

Questions for Discussion and Reflection

Chapter 1: An Overview

1. One of the key skills you will develop in using this book is the ability to work with students whose contributions are initially unclear, helping them move toward clarity. This kind of work is not easy at first. To prepare for this, try to recall a time when you could not explain your thinking to others because the ideas you were dealing with were new and complex. What would have helped you at that time?
2. This book will also help you develop the ability to tell when talk in your classroom is academically productive. Can you recall a time when you held a discussion in your class that was not academically productive? What happened? What was it like? Can you recall a time when you held a discussion that was academically productive? What were the qualities of that discussion? Do you remember anything you did to make it productive, or did it just seem to happen spontaneously?
3. Think back in your own education. Can you recall a teacher who made you feel that he or she really wanted to understand what you had to say? Try to picture a conversation with that teacher. What was it like?

Chapter 2: The Tools of Classroom Talk

1. For many teachers, the thought of using partner talk as many times as Mr. Harris does in Case 4 may seem disruptive. Go back over the case and consider other ways the discussion might have been conducted. In your own use of partner talk, have you found positive results? Have there been drawbacks? If so, how could you address the drawbacks?
2. One of the main goals of using classroom talk moves like those described in this chapter is to manage the unavoidable complexity



- and lack of clarity that occurs when students are learning something new and complicated. Consider each of the five talk moves. Could each be useful when you are faced with a student contribution that is completely unclear? Or are some better than others? Construct a situation in your classroom in which you are faced with an uninterpretable response and describe what you will do.
3. In the cases in this chapter, and throughout the book, you will see instances of students making assertions or observations that are mathematically incorrect. In many cases, because the emphasis is on sustaining student discussion and developing deeper understanding, the teacher chooses not to correct or call attention to these mistakes. What are some of the consequences of such choices? Have you had this experience? How did you deal with it? How might you deal with it in the future?

Chapter 3: Mathematical Concepts

1. This chapter examined the complexities of talking about mathematical concepts. What is a math concept? How are concepts different from skills? For each of the teacher/student vignettes, make a list of the concepts that were discussed.
2. One of the benefits of talking about concepts is that students' misconceptions or confusions often are revealed. Describe some examples from your own teaching experiences in which you learned about a student's misconceptions. For one example, give suggestions on how talk might be used to help students address the misconception.
3. Pictures and models can help students build relationships as long as the salient features of the picture or model are clearly understood by students. How did Ms. Sanchez use classroom discussions to help students understand the pictures of the parallelograms and the relationships between the dimensions and area?

Chapter 4: Computational Procedures

1. Reread the section on Mrs. DeFreitas's fifth-grade class discussion about the three possible answers to the multiplication problem. She chooses to post the three possible answers using letters. It is also possible to set up a discussion using the student names associated with

- claims or predictions. Can you think of occasions when one approach might have clear advantages? When might that approach have disadvantages? How do you decide which one to use?
2. After the vignette about Ms. Webster's third-grade discussion of regrouping in subtraction, we make the following claim: "Talking about computational procedures can do more than clarify students' understanding of the ins and outs of those procedures. It may actually promote a more profound understanding of the numbers and mathematical operations at the center of those procedures. In other words, at the same time that talk is building facility with procedures, it may deepen conceptual knowledge as well." Consider Ms. Webster's discussion, or others in this chapter. Do you see evidence for our claim?
 3. Sometimes teachers do not want students to discuss errors or misconceptions. What types of errors or misconceptions would you want students to discuss? Why? What type of errors or misconceptions would you rather not discuss? Why?

Chapter 5: Solution Methods and Problem-Solving Strategies

1. Make a list of the problem-solving strategies you think are most important for students at your grade level to be able to use. Write or find a mathematics problem that uses the math you are currently teaching and can be solved using two of these strategies. Design a talk lesson around this problem. See Chapter 9 for planning suggestions.
2. We stated in this chapter that representations can be powerful tools for mathematical thinking. Give an example from your own teaching or this chapter in which a representation (e.g., a picture, manipulative material, graph, equation, or word problem) clearly helped a learner understand a relationship or mathematical idea. How can talk be used to extend an individual student's insights to other members of the class?
3. Sometimes a student whose confidence is quite fragile will present a solution method that is deeply flawed. What might teachers do to help the class see that discussing different solution methods, right or wrong, helps move everyone toward understanding the mathematical truth of the situation? How do we do this and be sensitive to the individual needs of students?

Chapter 6: Mathematical Reasoning

1. National organizations and reports have highlighted the importance of algebra and algebraic reasoning. In the vignette, what did Mrs. Malloy do to focus the discussion on important algebraic concepts and skills?
2. Why talk about reasoning? Can students in grades K–2 reason about mathematical ideas? Explain.
3. Mrs. Wolfe spent a lot of discussion time analyzing the matrix. What are the benefits of spending time discussing representations?
4. Students often have difficulty understanding negations. Find another matrix logic problem in which some clues involve negations (e.g., the use of the words *none*, *no*, *not*, etc.). Describe the problem as if you were running a class discussion with students. What should you tell students? What should they figure out on their own?

Chapter 7: Mathematical Terminology, Symbols, and Definitions

1. Can you recall examples from your own teaching where the everyday meaning of a word seemed to cause difficulties with students acquiring the mathematical meaning of the word?
2. Can you recall examples where student knowledge of the everyday meaning of a word helped them understand the mathematical meaning of a word?
3. Consider the meaning of the equal sign in mathematics. How might you define *equal* for students at your grade level? What will your students say the symbol means? Are there particular problem contexts in which we use the term *equal* but perhaps shouldn't? If there are potential confusions at your grade level, how could you plan a discussion that might clarify these?
4. Reread the vignette about Mr. Radulfo's class discussing two-dimensional and three-dimensional shape names. Imagine that they continued talking about cylinders and a student asked how many faces a cylinder has. Mr. Radulfo suddenly realizes that he does not know how many faces a cylinder has! Is it the two ends only, or does the surface of the curved part count as a face? Math discussions sometimes lead to territory where the teacher is not sure of the correct answer. What could he do in this case? What would you do?

