

Contents

	<i>Acknowledgments</i>	vii
	<i>Chapters and Questions</i>	ix
	<i>Introduction</i>	xix
One	<i>Preparing for a Successful Year</i>	1
Two	<i>Planning for Instruction</i>	7
Three	<i>Creating a Productive Classroom Environment</i>	29
Four	<i>The First Week of School</i>	44
Five	<i>Leading Class Discussions</i>	63
Six	<i>Incorporating Writing into Math Class</i>	82
Seven	<i>Using Manipulative Materials</i>	112
Eight	<i>Using Calculators and Computers</i>	121
Nine	<i>Assessing and Grading</i>	137
Ten	<i>Connecting with Parents</i>	154
Eleven	<i>Handling Homework</i>	175
	<i>Bibliography</i>	189

Chapters and Questions

One *Preparing for a Successful Year*

- 1 What's the best way to determine what math concepts and skills I need to teach for my grade level? 2
- 2 What should I know about the national math standards? 3
- 3 My instructional materials give me the direction I need for planning day-to-day lessons, so why is it important to consider national or state standards? 4
- 4 How might I think about scheduling in all of the topics I need to teach, and matching my curriculum, major projects, and assessments to scheduling constraints? 5

Two *Planning for Instruction*

- 5 What do I need to include when considering my instruction for the year? 8
- 6 My textbook seems not to include some concepts that the district considers important at my grade level or that appear on the standardized tests. What's the best way to handle this? 9
- 7 My textbook covers too much material. If I taught every lesson included in the book, I would need two years rather than one! What are some ways to combine chapters or topics to make the amount of material more manageable? 10
- 8 My instructional materials for students require them to do a lot of reading. What are some tips for supporting students who have difficulty with reading? 11
- 9 My instructional materials use a problem-centered approach to teaching math, and skills are embedded in the curriculum. Don't students need to know the basics in order to be successful with such materials? 12

- 10 How can I open up my skills-centered instructional materials and use
them to support students' mathematical understanding? 13
- 11 I hear a lot about the importance of number sense. What exactly is
number sense? And how does it relate to the basics? 14
- 12 Can number sense be taught? 15
- 13 How do I determine what my incoming students know? What kinds of
assessments should I give and when? 17
- 14 What about standardized testing? What topics are best left until
standardized testing is finished? And how can I use testing
information from the previous year to learn about my students? 19
- 15 Some of my students really struggle with math. What are some ways to
make sure that I meet their needs? 20
- 16 How do I address the needs of students who finish assignments
quickly and who are ready to tackle more complex work? 22
- 17 How do I encourage my students to become independent learners? It
seems as though the moment I finish giving directions, half the hands
in the room go up. 23
- 18 What are effective ways to structure my daily math period? 24
- 19 My colleague has his students complete a warm-up at the beginning of
class. Are warm-ups an effective teaching tool? 26

Three *Creating a Productive Classroom Environment*

- 20 What are the benefits of classrooms where students are encouraged to
work together to solve math problems and discuss their solution
methods? 30
- 21 How do I set up a learning environment in which students are willing
to take risks? 30
- 22 My colleague suggested that I talk with my students at the beginning
of the year about working productively together. How can I do this
without lecturing my students about the importance of
cooperation? 32
- 23 How can I support students in working together productively? 36
- 24 What tools or protocols support equitable participation in the math
classroom? 36
- 25 Sometimes when students work together, one or two individuals do
most of the work while the other members goof off. What are ways to
ensure individual accountability when my students are working with a
partner or group? 37
- 26 Students' contributions are sometimes dismissed or marginalized by
those in their small group who are perceived as being "smarter" or
more popular. How can I address this? 38
- 27 When my students work in groups, I sometimes hear them putting
each other down. What should I do when this happens? 39

- 28 My students can't handle working together. Why would I even want to consider letting them sit in groups? 39
- 29 I'm reluctant to have students come to the front of the class to share their thinking because I'm concerned that other students will be disrespectful. Is it really worthwhile having students present their thinking in front of the class? 40
- 30 I'm thinking about how to physically set up my classroom. I thought about putting the desks in rows. Another teacher suggested that I move the desks to form small groups. Is this organization recommended? 41
- 31 Should I let my students sit where they want? 41
- 32 What about assigning seats? 41
- 33 How often should I have my students change seats? 43
- 34 What sorts of things might I post on the bulletin boards in my classroom? 43

