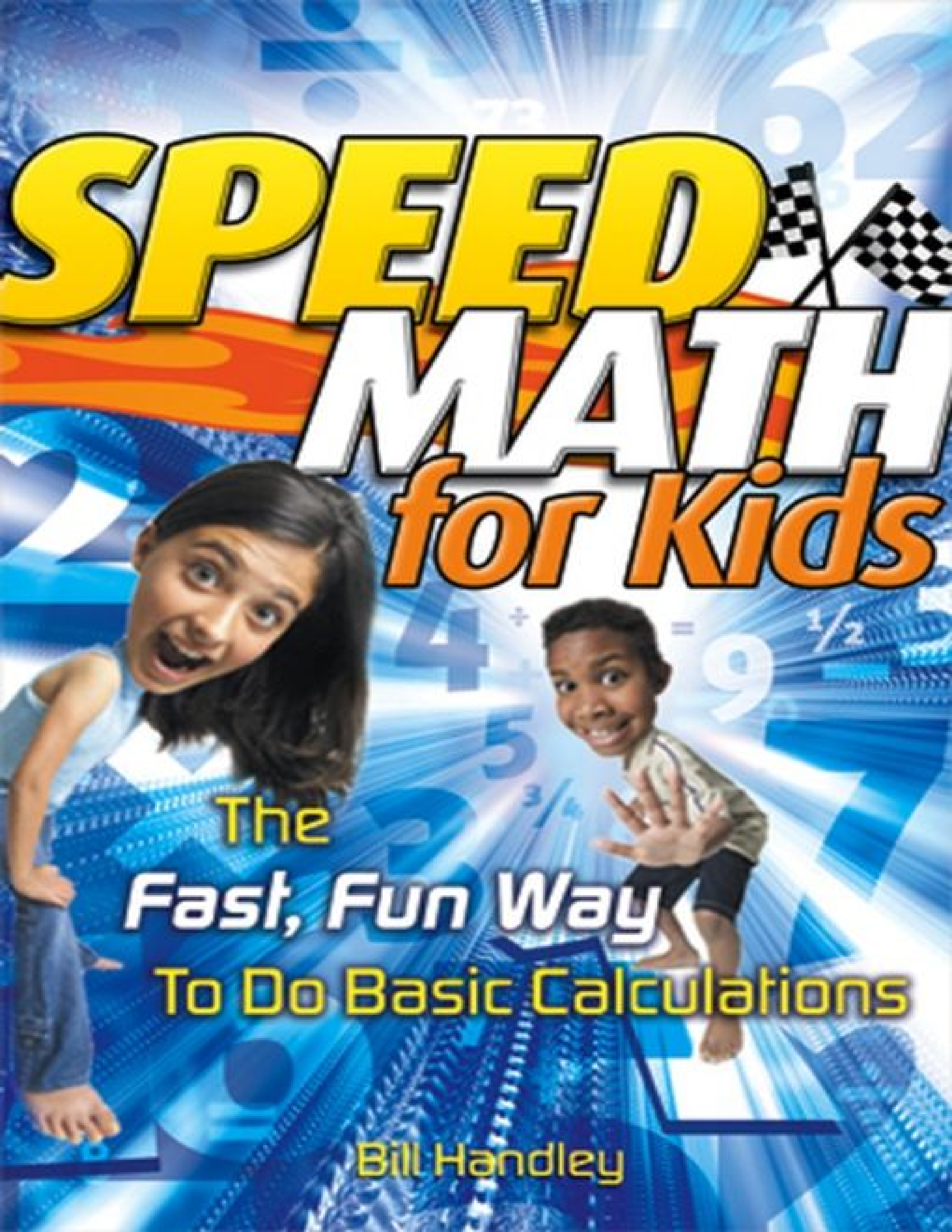
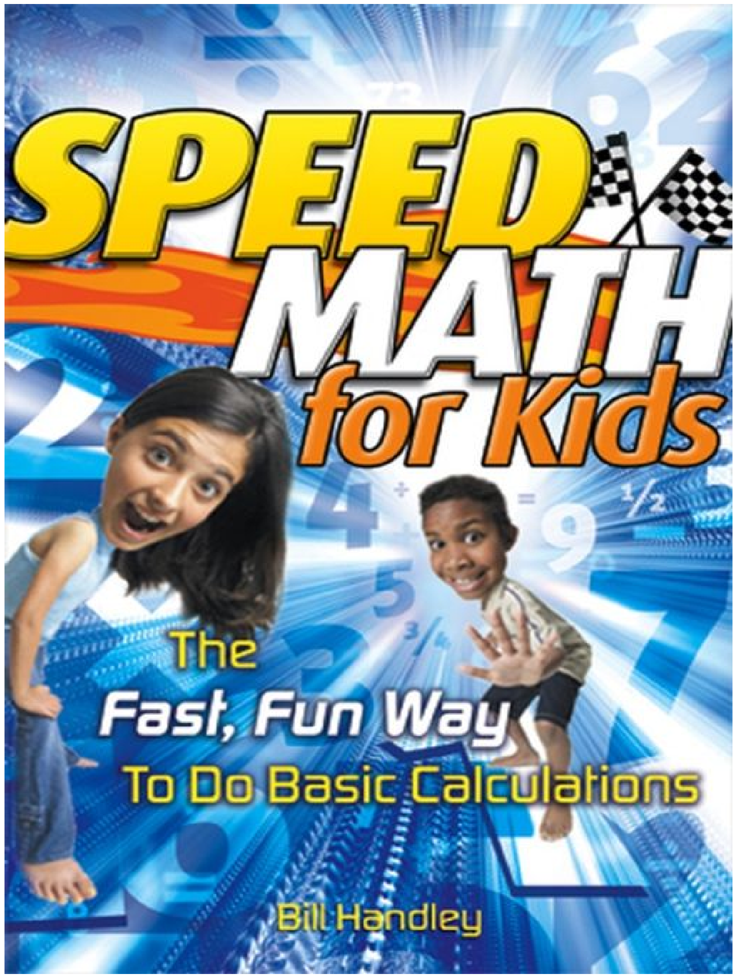

