?

**Student boy:** Two.

**Coach:** I have 2 tens sticks? [Removes one of the 3 ten sticks].

**Student:** Three.

**Coach:** I have 3 ten sticks, right? I have 3 ten sticks [writes 3 in the first column of the chart]. How many loose cubes do I have?

**Student boy:** Two.

**Coach:** Two. And where does that go? [Student points.] Here [pointing to the appropriate columns] 3 ten sticks, 2 loose cubes, 32. How many people, who else could explain this? What does the number 32, what do I have here?

**Coach:** Ah! Devantae tell us.

**Devantae:** You could have, um, 3 tens and you just add 2 more it would be 32.

**Coach:** Cool.

*would then ask him to explain his answer in the same manner I am asking him to explain the right answer—in this case, 32. He could have said 32 because he overheard someone say that. I don't know if he understands why it is 32 until I probe. Probing after a student provides an answer is critical in developing reasoning and discourse.*

*In watching the clip here, I realize that I asked too many questions without waiting for a response, which prompted the boy to stick with 32. Since I was not sure which of my questions he was trying to answer, I clarified that there were 32 cubes all together. I work to make sense of what students are saying and to see what their meaning is—to validate what they are saying in some way. I narrowed my question to one: "How many ten sticks do I have?" His answer is surprising, and he does not immediately self-correct. I remove one of the ten sticks to show him what 2 ten sticks looks like without saying a word, and he self-corrects. Sometimes students don't understand what we are asking. Communication is tricky for all of us. Managing discourse is all about listening well to students and trying to make meaning of what they are saying as much as working to get students to listen to one another. The better we listen to students, the better they listen to one another.*

*Notice that I started writing the numbers on the chart instead of asking this student where to place the number. After my earlier attempts to get Devantae and other students to instruct me where to place the digits and numbers, I realized that most of the students really didn't understand the chart. Because we were running short on time and since we'd redesign the chart for the next lesson, I thought it best to just place the numerals as we went along for those who were following.*

*When I ask for someone else to explain the meaning of 32 using the tens and ones, Devantae volunteered!*

## Reflections

It is exciting when a student who has been struggling, distracted, or tuned out becomes engaged. Devantae clearly had a familiarity with the Unifix cube model, and it would be interesting to watch his understanding develop over time.

This is an example of an imperfect lesson. Managing the balance between the desire to keep an individual student engaged and the desire to make sure that all students have access to the mathematics is something every teacher I have ever worked with has found challenging. Place value is challenging for young students to understand because it is more than knowing which digit belongs in the tens place; yet, it is a required topic, and attempting to give students access to it while realizing that some students have a hard time attending, even when they do understand what is being discussed, is no easy feat. Challenging students who seem to grasp the concept, while slowing down the conversation for the majority of students who don't yet understand, is the juggling act that teachers perform every day. There are no *right answers* or pat techniques that make the juggling flawless. Remember that students are simply at different points of understanding at the same moment in time. If we are patient, try lots of mathematical models and pedagogical techniques, teach them to hang in and help one another, and ask students continually what they think and understand, we can reach most students in our classroom.

When we think “These kids are low and these kids are high,” we limit possibilities and often unwittingly underestimate the capability of some students. We might not reach every student during one lesson, but when we do, teaching is satisfying and downright wonderful!

# GRADE 4: GETTING RELUCTANT LEARNERS TO SPEAK

## Introduction to Fourth Grade

Have you ever had students who rarely contribute in a whole-class discussion? Have you often found yourself calling on the same five or six students who are always ready with the answer you are looking for, thus enabling you to get through your lesson? Have you ever wondered how to engage all of your students or if that was even possible? Me too.

In this segment, I address these issues in a fourth-grade class in Monroe, Michigan, at the request of the classroom teacher. As a consultant, I come into the district about two to three times a year for three to four days at a time. I work side by side with coaches and teachers as we strive to plan robust mathematics (or science, social studies, or literacy) lessons that will address the challenges teachers face and engage the range of students in their classes. This class, like all of the Monroe elementary school classes I've worked in, is heterogeneously grouped, and the teacher teaches all core subjects. This is the first and only opportunity I will have to work with this class. The teacher, her coach, and several colleagues from across the district spent the first hour or so together examining the math in the lesson we were considering. Then, the teacher confessed her biggest concern was that some kids never spoke up in the whole-group discussions. We decided that addressing this concern was our most important goal and began to plan a brief mini-lesson in which I could experiment with ways to engage reluctant learners to speak up and to use visuals to give students access to mathematics.

The class was starting a unit on fractions, and I was interested in learning what the students already knew. My hunch was they had some prior knowledge and because the teacher had begun the unit a couple of days before and wasn't quite sure herself what prior knowledge the students brought to the topic, I started simply by asking them to tell me what they knew about one-eighth. I used a modified version of a routine I'll call *describe/wonder* in which students are asked to describe a visual, think about what they know about it, and eventually ask questions related to it.

Over time, the moves I tried here can be combined with other moves to ensure that the students who need to be challenged are also engaged. The teacher in this class has been using turn and talk and asking her students to explain their thinking. We are simply taking additional steps on the journey

toward robust academic discussions in which all students have something to contribute and something to learn.

As educators who are unwilling to settle for only reaching the most able students, we can challenge ourselves to use *both/and* thinking rather than *either/or* thinking. For example, we might ask ourselves, *How might I get both my reluctant learners and my more confident learners engaged simultaneously?* We can become aware of the beliefs and values that drive us and maybe consider questioning them. For example, we might ask ourselves, *When I say I want all students engaged, but tend to call only on students who are eager to contribute, what does that say about what I really want? To what degree do I believe that getting through my lesson according to some time frame is more important than ensuring all students are learning?* When we ask complex questions such as these, we stimulate our unconscious to become creative in finding solutions.

## You Know Something

The following eight-minute clip is unedited, raw footage of what actually happened as we tried out the mini-lesson.

When you watch the video, notice the opinions, concerns, and doubts that come up. For example, you may think to yourself, “I don’t have time to do this. I have to get through my lesson.” Or, “The kids who already know are probably bored.” Or, “The reluctant kids don’t really know that much.” See whether you can get past some of these fears and judgments for just a few minutes while you instead look for *moves* I make that engage reluctant learners. Remember that this is eight minutes out of a sixty-minute lesson and one that has a particular goal—getting reluctant learners to contribute. Do you think it is worthwhile to have the patience and compassion to give airtime to those who may not be as quick or knowledgeable? What might the quicker students be learning as you slow down to invite those with less confidence into the conversation?

I recommend that you watch the video all the way through. Watch for things that I said or did that got students engaged, and consider the *evidence* that the students I focused on actually were engaged. Maybe name the moves I made to help you determine which moves you might want to try with your reluctant students. Notice, too, that I’m not focused on depth here as much as on helping less confident students know what they know and making it safe for them to share their observations.

**Coach:** If you can’t see this, you need to move. And everybody needs to be able to see this, which is now blocked by this. So, you need to be able to see this number line. How many people can see? Can you see it, everybody? Can you see it?

*What seems to be a trivial thing—ensuring that everyone can see all the places where visuals are displayed or ideas will be recorded—is actually deceptively important. When we seat students in ways that they can see and highlight the importance of seeing, we are essentially giving a cue that what*

**Student:** Yes.

**Coach:** You guys can see it over there? Okay.

**Coach:** Okay, I am going to put a number, I am going to put it over here on the board. I don't want you to say anything. Don't call out or anything. Just look at the number [writes "1/8" on the board], and think in your head, what do I know about that number. Don't call out. And when you think you have something to say, you are going to put your thumb in your lap like this, and I am going to wait until everybody has a thumb in their lap, because I am sure everybody has something to say. It could be as simple as what you noticed. Or it could be something you understand about the number. So, looking at the number, look at the number. Look at the number, sweetie, it's up here. Something you notice about the number, maybe something you know about the number. Something you understand about the number. Got a thumb up? How about you, got something to say? Not yet. Well, think about it. Look at the number. Can you notice anything? You notice anything about the number that you could describe? Got something to say, right there? Yeah, got a thumb up. Hold on. Don't tell me. I just want to know if you have something to say. Okay. Thumbs-up, if you have something to say. You have something to say? Can you look at the number up there and think about what you notice? Okay, and then maybe you are going to get ready to tell that to the person next to you? Everybody got something? How about you? Not yet, look up there. I want you to think about that number. You notice something. You can at least say what's there, right? So, put your thumb up. Think about what you can say to your neighbor. Okay, turn and talk to your partner. Who do they normally talk to?

**Teacher:** Right now we usually start in a location in the talking circle for them to have a different partner.

*is coming is worthy of their attention. In addition, making sure that everyone can see everyone else is critical if we expect to have authentic conversation. Putting students in rows or even clusters in which students only see the back of some other students' heads is not conducive to academic discourse. When seated in a circle or a horseshoe or when students are asked to quickly rearrange their chairs to be able to face anyone who is speaking, a message is sent: what each of us has to say matters and will be attended to.*

*Many things are going on here that are worth unpacking. Asking students to "just look" and "think" puts the focus on attending to something and slowing down to think about it. Emphasizing "don't call out" establishes a norm. Providing an alternative way to indicate that a student has an answer—"put your thumb in your lap like this"—lets students know that you are aware that they have something to say, which lessens the likelihood that they will call out or start frantically waving their hands in the air, which is distracting to students around them who may still be thinking.*

*Saying out loud, "I am going to wait until everybody has a thumb in their lap, because I am sure everybody has something to say" sends the message that every student is capable of contributing and slows things down; therefore, that important wait time we've been told about our entire teaching career is actually practiced.*

*It is critical to take the time to refocus students who may not be taking the directions seriously, who may be used to tuning out, or who may be good at disappearing. I have found that doing this just a few times establishes a norm, and more and more kids focus and contribute because they know that I am going to insist that they do.*

*Notice that the tone is light. Examples of various answers they can contribute (e.g., something you notice, understand, or describe) are offered. Their responses allow students to be "right" most of the time. The next move is a turn and talk to ensure that*

