



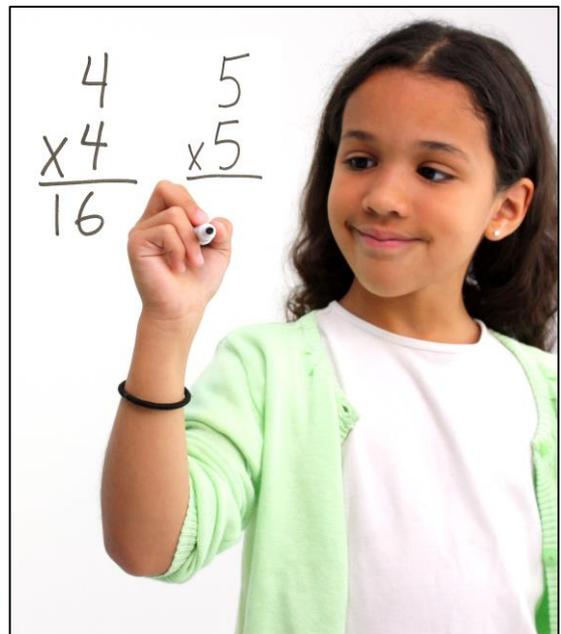
Reaching Competence

Mathematics Programme

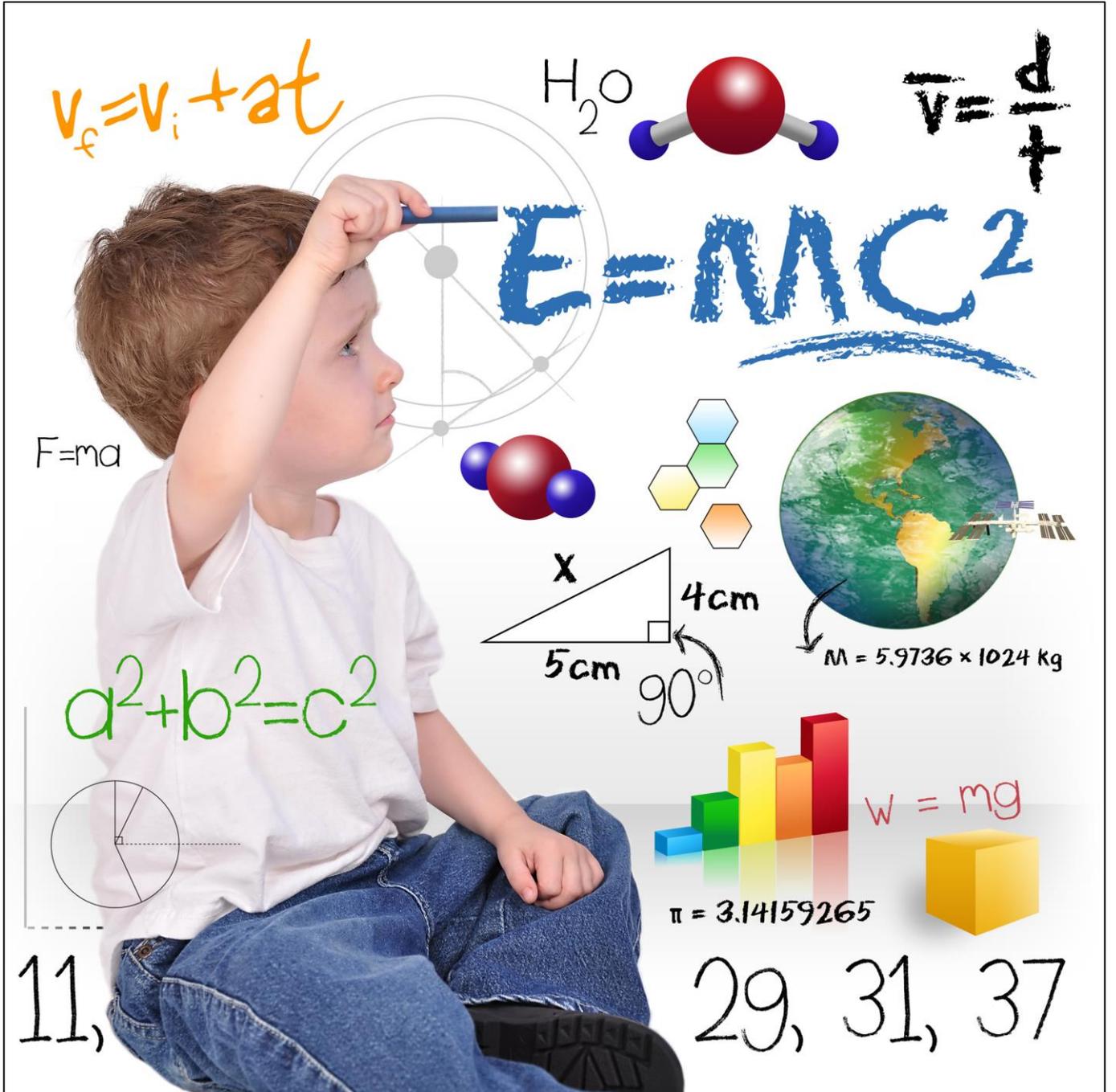
Ages 8 to 10

Addition, Subtraction and Multiplication

Book 15



By Lucy Patston



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Introducing Reaching Competence

by Reach Education

The Reaching Competence programme has been designed to enable parents and caregivers to mentor their own children at home in mathematics.

The programme progresses caregivers and children *together* along the mathematics curriculum being taught in schools. In this way, parents and caregivers are empowered to understand the curriculum and help children with their understanding. At the same time, parents and caregivers become knowledgeable as to which ways their children struggle and excel. In addition, learning can be conveniently popped into quiet moments or scheduled sessions depending on the family's needs.

I wish you all the best in your maths journey with your child or children. I hope you enjoy your time together.



Lucy Patston

PhD, Psychology
Founding Director of Reach Education

A handwritten signature in black ink, which appears to read 'Lucy Patston'.



About the Programme

Thinking and questioning

It is important to ensure that your child enjoys the activities and discusses their thinking with you.

Questions to help initiate thinking conversations

What did you learn?

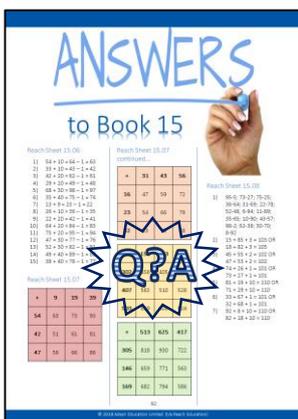
What did you find tricky?

What helped you to learn?

How did you work that problem out?

What do you think you need to work on next?

These questions encourage your child to think and reflect on their learning and what kind of learner they are.



The Reaching Competence Mathematics Programme by Reach Education covers the mathematics curriculum up to high school.