SPEED MATH for Kids
The Fast, Fun Way To Do Basic Calculations
Bill Handley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JB JOSSEY-BASS

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PREFACE

I could have called this book *Fun with Speed Mathematics.* It contains some of the same material as my other books and teaching materials. It also includes additional methods and applications based on the strategies taught in *Speed Mathematics* that, I hope, give more insight into the mathematical principles and encourage creative thought. I have written this book for younger people, but I suspect that people of any age will enjoy it. I have included sections throughout the book for parents and teachers.

A common response I hear from people who have read my books or attended a class of mine is, “Why wasn’t I taught this at school?” People feel that with these methods, mathematics would have been so much easier, and they could have achieved better results than they did, or they feel they would have enjoyed mathematics a lot more. I would like to think this book will help on both counts.

I have definitely not intended *Speed Math for Kids* to be a serious textbook but rather a book to be played with and enjoyed. I have written this book in the same way that I speak to young students. Some of the language and terms I have used are definitely non-mathematical. I have tried to write the book primarily so readers will understand. A lot of my teaching in the classroom has just been explaining out loud what goes on in my head when I am working with numbers or solving a problem.

I have been gratified to learn that many schools around the world are using my methods. I receive e-mails every day from students and teachers who are becoming excited about mathematics. I have produced a handbook for teachers with instructions for teaching these methods in the classroom and with handout sheets for photocopying. Please e-mail me or visit my Web site for details.

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INTRODUCTION

I have heard many people say they hate mathematics. I don't believe them. They *think* they hate mathematics. It's not really math they hate; they hate failure. If you continually fail at mathematics, you will hate it. No one likes to fail.

