

ADDITION FACTS THAT STICK

Help Your Child Master the Addition Facts
for Good in Just Six Weeks

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WELL-TRAINED MIND PRESS

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PREFACE

My first job out of college was teaching fifth grade in an excellent public school in the Boston suburbs. I was thrilled to have the chance to work in such a great school district, and I could hardly wait to meet my students as I prepared for my first year of teaching.

Most of all, I was excited to teach math. I majored in math in college, and I eagerly looked forward to sharing my love of the subject with my students. Even before school began, I started to plan lessons covering the usual fifth-grade topics, like geometry, fractions, decimals, and percentages.

However, it only took a couple weeks of school for me to realize that some of my students needed a better mastery of the basics—especially the addition facts—before they'd be ready to tackle fifth-grade work. My colleagues in the lower grades assured me that they'd taught the addition facts diligently and encouraged parents to work on the facts at home. So why did I have bright ten-year-olds in my class who couldn't add eight plus five?

As I probed further, I discovered that nearly all of my students had once memorized the addition facts. But the facts just hadn't stuck. Their teachers and parents had conscientiously made flash cards and drilled the flash cards over and over. This method had worked for some of the children. But for others, it seemed that the addition facts had gone straight into their short-term memories and then straight out again.

So, instead of repeating a method that hadn't worked, I decided to try a different approach with my fifth-grade students. Instead of using rote memorization to master the addition facts, I taught my students how to visualize the numbers and use mental strategies to find the solutions. This took a little teaching time at the beginning, but the results were worth it. At first, it took my students a few seconds to apply the strategies when finding sums. But with a little practice, the strategies became so automatic that they "just knew" the answers. I'm proud to say that every student in my class had fully mastered the addition facts before Thanksgiving—and had become much more confident and successful in their math studies as a result.

That was nearly fifteen years ago. Since then, I've taught several years of fifth-grade math classes, written math curricula, tutored students who struggle in math,

and begun homeschooling my own children. Through these experiences, I've refined the approach I used with my first class of fifth-graders to create a simple, effective program that will help any child master the addition facts—all without flash cards or rote memorization.

Over the years, I've met so many parents who want to help their children master these important math foundations but just aren't sure how to do so effectively. That's why I've written this book. It will guide you step by step as you help your child master the addition facts, once and for all, so that the addition facts truly stick.

INTRODUCTION

What makes this approach unique?

~~Practice all the addition facts at once.~~

Target one small group of addition facts at a time.

Instead of overwhelming your child with all 81 addition facts, this program breaks the addition facts into smaller groups. The facts in each group can be solved with the same strategy. So, instead of memorizing each fact individually, your child can learn one strategy and then apply the strategy to the entire group. It's a lot simpler to learn six strategies than it is to memorize 81 different facts.

~~Memorize answers.~~

Visualize numbers and use strategies to find the answers.

When children think about numbers, they tend to visualize piles of disorganized counters. So, to add $8 + 4$, they imagine a pile of eight counters and a pile of four counters and then count them all up to find the sum.



How most children imagine $8 + 4$.

But since counting is slow, inefficient, and error-prone, many parents resort to having their children memorize the addition facts by rote instead. In this book, rather than teaching your child to memorize each fact individually, you'll use a simple grid of ten squares (called a ten-frame) to help your child visualize the numbers up to ten.



The ten-frame, a simple tool for helping visualize numbers.

When children learn to visualize numbers on a ten-frame, they can use simple strategies to break numbers apart and put them together efficiently and accurately. For example, to add $8 + 4$, your child will learn to imagine both numbers on ten-frames.



$8 + 4$ modeled on the ten-frame. Notice how much easier it is to tell how many counters are in each row without counting each one by one.

Then, your child can simply visualize moving two counters to the top row to complete the row. Now, it's easy to see that the answer is $10 + 2$, or 12.



Moving two counters to the top row makes it easy to see that $8 + 4 = 12$.

With just six simple strategies like this one, your child will know all of the addition facts.

~~Drill the flash cards over and over.~~

Practice applying strategies to increase speed.

