Complete Mathematics for Cambridge Secondary 1

Getting started with Complete Mathematics

This support material has not been through the Cambridge endorsement process.
Getting started with Complete Mathematics

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1. How to use this teaching support

In order to use this teaching support most effectively, you will need to refer to your Complete Mathematics Teacher Pack 1.

Page references will be given throughout.
How to use this teaching support

This teaching support offers a step-by-step guide to using the Complete Mathematics Teacher Pack alongside the Student resources for effective 11-14 mathematics lessons, including how to:

- Give every student the right level of challenge for each exercise
- Build assessment confidence for Cambridge Checkpoint and beyond
- Solidify understanding through active learning.
2. How is the course structured?

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How is the course structured?

**Student Books**
Comprehensive coverage of the topics, matched to the Cambridge Secondary 1 curriculum framework.

**Homework Books**
Portable books that students can write in, for further practice of the Student Book topics.

**Teacher Packs**
Includes customizable materials for extra practice, and support for revision and assessment.
3. What’s in your Teacher Pack?

Matched to the Cambridge Secondary 1 Mathematics curriculum framework, the Teacher Pack contains extra material that builds on the Student Book and Homework Book.

- Active learning resources
- Resources for use with the Student Books
- Revision material
- Cambridge-style Progression tests
- Topic tests
- Worked solutions
- Teacher’s CD-ROM
4. How to use your Teacher Pack

Active learning resources: help students develop problem solving skills

Resources for use with Student Book 1: extend the Student Book topics

Revision material: help students to consolidate their knowledge

Cambridge-style progression tests: build confidence for the Cambridge assessments

Topic tests: extra, Cambridge-style assessment practice

Worked solutions: demonstrate the level of detail students should give

Teacher’s CD-ROM
Customise the materials to suit your learners’ needs

The next sections will demonstrate how to use the above resources effectively in your classroom.
5. How to use the Active learning resources

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<td>Worked solutions</td>
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<td>Worked solutions to some of the more difficult questions from Student Book 1</td>
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<tr>
<td>Answers</td>
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<td>Answers to Homework Book 1</td>
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Active learning resources
Teacher Pack 1 pages 5-26
How to use the Active learning resources
What is active learning?

Active learning is an educational approach in which students are encouraged to engage with the material to be studied through activities, such as discussion and group work.
How to use the Active learning resources
What are the benefits of active learning?

• Develops **problem solving skills** – an important area in the Cambridge curriculum framework

• Compared to individual written tasks, active learning tasks like discussion and group work give students more scope for **sharing knowledge** and **eliminating common misconceptions**

• Helps you to address **alternative learning styles and abilities**, as students can work at a level that suits them and their understanding

• Investigations and open questions **build critical thinking skills**, helping to build a solid foundation for Cambridge IGCSE

As well as developing these skills, the active learning resources help to **reinforce** topics covered in the Student Books.
How to use the Active learning resources
How does Complete Mathematics deliver active learning?

- 6 investigations or activities, linked directly to the Student Book
- Topics include *square numbers, linear equations* and *problem solving*
How to use the Active learning resources

Example: *Square pairs memory game*

The topic is introduced in Student Book

The active learning activity encourages group work and reinforces knowledge. Turn to Teacher Pack 1, p.10 for instructions on how to implement the activity in the classroom.

From Unit 4.3: Squares and square roots (Student Book 1, p.88)

The next page shows how the Teacher Pack helps you to implement the active learning activities.
How to use the Active learning resources
Example: *Square pairs memory game*

Teacher’s notes give the objectives and required knowledge, as well as suggestions on how to use the activity (e.g. as a plenary).

Introductory activities suggest ways to introduce the activity to the students.

Full procedure is provided, helping you to facilitate the activity effectively.

The differentiation section offers suggestions for making the activity harder, or for extension.

Activities are mapped to the Student Book.