But if you succeed and perform like a genius, you will love mathematics. Often, when I visit a school, students will ask their teacher, can we do math for the rest of the day? The teacher can't believe it. These are kids who have always said they hate math.

If you are good at math, people think you are smart. People will treat you like you are a genius. Your teachers and your friends will treat you differently. You will even think differently about yourself. And there is good reason for it—if you are doing things that only smart people can do, what does that make you? Smart!

I have had parents and teachers tell me something very interesting. Some parents have told me their child just won't try when it comes to mathematics. Sometimes they tell me their child is lazy. Then the child has attended one of my classes or read my books. The child not only does much better in math, but also works much harder. Why is this? It is simply because the child sees results for his or her efforts.

Often parents and teachers will tell the child, "Just try. You are not trying." Or they tell the child to try harder. This just causes frustration. The child would like to try harder but doesn't know how. Usually children just don't know where to start. Both child and parent become frustrated and angry.

I am going to teach you, with this book, not only what to do but how to do it. *You can be a mathematical genius*. You have the ability to perform lightning calculations in your head that will astonish your friends, your family and your teachers. This book is going to teach you how to perform like a genius—to do things your teacher, or even your principal, can't do. How would you like to be able to multiply big numbers or do long division in your head? While the other kids are writing the problems down in their books, you are already calling out the answer.

The kids (and adults) who are geniuses at mathematics don't have better brains than you—they have better methods. This book is going to teach you those methods. I haven't written this book like a schoolbook or textbook. This is a book to play with. You are going to learn easy ways of doing calculations, and then we are going to play and experiment with them. We will even show off to friends and family.

When I was in ninth grade I had a mathematics teacher who inspired me. He would tell us stories of Sherlock Holmes or of thriller movies to illustrate his points. He would often say, "I am not supposed to be teaching you this," or, "You are not supposed to learn this for another year or two." Often I couldn't wait to get home from school to try more examples for myself. He didn't teach mathematics like the other teachers. He told stories and taught us short cuts that would help us beat the other classes. He made math exciting. He inspired my love of mathematics.

When I visit a school I sometimes ask students, "Who do you think is the smartest kid in this school?" I tell them I don't want to know the person's name. I just want them to think about who the person is. Then I ask, "Who thinks that the person you are thinking of has been told they are stupid?" No one seems to think so.

Everyone has been told at one time that they are stupid—but that doesn’t make it true. We all do stupid things. Even Einstein did stupid things, but he wasn’t a stupid person. But people make the mistake of thinking that this means they are not smart. This is not true; highly intelligent people do stupid things and make stupid mistakes. I am going to prove to you as you read this book that you are very intelligent. I am going to show you how to become a mathematical genius.

HOW TO READ THIS BOOK

Read each chapter and then play and experiment with what you learn before going to the next chapter. Do the exercises—don't leave them for later. The problems are not difficult. It is only by solving the exercises that you will see how easy the methods really are. Try to solve each problem in your head. You can write down the answer in a notebook. Find yourself a notebook to write your answers in and to use as a reference. This will save you writing in the book itself. That way you can repeat the exercises several times if necessary. I would also use the notebook to try your own problems.

Remember, the emphasis in this book is on playing with mathematics. Enjoy it. Show off what you learn. Use the methods as often as you can. Use the methods for checking answers every time you make a calculation. Make the methods part of the way you think and part of your life.

Now, go ahead and read the book and make mathematics your favorite subject.

Chapter 1

MULTIPLICATION: GETTING STARTED

How well do you know your multiplication tables? Do you know them up to the 15 or 20 times tables? Do you know how to solve problems like 14 × 16, or even 94 × 97, without a calculator? Using the speed mathematics method, you will be able to solve these types of problems in your head. I am going to show you a fun, fast and easy way to master your tables and basic mathematics in minutes. I'm not going to show you how to do your tables the usual way. The other kids can do that.