Each book is divided into learning intentions that are appropriate for your child's age group. Learning intentions are maths skills that can be thought of as knowledge pieces. These pieces build on each other as students develop a deeper understanding of the concepts of mathematics.

Books 15, 16 and 17 cover the 27 learning intentions for children aged about 8 to 10 years old.

At this level, students are entering a transition where they start to see numbers as whole units, but also understand that they can be broken up within these units. They are also solidifying mental strategies and becoming more fluent at understanding the relationships between addition and subtraction, and multiplication and division.

Practice and Apply

Learning intentions are divided into Practice and Apply sections that should be worked through from start to finish.

The Practice sections are developed to 'drill the skill' that the students are learning. The grey boxes at the beginning of these pages are to aid parents' understanding and to explain how the learning intentions link in with other parts of the programme.

The Apply sections are developed to ensure students can apply their new knowledge or skill to a problem-solving situation. Problem solving is emphasised in the Reaching Competence Programme as this is a critical skill to have, and often one that students have difficulty with. Activities in the Apply sections are designed to broaden students' understanding and enjoyment of their new maths skills.

There is also a section containing the answers to all pages marked with the 'Q?A' icon.

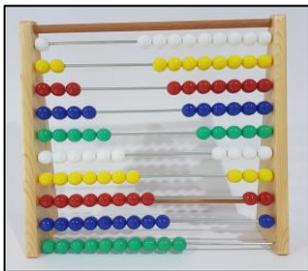


About the Programme

Resources needed for this book

The Resource List page provides a list of the physical resources needed to complete the programme and harness its greatest value.