Alternative approaches suggest ways to ensure the activity suits your students and their understanding.

All answers are provided.

Photocopiable student worksheets are provided in the Teacher Pack, with customizable, printable versions on the CD-ROM.

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Example: *Square pairs memory game*

For square numbers between 11 and 20.
For use with the activity in Section 4.3 of Student Book 1

Teacher’s notes
This activity can be used as a starter, a plenary or a revision exercise. This is a memory game. The aim is to learn the square numbers between 11² and 20².

Introductory activity
Give students an example of a pair of cards. On the first card will be the square calculation, on the second card will be the answer. Explain the rules of the pairs game.

Square pairs memory game
For square numbers between 11² and 20².

<table>
<thead>
<tr>
<th>Square calculation</th>
<th>Answer</th>
<th>Square root</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>11²</td>
<td>121</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12²</td>
<td>144</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13²</td>
<td>169</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>14²</td>
<td>196</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>15²</td>
<td>225</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>16²</td>
<td>256</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>17²</td>
<td>289</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>18²</td>
<td>324</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>19²</td>
<td>361</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>20²</td>
<td>400</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Alternative approaches
Students could play a game of snap with the cards. Or they could use the Set B cards – the square root cards and square root answers – instead. Or they can be creative and think of a different game involving these cards.

Answers

Square pairs memory game
Ask students to work in pairs or small groups. Point and cue the square calculations and square root answers cards (Set A). This makes one complete set of two pairs. You will need one set of the cards and deals them face down into four rows of five cards each.

Students take it in turns to turn over two cards. If they are a matching pair then keep the cards and have another go. If they are not a matching pair students must return them, face down, to the positions that they came from. At the end of the game, when all pairs are found, the winner is the person with the most pairs.

Differentiation
You could reduce some cards so that there are fewer pairs to work with or make the task harder by sliding extra cards of your own. Ask students to come up with their own extra pairs using the blank cards. In this way students can extend the activity to learn squares beyond 20² – 20².
6. How to use the extra Teacher Pack Resources for Student Book 1

Resources for use with Student Book 1
Teacher Pack 1 pages 27-29
How to use the extra Teacher Pack Resources for Student Book 1

This section includes further photocopiable resources that link to the material in the Student Book, extending students’ knowledge of the topics.
7. How to use the Revision and assessment resources

Revision material, Cambridge-style progression tests, and Topic tests
Teacher Pack 1, pages 30-106
How to use the Revision and assessment resources

• This section will show you how to use the **Topic tests** and **Revision material** (in the Teacher Pack), plus **Review sections** (in the Student Book) to prepare students for the practice Cambridge-style **Progression tests**.

• The balanced assessment materials in your Teacher Pack integrate **problem solving** and cover **all the content areas** in the Cambridge Secondary 1 curriculum framework:
  
  Number  Measure  
  Algebra  Handling data  
  Geometry

• **Mental strategies** are tested throughout – many assessments are non-calculator.

• **Detailed mark schemes** help you to monitor progress.
How to use the Revision and assessment resources

Revision material (Teacher Pack 1 pages 30-44)

• This Revision material in your Teacher Pack supplements the Review sections in the Student Book

• Also covering 6 chapters per section, the Review questions are not multiple choice, and include open questions to review concepts

Use the Revision material and the Review sections to prepare your students for the Topic tests and Cambridge-style Progression tests.
How to use the Revision and assessment resources

Revision material

- The revision material includes three multiple-choice exercises, each covering a block of six Student Book chapters – these cover the entire Cambridge Secondary 1 curriculum framework.

- It consolidates what has been learned in blocks: ideal for homework, or as an in-class quiz.

- The structure allows you to set exercises at the end of a single chapter, or series of chapters, with all answers provided.