**Coach:** Okay, so I want these two to talk to each other, you two, you two, like that...

*everyone hears what someone else is thinking, even if they have not yet thought of something to say.*

*This move is incredibly helpful to shy students, English language learners, and some special needs students. It provides a kind of rehearsal for them and gives them the opportunity to at least hear an idea if they don't yet have one, or to practice articulating an observation or description before being asked to do so in front of the whole group. One move that helps is, "Tell me something your neighbor knows about..." This move encourages listening as well as sharing.*

*The benefit of launching a lesson in the manner described is that it gives a teacher a very quick, informal assessment and time to confer briefly with students who are not yet confident that they have something to contribute. Though I had never worked in this class before, and I did not know which students were the reluctant learners the teacher was concerned about, I was able to determine who was reticent to speak in a matter of a seconds and home in on them—first by conferring with two particular students and by calling on other students during the whole-group share I had noticed during the thumbs-up routine were reluctant to participate.*

**Coach:** [works with a pair of students] I want you to look up there and tell me what you see?

*The request to ask students to tell you what they see creates safety because they cannot be wrong. They are not being asked to tell you an answer that you have in your head, but rather they are invited to tell you what they have in their head, thereby giving you a window into their thinking—otherwise known as making thinking visible.*

**Natalie:** It's one-eighth...

**Coach:** You knew something. You told me you didn't know anything.

**Cieara:** It's one-eighth, and it's a numerator.

*Acknowledging what the students do know, which seems quite mundane—it is one-eighth—is key to encouraging them to tell you more. That's the critical move, which happens a few times in this exchange. Helping students see what they know allows them to build on what they know. Once the door is open and we probe and encourage students to tell us more, they will reveal to us and to themselves that they know more than they originally claimed. Engaging in back-and-forth exchanges with students during which you show that you are genuinely*

**Coach:** You knew that, too.

**Natalie:** There's a numerator and a denominator.

**Coach:** Which one's the numerator? Do you have any idea?

**Natalie:** The top one.

**Coach:** The number, what number is the numerator?

**Natalie:** One.

**Coach:** And what's the denominator?

**Natalie:** Eight.

**Coach:** I thought you didn't know anything?

**Natalie:** Uh [laugh], ohhh.

**Coach:** Now you know something, right. Now when I call on you and say, can you tell us something about the number, what can you say?

**Natalie:** It's a numerator and a denominator.

**Coach:** And what kind of number is that, that has a numerator and denominator. Know what's it called?

**Cieara:** One-eighth.

**Coach:** The name of that fraction is one-eighth. So we know it's a fraction. We know it has a name, *one-eighth*. We know the numerator is 1. We know the denominator is 8. You know a lot. Do we know if it's bigger or smaller than another fraction? Do you have any idea, or...?

**Natalie:** It's um, well, the actual fraction is, bigger than one-sixteenth.

**Cieara:** We have been playing *Cover Up* and *Uncover*.

**Coach:** So you know a lot. Don't, so now when I am going to call on you, what, what are you going to say when I call on you?

**Natalie:** That there is a numerator and a denominator.

**Coach:** Beautiful. And what are you going to say? She's going to say that. What are you going to say when I call on you?

*interested in what they think is more revelatory than the ping-pong pattern of exchanges that occur in many classrooms.*

*In addition, giving them a heads-up that they will be called on and rehearsing with them what they will say seals the deal. They now know what to say and that what they say will be accepted. This again creates safety, which in turn will allow them to take greater risks in future discussions. Last, infusing language and getting students to speak in full sentences is crucial to developing their capacity to articulate ideas both orally and in writing.*

**Cieara:** It's a one-eighth.

**Coach:** It's name's one-eighth. Good for you. Why don't you say, "It's a fraction named one-eighth." My friend back there, do you have something to say? Okay, everybody is going to turn, what's your name again, I am sorry.

**Destiny:** Destiny...

**Coach:** Destiny. Destiny. Everyone's going to turn and look at Destiny, because she has something to say. And just, whatever it is, Destiny, is fine. So what do you want to say?

**Destiny:** I am saying that, like, one out of eight is like, they have four pieces, I mean one pizza and you put it into eight pieces and you ate a piece. That's one out of eight.

**Coach:** Okay, do you have the circle stuff, or not?

**Teacher:** I don't have any circle stuff.

**Coach:** Instead of pizza could we think of this instead? Is it, okay, like a chocolate bar? Okay, so we have a blue chocolate bar, and you are saying if you break it into eight parts, one of those parts would be one-eighth? I thought you had nothing to say. You had a whole lot to say, that's great. Right on the money. How many people know what she's talking about? Do you know what she's talking about?

**Kayleigh:** Mmm...

**Coach:** What's your name, sweetie?

**Kayleigh:** Kayleigh.

*Destiny is someone who initially was not engaged until I nudged her to come up with something to say. She did turn and talk to a partner, and I deliberately called on her to bring her right into the conversation. Who we call on after a turn and talk is an important choice because it will set the tone of the conversation and also can put important ideas on the table for discussion. One of the best ways to determine who should talk at the beginning of a whole-group share after a turn and talk is to listen in briefly on several pairs of students for something you want to highlight and then let those students know you want them to share what you want to highlight.*

*In this case, because I was conferring with two students, I wasn't able to listen in and made a choice based on the goal of getting reluctant learners to contribute.*

*Validating and illustrating what the student said is critical if I want to make sure that other students are attending and can then agree, disagree, or build on what was said.*

*To make sure that the visual is accurate, I do not draw a pizza freehand since it is highly likely that the pieces will not be equal. Instead, I use an accurate model (even though it is not a pizza) and ask for permission and check for understanding when I do.*

*The move of checking in with the class to see who is following what was said is critical and most often left out of academic discourse. This move establishes the importance of listening to one another and maintains the expectation that everyone is capable of following the conversation and at the very least could ask a question if they don't.*

*Kayleigh was another easy-to-spot student who was not following along and who was reluctant to ask*

**Coach:** Kayleigh, look over here. Pretend this is a chocolate bar, we are thinking about this number. What is she saying about this number and the chocolate bar?

**Kaleigh:** I don't understand it.

**Coach:** You don't understand it? Do you understand any part of it?

**Kaleigh:** No.

**Coach:** Do you understand that this is a whole chocolate bar?

**Kaleigh:** Yeah.

**Coach:** And do you understand that this is a piece of the chocolate bar?

**Kaleigh:** Yeah.

**Coach:** Okay, what's the name of that piece?

**Kaleigh:** One-eighth?

**Coach:** So you understand something, right?

**Kaleigh:** Yeah...[laughs]

**Coach:** So it's one-eighth, right? Is that, and what were you saying about the one-eighth?

**Destiny:** That if you had a pizza with eight pieces, and if you take one piece, you have one out of eight.

*questions or contribute thinking. Even though I had never worked with this class, it was not hard to discern the reluctant students because I'm tuned in to the students. I'm not focused on getting through the lesson as much as making sure students are engaged and working to make meaning.*

*When I ask "Do you understand any part of it?" I'm homing in to try and find the entry point to start the conversation with her. This is a very different question than "What don't you understand?," which is often the question I hear teachers asking. Usually kids can't answer the question of what they don't understand. Starting with the visual and making sure she understands it is helpful because it gives us something concrete to work from rather than keeping things strictly auditory and abstract.*

*If Kayleigh is not following, it is likely that other students are not. That is evident when I ask for a show of hands of who is following. Asking students to listen closely to what others are saying, even with a visual to help ground the conversation, is a new habit we are trying to cultivate and takes time to develop. It's a change in culture. The new culture emphasizes that we are all in this together; every student's voice has weight, and the teacher's voice is only one voice in the classroom—albeit the one with most weight.*

*Scaffolding for Kayleigh is vital. Many teachers might have asked "Who can help her out?" rather than stayed with her. When you move on to another student rather than scaffold, you are giving a message that says, "I don't really think you can get this"—unless you do come back to that student and try again after another student has shared, because we often need to hear things two or three times before we understand what is being said.*

*Returning to Destiny and getting her to repeat is critical. Do not repeat for students. If you do that, then you will continually have students mumbling, being inarticulate, and relying on you, the teacher, instead of growing in their capacity to reason and engage in conversation.*

**Coach:** Did you hear what she just said? Can you say that in your own words?

**Kayleigh:** Eight pieces in....

**Coach:** ...and this would be, one out of, one-eighth is, um, is one, I wrote this wrong, that's why you can't repeat it. One-eighth is one out of eight pieces. Does that make sense to you?

**Kayleigh:** Yeah.

**Coach:** So, if I was going to make this whole candy bar, how many of these pieces would it take?

**Kayleigh:** Eight.

**Coach:** Next, what do you want to say? What were you going to tell us about that?

**Cieara:** It's a fraction name.

**Coach:** It's a fraction, and the name of the fraction is...

**Cieara:** One-eighth.

**Coach:** Which means one out of eight, and I am going to add one thing, 8 equal pieces, because every one of these pieces is the same size. Got that? You following that? Very nice beginning there, Destiny. And, what's your name, sweetie?

**Cieara:** Cieara.

**Coach:** So, Cieara added the word *fraction*. And one of the things we want to use today are words that help us understand what we are talking about. So one-eighth is a fraction. And what do you want to say, my friend?

**Natalie:** It's a numerator...

**Coach:** I can't hear you. You got to talk so she can hear you way back there. Turn to her and tell her.

**Natalie:** There's a numerator and denominator.

*Again, referring back to the visual here gives Kayleigh an anchor, and asking her to restate is important. Kayleigh hasn't yet demonstrated that she understands.*

*I now bring Cieara and Natalie into the whole-group discussion knowing what they are going to say. Notice that Cieara attempts to incorporate the word fraction but doesn't quite state a full sentence. I rephrase for her and she fills in the one-eighth.*

*I'm writing language on the board now and adding the concept of equality—an idea that has not yet been mentioned. Natalie adds her part about numerator and denominator, and I write up that vocabulary. Normally, I have a piece of chart paper and keep what I call an organic word wall going during every math unit. I write the words as they come up, and once they are up, that chart stays visible, and we add to it and refer to it during the unit. I also expect students to use the words when I ask them to stop and jot. I literally say, "I expect you to use the math vocabulary on this chart when you write your reflections, understanding, or ideas."*

*Notice also that I do not restate for Natalie when she mumbles. I have her turn and speak up.*

**Coach:** Whoa! Numerator and a denominator. Everybody turn to your neighbor. What's the numerator in this fraction, what's the denominator? See how I am getting them to talk.