Instead of drilling flash cards over and over so that your child is exposed to the right answer enough times to memorize it, your child will practice *using strategies* until they become automatic. With consistent practice at applying the six strategies, your child will get faster and faster at figuring out the answers—and before long, he or she will “just know” the answers and have them fully mastered.

~~Review flash cards constantly to prevent forgetting.~~

Teach addition facts that stick!

When children memorize the addition facts individually, it's very easy to forget them, so constant review is necessary. But when children who have learned addition fact *strategies* momentarily forget a fact, they can figure out the correct answer quickly and easily—without any additional drill.

HOW TO USE THIS BOOK

This program is divided into six units, each designed to take about a week. Each unit targets a small group of addition facts that can be solved with the same mental strategy. You'll follow the same pattern of activities each week. By the end of six weeks, your child will have learned all the addition facts.

You'll use three different activities each week to help your child master the focus facts for the week: direct teaching, games, and written practice.

Day 1: Introduce new facts and teach a new game

On the first day of each week, you will use counters and a ten-frame to help your child learn to visualize numbers. You'll explain the new mental strategy to your child and ask questions to make sure he or she understands it. (Don't worry if you have never taught math before—this book will guide you step by step.)

Next, you will teach your child a game that provides lots of practice with the focus facts for the week. The games are not only fun, but they also provide a lot of practice in a short amount of time. Even more importantly, they allow you to quickly correct any mistakes and monitor how well your child is using the new mental strategy.

Days 2–5: Play game and complete practice pages

For the rest of the week, you will play the new game again each day. As you play, you'll encourage your child to continue using the mental strategy introduced on Day 1.

Your child will also complete a short practice page each day. This will give your child practice at solving the week's addition facts in written form. The practice pages also review all the addition facts your child has learned in previous weeks.

Teaching tips

- Schedule a consistent time each day for addition fact practice. You'll be less likely to forget, and your child will be less likely to argue. Try to choose a time when your child is alert and easily able to concentrate.
- Plan to work on the activities in this book for about 15 minutes each session, with five sessions per week. However, different children need different amounts of time to master each strategy. Feel free to take more than five days with each strategy if needed.
- Discourage your child from counting to solve problems. For example, many first- or second-graders might solve $8 + 5$ by starting at eight and counting on five more: "8...9...10...11...12...13. The answer is 13." However, counting is extremely inefficient and error-prone. Think how many opportunities there are to make a mistake if you use counting to find $9 + 8$! The only exception to this is Week 1, when your child will count forward one or two to solve the $+1$ and $+2$ facts. There are a lot fewer chances for errors when you're only adding on one or two.
- Keep the practice sessions positive, upbeat, and fast-paced. Have fun playing the games with your child, and enjoy the one-on-one time together.
- If your child is a reluctant writer, don't let writing difficulties interfere with mastering the addition facts. It's fine to have your child answer the worksheet problems orally rather than writing them.
- Many young children freeze when they feel time pressure. Unless your child is age ten or older, don't time him or her on the practice pages. For an older child, aim for your child to know each addition fact in three seconds or less.

Is your child ready to master the addition facts?

This book is designed for children who have had some exposure to numbers and addition but do not yet know the answers to the addition facts automatically. While it's fine to introduce your younger child to the games and strategies, don't expect thorough mastery of the addition facts until your child is *at least* six years old.

To be successful at mastering the addition facts, your child should first:

- Be able to count to 20 and recognize written numbers up to 20
- Understand that addition means putting two parts together to make a whole, and that numbers can be added in any order without changing the sum (i.e., that $3 + 2 = 2 + 3$)
- Have a beginning understanding of place-value (for example, knowing that 15 is the same as $10 + 5$)

If your child has these foundational skills in place, he or she is ready to master the addition facts.