Using the speed mathematics method, it doesn't matter if you forget one of your tables. Why? Because if you don't know an answer, you can simply do a lightning calculation to get an instant solution. For example, after showing her the speed mathematics methods, I asked eight-year-old Trudy, "What is 14 times 14?" Immediately she replied, "196."

I asked, "'You knew that?"

She said, "No, I worked it out while I was saying it."

Would you like to be able to do this? It may take five or ten minutes of practice before you are fast enough to beat your friends even when they are using a calculator.

WHAT IS MULTIPLICATION?

How would you add the following numbers?

$$6+6+6+6+6+6+6+6=?$$

You could keep adding sixes until you get the answer. This takes time and, because there are so many numbers to add, it is easy to make a mistake.

The easy method is to count how many sixes there are to add together, and then use multiplication to get the answer.

How many sixes are there? Count them.

There are eight.

You have to find out what eight sixes added together would make. People often memorize the answers or use a chart, but you are going to learn a very easy method to calculate the answer.

As multiplication, the problem is written like this:

$$8 \times 6 =$$

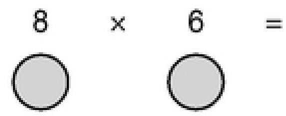
This means there are eight sixes to be added. This is easier to write than $6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 =$.

The solution to this problem is:

$$8 \times 6 = 48$$

THE SPEED MATHEMATICS METHOD

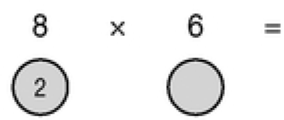
I am now going to show you the speed mathematics way of working this out. The first step is to draw circles under each of the numbers. The problem now looks like this:



We now look at each number and ask, how many more do we need to make 10?

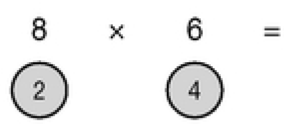
We start with the 8. If we have 8, how many more do we need to make 10?

The answer is 2. Eight plus 2 equals 10. We write 2 in the circle below the 8. Our equation now looks like this:



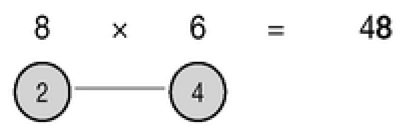
We now go to the 6. How many more to make 10? The answer is 4. We write 4 in the circle below the 6.

This is how the problem looks now:



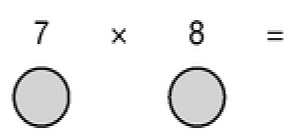
We now take away, or subtract, crossways or diagonally. We either take 2 from 6 or 4 from 8. It doesn’t matter which way we subtract—the answer will be the same, so choose the calculation that looks easier. Two from 6 is 4, or 4 from 8 is 4. Either way the answer is 4. You only take away one time. Write 4 after the equals sign.

For the last part of the answer, you “times,” or multiply, the numbers in the circles. What is 2 times 4? Two times 4 means two fours added together. Two fours are 8. Write the 8 as the last part of the answer. The answer is 48.



Easy, wasn’t it? This is much easier than repeating your multiplication tables every day until you remember them. And this way, it doesn’t matter if you forget the answer, because you can simply work it out again.

Do you want to try another one? Let’s try 7 times 8. We write the problem and draw circles below the numbers as before:



How many more do we need to make 10? With the first number, 7, we need 3, so we write 3 in the circle below the 7. Now go to the 8. How many more to make 10? The answer is 2, so we write 2 in the circle below the 8.

Our problem now looks like this:

Now take away crossways. Either take 3 from 8 or 2 from 7. Whichever way we do it, we get the same answer. Seven minus 2 is 5 or 8 minus 3 is 5. Five is our answer either way. Five is the first digit of the answer. You only do this calculation once, so choose the way that looks easier.

The calculation now looks like this:

For the final digit of the answer we multiply the numbers in the circles: 3 times 2 (or 2 times 3) is 6. Write the 6 as the second digit of the answer.