Four *The First Week of School*

- 35 What do students need to know at the beginning of the school year? 45
- 36 What are some of the things that I should consider when planning my goals for the first week of school? What general preparation is useful? 47
- 37 What might the first week of school look like? 48
- 38 It's only the first week of school and already I feel as if I'm losing the interest of some of my students. Some even say that they hate math! How can I turn things around? 54
- 39 I'd like to connect with my students' parents during the first week of school, but I don't have time to call all of them. What are some ways I can reasonably communicate with students' families? 56

Five *Leading Class Discussions*

- 40 What kinds of questions lead to quality class discussions? 64
- 41 How can I help my students become better at participating in class discussions? 65
- 42 What's a good way to introduce discussions in my class? 66
- 43 I'm comfortable giving my students problems to work on in pairs or groups and circulating around the class to help and guide them. But I'm not comfortable leading discussions with the whole class. I always seem to run out of time. Are whole-class discussions really that important? 67
- 44 I don't want to interrupt my students when they're working on a problem or an exploration, but I also don't want to skimp on class discussions. How do I carve out sufficient time for discussions? 68

- 45 What happens if I have difficulty following what students say when they present? 68
- 46 How do I decide who to call on during class discussions, so that I don't end up with the same students presenting over and over again? 71
- 47 What if nobody volunteers to share during the discussion? How do I get students to speak up? 71
- 48 During discussions with the whole class, sometimes the first student to share offers an idea that's sophisticated or complex, and the other students seem to shut down because their ideas aren't as fancy. Or a child shares something so esoteric, the discussion grinds to a halt. How do I facilitate discussions to keep the momentum going? 72
- 49 How do I establish a classroom atmosphere in which class discussion is valued? How do I help students learn respectful norms for interaction during discussions? 73
- 50 What's my role during a class discussion? What should I tell students about my role? 74
- 51 My students ask me why they have to explain their thinking all of the time. How should I answer them? 75
- 52 Occasionally when I ask a student to explain his or her thinking, the student shrugs and replies, "I just know." How should I respond? 75
- 53 How do I help students prepare for presenting their ideas in a class discussion? 76
- 54 I find it useful for students to show their work on an overhead when they present, but this process can be time consuming. My class period is only forty-five minutes. How do I maximize time for such presentations? 77
- 55 How do I help my students stay on task and focused during a class discussion? 77
- 56 I worry that students who struggle with math will find class discussions confusing and unhelpful. I've seen students who barely grasp one strategy simply tune out when other ideas are presented. 78
- 57 What about the sideline chatter that sometimes goes on when someone is presenting? 78
- 58 During class discussions my students' eyes glaze over at times and I suspect they are not following what is said. What are some ways to deal with this situation? 79
- 59 Students who make mistakes during class discussions are sometimes laughed at or taunted. How can I prevent this from happening? 79
- 60 How can I deal with students' mistakes or erroneous ideas during class discussions without making them reluctant to share in the future or, worse yet, turning them off math? 80

61 There are times when I make a mistake in front of the class, miscalculating or stating an idea incorrectly. What’s the best way for me to deal with this situation during class discussions? Could I use these occasions as a way to model for students how to handle making mistakes during class discussions? 81

Six *Incorporating Writing into Math Class*

62 Why is it important to have students communicate in writing in math class? 83

63 What ingredients are necessary to support adolescents’ writing in math class? 83

64 What types of writing assignments are appropriate? 84

65 I’m intrigued by the idea of having students write as they solve problems. What might this look like in my math classroom? 85

66 I think it’s important for students to describe, justify, generalize, and verify their mathematical thinking. But does this mean that students always need to write long explanations with complete sentences? 86

67 What help can I give my students in encouraging them to keep meaningful notes? 90

68 I understand why it’s important to have students write in math class. But how do I get my students to explain their ideas and thinking in writing? 93

69 What are ways to help students who struggle with writing? 93

70 I have a number of students who are just learning English, and they struggle with the writing I assign in math class. How can I best support them? 94

71 What’s the role of revision? Sometimes my students’ ideas are wonderful but there are many spelling and grammar mistakes in their writing. I don’t want to make students revise and edit every paper, but I do want them to understand the importance of good presentation. How do I strike the right balance between great ideas and good form? 95