[After the turn and talk]

**Coach:** Natalie is going to tell us which number is the numerator and which number is the denominator in this fraction, and then you are going to tell me what that means, right? So, Natalie, which one do you think is the numerator?

**Natalie:** The 1.

**Coach:** The 1. So, the number on top is the numerator.

*Last, I have the whole class turn and talk again, briefly, about the meaning of numerator and denominator. I stay focused on the meaning of the terms we are using and work to make sure every student is following the conversation using turn and talk as well as the moves mentioned earlier (restating, checking to see who is following, and getting students to speak up).*

*I then return to Natalie to have her describe the meaning of the numerator and denominator, which provides her with an opportunity to speak in whole sentences and to develop her own understanding.*

## Reflections

By the end of this clip, every student who usually didn't speak had spoken in the class. I deliberately called on students who I could tell within moments of starting the lesson didn't usually speak, even though the teacher never pointed them out. I invited them into the conversation in a variety of ways and set a tone that let them know that it was safe to speak *and* that it was expected.

Several scaffolds were used beyond the basic talk moves. These include the following:

1. Rehearse with students before calling on them.
2. Stay with a student long enough to find something to build on.
3. Use visuals to help them think something through.
4. Return to uncertain students after they hear an idea repeated.
5. Give students a heads-up that the teacher will call on them.
6. Write down verbatim what students are saying so their ideas are validated and developed.
7. Encourage students with "You can do this" or "You know more than you think you do, and I'll help you see what you already know."
8. Infuse new language into what they do know, so they see that they already have a budding math vocabulary and can easily develop a richer one.

These are ways we experiment with ensuring that our least confident students become risk takers who know that they can learn when they put in the effort.

# GRADE 3: MULTIPLE TALK MOVES IN ACTION

## Introduction to Third Grade

In this third-grade class, the teacher has been working with her students on all three of the basic talk moves—*turn and talk*, *tell me more*, and *repeat back*—as well as several additional moves. It is evident that the students are accustomed to turning and talking because they do so immediately after being asked. Everyone has a partner and knows who to turn to, and the talk is focused on the question at hand. It is evident that the students are used to the teacher’s probing questions because they stay focused through several exchanges, speak in full sentences, and use mathematical language in response to her follow-up questions. The teacher’s questions focus on meaning making and are checks for understanding. She praises thinking and emphasizes assisting others. See whether you can notice each of these aspects of talk.

Like all the teachers in this video series, this is the first time I am working with this teacher. She and I exchanged a few e-mails and met prior to the lesson to co-plan it. This lesson is from *Investigations in Number Data and Space* (Pearson Scott Foresman TERC 2012b), in which students determine the area and perimeter of various rectangles using 1-inch-square tiles as their unit of measure. They have worked with area and perimeter previously, first exploring one and then the other. In this lesson, they measure both. Even though the lesson is well explained in the unit, no written unit takes into account the class of students who will be engaging with it. The teacher needs to bring to the planning session what she knows about her class, her own understanding of the math content, and her ideas for tweaking the lesson to make it both accessible and challenging. Teachers—not books—craft rich lessons. Curriculum materials provide the basis for a rich and engaging lesson or series of lessons, but teachers mold those lessons to meet the needs of their students, to bring out the big ideas in mathematics, and to challenge students to question, explore, and engage in discussions that stretch their thinking and deepen their understanding.

## What to Do When Students Can’t Repeat Back

In this brief clip, we can see all three moves in action: *turn and talk*, *tell me more about that*, and *repeat back*. In addition, the teacher reminds a student, Ellen,

who didn't hear the thinking of a previous student to ask her to repeat what was said. This expectation generally needs a lot of repetition because most students do not realize it is their responsibility to learn. They can't learn if they can't hear or see what is being discussed. Even after the idea is repeated, Ellen is at a loss. The coach steps in, because the objective of repeating back is not to regurgitate but to make meaning. By suggesting that Ellen look at the model and think about it, she essentially says in her own words what was previously stated—how to describe a perimeter. These two moves—asking the speaker to speak louder if you can't hear and looking at the model to make sense of what is being said—are additional attempts to help students become skilled at engaging in academic conversations that result in learning. When the clip opens, the teacher has already established with the class that the perimeter of a 1-inch-square tile is 4 inches. The class has worked on perimeter and area earlier in the unit. These are not new ideas at this point.

**Teacher:** All right. Now, I wonder, um, what happens to area and perimeter when I put two colored tiles together? [Holds up two 1-inch-square tiles and aligns them to create a 2-by-1-inch rectangle.] Can you turn and talk with your partner and see what you can tell me about area and perimeter? [Students turn and talk to one another.]

**Coach:** I am going to write it over here, so that we could actually tick more things.

**Teacher:** Here's an eraser, too. Marker's down here.

**Coach:** Thanks.

**Teacher:** [vocal bell] I would love to know your thinking.

*When the clip opens, the teacher has already established with the class that the perimeter of a 1-inch-square tile is 4 inches.*

*Notice the teacher is posing the question as a wondering.*

*Notice that the students are sitting in a circle, which is common practice for this class. The teacher holds the tiles up so every student can see the new configuration, which is easy to do because of the circular configuration and proximity of the students.*

*She goes right to a turn and talk. This move makes clear that the students are meant to think. It also provides them a chance to get their thoughts together, complete the calculation, and rehearse what they want to say if called on during the whole-group discussion. The teacher does not follow the pattern—I do, we do, you do. In fact, she is turning that pattern on its head. You think, discuss, explain, we talk, and then I (the teacher) may clarify or summarize if necessary.*

*The teacher uses a vocal bell signal to regain the attention of her students. The students echo the sound and are ready to transition into whole-group discussion. These kinds of management moves seem natural. In fact, the teacher taught her*

**Teacher:** Braden, what can you tell me about these two shapes put together?

**Braden:** They are congruent.

**Coach:** Beautiful.

**Teacher:** What does that mean, congruent?

**Braden:** Same shape and same size.

**Teacher:** Hmm, same shape and same size. All right, what else can you tell me about this with regard to area or perimeter?

**Braden:** That if you, like, even if you turn it, or slide it or flip it, it will still be the same.

**Teacher:** Ah, the same what?

**Braden:** ...shape.

**Teacher:** Mmm. Tell me something else? Who, I wonder who can help, help my friend Braden out here? Braden, excellent thinking...

*students how to talk and listen to one another and to listen for the signal to return their attention to her.*

*Management matters for robust classroom discussions in which all students are given a fair shot at learning. Coming up with a simple, reliable, and regular signal to regain student attention is a small detail that makes a big difference.*

*What is not so visible is the teacher's implicit trust in her students. For many teachers, turn and talk is a worrisome move because they do not trust their students to follow instructions, and they are worried that they might not be able to regain their students' attention. These are legitimate concerns. Teaching kids, as early as possible in the school year, step-by-step expectations of them during a turn and talk is worth the effort. Few students come to school knowing how to engage in academic discourse.*

*Notice that the teacher's question here is an open question—one she doesn't know the answer to. It is the kind of question that will allow her to learn something about Braden's thinking.*

*When he uses the word congruent—a specific mathematical term—she asks him to define what he means. She is focusing on meaning making, not just answers.*

*She stays with Braden to see what else he can contribute. The idea of staying with one student for two or more exchanges helps students develop the capacity to shape their ideas and gives them a chance to express their ideas fully. The average student answer, according to Alexander (2008), is three to five seconds and ranges from one to three words. We are aiming to change that statistic. Douglas Reeves once said at a meeting I attended that getting students to speak in full sentences is the best way to increase learning and simultaneously improve test scores. I would add that it also develops language. Reasoning requires language.*

*Notice that the teacher keeps asking for specificity—precision in language is one of the eight*

*mathematical practices emphasized in the Common Core. This is the beginning of what that sounds like and the development of the habit of using mathematical language precisely.*

*The teacher uses the phrase “Who can help...Braden out here?”—a phrase I generally discourage because it signals to the student he is wrong. Teachers use this technique to get students to give the answer the teacher is looking for rather than attending to what the student is saying or to keeping the lesson moving at a rapid pace. In this case, though, it is not being used because Braden needs help or for pacing purposes; it is used to emphasize the interdependent relationships the teacher is aiming to foster.*

*Although Braden didn’t directly define perimeter, the teacher allowed him to speak his mind. In so doing, he contributed important mathematical language and ideas to the conversation. He didn’t directly answer the original question. That’s okay. It took about a minute to engage with Braden—a worthwhile minute in which student thinking is valued.*

*McKenzie goes right to the heart of the matter—perimeter. You may be wondering what to do if the next student doesn’t take you back to the focus you have in mind. Let the student express her idea and then just refocus the group by asking, “What do you have to say about perimeter and area?”*

*McKenzie explains why she thinks 6 is the perimeter, fully noting that that two side lengths are sacrificed to perimeter when they are combined to make a new shape. This is very important information, and now the teacher uses the restate move. She did not have students restate Braden’s ideas because they were not relevant to describe perimeter. So while she validated his thinking, she didn’t highlight it.*

*The teacher calls on a student who did not have her hand raised. This is a deliberate move, and one that has been established earlier. If we expect all students to engage in a lesson, then we cannot continue to call on only the eager students who*

**Teacher:** McKenzie?

**McKenzie:** Perimeter is 6, because perimeter is 2 inches at the top and 2 inches at the bottom, an inch on that side and an inch on that side, but you wouldn’t be counting the inside because it’s perimeter and you wouldn’t count it. It’s the outside you count.

**Teacher:** Hmm. Can somebody repeat what my friend McKenzie just said? Ellen, can you repeat what my friend McKenzie just said?

