



INTRODUCTION

Teaching Math to All Learners

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Another book on teaching math?

We knew when we set out to write this book that there were already several good resources available. We also felt, though, that too few were offered that focused on supporting students whose race, language, or socioeconomic or IEP status predicted a learning gap in math with their white and/or middle class gened counterparts. We wanted to explore the ways that math instruction might need to be **specially** focused when working with underserved populations.

In some ways — fundamental ways — teaching for all students is no different than teaching math well. The difference lies in the clarity, specificity, and “tightness” of instruction. While many children in low-poverty schools seem to achieve reasonably well with less-than-perfect instruction, evidence is pretty clear that children in high-poverty schools need excellent instruction from skillful teachers in the context of supportive administrative frameworks (Tapper, 2010). We will not address the question of administrative frameworks in this book, though that is an interesting question. Our goal is to focus on giving teachers tools they need to be skillful practitioners.

This book offers an approach to instruction for all students that is unique in three ways:

1. The use of inquiry to guide instruction.
 2. A strong focus on continuous formative assessment to understand student thinking and to inform instructional decisions.
 3. The use of a Main Lesson/Menu approach to lessons to address the need for both inclusion *and* differentiation.
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In Chapter 1, we’ll look at the theoretical framework – the underlying approach – to teaching math for all learners. We’ll look at how learners actually learn math and what teachers can do to facilitate that learning.

Chapter 2 examines an All Learners lesson. This book is focused on the instructional context and pedagogy that form the framework of teaching so that everyone can learn math with conceptual understanding. Through the use of an inclusive Main Lesson and a differentiated math Menu, we create a context for learning that can support success for a broad range of learners. Throughout this book we’ll reference the All Learners lesson model to situate activities and pedagogy.

One of the most important elements of creating success with mathematics is focus. A complete vision of math learning (as articulated by documents like the Common Core State Standards) is important for students to understand the breadth of math topics that will lead them to high school and beyond. But sometimes math learning in the U.S. can be “a mile wide and an inch deep” (Schmidt, McKnight & Raizen,

2005). At ALN we've done considerable work identifying the math concepts that will be most helpful for student success at each grade level. We've done this by parsing the concepts that will lead to success *in the next grade*. These concepts are called, *HLCs* or *High Leverage Concepts*.

Chapter 3 explores what HLCs are and how they might be used to support learning.

In Chapter 4, we explore the important formative assessment practices that support teacher understanding of student learning. Formative assessment is the heart of effective instruction because it asks the critical questions:

- “How does a student think about (or understand) a concept?”
- “What connections can a teacher make to further (or improve) this understanding?”

Without good formative assessment the creation of appropriate menu activities to support students is impossible.

In Chapter 5, we consider the ways in which student discourse supports, encourages, and facilitates instruction. We'll unpack a variety of talk moves that teachers can use during the Main Lesson, in small groups, and with individual students. The goal with this pedagogy is to help students find their own meaning with math concepts and be able to articulate that understanding for themselves and others.

Some readers of this book may also have read my earlier book on working with struggling math learners, *Solving for Why*. That book reviewed some basic challenges that students on IEPs face when doing mathematics. A number of teachers have put the principles from *Solving for Why* to use in their classrooms to support students with specific learning challenges. **In Chapter 6** we will dive into techniques some of these teachers have used. We'll also explore some general principles teachers use to create classrooms that support students with developmental delays, attention deficit, and specific learning challenges.

Chapter 7 is our take on the way mathematics can lead to greater equity among students. I'm fond of saying “math is the silver bullet.” That's because there is good evidence that being successful with math leads to greater opportunity both in school and in the greater world. At ALN, we believe that effective math instruction is an act that promotes greater social equity and opportunity for *everyone*. Chapter 7 will explore this idea.

We're making this manuscript available as an overview of teaching when the goal is for everyone to learn. We're making it available with the hope that teachers will find both the perspective and the techniques helpful for realizing the goal that every child can do math.

Who needs this book?

Teaching Math for All Learners is aimed at teachers who want to provide effective instruction for all the children in their classes. This book can be valuable for teachers who may feel overwhelmed by the array of learners they must support. The strategies the authors in this book advocate are aimed at a single goal – math for *everyone*. Most teachers are familiar with the notion that *most* children can reach *most* of the standards set for them. While to many this attitude seems “most realistic,” I believe it fails the American vision of what school should be – an education for *all*.

This book is not comprehensive in identifying all the techniques necessary to ensure that everyone learns, but it's a start. Teachers will find value information in these pages on how to meet the needs of learners whom they might have thought not capable enough. When we talk about all learners, we really do mean *all*, and our approach is our best set of tools to meet that goal.

Almost all teachers will have students in their classes with learning challenges of one kind or another. It's a wonderful fact that students come to school with a wide variety of knowledge and ability. This should be celebrated. The question is whether the schools are prepared to help students make use of what they bring rather than lamenting that they might be different. This book is an attempt to help teachers be prepared to support all the students in their classes to be successful with math – and the opportunities it affords.

References

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Tapper, J. (2010). *Making Meaning: Successful Mathematics Teaching Practices with Students in High Poverty Schools*. ProQuest LLC. 789 East Eisenhower Parkway, P.O. Box 1346, Ann Arbor, MI 48106. Tel: 800-521-0600; Web site: <http://www.proquest.com/en-US/products/dissertations/individuals.shtml>.

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