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Stuart Palmer David Greenwood Sara Woolley Jenny Vaughan Jenny Goodman David Robertson Georgia Sotiriou and Voula Sotiriou
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More information

STAGE 5.1/5.2 >>

# CambridgeMATHS

## NSW SYLLABUS FOR THE AUSTRALIAN CURRICULUM

>> Additional resources online

STUART PALMER | DAVID GREENWOOD
SARA WOOLLEY | JENNY GOODMAN
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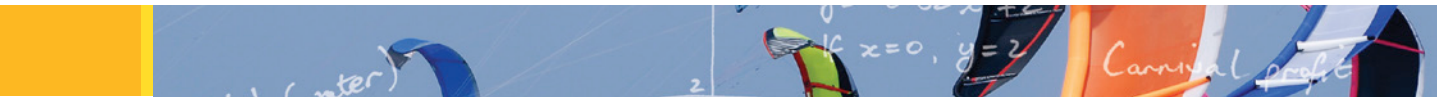

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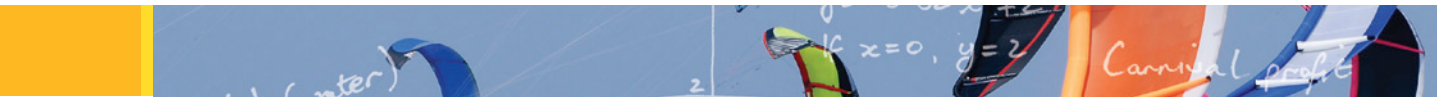


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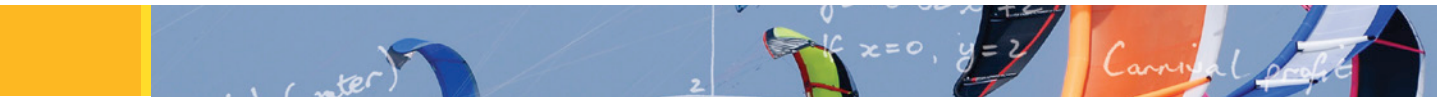


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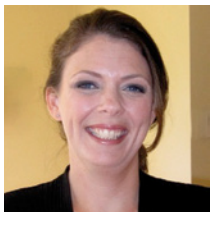
# About the authors

**Stuart Palmer** was born and educated in New South Wales. He is a high school mathematics teacher with more than 25 years' experience teaching boys and girls from all walks of life in a variety of schools. Stuart has taught all the current NSW Mathematics courses in Stages 4, 5 and 6 many times. He has been a head of department in two schools and is now an educational consultant who conducts professional development workshops for teachers all over NSW and beyond. He also works with pre-service teachers at the University of Sydney and the University of Western Sydney.

**David Greenwood** is the head of Mathematics at Trinity Grammar School in Melbourne and has 20 years' experience teaching mathematics from Years 7 to 12. He has run numerous workshops within Australia and overseas regarding the implementation of the Australian Curriculum and the use of technology for the teaching of mathematics. He has written more than 20 mathematics titles and has a particular interest in the sequencing of curriculum content and working with the Australian Curriculum proficiency strands.

**Sara Woolley** was born and educated in Tasmania. She completed an Honours degree in Mathematics at the University of Tasmania before completing her education training at the University of Melbourne. She has taught mathematics in Victoria from Years 7 to 12 since 2006 and has a keen interest in the creation of resources that cater for a wide range of ability levels.



**Jenny Goodman** has worked for 20 years in comprehensive state and selective high schools in New South Sydney and has a keen interest in teaching students of differing ability levels. She was awarded the Jones Medal for Education at the University of Sydney and the Bourke prize for Mathematics. She has written for Cambridge NSW and was involved in the *Spectrum* and *Spectrum Gold* series.

**Jennifer Vaughan** has taught secondary mathematics for more than 30 years in New South Wales, Western Australia, Queensland and New Zealand, and has tutored and lectured in mathematics at Queensland University of Technology. She is passionate about providing students of all ability levels with opportunities to understand and to have success in using mathematics. She has taught special needs students and has had extensive experience in developing resources that make mathematical concepts more accessible.