**Ellen:** I didn’t really get to hear it.

**Teacher:** Oh, then what should you say?

**Ellen:** Can you please repeat that?

**McKenzie:** The perimeter is 6 because there's 2 at the top, 2 at the bottom; those are all an inch, and an inch on that side and an inch on that side, but you wouldn't be counting the inside, because perimeter is the outside.

**Teacher:** All right, Miss Ellen, can you repeat what she said?

**Ellen:** [pause]

**Coach:** Here's a picture to help you think about it.

**Teacher:** Okay.

**Ellen:** I didn't really get what she said.

**Coach:** Let's see if you can think about it yourself. We are thinking about perimeter. She said, she thinks the perimeter is 6. Do you agree with her? Why?

**Ellen:** Because there's one, there's two squares put together so that's 1, 2, 3, 4, 5, 6, because there's 2 on the top and 2 at the bottom and two on that side and on that side.

**Coach:** Yeah, is that what you said?

[McKenzie nods her head yes.]

[Referring to Ellen]You were thinking exactly like she was.

**Teacher:** Great minds think alike.

*wave their hands in the air. We need to assist all students to be able to contribute to a conversation.*

*The teacher does not repeat what McKenzie said for Ellen; instead, she reminds Ellen of her responsibility to ask her classmates to speak up. This is a reminder to the whole class, a way of maintaining expectations, and a way of signaling to the class that their classmates' ideas are worth listening to.*

*McKenzie repeats her explanation almost verbatim, but Ellen is still having difficulty repeating what was said. At this point, we are not sure whether she is having a problem attending or listening or whether she is not understanding what perimeter means. I step in with a picture as a way to ground the conversation.*

*Ellen then offers information. She identifies the problem as not "getting" what was said.*

*There are a number of options here from a teaching perspective:*

1. *Ask another student to restate so Ellen can hear it again. However, because McKenzie's explanation was concise and articulate, it is unlikely that Ellen's hearing it again would help her make meaning.*
2. *Explain it to Ellen. This option is one many of us would lean toward; however, this keeps Ellen in a passive role and builds dependency on the teacher.*
3. *Have Ellen make sense of the visual herself with as much or as little scaffolding as possible.*

*We chose number 3 because my sense was Ellen tended to be a bit passive and was probably also a bit shy. She was not showing any signs of frustration or anxiety; therefore, nudging her to think for herself felt like a safe move.*

*Last, we asked McKenzie to verify that what Ellen said—her thinking—was similar to what McKenzie was thinking. This move is a fourth, more sophisticated, move than the basic three and often leads to students' honing their understanding of one another's ideas. In this case, the statements were close enough that no honing was necessary.*

## Reflections

Repeating back what someone else states is not always easy. Sometimes people can restate, paraphrase, or summarize what was said even though they don't understand it. Sometimes, because they don't understand it, or think they don't, they can't restate. Although restating is a useful move for developing the habit of actively listening to others, it does not ensure understanding. All the moves suggested in this guide are rules of thumb more than anything else. They work probably 90 percent of the time. What's more important than memorizing the rules is actually noticing what you tend to do in practice. Do you listen well to students? Do you take time to check for student understanding? How often do you invite students to let you know what they do and don't follow? If you are not doing much checking in with students, not using turn and talk very often, and are more often focused on getting through your lesson, it might be worthwhile to ask yourself what you believe about teaching and learning. Is it my job to "cover the curriculum" and "stay on pace," or might my job be more nuanced and less mechanical than that? Is it more important that students learn to learn or learn some fact or procedure today? How can I do both—help students learn to learn *and* teach them important mathematics?

# GRADE 6: WELL ON THE WAY TO ACADEMIC DISCOURSE

## Introduction to Sixth Grade

Sixth-grade teachers in the next two clips have been working to develop their students' capacity to engage in discourse without much prompting. The evidence of both teachers' success is that the students know exactly what to do when asked to turn and talk. The teacher can then walk around and listen in to the partnership conversations to determine who to call on to start the whole-group share.

During whole-group conversations, students often speak in an orderly fashion without raising hands and do so remarkably well. Their capacity to carry on a conversation without the teacher's direction is evident in the video. They speak directly to one another during whole-group discussions. They ask one another for clarification. They build on what the other is saying, and sometimes they challenge one another's thinking. In addition, these students ask one another for assistance as needed, evidence that they are practicing the metacognitive skills (for example, self-awareness and self-monitoring) associated with self-management of learning. These skills further enhance the likelihood that the students are engaged in and able to learn from the conversation. This behavior lets us know that the students consider it a safe learning environment in which not knowing is okay and asking questions is encouraged and valued.

These teachers have been practicing the usual talk moves—*turn and talk*, *repeat back*, and *say more about that*. They rarely use the repeat back move at this stage of the game because that move is designed to cultivate listening skills, to attend to one another as they speak. Once those skills are actively used regularly, students are often capable of agreeing with, disagreeing with, or building on what was said because they have heard what was stated. They often include parts of what was said in their comment or question, making it clear that they are listening. On occasion, when a conversation becomes confused, or when something important needs to be highlighted, the teacher may employ the restate move. This move slows down the conversation and allows students to refocus on the main idea and/or provides opportunity to sort out the confusion to ensure that everyone can make meaning.

We will see a clip from each class to show that both classes are behaving similarly. The teachers work closely with each other and have co-planned the

lesson that both their classes are working on. The lesson involves assisting the school principal in determining how much furniture to order to furnish two new classes in the coming school year. The lesson was an attempt to present a real-world problem to students to introduce them to combining like terms and exploring the meaning of variables.

## Making Sense of the Problem

Before the opening moment in the first clip, students wrote expressions that showed how many desks, tables, and chairs were represented in a blueprint. They had already studied the blueprint to make sense of it. The big idea here is *equivalence*—there is an infinite number of expressions that can be written for the same situation. When students work on simplifying expressions, for example, they engage with a form of equivalence. The teacher also wants students to understand that, when the time comes to purchase the classroom furniture, the person ordering will have to distinguish between types of furniture (for example, desks, chairs, tables) so that the furniture can be priced and ordered appropriately. This can lead to understanding the meaning of *like terms* in expressions or equations.

Notice that the teacher is using a modified version of *see/think/wonder*, a technique to ensure students are attending to the visual (in this case, two different expressions) to make sense of it.

**Teacher:** So, take a minute to look at this expression:

$$12(2d) + 8d + 18c + 8c + 12c + 1t + 1t$$

Let it digest in your head for a moment and ask yourself in your head, “Is this expression equivalent to this expression?”

$$32d + 38c + 2t$$

*The teacher is using a modified version of see/think/wonder to make sure students are making meaning of the two expressions under discussion. Before this moment, students had been asked to write expressions that showed how many desks, tables, and chairs were represented in a blueprint. The teacher wrote their expressions on chart paper and highlighted two expressions for everyone to discuss. One expression was essentially the simplified version of the other.*

*Notice that she asks students to look and “digest in your head”—think, and then wonder—“Is this expression equivalent to this expression?” She gives them time to think—a few seconds.*

**Teacher:** Turn and talk. [Teacher listens in as the students talk to partners.]

*She then uses the turn and talk move. The students immediately turn to their partners, make eye contact, and try to convince each other of their opinions. The teacher is free to roam around the*

**Teacher:** [refocuses one partnership and asks] But is it equivalent? That's the question. [Teacher refocuses whole group.] Eyes back over here. Are these two expressions equivalent? Do they represent the furniture in Ms. Dunlap's classroom? Talk to us.

**Trenton:** I think it does, because but . . .

**Amara:** It's not simplified.

**Trenton:** The top is the simplest form. And then the bottom one is like a harder way of reading.

**Amara:** The top one is simplified, and the bottom one is not.

**Teacher:** Do we agree with what Trenton and Amara said, that this is the simplified version? Okay?

**Student:** Mhmm.

**Teacher:** But my question to you is, "Are they equivalent?" Somebody talk more to that?

**Izzy:** I think they are equivalent, because like, there's for the longer version, like it's, they are the same thing, just one like you wrote how much there is, and like every single section like for the tables, you didn't just like add them up. You wrote it like 1 table plus 1 table, instead of just writing 2 tables. Like the desk like you wrote 12 desks, because there's like 2 and then you double it, because there's 2 of 12. But then you wrote 8 desks, because there's one that's 8. Like you didn't add them all together?

**Marcy:** What Izzy is trying to say is that you broke down the simplified version.

**Madi:** Marcy, could you please, I know what you mean, but I don't really get what you mean, "if you broke it down." Could you explain it more?

*circle, eavesdropping on the conversations to get a sense of what the students are saying.*

*At one point, she lightly interjects with one of the partnerships by restating her question. She gets their attention back easily and restates the focus question.*

*"Talk to us" is her signal to the students to start the conversation. She says "Talk to us," not "Talk to me." This is a subtle but important difference. Notice that she does not need to call on anyone in particular and that Trenton just starts. Amara, his partner, chimes in, and there are four statements made by the partnership, with Amara adding mathematical language—simplified—to Trenton's explanation. There is no teacher prompting.*

*The teacher does not indicate whether Amara and Trenton are right or wrong, but asks the group to respond as she essentially summarizes what they said.*

*A student or two make guttural sounds of agreement or nod their heads.*

*The teacher wants more discussion and essentially uses the tell me more about that move with a focus on equivalence—the big idea. Again, she lets the students take the reins, and Izzy speaks up.*

*Marcy then attempts to clarify Izzy's not-so-clear explanation, again unprompted by the teacher.*

*Another girl in the class then asks for further explanation. This spontaneous request for further clarification is a rarity and evidence that this student*

**Marcy:** Well, what Izzy said how, like the 32 desks, there are 3 sections of the 32? So when you look at it, it says 12 desks, 12 desks plus 8 desks.

**Teacher:** So Marcy, you are saying this means 12 desks plus 12 desks.

**Marcy:** Mhmm.

**Teacher:** And how do you know that?

**Marcy:** Because of the 3 sections on the blueprint. There's 2 sections with 12 desks.

**Teacher:** There's 2 sections with 12 desks. Okay, but using this expression, how would you know that this is equivalent to this?