What you'll need

All of the game boards and practice pages you'll need for this program are included in the back of the book. You'll also need a few everyday items to complete the activities and play the games:

- 15 small counters of two different colors (coins, dry beans, buttons, blocks, etc.)
- Coin (any kind)
- Two game tokens
- Paper and pencil
- Two decks of regular playing cards

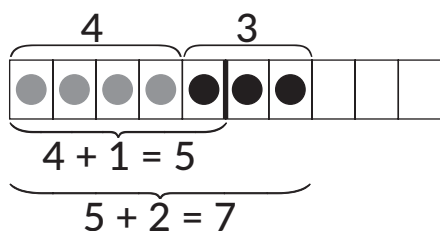
WEEK 3

**SUMS LESS
THAN TEN**

WEEK 3 AT A GLANCE

Strategy: Use five as a reference point.

This week, your child will tackle the last few sums less than ten. Each of these sums contains a number close to five, so your child will use the dividing line in the middle of the ten-frame as a mental reference point. For example, to solve $4 + 3$, your child will first add one to the four to make a five, and then add the remaining two.



Using the dividing line as a reference point to break $4 + 3$ into two problems that are easier to visualize: $4 + 1 = 5$ and $5 + 2 = 7$.

This week, your child will learn these new facts:

$$\begin{aligned}4 + 3 &= 7 \\4 + 4 &= 8 \\5 + 4 &= 9 \\6 + 3 &= 9 \\3 + 3 &= 6\end{aligned}$$

You will need:

- Ten-frames (page 57)
- Paper and pencil
- 15 small counters of two different colors (30 total)
- Extra piece of blank paper
- Two *Climb to the Top* game boards (one for each player, pages 61 and 63)
- Threes, fours, fives, and sixes from a deck of cards (four of each, 16 total cards)
- Week 3 Practice Pages (pages 93–99)

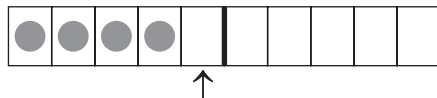
DAY 1: NEW TEACHING

Introduce new facts

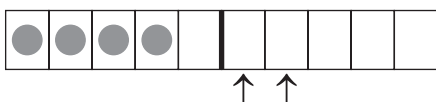
Write $4 + 3 =$ on a piece of paper and place four counters on the ten-frame.



“Imagine if I added three counters. First, I’d use one counter to fill in the empty box to complete the group of five.” (Point to this box.)



“Then, I’d still need to add two more counters on the other side of the dark line.” (Point to these two boxes.)



“How many counters would there be then?” *Seven.*

Have your child physically place three counters of a different color on the ten-frame to confirm the answer.



Have your child complete the written addition problem: $4 + 3 = 7$.

Repeat with the other addition facts for this week, as shown below. Always start with the larger number on the ten-frame, and ask your child to visualize the second number in the problem *before* constructing it with counters. As in the example above, remind him to use the dark line in the middle of the ten-frame as a visual anchor to help him “see” the answers rather than counting each counter one by one.



$$4 + 4 = 8$$



$$5 + 4 = 9$$



$$3 + 3 = 6$$



$$6 + 3 = 9$$

Practice visualizing combinations

Secretly put four counters of one color and three counters of the other color on the ten-frame. Cover the mat with a sheet of paper.



“I’m going to uncover the ten-frame for just a second. Your job is to tell me what addition problem the counters show.”

Take away the paper for two seconds, then cover the mat again. “What addition problem does this show?” ($4 + 3 = 7$, or $3 + 4 = 7$.)

If he’s not sure, uncover the mat and let him look for a longer period of time and count if necessary.

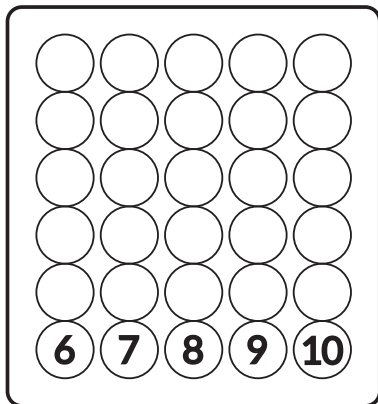
Repeat with the other addition facts from the previous activity ($4 + 4 = 8$, $5 + 4 = 9$, $6 + 3 = 9$, $3 + 3 = 6$). As your child gets better at recognizing the combinations, uncover the mat for shorter and shorter periods of time.