## Consultant

**Beth Godwin** is the author of several Cambridge titles, including *Spectrum Maths Gold Year 7* and *Year 8*. She has presented seminars and workshops to educators on topics including differentiating the curriculum, behaviour management and developing literacy skills. Currently the principal of Cabramatta High School in New South Wales, Beth has experience in ensuring that the curriculum is accessible to all students.

# Introduction and guide to this book

This resource developed from an analysis of the NSW Syllabus for the Australian Curriculum and the ACARA syllabus, Australian Curriculum: Mathematics. It is structured on a detailed teaching program for the implementation of the NSW Syllabus, and a comprehensive copy of the teaching program can be found on the companion website.

The language and concepts have been carefully reviewed and revised to make sure that they are effective for students doing Stage 5.1/5.2. For each section, the coverage of Stages 4, 5.1, 5.2 and 5.2◊ is indicated by 'ladder icons'. More questions are provided for the Understanding and Fluency components of Working Mathematically, and there are fewer advanced and challenging questions, than in the Stage 5.1/5.2/5.3 textbook. However, the sequences of topics of both textbooks are aligned to make it easier for teachers using both resources.

The chapters are based on a logical teaching and learning sequence for the syllabus topic concerned, so that chapter sections can be used as ready-prepared lessons. Exercises have questions graded by level of difficulty, indicated in the teaching program, and grouped by the NSW Syllabus's working mathematically components, indicated by badges in the margin of the exercises. This facilitates the management of differentiated learning and reporting on students' achievement.

For certain topics, the prerequisite knowledge has been given in sections marked as REVISION, while EXTENSION marks a few sections that go beyond the syllabus. Similarly the word FRINGE is used to mark a few topics treated in a way that lies at the edge of the syllabus requirements, but which provides variety and stimulus. Apart from these, all topics are aligned exactly to the NSW Syllabus, as indicated at the start of each chapter and in the teaching program.

## Guide to this book

### Features:

**NSW Syllabus for the Australian Curriculum:** strands, substrands and content outcomes for chapter (see teaching program for more detail)

**What you will learn:** an overview of chapter contents

**Chapter introduction:** use to set a context for students

# Guide to this book (continued)

**Pre-test:** establishes prior knowledge (also available as a printable worksheet)

**Topic introduction:** use to relate the topic to mathematics in the wider world

**HOTmaths icons:** links to interactive online content via the topic number, 1A in this case (see page xiii for more)

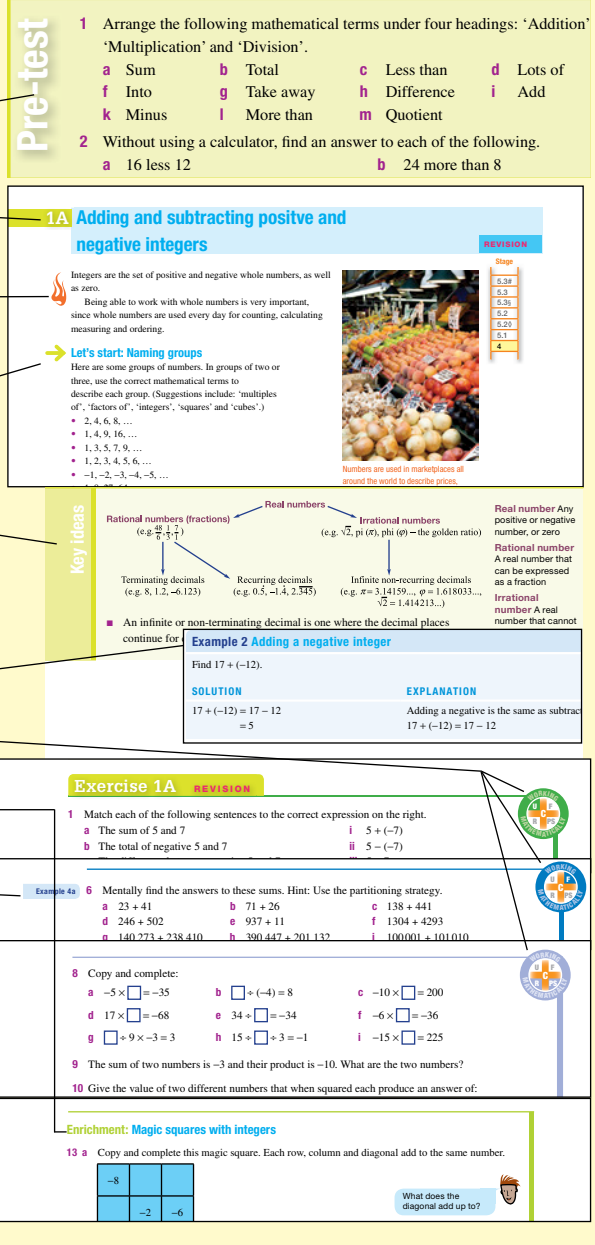
**Let's start:** an activity (which can often be done in groups) to start the lesson