**Marcy:** Because the parenthesis around it tells you to multiply it, and it says 2 desks, so it says multiply 12 by 2.

**Teacher:** And Madi, yesterday, you referred to that as not multiplying, but what did you say?

**Madi:** Uh.

**Teacher:** Who can remind Madi what she said yesterday? Go ahead, talk to me, Madi.

**Amara:** Correct me if I am wrong, didn't she say *duplicating*?

**Madi:** Yeah, yeah.

*takes seriously the principle of learning known as socializing intelligence because she exercises her responsibility to learn.*

*Marcy patiently restates her idea. No one laughs, rolls their eyes, or makes a disparaging comment. In fact, the class appears to listen politely to the exchange. I infer that there may be others who were not following the conversation, so this question slows the conversation to make sure all have access. These learned behavior patterns are part of the norm.*

*The teacher here works to clarify further, perhaps thinking that if one student is having difficulty following the conversation, probably other students are as well.*

*She stays with the conversation—keeping one idea on the table—knowing that slowing down and focusing on making sense of the expressions is key to student success.*

*There are a number of exchanges between the teacher and Marcy focused on attending to the question asked by the girl who wasn't following.*

*The one part of this exchange that I think might be considered a bit of a detour is when the teacher says to Madi, "[Y]esterday...what did you say?" To my ear, this is a "Guess what's in my head?" question. I think it is better to say, "Yesterday, Madi called this 'grouping,'" rather than getting students to remember what was said. The teacher wants students to make a connection between what is being discussed currently and language that came up yesterday. My advice in this situation is to give the students the language or point out the connection rather than playing the memory game.*

*What is lovely, though, is that the students try to remember and one girl says, "Correct me if I am wrong," another indication that the students in this class have learned that being wrong is part of the learning process.*

**Teacher:** Okay. Did I hear anything different than what Madi said? So the 12 would represent 12, okay...she had said 12 groups of 2 desks. All right, go ahead Marcy, continue.

**Marcy:** And then for the chairs, there's 3 different sections of chairs, and so one says 18 chairs for one section and then 8 chairs right there for another section, and 12 chairs for another section.

**Teacher:** And that makes?

**Marcy:** That would make 38 chairs.

**Teacher:** Audience? [Students put thumbs up.]

**Marcy:** And then it says 1 table plus 1 table would make 2 tables.

**Nayeli:** Um, you forgot to add the, um, to add, the 8 with the 24 desk...

**Marcy:** Oh, right. The 8 desks added to the 24 would make 32. Thank you, Nayeli.

**Teacher:** So you guys just proved to me that this expression is equivalent to this expression. In your notebook, I would like for you to stop and jot, we haven't tried this before, but stop and jot another equivalent expression that can represent the furniture in Miss Dunlap's classroom. Go!

*Despite the brief detour, Marcy is able to pick up where she left off, showing that even when we do take detours, we can steer ourselves right back on track. Also, Marcy's capacity to keep focused is an example of what it means to build student stamina to stay engaged during whole-group discussions.*

*The teacher draws the rest of class back in by checking in with them, and, surprisingly, most of them are following along as indicated by thumb signals. She is also chunking the conversation now by checking in with the class about the first part of the expressions related to chairs and will then chunk the rest of the conversation related to desks and tables.*

*Clearly, Nayeli is following along because she notices an error and points it out to Marcy, who actually thanks her for doing so!*

*What is lovely about this teacher is that she is willing to try new things on the spot, while being videotaped! She asks her students to "stop and jot"—a new move for her and the class. This move gives her immediate, informal assessment in terms of whether students can apply what was being discussed.*

## Digging into Big Ideas

We move now to another sixth-grade class. This class is studying the same content as in the previous clip, but it's at a different point in the lesson. Two teachers co-created the lesson and observe each other as the lesson is taught. They work closely together on a regular basis and consistently collaborate on lesson design, share experiences, and reflect on and refine their practice without any special support from administration, although the administration encourages and appreciates their efforts.

The students are coming out of a turn and talk as the clip opens. They have written expressions to show how much furniture to purchase for two classrooms and shared some of them before the turn and talk. The teacher has recorded several expressions on chart paper. One student's expression provided one sum—144—representing 144 pieces of furniture but did not distinguish how many items for each of the three types of furniture to be purchased. Another student showed the totals for each category of furniture to be purchased. Then, a third student questioned what the expression should really entail, because what should be shown is what is needed for each class as well as the totals for each kind of furniture. She went on to question and modify the expressions that had been created by her classmates and were on the chart paper:

Which of the following will give the principal the information she needs to order the appropriate amount of furniture for two classrooms?

$$72 \times 2 = 144 \text{ pieces of furniture}$$

$$2(38c + 32d + 2t)$$

$$2(38c) + 2(32d) + 2(2t)$$

In earlier discussions, students learned that the letters D, C, and T represent desks, chairs, and tables, respectively. The conversation also dipped into ideas of equivalence, which was one of the goals of the lesson.

Notice also the easy rapport between teacher and coach. We are coteaching, not tag teaching. The teacher started the conversation but is comfortable with my asking questions from time to time, explaining ideas, or nudging students for further explanation. This is another example of how this teacher trusts the process, her students, and me. She does not feel the need to be in control at all times.

**Teacher:** All right, bring it back please. Three, two, and one. Oh, excuse me, Jayda. Okay, so which one makes the most sense [refers to the expressions on the board]? Go ahead.

**Justin:** I think the second one, because if you just said you needed 144 pieces of furniture, you wouldn't know how much of each one to get of chairs, tables, and desks.

*As in the previous class, the teacher does not call on any particular student. When she says "Go ahead," she is signaling to the group to start a discussion. Justin jumps in quickly and gets things going.*

*Justin immediately sees why just providing the total number of pieces of furniture without distinguishing the quantities needed for each type of furniture is problematic.*

**Mikenzy:** I agree with Justin. After the explanation, I kind of like get why, like what I was thinking kind of wouldn't work. Because like you have to tell her which is which. You can't just say 144 and she wouldn't know. She might mix it up, like get 2 chairs, 32 tables or whatever. So after Caitlyn's explanation, I would go with the second one.

**Madi:** I disagree with both problems.

**Coach:** [giggles] Good, why?

**Madi:** Because it looks equivalent. Because it looks like you are adding 38 plus 32 plus 2 and then you times, and then you end up getting 72 and looks like you are times-ing that by 2, which is the same thing as the top one. She'd have to do 38 times 2, 32 times 2, and 2 times 2. So it's like the way she wrote it. It's like, like if, if I was handed that I would say like, am I just adding that and then I'm times-ing by 2 because it looks like they are the same problem, just written differently.

**Mikenzy:** I agree with Madi now. It's kind of like I agree like it's just like most likely the one on top, because once you times everything by 2 on the bottom problem, it's pretty much the same thing, like after you do that, you pretty much get to the top one that we were talking about. Like the 72 times 2. You pretty much get to that after you do the bottom one. So I agree with Madi that you have to do each one separately. And then like you do 38 times 2 and then you do, and then you write the answer down and write like chairs after that or like a C or whatever.

**Teacher:** So what is 38 times two?

**Student:** I have it as 76.

*Mikenzy, the girl who responds, is one of the students who in an earlier discussion just prior to the turn and talk was arguing for needing one number as the final answer. She was thinking more about finding an answer to an equation than making meaning of the numbers.*

*Justin's reasoning influences hers, and she changes her mind and provides her reasoning based on the arguments made by other students in the class. This could be considered evidence of learning or at least evidence of thinking. The exchange has the beginning characteristics of mathematical argumentation, which is one of the math practices emphasized in the Common Core.*

*Madi adds another idea to the mixture and confidently disagrees with her classmates just when it seems like the group has come to a consensus. This is, in my opinion, an exciting moment because it shows that kids are really thinking and not just satisfied with getting an answer. It does slow the lesson down a bit, but ultimately it deepens the discussion.*

*When Madi says "it looks like they are the same problem, just written differently," she is talking about equivalence. Equivalence is a big idea, and understanding it is a goal of the lesson.*

*Now the same girl, Mikenzy, who changed her mind a moment ago is also beginning to notice the equivalence aspect of the expressions as well as thinking about the context—the meaning of the numbers.*

**Teacher:** Seventy-six what?

**Group:** Chairs.

**Teacher:** And 64 what?

**Group:** Sixty-four desks and then 4 tables.

**Teacher:** Okay.

**Mikenzy:** Yeah, but then we'd have to split up again to show how much for each room.

**Coach:** Hmm. So it would be interesting to write a number sentence or expression that showed how much for each room and how much in total for each one [type of furniture]. Is that up there somewhere already?

**Madi:** I would say you could just put, like if you're figuring out how much furniture all together, just put the plus sign in between each number and put the equal sign . . .

**Teacher:** Are you talking about right here?

**Madi:** Yeah.

**Coach:** And put the equal sign after the red?

**Madi:** No, put the equal sign there.

**Coach:** Equal sign where?

**Teacher:** Where I was about to put it?

**Madi:** Yeah, And then you could either do 2 classrooms or 144.

*The teacher moves to get the set of numbers up on the chart for all the students to see.*

*She pushes for precision—76 what? 64 what?*

*Notice that, by the second group response, the students are using the labels for each item.*

*Now another student is considering context again and adding more nuance. The principal needs to know how much for each room, not just the total for both rooms.*

*The coach stays with the idea and works to connect it back to the representations already on the chart paper to help the student make a connection and think about representing her idea algebraically. This dance back and forth between making visible the thinking by recording it and orally articulating and exploring ideas is one way to keep more students engaged—that is, able to follow the discussion. The visuals help those who are getting lost in the auditory.*

*Madi is clearly listening as she offers a suggestion for how to represent the idea raised by the coach by modifying one of the expressions on the chart paper. The coach's question added a bit of complexity to challenge the students.*

**Coach:** Okay, now wait a minute. Whoa. What's your name, the girl with the hat?

**Izzy:** Izzy.

**Coach:** Izzy, you have been wanting to say something. Are you following this conversation?

**Izzy:** What I would like to say is that I agree because now what Madi just said, I totally get.

**Coach:** Can you explain it, because I am like whoa, there's a lot going on there. Everybody listen, because it's kind of a big idea what we are talking about.