72 How can writing be used as a vehicle to help my students reflect on their learning? 97

73 My teaching partner had her students write a “math autobiography.” She said that she learned a lot about her students by giving that assignment, and it helped set a positive tone for the year. What other kinds of general writing assignments might I consider? 105

74 What are some ways to help students learn math vocabulary words? 106

75 I’ve been pushing my students to write more thorough explanations when they are solving problems. What should I look for when I read their work and what kinds of written feedback should I give students about their writing? 107

- 76 Must I respond in writing to each student's paper? I'm concerned about the time commitment required. What are some other ways to communicate to students that I've read and carefully considered their ideas? 108
- 77 I'm tired of hearing my students complain when I ask them to write in math class. Why are they so negative, and how should I respond? 108
- 78 When I have my students write, some of them finish their work faster than others. How do I deal with students who finish early? 109
- 79 When students work together, will one paper from the two students suffice or should I have each student individually write up the assignment? 109
- 80 Where should I store all of my students' writing? 110

Seven *Using Manipulative Materials*

- 81 My curriculum requires the use of manipulative materials such as tiles, pattern blocks, and geoboards, but I'm concerned that my middle school students may consider them "babyish." How can I help them understand why manipulative materials are important for helping them learn math? 113
- 82 Using manipulative materials sounds intriguing, but I see a potential management nightmare. I can just imagine blocks and rubber bands flying across the classroom the moment they get into students' hands. How can I ensure that students stay on task when using these materials? 115
- 83 Do students really need time to explore the materials before using them for learning? 116
- 84 I'm concerned that my students won't take manipulative materials seriously as tools for learning mathematics. 118
- 85 How do I help students develop an understanding of the manipulative material they're using so it can be used as a mathematical tool? 118
- 86 I know that my less experienced learners will benefit from using manipulative materials, but do my most experienced learners really need them? 118
- 87 How often should students use manipulative materials? Should they be used daily? 119
- 88 What happens when students don't seem able to connect what they are doing with the manipulative materials to the problems they are expected to solve in their text? 119
- 89 What are efficient ways to store manipulative materials in the classroom? 120

Eight *Using Calculators and Computers*

- 90 How are calculators and computers changing math instruction? 122
- 91 What are the benefits of using calculators and computers in math class? 123

- 92 I know that there are several kinds of calculators available, such as scientific and graphing. How do they differ and what kinds of calculators should adolescents use? 124
- 93 Should students use calculators instead of using paper and pencil and mental math? 124
- 94 Can calculators really be used to support the development of students' number sense rather than hinder it? It seems like some students use the calculator as a crutch. 125
- 95 How can I help my students become more proficient with their basic facts so that they don't always grab a calculator to compute problems they should be able to figure mentally? 128
- 96 What are ways to teach students how to use a scientific or graphing calculator? 130
- 97 My school doesn't provide calculators for students, so they bring their own from home and they're all different kinds and brands. What should I do about dealing with the differences? 131
- 98 Our school provides calculators for students. A colleague told me that he doesn't make them available to students anymore because they didn't take proper care of them—too many were damaged, destroyed, or stolen. I want my students to have access to calculators. How do I encourage their proper use? 132
- 99 How do I make sure that my class set of calculators remains in the classroom when the bell rings? I don't distrust my students, but I can see them accidentally walking out of class with a graphing calculator. 133
- 100 Calculators and batteries are expensive! How can I obtain them without spending my own money? 134
- 101 What are some effective uses of computers in math class? 134

Nine *Assessing and Grading*

- 102 I'm interested in regularly assessing student understanding to help me make better teaching decisions; I don't want to rely solely on the end-of-unit test. How can I make assessment an ongoing part of my teaching practice? 138
- 103 A teacher at my school recently attended a workshop on assessment, and came back talking about "summative" and "formative" assessments. What do these terms mean? 139
- 104 What role does teacher observation play in assessment? I often feel like I learn a lot about my students when I observe them as they work on a math problem or share their ideas during a discussion, and I want to formalize these observations. 139
- 105 What are some ways besides multiple-choice tests, which seem to have many disadvantages, of finding out what an individual student knows and can do? 141

