

Building Fact Fluency

A TOOLKIT FOR MULTIPLICATION & DIVISION



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 Multiplication & Division*, 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

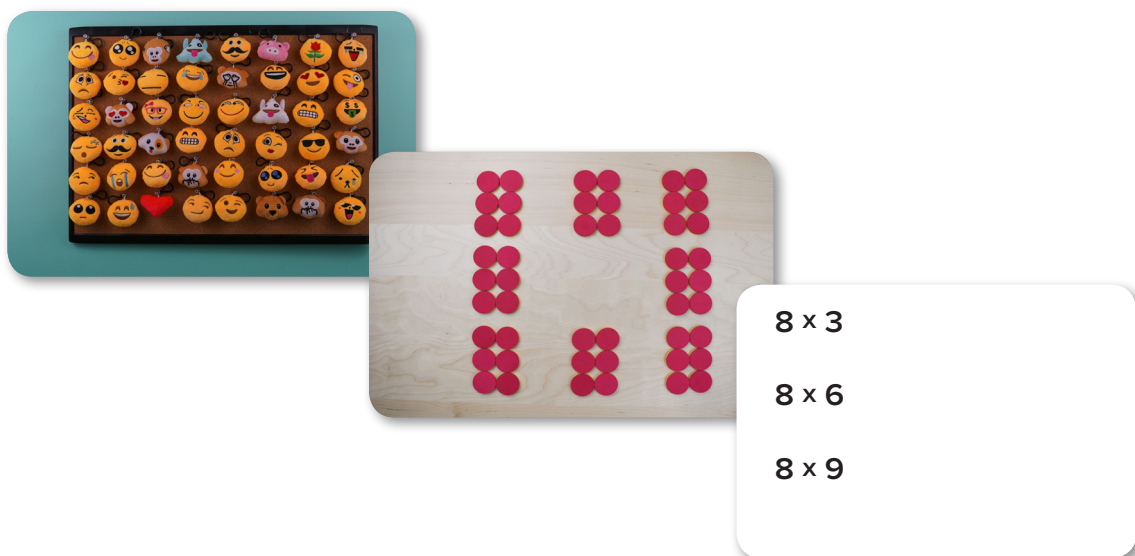
First of all, we want to make it clear that it's important for students to learn their multiplication facts (such as 4×6 or 9×5), so that later on, they won't have to stop their thinking in the middle of a more complicated problem to figure out their facts. At the same time, it's essential that students understand the meaning of multiplication and division and build solid foundations for multidigit operations and 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 multiplication and division.

Your child will have ample opportunities to solve problems about accessible, everyday objects such as peaches, balloons, and tennis balls, as well as problems using mathematical tools and numbers. Early on, children will add or skip-count to figure out answers. 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 6×8 might be:

- ◆ Setting out or drawing 6 groups of 8 objects and counting them all.
- ◆ Connecting to a fact they know. Perhaps: “I know 5×8 is 40, so 6×8 is 48.” Or, “I know 6×4 is 24, so 6×8 is 48.”
- ◆ Eventually, with enough practice, students will say, “ 6×8 is 48. 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 “48” when we ask, “What’s 6×8 ?” We also want them to understand 8×6 , 26×8 , and 60×80 , all of which relate to 6×8 . We want something deeper than memorization: we want to lay a foundation that will support students through multi-digit arithmetic, fractions, ratios, proportions, and algebra. That’s one reason why we emphasize multiple ways of “seeing” and thinking about each fact. For example, the images below are examples of ways your child will work with 6×8 : in an array of everyday objects, in groups of tools, and with numerals. In all cases, we’re going for relationships. 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" their 5s, but skip count to solve their 4s. *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 multiplication and division (8×9 becomes 28×9 or 28×19). 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

Name: _____ Date: _____

Frankie picked peaches. If he wanted to pack them 4 to a basket, how many baskets would Frankie need?

[20] [36] [84]

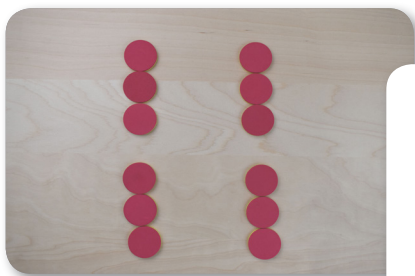
which strategy to use. These choices are essential, both so students can be appropriately challenged, and so students engage with the numbers and build the kind of understanding they won't forget.

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.” We want to go slowly enough that students make connections across contexts, representations, and problems. For example, look at some of the ways students will think about 4×3 and 3×4 in *Building Fact Fluency*.



- 2×4
- 3×4
- 6×4
- 9×4



- 2×3
- 4×3
- 8×3
- 16×3

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

The Double Double Game (6-Sided Dice)

6	8	16	20	3	12
12	10	4	8	24	8
1	6	24	2	8	20
8	3	12	6	12	16
5	16	8	4	2	8
4	10	1	8	12	3

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

Identity Property	Double	Double the Double
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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 think I can fit 4 rows of cookies on this baking sheet, with 3 cookies in each row. I wonder how many cookies that is?
- ◆ I bought 48 daffodil bulbs and want to plant them in bunches of 6 near our door. How many bunches can we make?
- ◆ If we check out 10 books from the library each week, how many books can we read this summer break?
- ◆ Auntie lives 8 blocks away. If we walk there and back, how many blocks is that?

