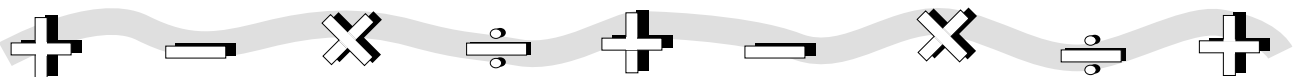
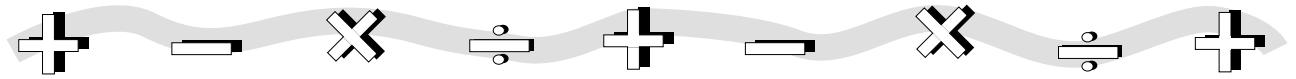


# Table of Contents

<b>Introduction</b> . . . . .	3
<b>Where to Begin</b> . . . . .	6
<b>Tips and Tricks for Teaching Maths Facts</b> . . . . .	16
Teaching Tips . . . . .	17
Addition Tricks . . . . .	20
Subtraction Tricks . . . . .	36
Multiplication Tricks . . . . .	44
Maths Patterns for Subtraction and Multiplication . . . . .	52
<b>Managing the Maths Facts Program</b> . . . . .	64
Showing Progress . . . . .	65
Dealing with Setbacks . . . . .	66
Creating Practice Sheets . . . . .	69
Sample Practice Sheets . . . . .	70
Integrating the Maths Facts Program with the Maths Curriculum . . . . .	77
Closing the Maths Facts Program . . . . .	83
Sample Letters to Parents . . . . .	85
Maths Facts Record Keeper . . . . .	88
Index of Maths Facts Listed by Tricks . . . . .	90
Glossary . . . . .	92
Student Progress Chart . . . . .	94
Addition Chart . . . . .	95
Multiplication Chart . . . . .	96
Hundreds Chart . . . . .	97
List of Tricks . . . . .	98
<b>Student Practice Pages</b> . . . . .	99





# Introduction

*How to Teach Maths Facts* is based on over 20 years of experience and success teaching maths facts to children. The maths facts program described in this book is a step-by-step plan that will offer children an opportunity to master maths facts without cumbersome counting. Students will grow both academically and emotionally as they experience success in this program. Whether you are a parent, a teacher, a tutor, or a classroom aide, you will find the maths facts program valuable for teaching mastery of maths facts. Moreover, after using these techniques, you will see how easy it is to teach maths facts.

The key components to mastery and success using the maths facts program include the following:

- useful tricks for teaching facts
- adult-directed lessons
- repetition
- progress through sequential steps
- individualisation
- one-on-one practice, at least three times a week

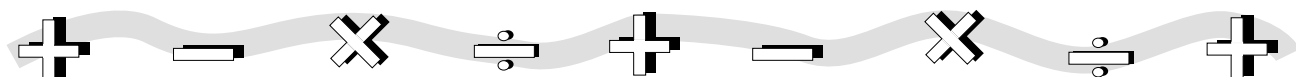
Included in the book are chapters on establishing baseline student knowledge; setting up and implementing the program; a variety of methods, cues, tricks, patterns, and diagrams for the purpose of teaching maths facts; record-keeping charts and directions for record-keeping; practice work sheets; and information on integrating the maths curriculum with the maths facts program.

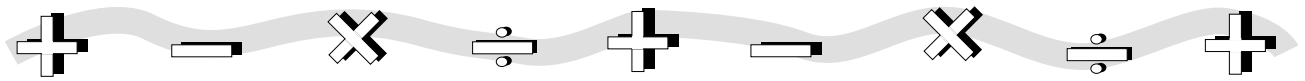
## Who Can Use the Maths Facts Program?

The maths facts program was created for a variety of children, including:

- learning-disabled students
- physically challenged students
- preschoolers with appropriate readiness skills
- upper-level students needing remedial work in the basics of maths
- children with attention deficit disorder or other special needs

Although the strategies described in the maths facts program were originally designed to meet the individual needs of special education students, the program has been effective for just about any student needing to master the basic maths facts.