**Key ideas:** summarise the knowledge and skills for the lesson

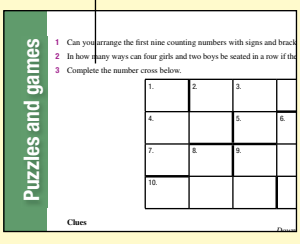
**Examples:** solutions with explanations and descriptive titles to aid searches (digital versions also available for use with IWB)

**Exercise** questions categorised by the **working mathematically components** and **enrichment** (see next page)

Questions are linked to examples

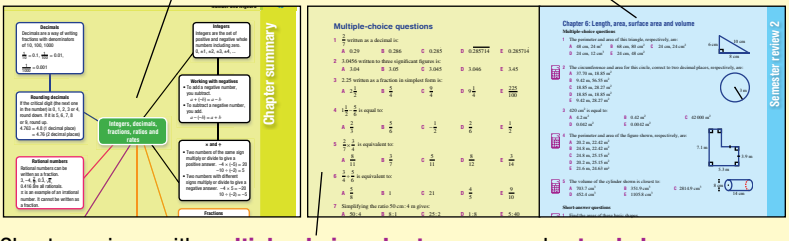



## Puzzles and games




**Chapter summary:** mind map of key concepts & interconnections

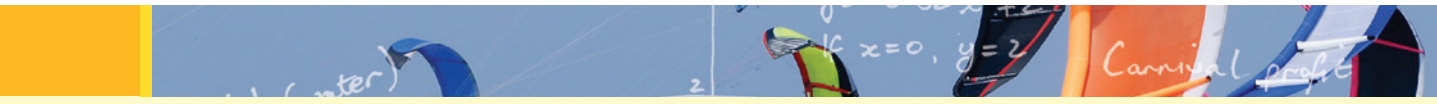
2 **Semester reviews** per book




Chapter reviews with **multiple-choice, short-answer** and **extended-response questions**

Textbooks also include:

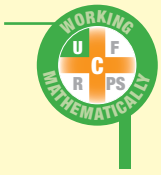
- Complete **answers**
- **Index**
- **Using technology** activities



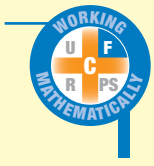
## Working mathematically badges

All exercises are divided into sections marked by Working mathematically badges, such as this example:

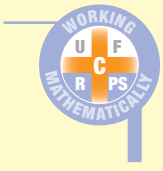
Understanding & Communicating




Fluency & Communicating



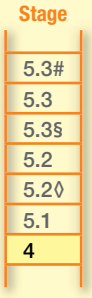

Problem-solving, Reasoning & Communicating




The letters U (Understanding), F (Fluency), PS (Problem-solving), R (Reasoning) and C (Communication) are highlighted in colour to indicate which of these components apply mainly to the questions in that section. Naturally there is some overlap between the components.