Because our programme integrates electronic applications, we strongly recommend having access to either an Apple or Android device. However, if a device is not available, this won't detract from the learning provided by the other activities suggested. Game choice and settings instructions are given on the instruction pages.



Timing

It is ok to sneak an activity into a spare moment with your child.

If possible though, set specific days and times for each maths session, and try following the structure for this book:

- 30 minutes of Practice
- 30 minutes of Apply

Setting the pace

Students will progress through each learning intention at a different pace. One may take a few minutes to master and apply, while another may take a few hours, a week, or more. This is normal, but if frustration arises, move on to another learning intention and return to the difficult one after the next has been mastered.

Reach support

If you have any questions as you move through the programme, please don't hesitate to email us at support@reacheducation.co.nz



We will be happy to support you in helping your child's confidence and maths ability grow, and are keen to hear any feedback you may have on our programme.



Overview of Books for Ages 8 to 10

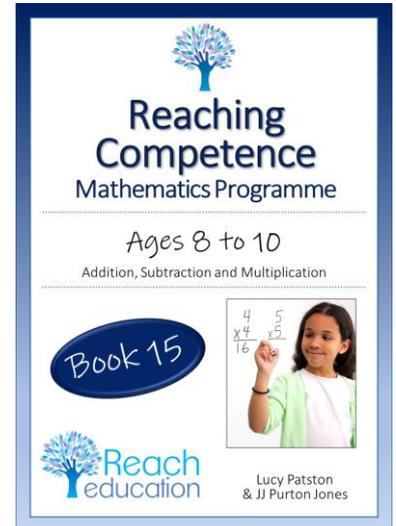
Book 15

Addition and Subtraction

- Able to use a range of mental strategies for addition
- Able to use a written algorithm for addition
- Able to use a range of mental strategies for subtraction
- Able to use a written algorithm for subtraction
- Able to read numbers greater than one thousand
- Able to explain the value of digits in numbers greater than one thousand

Multiplication

- Knows multiplication facts $\times 6$
- Knows multiplication facts $\times 8$
- Knows multiplication facts $\times 7$
- Has knowledge of the doubling and halving strategy



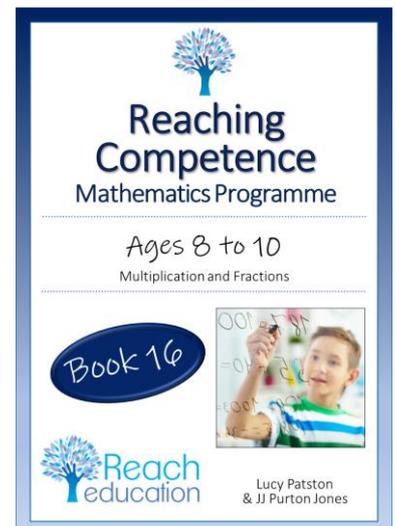
Book 16

Multiplication

- Has knowledge of the distributive property of multiplication
- Knows multiplication facts $\times 11$ and $\times 12$
- Able to use multiplication facts to solve division problems

Fractions

- Able to find non-unit fractions of shapes
- Able to find non-unit fractions of numbers
- Able to add and subtract fractions with the same denominator
- Able to recognise improper fractions
- Able to understand a decimal as a fraction



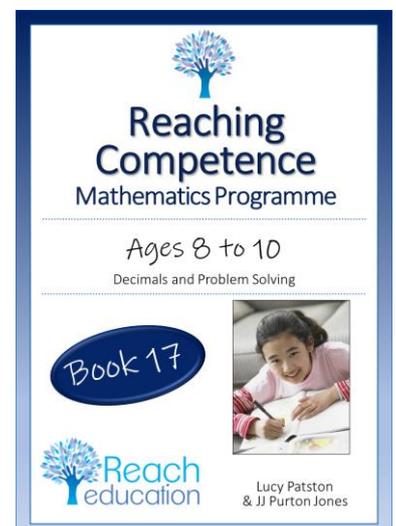
Book 17

Decimals

- Able to explain the value of digits up to two decimal places
- Able to order decimals with up to two decimal places
- Able to explain zero as a place holder
- Able to add and subtract decimals up to two decimal places

