Introduction: Redefining Practice

Teachers have always known that their students require opportunities to practice the things they have learned. Opportunities for practice are particularly important in mathematics. When children learn a new skill or concept in math without having had the time to put that new idea into practice, they tend to forget what they've learned.

Traditionally, practice has been synonymous with drill. The teacher models or introduces a procedure or math fact and then gives students worksheets full of problems so that they can "practice" over and over. The objective of this form of practice has often been memorization rather than understanding.

The purpose of *Minilessons for Math Practice, Grades 3–5* is to broaden the notion of what it means to provide students with practice in mathematics. Instead of focusing just on facts, procedures, and memorization, the goal of this book is to give students ongoing experiences that will help them practice math concepts, skills, and processes so that they may deepen their understanding of mathematics and apply what they've learned to new problem situations.

Another goal of the book involves broadening classroom opportunities to do mathematics. There is limited time in the school day dedicated solely to math. This book looks at ways to insert mathematics throughout the students' day. *Minilessons for Math Practice* offers ideas for quick activities that can be used in various contexts.

In addition, a goal of this book is to broaden the mathematics curriculum. Most teachers are required to use a district-adopted curriculum and have little extra time for supplemental materials. The activities in this book can be used with any existing math program to help students meet local, state, and national math standards.

Features of This Book

There are several key features in *Minilessons for Math Practice*. One is that the activities in it take little or no preparation. They are easy to implement. And the activities take only five to fifteen minutes to teach. Throughout the day teachers find themselves transitioning their students from one activity to another, from one place to another, or from one subject to another. These transitional times require teachers to focus the attention of their students so they can move smoothly through shifts in the day. The activities in this book convert these transitional times into rich mathematical events.

Another important feature is that all of the activities can be repeated. For example, many of the games in the book can be played throughout the year to give students ongoing practice with numbers and operations. *Looking at Data* can be repeated simply by changing the survey question so that students can continue to practice analyzing data as the year progresses. For *Guess My Rule,* you need only to offer students different numbers to compare. Or you might shift the *Guess My Rule* content area by presenting polygons, in order to give students continued experience with two-dimensional shapes, even after your unit on geometry is over.

The lessons in *Minilessons for Math Practice* focus on questioning and classroom discussion. While the activities in the book are engaging and fun, they become mathematically loaded when the teacher spotlights the key mathematical concepts and skills. This spotlight becomes a focal point for the students when the teacher asks challenging questions and helps students develop their own ways to express their thinking using mathematical language.

Organization of the Activities

The twenty-seven activities in this book offer experiences in all of the content areas important to mathematics: number, measurement, geometry, data analysis and probability, and algebra. As well, the lessons model how to develop several important math processes: problem solving, reasoning and proof, communication, connections, and representation.

See the contents chart following this introduction to identify activities that fit the content area of choice. Since many of the activities address more than one content area, the content area of focus for each vignette is highlighted in the chart with a bold **X**. Other potential content connections are noted with a small x.

The activities in the book each have eight components:

1. the content area(s)
2. materials
3. time
4. an overview of the activity and an explanation of the mathematics involved
5. step-by-step teaching directions
6. a list of key questions to ask students during the lesson
7. a brief vignette from the classroom that describes how we taught the activity
8. ideas for extending the activity throughout the year

Getting Started

The activities provided in this book have been field-tested in diverse classroom settings. They typically take fifteen minutes or less. However, when introducing the activities to your students, you might find you need more time. In some cases it makes sense to budget a thirty- to forty-five-minute time slot for the first presentation of an activity. Much of the decision will depend on your students' prior experience and your goals for the session. Once you've made the initial time investment, the activities should run smoothly in a five- to fifteen-minute time slot for the rest of the year.

The lessons in *Minilessons for Math Practice* are language rich, allowing students to develop, organize, and explain their thinking. However, the ability to communicate mathematical ideas is a skill that develops over time. Your initial discussions with your students might be briefer and less profound than you had anticipated. Don't be discouraged. Over time, with good questions and a safe environment, students will become more confident and more competent in discussing their mathematical thinking. This is especially true for English language learners.

The key questions listed before each vignette and the descriptions of classroom interactions within the vignette give examples of activity structures that maximize participation and develop mathematical thinking and language. Notice that we use different types of questions throughout the activities. Some questions focus students on specific solutions, while other questions focus students on multiple approaches, strategies, or techniques.

Since the activities are designed primarily for whole-class settings, we gave special thought to meeting the needs of diverse learners. The activities need to be accessible to all students while also being rich enough to engage all students at deep mathematical levels. Throughout the book, the

vignettes model ways to encourage participation by all students and ways to help students develop the language and communication skills necessary for math talk.

We encourage you to use the book flexibly and adapt the activities to best meet your instructional goals and your students' needs. You might use the activities to supplement your current unit of study in mathematics. Alternatively, you might use some activities in *Minilessons for Math Practice* to keep past math studies fresh in your students' minds. Another option is to use activities as previews or introductions to upcoming units of study.

We recognize that classroom teachers face more and more challenges each year as they struggle to help their students meet local, state, and national standards and perform well on standardized tests. We hope that the activities in this book will support you in these efforts and we encourage you to use the book in ways that best meet the needs of your students.

However you choose to use the book, we hope you find effective and fun ways to engage your students mathematically. We also hope this book helps open your students' minds to math throughout each day and throughout the school year.