### Stage ladder icons

Shading on the ladder icons at the start of each section indicates the Stages covered by most of that section.




This key explains what each rung on the ladder icon means in practical terms.
For more information see the teaching program and teacher resource package.

| Stage | Past and present experience in Stages 4 and 5 | Future direction for Stage 6 and beyond |
|---|---|---|
| 5.3# | These are optional topics that contain challenging material for students who will complete all of Stage 5.3 during Years 9 and 10. | These topics are intended for students who are aiming to study Mathematics at the very highest level in Stage 6 and beyond. |
| 5.3 | Capable students who rapidly grasp new concepts should go beyond Stage 5.2 and study at a more advanced level with these additional topics. | Students who have completed Stage 5.1, 5.2 and 5.2 and 5.3 are generally well prepared for a calculus-based stage 6 Mathematics course. |
| 5.3§ | These topics are recommended for students who will complete all the Stage 5.1 and 5.2 content and have time to cover some additional material. | These topics are intended for students aiming to complete a calculus-based Stage 6 Mathematics course. |
| 5.2 | A typical student should be able to complete all the Stage 5.1 and 5.2 material by the end of Year 10. If possible, students should also cover some Stage 5.3 topics. | Students who have completed Stage 5.1 and 5.2 without any 5.3 material typically find it difficult to complete a calculus-based Stage 6 Mathematics course. |
| 5.2◊ | These topics are recommended for students who will complete all the Stage 5.1 content and have time to cover some additional material. | These topics are intended for students aiming to complete a non-calculus course in Stage 6, such as Mathematics General. |
| 5.1 | Stage 5.1 contains compulsory material for all students in Years 9 and 10. Some students will be able to complete these topics very quickly. Others may need additional time to master the basics. | Students who have completed Stage 5.1 without any 5.2 or 5.3 material have very limited options in Stage 6 Mathematics. |
| 4 | Some students require revision and consolidation of Stage 4 material prior to tackling Stage 5 topics. | |

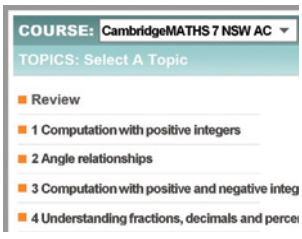
# Additional resources online

CAMBRIDGE HOTmaths interactive maths online

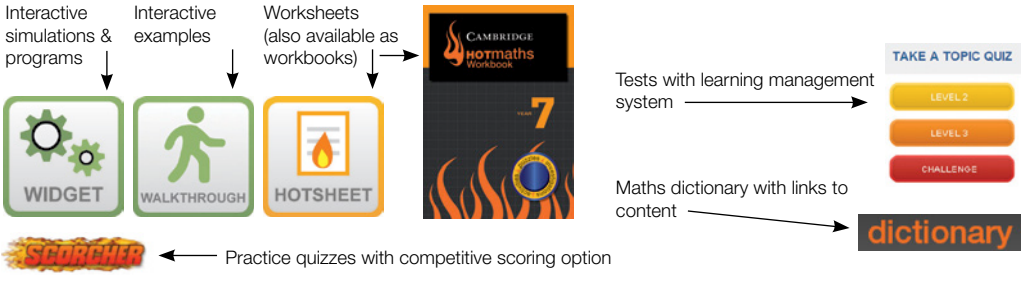
## INTEGRATED PROGRAM

The *CambridgeMATHS*/***HOTmaths*** integrated program for the Australian Curriculum offers the best of textbook and interactive online resources. It can be used with a HOTmaths account (eg for class demos via IWBs or data projectors) or with student accounts, which enable access to the full range of features, including use at home.

The integrated program is linked from icons and the topic numbers in the textbooks, as detailed in a document available (free) from the Cambridge website.




All HOTmaths features are included in the program, eg:




www.cambridge.edu.au/hotmaths

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