Play *Climb to the Top*

Teach your child how to play *Climb to the Top* and play several times.

MATERIALS

- Two *Climb to the Top* game boards (pages 61–63)



- Threes, fours, fives, and sixes from a deck of cards (four cards of each kind; 16 cards total)
- 15 small counters per player

OBJECT OF THE GAME

Be the first player to fill in an entire column and reach the top of the game board.

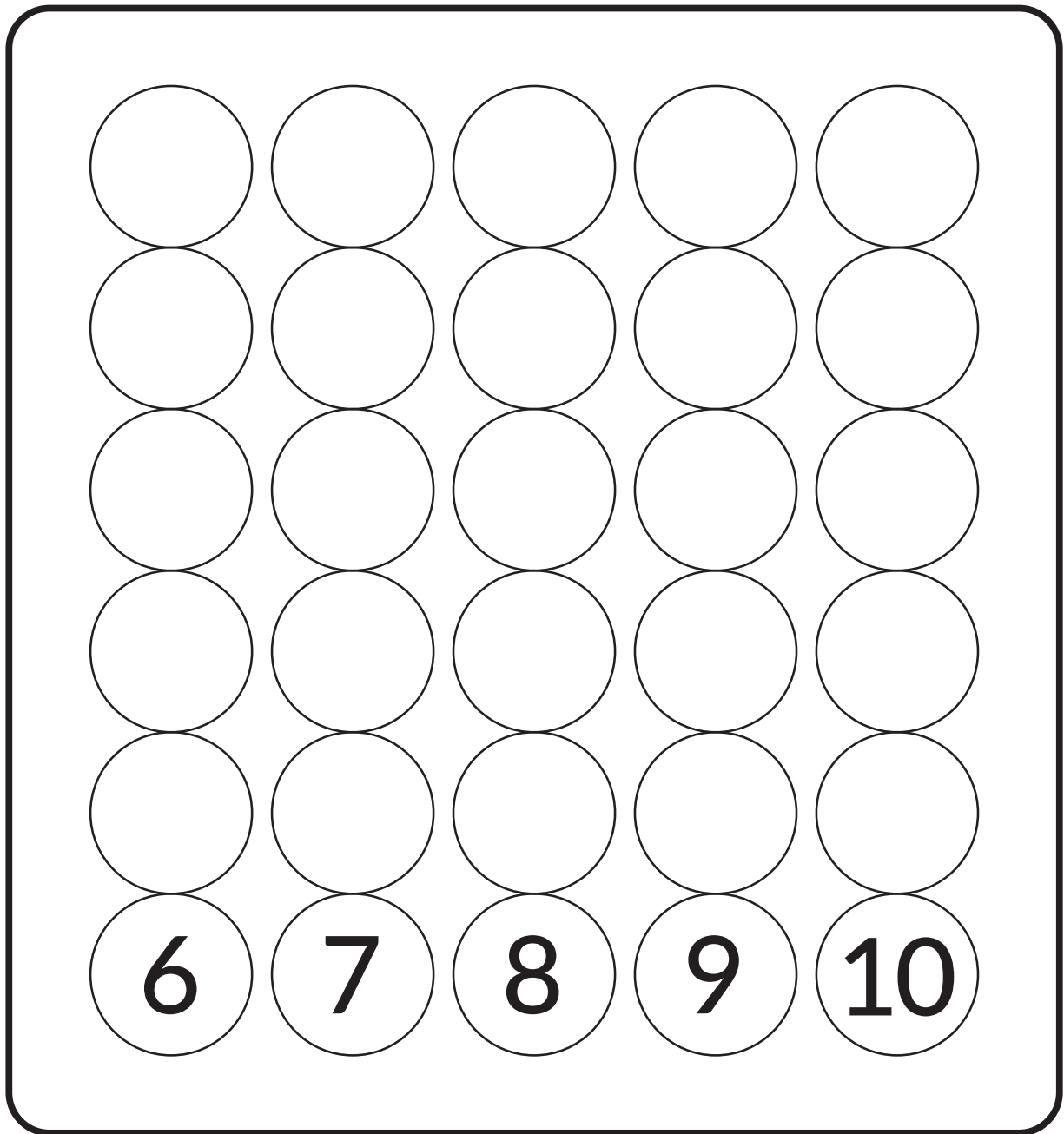
HOW TO PLAY