Problem Solving

- Able to use a calculator efficiently, including the memory
- Able to use brackets and understand the order of operations
- Able to identify rules to solve problems and patterns
- Able to select an appropriate operation to solve a problem
- Able to solve problems involving decimals





Book 15 Apple and Android Applications*

Apple Apps



**Math Slide:
Hundred, Ten,
One**
By Math Adventures

This is currently the most advanced of the Math Slide apps by Math Adventures. We will be playing most of the games in this app. The games work well whether played with players of equal, or unequal, ability.



Hit the Button
By Topmarks Online Ltd

This app is super. You pay a small amount, but it's well worth it and we'll be using the games throughout Books 15 to 17. Simple to use, beautifully presented and specific enough for us to tap individual learning intentions.



**Math Slide:
Multiply & Divide**
By Math Adventures

This is one of a range of apps by Math Adventures where 1 to 4 players can play around a device at a time. The games are multichoice, and quite specific, which is helpful.

Android Apps



**Add & Subtract
with Regrouping**
By Ready Set Learning

This app is perfect for our standard written method learning intentions in this book. Here, players can write on the screen (and erase errors if necessary) before choosing the correct answer.



Hit the Button
By Topmarks Online Ltd

This app is super. You pay a small amount, but it's well worth it and we'll be using the games throughout Books 15 to 17. Simple to use, beautifully presented and specific enough for us to tap individual learning intentions.



**Times Tables
Game (free)**
By WissApp

This is a really lovely app with great backgrounds. The app is well presented and provides a really flexible menu, whereby you can pick which tables and which level to have equations presented at.

* Reach Education does not endorse the apps recommended here. We have spent time researching apps, on both Apple and Android devices, to find those we feel best suit our programme for the least amount of expenditure to caregivers. It should be noted that Reach Education is not in any way in partnership with the owners of these applications, which may be updated without our knowledge. Please contact us at support@reacheducation.co.nz if you believe a recommended app has been changed significantly from what we describe here, or you can recommend apps you feel would better suit the needs of students at this stage.



Book 15 Learning Intention Completion Chart

Learning Intention	Date	Sticker
1. Able to use a range of mental strategies for addition	<input type="checkbox"/>	<input type="checkbox"/>
2. Able to use a written method for addition	<input type="checkbox"/>	<input type="checkbox"/>
3. Able to use a range of mental strategies for subtraction	<input type="checkbox"/>	<input type="checkbox"/>
4. Able to use a written method for subtraction	<input type="checkbox"/>	<input type="checkbox"/>
5. Able to read numbers greater than one thousand	<input type="checkbox"/>	<input type="checkbox"/>
6. Able to explain the value of digits in numbers greater than one thousand	<input type="checkbox"/>	<input type="checkbox"/>
7. Knows multiplication facts x6	<input type="checkbox"/>	<input type="checkbox"/>
8. Knows multiplication facts x8	<input type="checkbox"/>	<input type="checkbox"/>
9. Knows multiplication facts x7	<input type="checkbox"/>	<input type="checkbox"/>
10. Has knowledge of the doubling and halving strategy	<input type="checkbox"/>	<input type="checkbox"/>

practice practice practice



Learning Intention 1:

Able to use a range of mental strategies for addition

Students need to be able to solve calculations mentally. It doesn't matter which strategy they use, so long as they are able to explain their process to you.

Activities



While these first few pages are revision, take plenty of time to go over the strategies, ensuring your child remembers, and is able to use, each strategy. You could write down an example for them to work through with you. They should be able to tell you their mental process for arriving at a solution.

1. Reach Sheets 15.01 & 15.02: Let's remember mental strategies for 2-digit addition.
2. Reach Sheets 15.03 to 15.05: Let's remember mental strategies for 3-digit addition.
3. Reach Sheet 15.06: Let's remember adding 9 using $+ 10 - 1$.
4. Reach Sheet 15.07: Use your favourite way to find the solution in your head.
5.   Math Slide: Hundred, Ten, One. Play Games 1 and 5.

