

A Letter to Readers

Dear Parents and Caregivers,

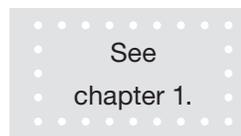
How can I really help my kid with math? Not just with tonight's math homework, but for life? What if I don't know all the math myself?

If you are a parent or caregiver, your child's questions about his or her math homework may have already caused you to ask yourself questions like those above—and more. *Adding Math, Subtracting Tension* is designed to help you develop a relationship with your child that will not only include math in a friendly and fun manner but will also strengthen your child's understanding of this important topic. If you have read my previous book, for prekindergarten–grade 2, you already are familiar with some ways to complement school learning with family-centered activities that are relaxing and enjoyable for everyone. If you are beginning with this volume for grades 3–5, welcome to a way to approach math that will further your child's knowledge while avoiding the conflicts that often accompany this subject.

Children work hard to make sense of the world they see and hear. In nearly every area of their lives, we try to help them develop that sense and become more independent. We help them to develop street smarts, and we share some of the thinking behind the decisions we make. History and social studies are now taught in a way that encourages children to think and research, expecting them to question how events affected different groups of people and not just to memorize events and dates. However, when it comes to math, we often expect children to stop using their reasoning, and we ask them to accept and memorize without question someone else's method of finding an answer. We keep them dependent on an external authority (the teacher, the book, us) to know whether they've done the right thing. Children want to know what they are doing and why they are doing it. When they do not, they easily lose track of what they are supposed to do and become frustrated and upset. Our job as parents and caregivers, then, is to find ways to make math both understandable and meaningful.

A vast amount of mathematics is included in grades 3 through 5. Children are expected to learn to perform arithmetic on numbers of many types: large whole numbers, fractions, and decimals. They learn to use a wide variety of measurement instruments including rulers, clocks, scales, and thermometers and to employ different numbering systems with each of these. Their homework might involve types of questions that you never faced during your own school days, and it might venture into topics you are uncertain about. Children sometimes come home unsure of what was taught and anxious about or frustrated by the assignment. All of this can lead to tension for the whole family. In these situations, an important part of your role is simply listening. Sometimes, just telling you what the question asks or where the difficulty lies is enough to help your child solve a problem. Of course, listening alone is not always sufficient, and so we will look at the math your child is likely to encounter during these three years and a little beyond. I will describe activities that can help your child memorize the multiplication tables as well as understand what she is doing and why. I include some common mistakes, so that you will see that they are normal and learn how to handle the misinterpretations that lead to errors.

Why is it that school math is difficult for so many students? There are numerous reasons. Every class has many students, with many different levels of understanding. The curriculum may include topics that some children are not yet ready to learn. One teacher might spend most of math time addressing the needs of the students who are having the most difficulty, while leaving bored those who are eager to learn more. Another teacher may be proceeding through topics without giving enough help to strugglers. A tremendous problem is that, in most states, many elementary school teachers are not sufficiently prepared to teach math. They often do not understand the crucial role that early, basic topics play in future math learning. They may know only one way to perform an arithmetic operation and not be able to recognize other equally useful ones. Such teachers may insist on steps that your child recognizes as unnecessary. Other teachers may accept any method that provides a correct answer without regard to its efficiency or applicability to other questions. These situations can increase the tension between home and school. I had the good fortune to have a mother who shared with me that my teacher told her not to teach me math at home because, if it was done in a different way, it was “too confusing.” We both agreed that neither of us was confused, so the confusion must belong to the teacher and



Margin notes of this type will direct you to helpful information elsewhere in this book, or in my previous book, *Adding Math, Subtracting Tension* for prekindergarten to grade 2.

was no reason for my mother to stop answering my questions at home. You and your child may need to exercise tact with the teacher as you continue to explore math together.

Another challenge for parents occurs when their child says, “Just tell me what to do and let me get the homework finished.” If math at school is a set of rules to be memorized without understanding, children come to believe that this is what math is everywhere, and they do not want to be “bothered” with understanding. The pain of being asked to do things that do not make sense leads children to squelch their natural desire to make sense of the world. But the unease and fear of humiliation persist, making them afraid to try to build understanding. This is why it is vital that you keep talking with your children about math from a young age in order to keep them from developing that fear. When I worked in a school in East Harlem, in New York City, the children told me that I made them work harder in my class than they had ever worked in math before but that they liked it because **they knew what they were doing** and **why they were doing it**.

If you want to know what your child is likely to be working on in school at each grade level, some excellent sources are the National Council of Teachers of Mathematics’ *Curriculum Focal Points* and *Principles and Standards for School Mathematics* (available at <http://www.nctm.org/standards>) and the Common Core State Standards Initiative (<http://www.corestandards.org/the-standards/mathematics>). The latter is an agreement among almost every U.S. state on the mathematics topics that should be learned at each grade level. However, each child learns at his or her own pace, and this is why your help is vital. If your child does not know the meaning of *one-fourth*, she cannot understand what is meant by *three-fourths*. On the other hand, if she understands decimals well, she may be impatient while the rest of the class is trying to learn them. You are in a position to know exactly what your child is ready to work on, while a teacher with many students may not be able to accommodate both those children not yet ready for the next chapter and those eager to proceed faster. For this reason, and because much of math learning is sequential, I have not labeled the activities in this book by grade. Within each topic, find out what your child already knows and then go on to the next level, as far as makes sense to your child.

Parents often ask me whether calculators are good or bad for children’s learning. They correctly sense that something is missing when children need calculators to perform simple arithmetic operations. Although we use calculators to avoid tedious computation, number

sense is developed through counting, arithmetic, and understanding how numbers relate to each other. This occurs when children do the math themselves and get very familiar with ways to perform operations. If students know how to do arithmetic only as a step-by-step process, with no understanding, they might as well use a calculator. But in today's world, knowing rote arithmetic is not sufficient. People are asked to understand many kinds of numerical data and to use them to make decisions about health, the environment, and politics. That is why many math books present math for much greater understanding than was expected fifty years ago, and why the Common Core State Standards and *Principles and Standards for School Mathematics* emphasize concepts and problem solving as well as skills. This does not mean that calculators cannot be a part of learning. In this book, calculators are suggested in several places as a way to increase your child's number power.

The big, important topic of third grade is multiplication, so chapter 1 begins with it. From multiplication we will move on to division, geometry, deep understanding of place value, fractions, decimals, measurement, statistics, probability, and algebra. Don't worry if you think you do not know these topics well enough yourself. You can learn with your child, and working together as partners makes it more fun. If you feel comfortable with the topics, try exploring them as presented here, paying attention to how your child thinks and learns. Become aware of what the common mistakes are, and discover ways to learn from them rather than become embarrassed by them. The math is presented in a manner that provides the understanding that will be needed for further math.

Because of the limitations of our English language, chapters alternate between referring to a child as "he" or "she." You can choose to read the book out of order. If you need prior knowledge, a sidebar tells where to find it. A "More4U" symbol indicates PDF downloads for games or activities can be found at NCTM's online resource center at <http://www.nctm.org/more4u> and accessed with the code on the title page of this book.

If you find yourself bored or having difficulty while reading the details of the mathematics here, you can skip to the games in each chapter and play them first. After playing, you may find the explanations more meaningful, especially if you have not done math for a while. So choose a topic you want to work on with your child and talk about math!

—Frances Stern



Margin notes with this icon indicate that printable images such as charts and game boards are available at www.nctm.org/more4u.