Shuffle the cards and place the stack face down on the table. On your turn, turn over the top two cards and find the sum of the cards. Place a counter on the lowest empty box in the column that matches the sum. For example, if you draw a five and a three, place a counter in the box above the eight. Sums greater than ten are wild, and you get to choose which column to place the counter in.

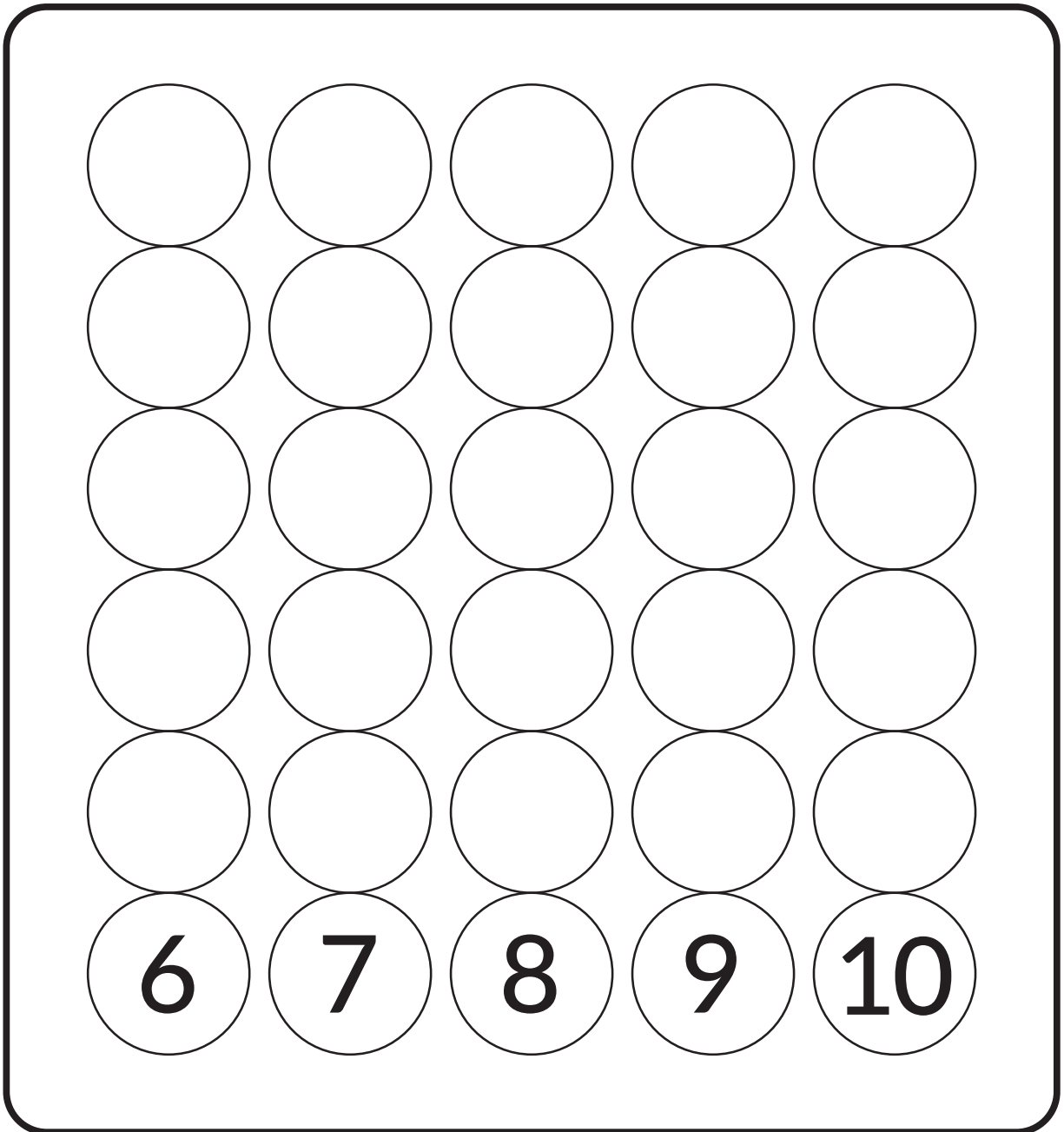
Play then passes to the other player. Continue until one player has filled in an entire column and reached the top.