- Example: Multi-choice Exercise A includes 92 multiple choice questions, covering Student Book 1 Chapters 1-6.
How to use the Revision and assessment resources
Cambridge-style Progression tests (Teacher Pack 1 pages 45-71)

- Each Cambridge-style Progression test covers the **whole** of Student Book 1 – ideal as an end-of-year assessment, or as preparation for the Cambridge Progression tests

- Your Teacher Pack includes practice papers for all three Cambridge Progression tests:
  - Paper 1 (non-calculator)
  - Paper 2 (calculator)
  - Paper 3 (mental strategies)

- Questions are taken from across the entire Stage 7 curriculum framework.
How to use theRevision andassessment resources
Cambridge-style Progression tests

- These tests include detailed mark schemes to help you to **effectively** monitor progress.

<table>
<thead>
<tr>
<th>Question</th>
<th>Marks</th>
<th>Answer</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 (a)</td>
<td>[1]</td>
<td>( T = bx )</td>
<td>Mark generously if intention is clear, for example accept ( t ) instead of ( b ) (answer).</td>
</tr>
<tr>
<td>16 (b)</td>
<td>[1]</td>
<td>$316.70</td>
<td>Allow a Biller through mark for a correctly worked calculation of 18.3 into shaped answer in part (a).</td>
</tr>
<tr>
<td>16 (c)</td>
<td>[1]</td>
<td>( \frac{1}{2} ) or ( \frac{5}{10} )</td>
<td>Accept 0.17 or 0.18. Do not accept ratio answers, for example 2:1. Do not accept answers in words, for example &quot;2 out of 12&quot;.</td>
</tr>
<tr>
<td>16 (d)</td>
<td>[1]</td>
<td>( \frac{3}{2} ) or 1.5</td>
<td>Do not accept ratio answers, for example 3:2. Do not accept answers in words, for example &quot;3 out of 2&quot;.</td>
</tr>
<tr>
<td>16 (e)</td>
<td>[1]</td>
<td>6</td>
<td>Condone 6 out of 10 here (since this is not a probability answer).</td>
</tr>
<tr>
<td>17 (a)</td>
<td>[1]</td>
<td>60°</td>
<td></td>
</tr>
<tr>
<td>17 (b)</td>
<td>[1]</td>
<td>60°</td>
<td></td>
</tr>
<tr>
<td>17 (c)</td>
<td>[1]</td>
<td>60°</td>
<td></td>
</tr>
<tr>
<td>18 (a)</td>
<td>[2]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 (b)</td>
<td>[2]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 (a)</td>
<td>[3]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Paper 2 mark scheme** (p.69)
How to use the Revision and assessment resources
Cambridge-style Progression tests

Use the mark schemes to explain how students can maximise their marks.

Paper 2 question (p.65)

Paper 2 mark scheme (p.69)
How to use the Revision and assessment resources
Topic tests (Teacher Pack 1 pages 75-106)

Your Teacher Pack contains three Topic tests, each covering a block of six Student Book chapters (like the Review sections and Revision material) – with all answers provided.

- Topic tests could be set each term, or as a class test.

- Cambridge-style questions allow students to practise problem solving skills, and mental strategies – building confidence for the Cambridge Checkpoint test.

From Topic test – Chapters 1-6 (Teacher Pack 1, p.75)
8. Worked solutions
Teacher Pack 1 (pages 107-111)

- Worked solutions for the most complex questions in the Student Books are included to help you:
  - **Demonstrate the level of detail** students should include in their answers
  - Indicate the layout expected to **maximise method marks** as students move towards Cambridge IGCSE level
  - Ensure students understand the **most challenging topics** and are **working at the highest levels**
Worked solutions
Example

From Chapter 13: Fractions, decimals and percentages (Student Book 1, p.231)

Exercise 13F, Question 7

80 litres = 40%
Divide both figures by 4 to get 20 litres = 10%
Multiply both by 10 to get 200 litres = 100%, so a full tank holds 200 litres.