Here is the finished calculation:

Seven eights are 56.

How would you solve this problem in your head? Take both numbers from 10 to get 3 and 2 in the circles. Take away crossways. Seven minus 2 is 5. We don't say five, we say, "Fifty ..." Then multiply the numbers in the circles. Three times 2 is 6. We would say, "Fifty ... six."

With a little practice you will be able to give an instant answer. And, after calculating 7 times 8 a dozen or so times, you will find you remember the answer, so you are learning your tables as you go.

Test yourself

Here are some problems to try by yourself. Do all of the problems, even if you know your tables well. This is the basic strategy we will use for almost all of our multiplication.

a. 9 × 9 =
b. 8 × 8 =
c. 7 × 7 =
d. 7 × 9 =
e. 8 × 9 =
f. 9 × 6 =
g. 5 × 9 =
h. 8 × 7 =

I How did you do? The answers are:

a. 81
b. 64
c. 49
d. 63
e. 72
f. 54
g. 45
h. 56

Isn't this the easiest way to learn your tables?

Now, cover your answers and do them again in your head. Let's look at 9 × 9 as an example. To calculate 9 × 9, you have 1 below 10 each time. Nine minus 1 is 8. You would say, “Eighty...” Then you multiply 1 times 1 to get the second half of the answer, 1. You would say, “Eighty ... one.”

If you don’t know your tables well, it doesn’t matter. You can calculate the answers until you do know them, and no one will ever know.

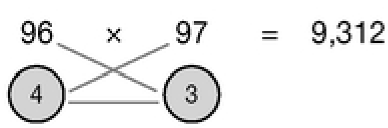
Multiplying numbers just below 100

Does this method work for multiplying larger numbers? It certainly does. Let’s try it for 96 × 97.

96 × 97 =

What do we take these numbers up to? How many more to make what? How many to make 100, so we write 4 below 96 and 3 below 97.

What do we do now? We take away crossways: 96 minus 3 or 97 minus 4 equals 93. Write that down as the first part of the answer. What do we do next? Multiply the numbers in the circles: 4 times 3 equals 12. Write this down for the last part of the answer. The full answer is 9,312.

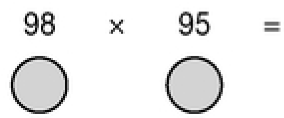


Which method do you think is easier, this method or the one you learned in school? I definitely think this method; don’t you agree?

Let’s try another. Let’s do 98 × 95.

98 × 95 =

First we draw the circles.



How many more do we need to make 100? With 98 we need 2 more and with 95 we need 5. Write 2 and 5 in the circles.

Now take away crossways. You can do either 98 minus 5 or 95 minus 2.

98 - 5 = 93
or
95 - 2 = 93

The first part of the answer is 93. We write 93 after the equals sign.

Now multiply the numbers in the circles.

2 × 5 = 10

Write 10 after the 93 to get an answer of 9,310.

98	×	95	=	9,310
(2)		(5)		

Easy. With a couple of minutes' practice you should be able to do these in your head. Let's try one now.

$96 \times 96 =$

In your head, draw circles below the numbers.

What goes in these imaginary circles? How many to make 100? Four and 4. Picture the equation inside your head. Mentally write 4 and 4 in the circles.

Now take away crossways. Either way you are taking 4 from 96. The result is 92. You would say, "Nine thousand, two hundred ..." This is the first part of the answer.

Now multiply the numbers in the circles: 4 times 4 equals 16. Now you can complete the answer: 9,216. You would say, "Nine thousand, two hundred ... and sixteen."

This will become very easy with practice.

Try it out on your friends. Offer to race them and let them use a calculator. Even if you aren't fast enough to beat them, you will still earn a reputation for being a brain.