- 106 Communication is an important area in math instruction. How can I support my students in becoming more proficient at communicating on assessments what they understand? 141
- 107 I've noticed that my students learn from one another when they work together. As a result, I've sometimes assigned a group project to my students. I'm thinking I can do the same with regular assessments, such as quizzes or tests. What are the benefits of working on an assessment together and what tips can you suggest about determining who should work with whom? What about grading the collaborative work? 142
- 108 My colleague allows students to retake assessments. Is this practice advisable? 143
- 109 Should students' assessments be stored, and if so, how? 144
- 110 I've experimented with a variety of methods for scoring students' work and assessments, and many seem complicated, especially when you have a lot of students. What are some tried-and-true methods for scoring student work and assessments? 144
- 111 Should I grade or score every assignment? 146
- 112 How should I score homework? I bring home more piles of homework papers than any other kinds, and I know there are more efficient ways to manage the flow than going through a huge stack each evening. 146
- 113 How should I prepare students for the tests that the district or state requires? 147
- 114 How do I help my students prepare for standardized assessments? 148
- 115 What kinds of strategies can I teach my students to use when taking multiple-choice tests? 149

Ten *Connecting with Parents*

- 116 What are some effective ways to connect with parents of adolescents? 154
- 117 A math colleague of mine who teaches at another school has no trouble getting most of her parents to attend Back-to-School Night. At my school, however, in a typical year only about a fourth of the parents show up. How can I encourage more parents to attend Back-to-School Night to learn about their child's math education? 155
- 118 What general guidelines will help me prepare for Back-to-School Night? 155
- 119 I have enough time at Back-to-School Night to do an activity with parents. What kinds of activities might I include? 156
- 120 I don't have enough time at Back-to-School Night to do an activity with parents. What should I be sure to address? 160
- 121 What kinds of handouts about my math program would be most helpful to prepare for parents at Back-to-School Night? 161

- 122 A math teacher in my school sends home regular letters to parents. I'd like to try this, but it seems like a lot of work, and I'm not sure all of my students would take the letters home. Is the payoff of using parent letters worth the trouble? 162
- 123 How should I prepare for parent-teacher conferences? 163
- 124 What are effective ways to begin a parent conference? Should I ask parents what questions they have, or just begin discussing how their child is doing? 164
- 125 Some of my students' parents have told me that they dislike math. How can I ensure that they don't pass their attitude on to their children? 164
- 126 How can I support parents in helping their child with math at home? 165
- 127 What if parents tell me that they don't understand the math behind their child's classwork or homework? 166
- 128 A parent asked me why math instruction today is different from when they were in school. What might I tell them? 167
- 129 At my school, eighth graders are placed in either eighth-grade mathematics or high school algebra. Parents sometimes ask to have their child placed in the algebra class when my assessments indicate they truly aren't ready. How might I handle this sticky situation? 167
- 130 I routinely ask my students to explain their thinking both verbally and in writing. A parent challenged me about this, asking, "Why do students always have to explain their thinking? Isn't it the answer that's important?" How might I have best responded to her? 168
- 131 A parent told me that she heard that students no longer had to memorize their multiplication facts. She wondered what had happened to the basics. What should I tell her? 168
- 132 Some of my colleagues at other schools hold "math nights" at school. What do these events involve, and what are ways of ensuring their success? 169

Eleven *Handling Homework*

- 133 What are the purposes for assigning math homework? 175
- 134 Is it beneficial to always assign the same kind of homework, or should I introduce more variety? 176
- 135 How long should it take students to complete their math homework? 177
- 136 Getting students to complete their math homework is difficult. What are ways to encourage students to complete assignments? 178
- 137 What should I tell students to do if they get stuck while they're working on their homework? How can I involve parents in helping them? 180

- 138 My class periods are short, and reviewing homework that students have completed sometimes takes too much class time. But simply collecting and grading the assignments doesn't seem to motivate my students to complete their homework. What are some effective ways to deal with completed homework? 181
- 139 I'm overloaded with completed homework assignments! Is it really necessary to collect and read every assignment? 183
- 140 What should I do if students don't do their homework? 183
- 141 What about late homework? Some students don't do any homework during the quarter and then hand in a blizzard of math papers for me to score before the end of the grading period. 184
- 142 How should I score the homework that my students complete? 184
- 143 I teach 160 students a day. How do I organize the homework they turn in? 185
- 144 I like the idea of having students display their homework in class, but I don't want the next period's class to see it. How might I deal with this situation? 185
- 145 My eighth graders don't know their multiplication facts. Should I make them memorize them for homework? 185