

Building Fact Fluency

A TOOLKIT FOR ADDITION & SUBTRACTION



Dear family members and caregivers,

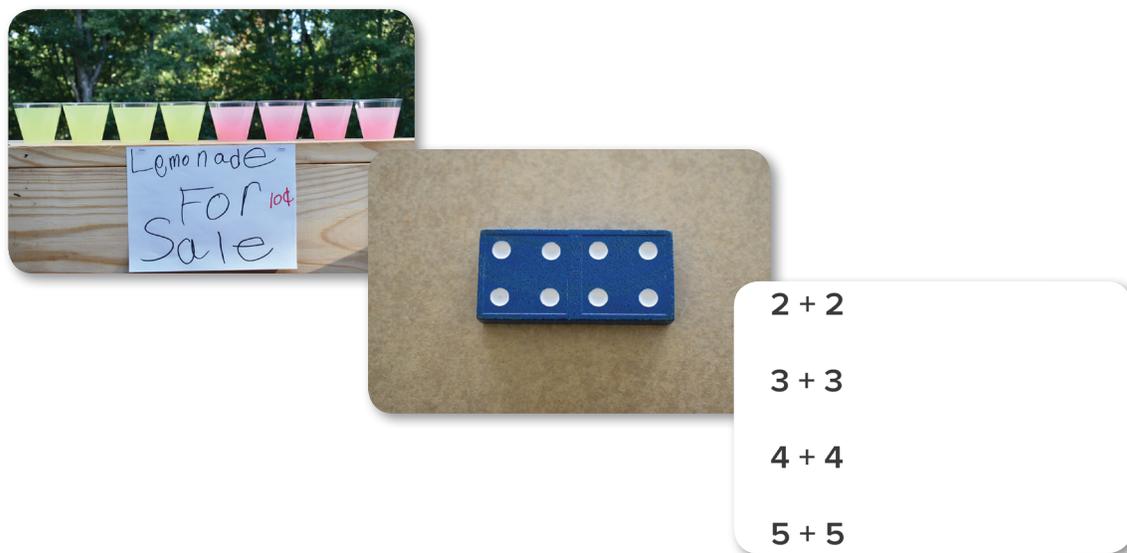
Hi, we are Graham Fletcher and Tracy Zager, parents, math teachers, and the authors of *Building Fact Fluency: A Toolkit for Addition & Subtraction*, which your child’s teacher will be using this year. We wanted to share just a bit about the goals of this resource, some ways it’s different from what you’ve probably seen before, and how you can support your child at home.



Eyes on the Prize

First of all, we want to make it clear that it’s important for students to learn their single-digit number combinations, (such as $3 + 5$ or $9 + 8$), so that later on, they won’t have to stop their thinking in the middle of a more complicated problem to figure out their facts. At the same time, it’s essential that students understand the meaning of addition and subtraction and build solid foundations for place value. The good news is, we don’t have to choose between learning facts and learning math with understanding. In *Building Fact Fluency*, we work on both goals at the same time, and students learn their facts as an outcome of exploration and work with addition and subtraction.

Your child will have ample opportunities to solve problems about accessible, everyday objects such as markers, toy cars, and apples, as well as problems using mathematical tools and numbers. Early on, children will count to figure out answers. That’s great—counting is foundational. Eventually, they’ll begin to use more efficient and effective strategies to derive their answers by using what they know to figure out what they don’t know, which is the heart of doing mathematics. Over time and with enough practice, they’ll come to “just know” most of their basic facts.



A typical progression for learning the combination $4 + 5$ might be:

- ◆ Setting out 4 objects or fingers and 5 objects or fingers and counting them all.
- ◆ Starting from 4 and counting on: 4, 5, 6, 7, 8, 9.
- ◆ Starting from the bigger number, 5 in this case, and counting on: 5, 6, 7, 8, 9.
- ◆ Connecting to a fact they know. Perhaps: “I know 4 and 4 is 8, so 4 and 5 is 9 because it’s just 1 more.” Or, “I know 5 and 5 makes 10, so 4 and 5 would be 9, because it’s just 1 less.”
- ◆ Eventually, with enough practice, students will say, “4 and 5 is 9. I just know that one.”

You might wonder why we should go through this progression—isn’t it faster and easier just to memorize? To answer that question, we need to remember our goals. We want more than students answering “9” when we ask, “What’s $4 + 5$?” We also want them to understand $34 + 5$, or $104 + 15$, or $40 + 50$, all of which relate to $4 + 5$. We want something deeper than memorization. We can teach kids to recite that $10 + 6 = 16$, but regurgitating that fact without understanding tens and ones won’t help them think about $16 + 12$ as 2 tens and 8 more ones, or 28. If students spend time making and breaking apart tens and hundreds, however, they lay a foundation that will support them through multi-digit arithmetic, decimals, large numbers, and algebra. If we invest time now in building your child’s number strategies, your child will reap the benefits for years to come.

Students are typically in different places in this continuum at the very same time, depending on which strategy we're working on, how the problem is presented, and a variety of other factors. The same child might "just know" the combinations that make 10 (1 and 9, 2 and 8, 3 and 7, and so on), but still count on from 9 to solve $9 + 3$. *Building Fact Fluency* is designed so, wherever students are, they can work at a "just right" level of challenge so they become increasingly fluent. If your child is already comfortable with a particular strategy, they'll extend that strategy into multi-digit addition and subtraction ($9 + 7$ becomes $19 + 7$ or $99 + 17$). Students will have opportunities to discuss the patterns they notice across these different problems, which helps them build connections and deep number sense.