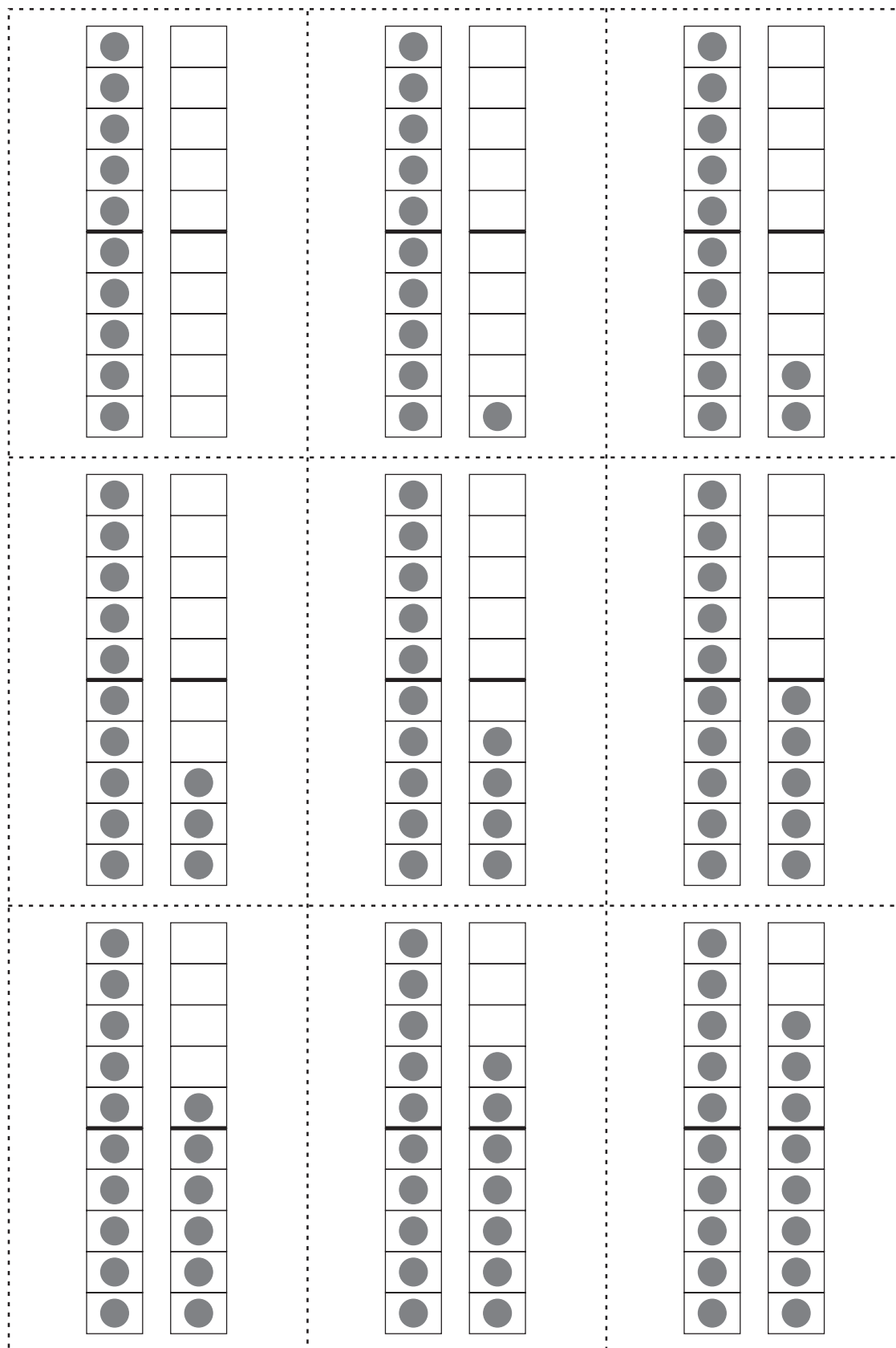
As you play, continue to encourage your child to visualize the sums on the ten-frame rather than construct them with counters, but allow him to construct them if needed.