**Izzy:** Well, um, she's saying that 76 plus 64, like she's just adding them together. And at the end, she can say like 144 for the furniture all together. Or she can say two classrooms, because that's the total for two classrooms of them. Because she just doubled the 38.

**Coach:** Is that what you were saying about the 144?

**Madi:** It's equal to the same thing. You could either write it in words or write it in numbers.

**Coach:** So, you are saying there's 144 pieces of furniture no matter what, for two classes, but there's this many of chairs, there's this many of tables, there's this many of desks. And if you wanted to be able to see how much were for each classroom . . .

**Madi:** Then your answer is right there.

**Coach:** Then the answer is below where it says 38 plus 32 plus 2T.

**Madi:** Yeah, because it's just like there's two different, like you could either figure out how much pieces

*Madi's voice tends to dominate the conversation. I'm sensing some students are not following the conversation, and a couple seem to have something to say. I work to bring more students into the conversation and start with Izzy, who has been trying to say something but didn't quite take the opportunity yet.*

*It is important to give students who have an "aha" moment a chance to articulate their thinking. Once Izzy tells us that she "gets" what is being discussed, I make sure she explains her idea, which makes her thinking visible as a way of informally assessing what she understands.*

*I also make an important move here—"Everybody listen"—which alerts the group to refocus as I know that the main point of the lesson is now under discussion and everyone needs to attend, especially at this time. This is called highlighting or marking an idea and serves two purposes—(1) to refocus the group and (2) to home in on an important idea.*

*I then check with Madi to ascertain whether her classmate paraphrased her idea. Sometimes when students paraphrase another student, they actually do not restate the original idea but change it. In this case, I'm not sure exactly what Izzy is saying, and asking Madi if she agrees with what is being said buys me some time to make sense of it myself and allows the original speaker to confirm the idea.*

*I then work to summarize the conversation in service of the group with the intention of making sure that everyone is following the discussion.*

*Once again Madi takes the ball and runs with it. One rule that may need to be put into place to ensure more voices are active during whole-group discussion, especially one that is managed by the students themselves, is three before me. Meaning,*

of furniture all together or just how much individually, and how they're both 144.

**Coach:** Who's following what she's talking about?

Raise your hand if you are following what she's talking about? There are some people who are not. Make sure your neighbor is following the conversation. Could you talk to this girl? Just talk to your partner real quick. Make sure that your partner follows.

*if you have an exchange or two with someone—you've put your idea out there—you must wait until at least three other people have spoken before you speak again. This is not a hard-and-fast rule but a guideline that can develop social awareness and help get more voices in the conversation.*

*At this point, I feel the conversation is becoming one-sided. It is between three or four students in the class, and we are losing the group. This is a signal that it is time for a partner talk. I check to see how many people think they are following and notice it is about half the class. I then direct the class to engage in a turn and talk with the explicit direction to "Make sure your neighbor is following." This signals the students who do know to ask the students who are not sure what they understand. Those who do understand have the opportunity to explain their thinking, which deepens their own thinking and gives the other students an opportunity to hear the ideas again.*

## Reflections

These two classes exemplify what it looks and sounds like when students internalize many of the habits of academic conversations. For example, students ask one another for further explanation, thereby mirroring the teacher move of *say more about that*, which is evidence that this has become a norm. They ask for clarification, correct one another's mistakes, receive correction gracefully, and use it to rethink their thinking.

The teachers and the coach are less concerned about getting through the lesson than having students make meaning of the problem. The teachers organically slow down to delve, notice when only a few students are vocal, and refocus the group to attend carefully and then to turn and talk. Additional moves, such as highlighting, summarizing, and chunking, are used, which build on the repertoire of *turn and talk*, *repeat back*, and *say more about that*.

There is always more we can do; the same dilemma of a few voices carrying the conversation emerges in this student-led discussion, as often happens with teacher-led discussions. One possible strategy for handling this situation, as suggested in the previous annotation, is to heighten student awareness about it and to offer a guideline in which students are instructed to wait until at least two or three others have spoken after them before making another contribution. Once students and teachers truly value the importance of talking through ideas as a key strategy for learning, they invent all kinds of moves that result in engaging conversations and deeper student understanding.

## CONCLUSION

Throughout this series, we looked at specific talk moves to engage students in rich mathematical discourse. We named the three basic talk moves *turn and talk*, *repeat back*, and *say more about that* and saw these moves in action in different classes. We provided annotated transcripts in which I named particular choices I made and reflected on my reasoning for those choices. What I may not have made explicit, however, is a belief system that underpins my choices and my approach to teaching.

Teaching is about developing the capacity of students to think for themselves about important ideas in order to navigate through our complex world intelligently. It is a teacher's responsibility to assist students to become compassionate, caring world citizens who know how to communicate well with people of all persuasions. These things are equally if not more important than the information teachers are presently asked to make sure students receive. Information is not knowledge, and information is easy to get these days. Applied knowledge, however, is earned through experience and interactions with others. Because I am aware of my beliefs, I can make informed choices about how and what I teach and defend those choices without being defensive when questioned about them. I am often challenged by some of the people I work with in schools when a lesson we planned didn't go according to plan, when I didn't have a summary meeting at the end of the lesson, or when we didn't meet an objective. At these times, my beliefs and the beliefs of other educators begin to surface and allow us an opportunity to examine and challenge our thinking and practices.

The ability to examine and challenge our beliefs and practices—to hold them out for scrutiny, to massage them and add nuance to them, even to discard outmoded ones—is what learners have. To help develop learners who can do these things, educators at every level of the system need to become effective communicators. In our interactions with one another, we need to be able to question our ideas, lesson plans, policies, and habits openly, candidly, and without defensiveness to be able to teach our students how to do so. We need to be able to hear one another's ideas without rejecting them before considering them. We need to learn to listen to one another with open minds if we are to understand one another. When we do this, we are truly in a learning stance and can learn anything we put our minds to, given enough time and practice. I want classrooms and faculty rooms to resound with this kind of dialogue, no matter the topic—math, science, pedagogy, policy, or purpose.

I realize that classroom teachers feel an enormous amount of pressure related to the policies of the past decade and often feel a need to get through a lesson, hit an objective, share a large amount of information in a short amount of time, and prepare for standardized tests. It is hard for many to slow down, listen to students, trust the process of learning, and allow the level of engagement with important ideas to determine the flow of the lesson rather than the clock. When we are clock driven, we often lose sight of what matters most—student learning—in the name of covering the curriculum. Stress replaces wonder, and conflicting desires maintain the status quo.

My experience has shown over and over that teachers and students learn best when they are asked to think for themselves, discuss ideas with others, experiment, grapple with concepts, and are given the space to think and even fail on the road to mastery. The road to mastery is strewn with approximations, detours, errors, and mechanical implementation before automatization, which comes from an internalized and well-practiced application of new skills. The journey builds stamina, a belief in one's capacity, and a visceral understanding that perseverance furthers in all endeavors. Traveling the road with other learners helps us discover the importance of perspective, tolerance, openness, and willingness to share ideas, skills, and encouragement.

The most exciting and fulfilling moments I have had as a teacher of children and adults alike are those in which we are all engaged in rich conversations around topics with no easy answers—the kind that continue long after the bell rings. Conversations in which something novel, interesting, and challenging is chewed on and leads to richer, deeper questions and innovation or understanding. Mathematics combined with meaningful discussion around relevant topics can arouse curiosity and generate all kinds of ideas and passion, even among people who openly claim “I am not a math person.” Being given time to think, to experiment, even to play with manipulatives or problems alone, with a partner, or in a small group, and then sharing one's wonderings, without having an immediate answer, keeps the door of curiosity wide open.

Would you rather be driven by the clock or driven by ideas? Is it more important to meet a narrow objective or to open wide the doors of inquiry? Either/or dichotomies just keep us stuck. Maybe the better question is, How can we make sure we really engage students in meaningful mathematical discussions and work through enough of the curriculum to ensure they understand the important ideas, practices, structures, and procedures to use mathematics well in their lives and to pass whatever tests they are faced with? That's a more interesting question that could spawn all kinds of conversation, which in turn might inspire innovation.

Adding talk to the equation in all subject areas, and at the adult as well as the student level, may lead us to new discoveries, not only in math but also in teaching and in learning.

## APPENDIX A TURN AND TALK: ONE POWERFUL PRACTICE, SO MANY USES

In the United States and Canada, educators agree that robust student academic discourse is vital for deep learning. It is also a practice we see far too little of in many classrooms. Standards for all academic areas emphasize the ability to communicate ideas, articulate reasoning, and listen respectfully to other perspectives as critical life skills no matter what the domain. Research from around the world validates the importance of dialogue as a key avenue for learning content with understanding and developing reasoning, social skills, and intelligence. Whether students are learning English as a second language, have language-processing issues, come from impoverished backgrounds, or are highly verbal upon entering school, they are all expected to engage in discussions using academic language and eventually to write in the content areas using appropriate terminology and sentence structure. Various researchers have linked academic success with the capacity to engage in conversation and to ask and answer questions in full sentences.

Many teachers simply do not yet know how to engage students in robust discourse that develops language and the capacity to reason in the content area. We have been studying classroom talk for many years and in many settings at all grade levels. We have learned to name specific moves teachers can make to engender higher levels of student talk. There are several useful moves. However, we think there are some very basic early moves all teachers can learn to use quickly and regularly no matter what their present skill level, academic expertise, or grade level. One of the most powerful and easy-to-implement moves is turn and talk, also called *think/pair/share*, or *partner talk*. These are variations of a practice that have far-reaching benefits for students. Turn and talk is a teacher-offered opportunity for students to turn to another student and talk something through for a brief period before whole-group discussion or lecture resumes. We have identified ten situations in which turn and talk is an appropriate pedagogical move and explain each one later in the text.