Some Ways Building Fact Fluency Is Different

You might notice that your child's teacher will use a variety of assessment measures and techniques to determine how your child's strategies, understanding, and facts are coming along. Through quick conferences, looking at student work, observing students while they play games, and asking students about their thinking, your child's teacher will have all the high-quality information they need to make good instructional decisions, without anxiety-provoking timed tests.

You also might notice that "practice" looks different from what you might remember or expect. We want math to be enjoyable for children. Therefore, we've designed several different activities and routines that will invite students into math and engage them while they practice. Many of these routines start with multimedia—a short action video or a series of engaging photographs. These activities are designed to be accessible to all students and draw them into math, rather than push them out.



Another aspect of *Building Fact Fluency* that might surprise you is that students have a lot of choice. They often choose what size numbers to use and always choose which strategy to use. These choices are essential, both so students can be appropriately challenged, and so students engage with the numbers and build the kind of understanding they won't forget.

Finally, you'll notice that even though one of our ultimate goals is for students to know their facts with efficiency, speed is de-emphasized during the learning process. Taking the necessary time to build understanding and fluency now is so important and pushing for speed can undermine the thinking we're trying to develop. Also, it doesn't work—

students who memorize quickly forget quickly, and teachers end up re-teaching the facts year after year. Therefore, we hope you will be patient and support your child through this journey rather than rushing to the finish line. We have to keep reminding ourselves that “The tortoise wins the race.”

How to Support Your Child’s Fluency at Home

You have a key role in supporting your child’s development as a mathematical thinker, and we hope you’ll partner with your child’s teacher if they send practice home.

For example, you might see games come home, and they are an outstanding way for children to practice their math facts and strategies with you, other family members, neighbors, or friends, either in person or via a video call. We hope you’ll enjoy playing these games because they’re really engaging and full of strategy. As you play with your child, you might ask them questions, such as:

- ◆ What are you hoping to roll (or draw)? Why?
- ◆ What are you hoping I’ll roll (or draw)? Why?
- ◆ What are you hoping I won’t roll or draw? Why?
- ◆ Is there a way you might block me?
- ◆ What’s your strategy?
- ◆ How come you chose that move?

Dominating Doubles within 12 📄

4	8	6	10	8	4
2	4	2	1	3	10
4	10	3	8	2	6
3	12	6	10	8	4
8	1	4	3	6	12
4	3	2	8	10	1

Place the chip in the box for the move you want to make.

Double the Die

Halve the Die

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When your child figures out a fact, you can ask them, “How did you figure that out?” because verbalizing their strategies can help children make connections and develop reasoning.

You can also support your child by talking about numbers as they come up in your daily lives. If you’re cooking, shopping, building, crafting, setting the table, doing chores, and so on, you can ask questions about the mathematics you are already doing. For example:

- ◆ I wonder how many socks we just took out of the dryer? How many pairs could that be when we fold them?

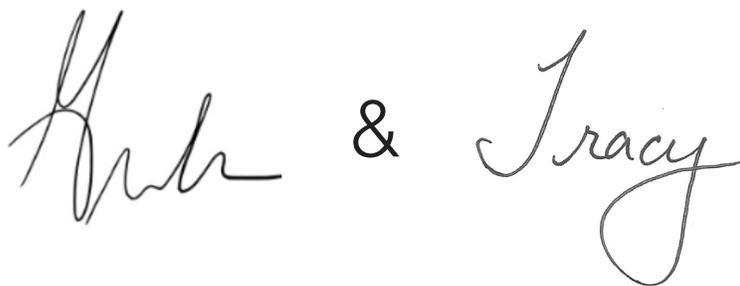
- ◆ If a grown-up eats 2 eggs and a kid eats 1 egg, how many eggs do we need to make scrambled eggs for all of us?
- ◆ We've already read 16 picture books this week! How many more do we need to read to get to 20?

Starting Math on the Right Foot

The math in *Building Fact Fluency*—addition, subtraction, and place value—are three of the most important topics in elementary mathematics. It's so important that your child has sufficient time to explore and make sense of these concepts on their way to fluency. Yes, we want them to learn that $9 + 7 = 16$, but we also want them to understand why $9 + 7$ is the same as $7 + 9$, and reason that if $9 + 7 = 16$, then $16 - 9 = 7$. Students who think about these relationships and understand their meaning are off to a great start in mathematics. Perhaps even more important, students who are given opportunities to figure things out learn that they are problem solvers. They feel confident that they can make sense of math because they are already making sense of math.

This is what we want for your child. We want them to enjoy the process of becoming fluent in addition and subtraction so they can feel confident about themselves going forward, in and out of math class.

All the best and thanks for joining us on this mathematical journey to fact fluency.

The image shows two handwritten signatures in black ink. The first signature on the left is 'Graham' and the second on the right is 'Tracy'. They are separated by an ampersand (&).

Graham Fletcher and Tracy Johnston Zager
Authors of *Building Fact Fluency*