## Introduction *(cont.)*

### Rationale for the Maths Facts Program

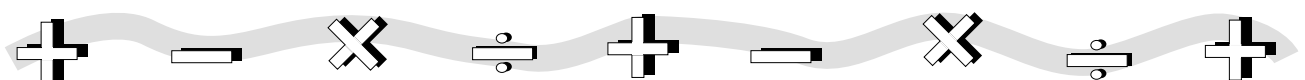
School children are typically given arithmetic papers filled with maths facts and are taught to arrive at an answer using memory, fingers, hands-on counters, a number line, or a calculator. Teachers then give these same students timed tests, a useless and frustrating exercise for the children if they are not yet proficient with maths facts.

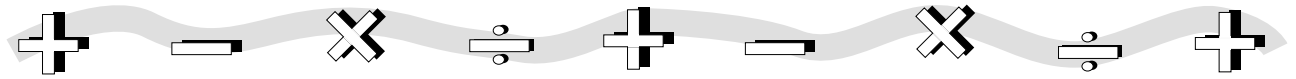
Timed drills generally measure who can count fastest, though not necessarily who can count most accurately. In addition, maths textbooks often introduce maths facts in groups that make it difficult for children to memorise answers.

Memorising basic maths facts is important because knowledge of the maths facts is fundamental to higher levels of mathematics, problem solving, and functioning in the community. Here are just six tasks requiring simple mathematics skills that every adult encounters:

1. Creating a 12-month budget requires mastery of multiplication, subtraction, and division facts.
2. Purchasing materials sold in fractions of a unit often requires division and multiplication.
3. Measuring rolls of wallpaper requires addition, multiplication, and division.
4. Decreasing a recipe requires multiplication and division.
5. Deciding which product is a better value per unit requires division.
6. Counting change from different monetary notes requires subtraction.

Children who count on fingers or who mentally calculate an answer make frequent mistakes and waste time. Often a child loses his or her place in the process because it takes too long to count out the answer for one maths fact. Furthermore, it is not practical to use a calculator wherever one goes.





## Introduction *(cont.)*

### How Long Will the Maths Facts Program Take?

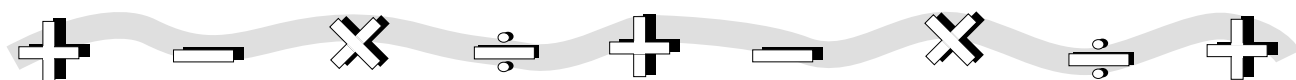
For motivated students, mastery of all the addition and subtraction or multiplication facts will take about 6 to 12 weeks with three sessions per week, or about 18–36 sessions. If this seems extensive, consider that students who are already in years three to eight are often unable to do more difficult calculations because they do not know the basics. The investment of two or three months will facilitate future learning in mathematics.

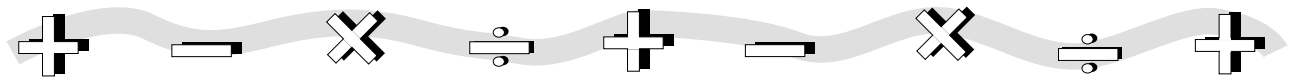
Other students may require several additional weeks or even months to master all the facts. Mastery is accomplished at a pace that works best for each individual child. For those children taught at school, follow-up practice at home is recommended. In addition to frequency of sessions, the time it takes for mastery of all the maths facts will depend on how many facts need to be learnt, student motivation, and what, if any, handicapping conditions exist.

The maths facts program is only one part of the child's total maths curriculum. As the student learns new maths facts, he will be able to progress in maths skills and problem solving. Educators will be able to integrate the student's new knowledge with the maths curriculum using maths books, teacher-directed lessons, supplementary work sheets and hands-on materials. Therefore, the students should be given these kinds of activities in conjunction with the maths facts program.

The program strategies will also be effective for younger children who have just begun formal instruction in maths. Parents can teach maths facts to preschoolers who have the readiness skills. (See page 7, Prerequisites to Learning Maths Facts.) In these cases there will be no need to establish a baseline of known facts.

