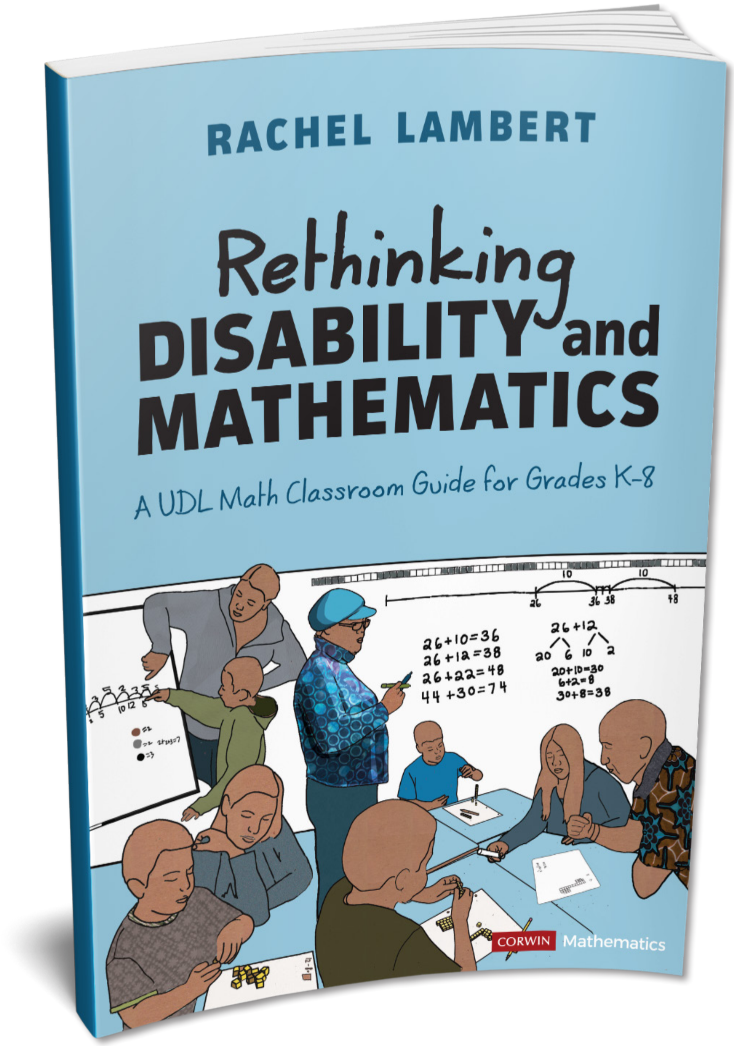

Thank you

FOR YOUR

INTEREST IN

CORWIN

Please enjoy this complimentary excerpt from Rethinking Disability and Mathematics.

LEARN MORE about this title!

CORWIN

Trust has been my key to becoming an effective math teacher. I trust that my students have the ability to make sense of math. I trust that they will arrive at the understandings they need at their pace. Trusting my students has empowered them. In my classroom, students know that I will not be coming to the rescue at the first sign of trouble because I believe in their own abilities. When they get stuck I redirect them back to themselves, "What do you know about numbers that can help you?" "It's hard," they tell me. "Yup, but you'll figure it out," and eventually they do. They do because through my trust, they trust themselves. We need to empower students to trust themselves.

—Sussan De Matta, fifth-grade special education teacher (Figure 1.1) ●

Figure 1.1 • *Sussan De Matta, fifth-grade special education teacher*

I begin this book with this idea, expressed by this exceptional math teacher, that when we as teachers trust in the thinking of our students, especially our students with disabilities, we create the conditions our students need to trust themselves as mathematical thinkers. When we, their teachers, believe that our students can and will solve complex problems, they will be able to.

In my work for almost 30 years in education, first as a general education and special education classroom teacher and now as a teacher educator and researcher, I have seen students with disabilities underestimated and over-scaffolded. These students are conceptualized as broken, as needing to be fixed. Their mathematical thinking is not trusted. Deficit conceptions of learners turn into deficit pedagogies that assume students cannot think for themselves. And these problems become intensified for students with disabilities who are Black, Latino/a, Indigenous, and/or multilingual.

This book is dedicated to overturning deficit pedagogies and returning mathematical agency to all students with disabilities. Mathematics can and should be a transformative space for these students, where they can discover their power and potential.

In this book, you will be invited into classrooms like Sussan's that provide students the space and support to allow students with disabilities to thrive as mathematical sense-makers. We will meet teachers who believe that all their students are mathematical thinkers and who design classrooms to build on students' thinking. We will highlight the mathematical thinking and brilliance of students with disabilities. We will frame these classrooms using Universal Design for Learning in Mathematics (UDL Math), which applies the theoretical framework of UDL to research in meaningful mathematics.

Before we jump into Sussan's classroom, you need to do some math! In order to appreciate the mathematical brilliance of the children, you need to tackle the problem first. So grab some scratch paper and get started. I recommend starting off, as children most often do, by drawing.

Try It

1. I have 12 cans of paint. I need $\frac{1}{4}$th of a can of paint to paint one chair. How many chairs can I paint?
2. What if it takes $\frac{3}{4}$ths of a can of paint to paint one chair? How many chairs can I paint with 12 cans of paint?

What did you notice about this problem? It's a tricky one, for sure. Some might start by drawing paint cans and chairs and then distributing $\frac{1}{4}$th of each can of paint to each chair. Some might find a ratio and work from there. Maybe some might think: If $\frac{1}{4}$th of a can of paint will cover 1 chair, then $\frac{4}{4}$ths of a can of paint will cover 4 chairs, and then they could multiply 4 × 12 to get the total. Some might have added or skip-counted the $\frac{1}{4}$ths until they got to 48. In that case, you might have seen this situation as

$$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4} = 48$$

Or perhaps as $12 \div \frac{1}{4} = 48$, thinking about it as how many groups of $\frac{1}{4}$ths fit into 12?

Although this is a division of fractions problem, that is often not initially obvious to either children or adults. The first two strategies I described use multiplication to figure out how many groups of $\frac{1}{4}$th. For a problem like this, which Susan Empson and Linda Levi (2011) call a *Multiple Groups Problem (Division)*, kids usually draw it out to understand the relationships involved. I am not embarrassed to say that I do the same when I am multiplying or dividing with fractions. I always need to see the situation in a model before I understand exactly what is happening. In this way, I am like most students, who begin with *direct modeling*, a term from cognitively guided instruction (CGI, Carpenter et al., 2015) that simply means that a student chooses to represent each item in a problem to solve it, either with manipulatives or through drawing.

This kind of fraction division problem is included in the fifth grade in the Common Core State Standards (CCSS; National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010)—students are asked to solve real-world fraction division problems like the one in this case, a whole number divided by a unit fraction ($12 \div \frac{1}{4}$). The standards set the expectation that students will begin by using visual models to solve these problems, drawing on their knowledge of both fractions and how multiplication and division are related. As we will see, Sussan offered her special education students the choice of solving with either $\frac{1}{4}$ths or $\frac{3}{4}$ths, the first option meeting grade-level standards and the second number choice (a common fraction with a number other than 1 in the numerator) going beyond them.