To effectively employ “turn to your partner and discuss” as a frequent and useful talk move, many teachers would need to rethink their instructional pace. Presently, many of us are clock driven. We may have five to seven minutes to launch a lesson, twenty to twenty-five minutes for students to work, ten to fifteen minutes for students to present their work, a few minutes for the teacher to summarize, or some variation of this scenario. Turn and talk requires a shift from pacing based on time constraints and mechanistic formats

to pacing based on cognitive demand and student engagement. It keeps student meaning-making at the center of the lesson and slows down the rapid-fire explanations and questions by teachers. It enables students to provide thoughtful responses. The lesson is no longer clock driven but is powered by the depth to which students are willing and able to think critically and engage in discussions about important ideas.

When we attempt to get students to talk to one another about content, the quality of the content in the lesson becomes apparent. You cannot talk about nothing. When the grain size of the lesson is too small, too factual, or too skills based, there is nothing for students to discuss. Most lessons we observe are too focused on small bits and pieces of information, which many students may already know, rather than on issues, big ideas, or essential questions. Literacy lessons are often lessons in practicing reading or writing techniques rather than true studies of literature, genres, authors, or media. Math lessons are often opportunities to practice procedures and skills rather than problem solve. Many students' exposure to science and social studies is in a textbook. To think deeply about content, there needs to be rich content to think about—puzzling, problematic, stretch-to-understand content—which can authentically surface disagreements, skepticism, confusion, belief systems, misconceptions, questions, and so on. Turn and talk can force teachers to rethink their lesson (and unit) design to ensure that lessons are cognitively demanding and challenge students to consider important, complex questions and issues germane to the content domain.

For some teachers, a significant shift away from teaching as the dissemination of information is required to increase the ratio of student-to-teacher talk. For students to share their ideas with their teachers and classmates on how something works, why a war was fought and whether war is ever moral, how to solve a mystifying mathematics problem, or what are the merits of a particular character in the historical novel, teachers have to refrain from doing the thinking for students. Instead, teachers can invite students to share their ideas and to think critically about the ideas and opinions of others. Teachers can, of course, infuse ideas into a conversation if, through student talk, teachers realize students are missing important aspects of the topic under discussion.

Partner talk is a safe place for students to consider one another's ideas, to articulate their own thinking, to question shaky reasoning, and to prepare to participate in a whole-group discussion. To use turn and talk effectively, teachers have to tell less to, and ask more of, their students.

## **Benefits of Turn and Talk**

1. Provides a safe space to practice sharing one's thinking
2. Develops the capacity to listen to others

3. Develops the ability to think about what one knows and to articulate one's ideas in ways that other people can understand
4. Develops the ability to ask questions to deepen one's understanding of what is being discussed
5. Develops the capacity to articulate an idea using new terminology
6. Develops confidence in one's own voice
7. Develops a learning environment in which all students are expected to participate and scaffolding is provided to ensure they do
8. Enables at least 50 percent of the students to talk in a given lesson
9. Can be used quickly, frequently, in any content area, at any grade level
10. Allows students to improve the ability to engage in reasoned discussion, an important life skill
11. Keeps meaning making at the center of the lesson

### Ten Clues That Indicate It's Time to Turn and Talk

**1. Agree/disagree/not sure.** Whenever there is a disagreement in the air, it is likely a good time for students to turn to a neighbor and take a stand. Students should be instructed to vote at the count of three in the following manner—*thumbs-up/agree*, *thumbs-down/disagree*, *thumbs-sideways/not sure* (or use clickers, which are part of technology resources in some schools). It is important to have individuals vote simultaneously and individually to minimize being influenced by others. It is also important to include *not sure* as an option to validate that it is okay to not know. In addition, if some students are not sure, they can now be the people to whom those with opinions address their reasoning to “convince” those who are on the fence of their point of view. This gives an active role to all students and develops the capacity to “argue” respectfully and use reasoning to convince others. It changes the norm from *the teacher is the source of answers* to *reasoning, thinking things through, and gathering evidence* as the source of finding answers or having informed opinions. It also helps students realize that having an opinion before one has enough information or understanding is not what thoughtful people do.

**2. Digest an idea that is under discussion.** A critical feature of classes that engender robust student discourse is that the pace of conversation is slower, more methodical, and deeper than the usual ping-pong pace of most classroom talk. In most classes, the teacher asks questions in rapid-fire succession and bounces from one student to another (usually those whose hands are raised). Each student answers the question in a word or a phrase, with little follow-up or probing by the teacher for further explanation from the student. Once an answer is given, the teacher often moves on to the next question. Rarely does the teacher check whether other students understand.

The practice seems to suggest that, as soon as the “right answer” is stated, it is assumed everyone understands, and we can fly through more information.

In contrast, there is a different dynamic in classes in which big ideas or essential questions are discussed. Usually, the teacher attempts to keep one main focus on the table and get several students to think aloud about the topic. To develop students’ capacity to think aloud in a whole group, the teacher can highlight the idea and ask students to turn to a neighbor to explain the idea to one another to ensure that all students are thinking about the same concept. If a student cannot explain the idea during turn and talk, that’s okay because there will be a whole-group talk in which the student will have another opportunity to hear the idea. Expectations are focused on engagement, which is central to meaning making. *How much of what has been presented do you understand? Do you have questions you could pose to help you understand more deeply?* This practice holds a high expectation that *all* students can in fact learn important ideas.

Students who can explain an idea to one another come to see what they understand and what they have questions about. Then, when the whole group reconvenes, all students can either explain the concept or ask a question about it. Learning to ask clarifying and probing questions is a high-level metacognitive skill needed for both critical and creative thinking.

**3. Explore an idea without expectation of mastery.** When a major idea comes up or a child puts forth a conjecture or generalizes beyond the specific example under discussion, it is helpful to use turn and talk as a barometer to measure students’ making sense of the idea. In this instance, pair talk is used to explore an idea that may initially be beyond the understanding of most students. Although pair talk gives students an opportunity to examine an idea, it is not expected that all children will master the idea under discussion by the end of the turn and talk. Because some ideas are beyond immediate understanding for the entire group, the whole-group discussion that follows turn and talk will help more students understand. If the idea is big enough or the question really essential, posing the question or posing the idea as a conjecture and returning to it over time is more likely the way that deep understanding will be facilitated.

**4. Time to rehearse before sharing.** Teachers can prompt students to think about an idea or problem or make a hypothesis or conjecture and share their idea or thinking with a neighbor to prepare for a discussion with the whole group. This move can develop self-confidence because it allows for reflection and practice in articulation in relative safety before having to expose ideas in a large group. This move can also ensure that students will have more to say because they have had a chance to think before engaging in a whole-group dialogue.

**5. Gathering prior knowledge.** When launching a unit, a new topic, or a new vocabulary, or examining a word problem prior to solving it, students can be asked to think about what they already know about the topic and then turn to a partner and list all the things they know. When the whole group reassembles, a collective class list can be created from the partner talk more rapidly and with more students' input than if this process is done only as a whole-group activity from the start.

**6. Wondering.** Learning to ask questions is a critical life skill and one students seem to engage in less and less the longer they are in school. When a new topic is introduced, students can be asked to turn to a partner and list questions about the new topic. Again, this rehearsal time with a partner gives reticent students in a whole group or who lack confidence or questioning skills a chance to engage in a low-risk manner. In addition, if they are carefully paired with students who are a bit more verbal, they can hear a few questions that might generate some of their own. In the worst-case scenario, they can contribute one of their partner's questions to the whole-group discussion. Although some may argue that this is not developing the capacity of the reticent student, we would disagree because having something to contribute (e.g., speaking a question in a full sentence to a whole group) is likely to be more of a contribution than the student would have made without the scaffolding. With enough practice and encouragement, shy and English language learners contribute more of their own ideas—first in pairs and later in the whole group.

**7. Preparing to write.** We are often able to verbalize before we are able to write. When an idea has been discussed for some time and the teacher wants students to write their own definition or explanation of the concept, it is sometimes helpful for students to turn to a neighbor and say verbally what they intend to write. Students could then write down their responses. Partners can exchange papers and help each other improve their written work by reading the written responses aloud for meaning. Often the process of reading aloud exposes left-out words or incomplete thoughts, and students can self-correct as a result. Partners can also offer each other suggestions for improvement. This process can be tried in a fishbowl format, in which one pair of students demonstrates the process, before requiring students to try it on their own.

**8. Teaching one another.** When an idea comes up for discussion and only some of the students seem to understand the concept, it may be time to turn and talk. If students are seated in groups of four, then through a show of hands, see whether at least one student in each group has some grasp of the concept. If students are in pairs, then through a show of hands you are looking

for approximately half the group to have some sense of the idea under discussion. A teacher can find this out very easily by asking, *Who understands what we are talking about well enough to explain it to someone else?* If just a few students respond affirmatively, then one or two students who understand can explain the idea again to the whole group, and the teacher can ask for another show of hands. After hearing the idea again, more students may now be ready to explain the idea to a partner. This sends a strong signal that everyone can—and is expected to—make sense of important ideas under discussion.

**9. New language.** When you want students to try out new vocabulary, have them explain the meaning of the word to other students in their own words. Have them turn to a partner and use the word(s) in a sentence or story.

**10. Deer-in-headlights response.** When you ask a question and your students look at you like a deer in headlights, assuming it is a well-phrased question, give students at least ten seconds to think and then have them turn to a neighbor to see whether they can together come up with an answer to the question. Then resume a whole-class conversation about the question.

## Pitfalls in Facilitating Turn and Talk

Mistakes that teachers make when they first begin using turn and talk include the following:

**1. Giving students too much time to talk.** Turn and talk is short, lasting about thirty to ninety seconds, depending on the meatiness of the topic. If it goes on too long, it can lead to students talking about irrelevant topics and to misbehavior. Longer periods of talking to a neighbor are beneficial when you want students to grapple with an idea, discuss various perspectives of an issue, or dive deeply into dissecting a problem. However, perhaps it would be helpful to give these types of discussions a different name—sustained discussion or *mini-dives* or something that indicates that students will be given a substantive amount of time to think and discuss a question in depth. The teacher's role and purpose in these types of dialogues differ in the sense that the teacher may actually engage with specific groups during the discussion, take notes on what students are saying, and use those notes to orchestrate a whole-group discussion or informally assess students.

