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BUILDING A MATH-POSITIVE CULTURE

*How to Support Great
Math Teaching
in Your School*

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Introduction

It seems that we see headlines almost daily reporting some change in educational policy at the national or state level. A leader who wants to see improved student achievement in mathematics may not know where to start. Will the standards change? What state accountability measures should drive our efforts? Do the experts agree on how to improve mathematics teaching and learning? Forces outside your school or district may seem to offer little in terms of a firm foundation on which to build programmatic changes. But a leader can still make a difference, even in this seemingly volatile environment. The nature of an effective mathematics program remains consistent in many ways, even as we need to make adjustments for the changing world our students face. A leader working with a group of committed teachers can support effective mathematics teaching and learning in several important ways, from providing a boost for a program already showing signs of success to instigating a more substantial turnaround.

Preparing students for their future calls for fresh thinking about mathematics teaching and learning. Many in the general population don't like math and consider it to be hard. While they may see the usefulness of basic arithmetic (although that skill is becoming less necessary as technological devices become more accessible), they may not see

the use for other types of mathematics, such as algebra. And many believe that math ability is something a person is born with—or without. Yet, quantitative skills are becoming more and more important for dealing with the pervasive use of data in our daily lives. The need for a renewed vision of vibrant, relevant mathematics has never been greater. And the need to sell the public—and even teachers—on the importance of broad and deep mathematics education presents not only a significant challenge but also a great opportunity for leaders.

Shifting the mathematics program in a school or school system is an ambitious task that can yield huge benefits for students. Leaders can effectively drive such an effort using some key tools, depending on their particular role and job responsibilities. They can build collective support around a new vision of mathematics, provide essential resources and support for teachers, and implement or encourage policies that nurture and sustain long-term improvement.

This brief book offers an overview of what an effective and successful mathematics program might look like at any level in the K–12 system, as well as examples of what a leader can do to support support that goal. We will consider the needs and abilities of the students we serve, the nature of the mathematics we want them to learn, the kinds of classrooms where that learning can best take place, the culture of schools where such classrooms thrive, and the first steps in a process for creating those schools.

To further explore how to create and support math classrooms focused on meaning and deep understanding,

see my companion volume for teachers, *Making Sense of Math* (Seeley, 2016).

What Does It Mean to Be Good at Math?

Mathematics seems to be unique in the attitudes it brings out in people. Many adults dislike mathematics, and many believe they are just not born to be “math people.” Unfortunately, that harmful belief seems to have been passed on to many students. In truth, there is absolutely no evidence to support the idea that mathematical ability is based on a “math gene.” Mathematics has many dimensions, and there are many ways to be good at math. We now know that anyone of average intelligence can learn mathematics if we teach it in appropriately engaging ways. Emerging work on the nature of intelligence and how people learn mathematics is helping educators reexamine old assumptions and beliefs about what it takes to be good at math and even what it means to be smart in general.

A Growth Mindset of Intelligence

Historically, two bodies of thought have dominated both research and public perception about intelligence. In the groundbreaking book *Mindset*, Carol Dweck (2006) describes two mindsets about intelligence—a *fixed mindset*