Climb to the Top



Climb to the Top





Week 3: Sums Less Than Ten**Practice Page 1**

$3 + 3 = \underline{\quad}$

$5 + 5 = \underline{\quad}$

$5 + 4 = \underline{\quad}$

$9 + 1 = \underline{\quad}$

$7 + 2 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$2 + 8 = \underline{\quad}$

$6 + 3 = \underline{\quad}$

$3 + 4 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$6 + 4 = \underline{\quad}$

$3 + 3 = \underline{\quad}$

$1 + 5 = \underline{\quad}$

$2 + 4 = \underline{\quad}$

$7 + 3 = \underline{\quad}$

$4 + 3 = \underline{\quad}$

$4 + 5 = \underline{\quad}$

$6 + 2 = \underline{\quad}$

$3 + 6 = \underline{\quad}$

Week 3: Sums Less Than Ten**Practice Page 2**

$5 + 4 = \underline{\quad}$

$3 + 3 = \underline{\quad}$

$1 + 9 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$3 + 7 = \underline{\quad}$

$2 + 5 = \underline{\quad}$

$6 + 3 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$8 + 1 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$3 + 4 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$8 + 2 = \underline{\quad}$

$5 + 5 = \underline{\quad}$

$3 + 3 = \underline{\quad}$

$4 + 3 = \underline{\quad}$

$1 + 6 = \underline{\quad}$

$6 + 4 = \underline{\quad}$

$3 + 6 = \underline{\quad}$

$4 + 5 = \underline{\quad}$

$7 + 1 = \underline{\quad}$

Week 3: Sums Less Than Ten**Practice Page 3**

$1 + 9 = \underline{\quad}$

$5 + 4 = \underline{\quad}$

$3 + 3 = \underline{\quad}$

$2 + 5 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$3 + 7 = \underline{\quad}$

$8 + 1 = \underline{\quad}$

$6 + 3 = \underline{\quad}$

$2 + 2 = \underline{\quad}$

$1 + 1 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$3 + 2 = \underline{\quad}$

$5 + 2 = \underline{\quad}$

$8 + 2 = \underline{\quad}$

$5 + 5 = \underline{\quad}$

$6 + 4 = \underline{\quad}$

$4 + 3 = \underline{\quad}$

$1 + 6 = \underline{\quad}$

$7 + 1 = \underline{\quad}$

$3 + 6 = \underline{\quad}$

$4 + 1 = \underline{\quad}$

Week 3: Sums Less Than Ten**Practice Page 4**

$5 + 5 = \underline{\quad}$

$5 + 4 = \underline{\quad}$

$4 + 2 = \underline{\quad}$

$7 + 2 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$9 + 1 = \underline{\quad}$

$2 + 8 = \underline{\quad}$

$6 + 3 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$3 + 5 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$3 + 4 = \underline{\quad}$

$1 + 3 = \underline{\quad}$

$1 + 5 = \underline{\quad}$

$6 + 4 = \underline{\quad}$

$7 + 3 = \underline{\quad}$

$4 + 3 = \underline{\quad}$

$2 + 1 = \underline{\quad}$

$6 + 2 = \underline{\quad}$

$3 + 6 = \underline{\quad}$

$4 + 5 = \underline{\quad}$