Beating the calculator

To beat your friends when they are using a calculator, you only have to start calling the answer before they finish pushing the buttons. For instance, if you were calculating 96 times 96, you would ask yourself how many to make 100, which is 4, and then take 4 from 96 to get 92. You can then start saying, “Nine thousand, two hundred ...” While you are saying the first part of the answer you can multiply 4 times 4 in your head, so you can continue without a pause, “... and sixteen.”

You have suddenly become a math genius!

Test yourself

Here are some more problems for you to do by yourself.

a. 96 × 96 =
b. 97 × 95 =
c. 95 × 95 =
d. 98 × 95 =
e. 98 × 94 =
f. 97 × 94 =
g. 98 × 92 =
h. 97 × 93 =

The answers are:

a. 9,216
b. 9,215
c. 9,025
d. 9,310
e. 9,212
f. 9,118
g. 9,016
h. 9,021

Did you get them all right? If you made a mistake, go back and find where you went wrong and try again. Because the method is so different, it is not uncommon to make mistakes at first.

Are you impressed?

Now, do the last exercise again, but this time, do all of the calculations in your head. You will find it much easier than you imagine. You need to do at least three or four calculations in your head before it really becomes easy. So, try it a few times before you give up and say it is too difficult.

I showed this method to a boy in first grade and he went home and showed his dad what he could do. He multiplied 96 times 98 in his head. His dad had to get his calculator out to check if he was right!

Keep reading, and in the next chapters you will learn how to use the speed math method to multiply any numbers.

Chapter 2

USING A REFERENCE NUMBER

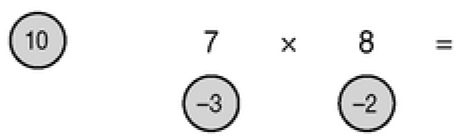
In this chapter we are going to look at a small change to the method that will make it easy to multiply any numbers.

REFERENCE NUMBERS

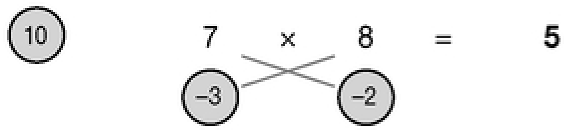
Let's go back to 7 times 8:

The 10 at the left of the problem is our *reference number*. It is the number we subtract the numbers we are multiplying from.

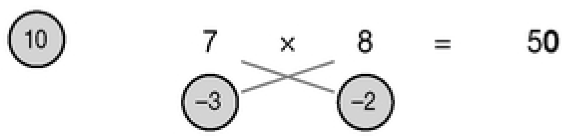
The reference number is written to the left of the problem. We then ask ourselves, is the number we are multiplying *above* or *below* the reference number? In this case, both numbers are below, so we put the circles below the numbers. How many below 10 are they? Three and 2. We write 3 and 2 in the circles. Seven is 10 minus 3, so we put a minus sign in front of the 3. Eight is 10 minus 2, so we put a minus sign in front of the 2.



We now take away crossways: 7 minus 2 or 8 minus 3 is 5. We write 5 after the equals sign.

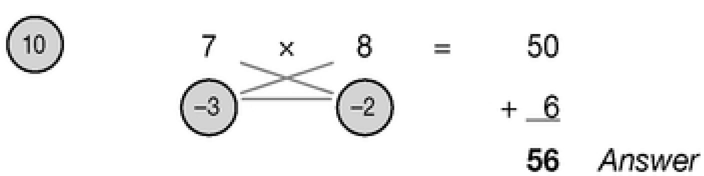


Now, here is the part that is different. We multiply the 5 by the reference number, 10. Five times 10 is 50, so write a 0 after the 5. (How do we multiply by 10? Simply put a 0 at the end of the number.) Fifty is our subtotal. Here is how our calculation looks now:



Now multiply the numbers in the circles. Three times 2 is 6. Add this to the subtotal of 50 for the final answer of 56.

The full calculation looks like this:



Why use a reference number?

Why not use the method we used in Chapter 1? Wasn't that easier? That method used 10 and 100 as reference numbers as well—we just didn't write them down.