Parents are cautioned to make lessons brief and learning fun. It is possible to excite the youngest learners with the fascinating field of mathematics.





# Putting the Maths Facts Program to Work

## Prerequisites to Learning Maths Facts

Before students begin the program, they should have mastered certain skills. The following checklist will help you decide if a student is ready to begin.

- Student can recognise and name the numbers from zero to 18 in order to do addition or subtraction.
- Student can recognise and name any number from zero to 100 to begin multiplication.
- Student can count orally to at least 18 for addition and subtraction and to 100 for multiplication.
- Student can name the number that comes before and after any given number from zero to 10.
- Student can count backwards from 10.
- Student can count forwards and backwards by twos up to 10 and can count forward by fives to at least 45.
- Student can demonstrate counting at least 20 objects correctly.
- Student can demonstrate knowledge of addition by adding groups of items together, representing addends, and arriving at the correct sum.
- Student can demonstrate subtraction by subtracting items for the minuend from the subtrahend and arrive at a correct answer. (In a subtraction problem, the subtrahend is the top number and the minuend is the bottom number.)
- Student working on multiplication facts can demonstrate knowledge of multiplication by grouping objects according to the multiplicands (numbers being multiplied).

## Definition of Terms

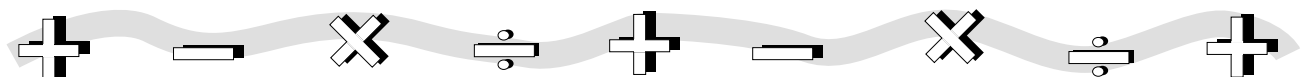
The following concepts apply as you read through the program:

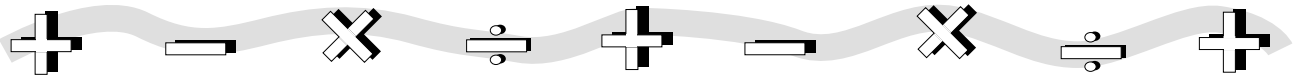
**learn:** to master, memorise, or give a correct and immediate answer to a maths fact without using fingers

**known or rote answer:** mastered and memorised

**educator or teacher:** any adult who is implementing the maths facts program

**give a new maths card or fact:** to introduce and teach the fact and then make an 8 cm x 11 cm flash card for the student





# Putting the Maths Facts Program to Work *(cont.)*

## Implementing the Program

Here is an outline of the procedure to implement the program. Follow it step by step to test, teach, re-test, and record the student's progress.



### I. First Assessment

Use flash cards and one of the record keepers (pages 88 and 89) to get a baseline of known facts.



### II. Setup

Make a pack of known facts for school practise.

Make a duplicate or nearly duplicate pack for home practise.

### III. Second Assessment

Use the school maths facts pack to verify that the known facts are mastered.

Send home duplicate or nearly duplicate pack.

### IV. Routine Practice Sessions

Students should practise utilising the record-keeping sheets at least three times weekly.

Teacher flashes maths facts pack to student.

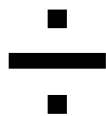
Give new facts, if appropriate.

Assign maths practise sheets, if appropriate.

Add a quick card to the maths pack. (See page 15 for an explanation of the quick card.)

### V. Program Maintenance

See page 84 for how to help students maintain their knowledge.



### VI. Integrate the Maths Facts Program

See pages 77–80 for information on integrating the program with textbooks and other curriculum materials.



The maths facts program begins with a simple assessment which establishes a baseline showing which maths facts the child knows. A maths facts pack with the known facts then will be made for the student. During the second assessment session, the teacher will flash those known cards to the student to ensure that the facts are truly mastered. At each future session, the teacher will continue to flash the pack of known cards and, when appropriate, add at least one new maths fact to the pack. Record-keeping will be essential. Practice sheets are optional but recommended. After all the maths facts are mastered, the student should be on a maintenance program. At any time, the maths facts program can be integrated with the maths curriculum, if applicable.