Chapter 8: Getting Started

1. Ensuring equitable participation is not always easy. Discuss some of the major obstacles that you face in getting everyone to participate in your classroom, within your school. What kinds of practices or routines could help mitigate your particular set of obstacles?
2. If you are reading this book, chances are that you have tried to use discussion in your classroom before. Can you recall students who had trouble participating in the past? Discuss personal, cultural, social, psychological, or medical issues that might lead to some students not talking at all, or talking too much. Discuss your attitudes and feelings about these things. Identify one or two of the most difficult situations and think about ways to deal with them if they should arise.
3. We have stressed in this chapter that students must feel safe from ridicule or they will not participate. What if you begin to use classroom talk in the ways described in this chapter and some students do not cooperate? Do you and your school have a behavioral system in place that will support you in instituting a zero-tolerance policy for disrespectful behavior? What are the procedures? Is it clear how you would use them in your classroom?
4. It is sometimes more difficult to implement a change in your pedagogical practice if you do not have support from your fellow teachers. If more than one teacher at your school is working on using classroom talk to support math learning, how can you work together to support one another, given your time constraints and resources? What aspects of the five principles covered in this chapter could you help one another implement? Can you involve your principal or department head in your efforts? How?

Chapter 9: Planning Lessons

1. Some teachers find that the Asking Questions part of planning is the most challenging because they aren't sure what questions to ask. Describe what is meant by high-level questions. What resources are available to teachers to help them determine the mathematical goals and related high-level questions when planning?

2. If you have tried using discussion in your classroom, describe what you found was most helpful in planning the use of talk. If you have not yet tried to use talk with students, write a talk lesson plan using the components described in this chapter.
3. In the discussion about the degrees in a circle, Mrs. Carlson did not tell A. J. the “right” answer. She was not the authority on the correctness of the answer. Instead the mathematical logic presented by Arjun and Andrew was used to explain *infinity* and *justify conclusions*. It can be unsettling for a teacher to not be the person who tells students they are right or wrong. What are the benefits of using students’ reasoning to justify the correctness of a solution?
4. Write a talk lesson plan that could be used to continue the lesson in this chapter on deriving the area of a circle from the area of a parallelogram.

Chapter 10: Troubleshooting

1. Which of the challenges described in the first part of this chapter have you experienced? Which of the authors’ suggestions helped you overcome these challenges? What other strategies have worked?
2. Calling on students is a particularly emotional and complex issue. What do you think about calling on students who have not raised their hands to speak? Do you think calling on them is an effective instructional strategy? Why or why not?
3. The authors describe what happened when they asked their students to react to the use of productive talk in math class. Ask your students what they think about talking in math class. Specifically, ask them to describe how they think talk has or has not helped them learn math.

Case Study 1: Grade 3: Looking at the Shape of the Data

1. This case study highlighted the importance of setting up a respectful, supportive environment for mathematical discourse. What has helped you and your students create and maintain such an environment?
2. What strategies have helped your students get better at listening to each other during a whole-class discussion? What hasn’t worked?

3. How have you reacted when a student (such as Martin) makes a disrespectful comment during a discussion? What has worked? What hasn't worked?
4. After teaching her lesson, Mrs. Robert wrote notes to prepare for the next day's class. If you were Mrs. Robert, what would you write in your notes? What strategies might she use to increase the productivity of the next day's discussion?

Case Study 2: Grade 5: Algebra

1. At the end of the class, Ms. Nolan herself raised one of the points listed under the section titled "Anticipating Confusion" in her lesson plan. Which of the other points listed under "Anticipating Confusion" came out in the lesson? How were they dealt with? Were there other confusions that arose that Ms. Nolan hadn't planned for?
2. The students used a question mark symbol in the sentence $? \times 25 = 2.00$ instead of a more formal symbol, such as x . Ms. Nolan did not encourage them to use a more formal symbol. What do you think about this decision? What other decisions might Ms. Nolan have made here?
3. Look back at the questions Ms. Nolan listed in her lesson plan under "Asking Questions." Did she ask each of these questions in the discussion? After seeing what occurred in the lesson, what other questions should she write here?
4. Find at least one line in the dialogue when Ms. Nolan asked a student to repeat a classmate's statement. Why do you think she chose to use this talk move at this point?
5. Find at least one line in the dialogue when Ms. Nolan used revoicing. Why do you think she chose to use this talk move at this point?

Case Study 3: Grade 6: Fair or Unfair

1. The agree-or-disagree talk move is prominent in this case study. Look back through the dialogues for one example of the agree-or-disagree talk move. Why do you think Mr. Donnell chose to use this talk move at this point in the lesson?



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2. We certainly don't want to ask our students whether they agree or disagree with every comment. What criteria can help you decide when to use this talk move?
3. In Line 50, Liam explains that he disagrees with Deanne's idea of fairness. However, Deanne's idea of fairness is correct. Describe how Mr. Donnell handles this situation. What else might he have done to help Liam and his classmates understand?
4. Responding to a student who disagrees with a correct notion or agrees with a flawed or incorrect idea can be tricky. Think back to a time when either of these situations occurred during one of your whole-class discussions. How did you respond? What worked? What didn't work?