**2. Asking students to talk about nothing.** To have a successful turn and talk, there needs to be something worth talking about. The topic should generate disagreement, require analysis, create confusion, and stretch the students' thinking.

**3. Not making your expectations clear.** Clarify what students are expected to do during a turn and talk. Students who are not accustomed to engaging in this practice need specific examples of what turn and talk looks, feels, and sounds like. For example, “I want you to turn to a neighbor and tell your neighbor whether you agree or disagree with what was just said, and why. Give at least one reason for your thinking. Then listen to your neighbor’s opinion and reason. I’m going to call on someone to tell me what their neighbor thinks. Go.” You might also tell them what signal you will use for them to stop talking to their partner and turn their attention back to the whole group.

**4. Getting sucked into individual conversations and losing the timing.** In an effort to hear what students are saying and perhaps know whose idea to highlight, teachers often listen in on conversations. The problem occurs when they actually engage with a pair of students and get involved in the conversation, rather than just listening in. The exception to just listening in might be when you notice that two students are not talking to each other. In that event, it is helpful to confer and give them a little nudge to help them get started. As soon as they do, walk away and let them talk.

### Tips for Facilitation

1. Set clear expectations.
2. Observe the process as students engage in it and give descriptive, immediate feedback in relation to the process. For example, “I notice that now everyone is turning to look at his or her partner during turn and talk. That’s a real improvement. The next thing we need to work on is making sure both partners get a chance to speak.”
3. Circulate quickly to “eavesdrop” on one, two, or three groups, but do *not* linger or engage in the conversation with those groups. Select one of the groups you overheard to start the whole-group conversation based on what you want to highlight.
4. Keep it short—about thirty to ninety seconds.
5. If there are pairs that consistently do not talk, then go directly to that pair as soon as the class is in think/pair/share mode and jump-start the conversation with the pair you have identified as not participating. You can jump-start by restating the question and asking one of the students what they think. Turn to the other student and say, *What do you think about what was just said?* Do not say, *You weren’t listening.* Instead, repeat the question or directions and sincerely ask the students to tell you what they think. If that doesn’t work, ask the students if they are confused or uncertain and then probe their confusion. Tell the student pair that you expect them to listen to the other students’ ideas when

- you bring the group back together and then you are going to ask them again what they think. This gives them a clear expectation and a heads-up. It holds the standard high and encourages them to participate.
6. Do *not* lose sight of time for the whole group when eavesdropping or interacting with individual pairs of students. It's better to leave them wanting to say more to each other than to have them run out of things to say and start talking about other topics or getting distracted.

Some version of turn and talk is often used in literacy lessons; yet, teachers rarely transfer the practice into mathematics, science, or social studies classes. It is an essential practice that should be used in any content area and at all grade levels. We use it often when working with adults. We hope we have laid the foundation for using this powerful move in all content areas and many times throughout the day. This practice is the beginning of building academic discourse among students of any age and in any setting.

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Metamorphosis Teaching Learning Communities

# APPENDIX B TALK MOVES FOR CLASSROOM DISCOURSE

## Set Clear, Explicit, and High Expectations for Both Speakers and Listeners

To create an environment conducive to learning, establish conversational norms that teach students how to engage in discussions. My preference is to create a list with student input by asking them what they think would be important as they respectfully converse and adding items to the list that are important. This list, along with sentence starters such as, “I agree/disagree with \_\_\_\_\_ when he said \_\_\_\_\_ because,” can be posted as anchor charts to refer to when we are building the culture of dialogue.

Conversational norms for student discussions follow:

- Face and look at the speaker.
- Speak loud enough for everyone to hear you. (The teacher does not repeat for the student when the student cannot be heard; instead, the teacher instructs the speaker to try again.)
- Signal for the speaker to speak louder if you cannot hear.
- Focus on what the speaker is saying and do your best to understand his comments.
- Listen so well you can restate the speaker’s point or ask a clarifying question.
- Be prepared to be called on whether or not you volunteered.
- Be prepared to restate what was said prior to agreeing, disagreeing, adding on, or changing the topic.
- Wait patiently while others think and prepare to speak or sort through confusion.
- Be willing to assist others when asked and to ask for help when you are not following.
- Ask questions until you understand.

## Basic Talk Moves That Cultivate a Learning Environment

- **Tell us more.** No matter what a student’s response is to a question or comment, ask her to *say more about that*. Whether a student has given a right or a wrong answer, ask him to explain his thinking and stay with the student for several exchanges until he fully explains his idea.

Explicitly state that you want students to articulate their ideas in full sentences and as clearly as possible. Remind all students to focus on the speaker because you will ask one of the students to repeat the point, idea, or disagreement.

- **Get a student to restate.** Select a student to restate the idea under discussion, and if the student is not able to, tell her you will come back to her after you get someone else to restate, and then remember to come back to the original student. You may need to get two or three students to restate to make sure all students have an opportunity to get their minds around the idea under discussion. Remind them that you can call on anyone and that it is their job to listen well enough to restate or ask a clarifying question. When about half the class seems to have a handle on the topic of discussion, you can then try a turn and talk to provide an opportunity for all students to understand the idea.
- **Turn and talk.** Ask students to turn to a partner and discuss the question, idea, or argument. Use this move often and for many different purposes throughout a lesson. Use it to digest, to explore, or to expand an idea under discussion, to share prior knowledge, to rehearse for a share out, or to give students a chance to teach one another. Make sure everyone has a partner and everyone is either talking or listening. Listen into conversations without interfering to hear student thinking and to decide who to choose to start the conversation when you return to a whole-group format.
- **Ground the conversation.** On a board or a chart pad, write the points students are making or the processes they are explaining or provide some kind of visual for students to refer to as they respond to one another's ideas.
- **Record mathematical terms.** To help develop academic language, write mathematical terms as they arise in a conversation. Keep the terms front, center, and visible so students can incorporate them into their explanations both orally and in writing.

### More Talk Moves

- **Infuse language.** When students use colloquial language instead of academic language, restate what the student has said, infusing academic language and writing the new term on the board. Then ask someone to restate so that the new terminology starts to be used organically during the conversation.
- **Check for understanding.** When students' explanations are not clear, try paraphrasing what you think they mean and ask them to confirm that you are correct. Maybe ask them to try again to help you and the class understand their perspective. Sometimes, when a student is having difficulty understanding, you can ask whether anyone in the class

thinks they understand and can paraphrase the idea for the rest of the class. Then be sure to check with the original speaker to see whether the restatement is accurate.

- **Encourage and nudge.** When students understand a part of an idea, are on the right track, offer an idea, and then back away, encourage them to stay with it. Nudge them to restate what they thought they heard and check for understanding. Then nudge them to explain their thinking and let them know that taking these kinds of risks is what learners do. Recognize and acknowledge their courage.
- **Reroute questions.** When students ask you questions, reroute them to the class: *What do the rest of you think?*
- **Feign confusion.** To keep conversations going, to highlight discrepancies in thinking, or to get students to become more articulate, pretend you aren't following their reasoning. Get them to try again, and ask others to help explain. Then summarize the idea. In this way, you model what learning looks and feels like while at the same time making it safe for students to speak up when they don't understand.
- **Set up arguments.** When there is more than one answer or when there are different perspectives being expressed, write down the different answers or highlight the different points of view and then ask students to take a stand. This is a good time to use simultaneous thumb signals (agree, disagree, not sure). Give each group a role: Students who are unsure will need to be convinced by other groups who will need to express their arguments to the students who don't yet know what to think. Call on a student to defend his or her point of view and then turn to a student who doesn't yet understand and ask whether he or she has been convinced. If not, why not, and if so, why?
- **Allow struggle.** When a student has difficulty explaining, allow him or her to struggle a bit but not to the point of frustration. Leave him or her with something to think about or to puzzle through, rather than giving the answer or explanation. Encourage them to keep thinking and tell them you will check back with them. Make sure to come back and check in to see where they are in their thinking, and, if needed, ask the class to explain.
- **Rehearse with reluctant students.** When you are aware that particular students rarely contribute to small- or whole-group discussions, talk with them privately before a whole-group discussion and ask them to tell you something they know about the topic. Then tell them you would like them to share that knowing with the class, and you will call on them first to do so. Or if they say they don't know anything, help them shape a question they can pose to start a class discussion. Have them rehearse the question with you and then encourage them to ask their question to the class.



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For more than twenty years, Lucy West has been studying mathematical classroom discourse. She believes that teachers need to understand what their students are thinking as they grapple with rich mathematical tasks and that the best way to do so is through talking and listening. *Adding Talk to the Equation* helps teachers learn how to skillfully lead math conversations so all students stay in the game, stay motivated about learning, and ultimately deepen their understanding.

This video features five case studies filmed in grades 1–6 and shows teachers at various stages in their practice of generating and managing rich mathematics conversations. Lucy emphasizes the progression that occurs as teachers get more comfortable with new talk moves and as they learn to tune in and respond to the math conversations taking place among their students. Although these discussions occur during math instruction, the strategies used to create an environment for respectful, productive discourse can be applied to any subject area.

The video segments examine the importance of creating a safe learning environment; the value of thinking, reasoning, and questioning; the role of active, accountable listening; and the necessity of giving all students a “You can do this” message. Lucy also emphasizes that slowing down, even in the face of time constraints, is crucial for creating a classroom where all students feel they have something to contribute.

The companion guide includes transcripts of all of the case studies, with detailed commentary from Lucy that gives you a window into her thinking and the complexities of the work she is doing with teachers, as well as her reflections on missed opportunities.



**Lucy West** has worked in education for more than thirty years, starting as a second-grade teacher in New York City, then serving as the director of mathematics for District 2, the deputy superintendent of Region 9, and assistant principal of PS 234. Her company, Metamorphosis: Teaching Learning Communities, Inc., is dedicated to partnering with districts to design and enact effective professional learning initiatives that result in increased student learning through improved instruction. Lucy is also the coauthor of *Agents of Change: How Content Coaching Transforms Teaching and Learning* and *Content-Focused Coaching: Transforming Mathematics Lessons*.



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