(Alternative method: \(80 \times \frac{100}{40} = 200\))

Worked solution (Teacher Pack 1, p.110)
9. Answers

- Answers to all of the **Student Book** and **Homework Book** exercises, as well as the **Active learning resources**, **Revision material** and **Cambridge-style Progression** and **Topic tests**, are all provided in the Teacher Pack.
10. How to use the Teacher’s CD-ROM

PowerPoint presentations

This includes ready-made PowerPoint presentations that introduce and summarise all topics in the Student Books.

Use the PowerPoint presentations for demonstrating at the front of class.

Before you start

You should know ...
1. A fraction can be shown by a picture:
   - \( \frac{2}{4} \) is shaded
   - \( \frac{3}{4} \) is shaded

2. Your multiplication tables up to 10 x 10.

3. What is the value of the digit 4 in these numbers?
   - a 94  b 481  c 4012
     - a four
     - b four hundred
     - c four thousand

Check in
1. a What fraction of each shape is shaded?
   - i \( \frac{3}{10} \)
   - ii \( \frac{10}{30} \)

b Draw shapes to represent
   - \( \frac{2}{3} \)

2. Write down the answers to:
   - a \( 2 \times 7 \)  b \( 3 \times 6 \)
   - c \( 8 \times 4 \)  d \( 5 \times 4 \)
   - e \( 9 \times 7 \)  f \( 9 \times 8 \)

3. Write down the value of the 4 in:
   - a 24  b 42
   - c 402  d 645
   - e 4132  f 49206
   - g 14873
How to use the Teacher’s CD-ROM
Editable resources

The Teacher Pack resources are available in PDF and Word formats, so you can print them out or display them on an interactive whiteboard.

You can also edit the resources to best suit the needs and abilities of your class.
How to use the Teacher’s CD-ROM

Glossary

A glossary of key mathematical terms helps your students to focus on the mathematics – ideal for students whose first language is not English.
11. How to support the step up to Cambridge IGCSE Teacher Pack

- **Differentiation and Alternative approaches sections** for the Active learning resources indicate how to extend the activities for your most able students, building confidence for the step up to Cambridge IGCSE Mathematics.

- Use the **editable worksheets** on the CD-ROM to ensure the activities suit your students’ abilities.
How to support the step up to Cambridge IGCSE Student Book

Use the differentiated questions in the Student Books to stretch your students and build confidence for Cambridge IGCSE

Numbered questions without a box provide initial practice

Questions with a box provide challenge for the average student

Questions with a filled box provide stretch and challenge for more able students

From Unit 7: Fractions (Student Book 1, p.148)
How to support the step up to Cambridge IGCSE
Student Book

- For further extension, Chapter 19 in each Student Book introduces a Cambridge IGCSE topic, stretching learners beyond Cambridge Secondary 1 and building confidence for Cambridge IGCSE

Example from Sets and Venn diagrams (Student Book 1, pages 306-318)
How to support the step up to Cambridge IGCSE
Homework Book

Use the Homework Book for further practice, to solidify the concepts and build confidence for Cambridge IGCSE

Numbered questions without a box provide initial practice

Questions with a box provide challenge for the average student

From Unit 4: Multiples, factors and primes
(Homework Book 1, p.23)
12. About Complete Mathematics
How does the course help you to support strong achievement?

1. **Comprehensive** – we are working with Cambridge towards endorsement

2. **Build foundations** – extend knowledge beyond Cambridge Secondary 1, for a flying start at Cambridge IGCSE®

3. **Strengthen confidence** – over 400 pages of stretching practice to reinforce each concept

4. **Eliminate confusion** – worked examples break down the calculations

5. **Dedicated teacher support** – tailor the material to your class, helping you to prepare your students for strong achievement
About Complete Mathematics Professional Development

We are now offering in-school training alongside the course, supporting you in delivering engaging lessons and getting the best out of your students.

Led by experts, this day-long professional development course is made up of four modules, focusing on key areas of the Cambridge Secondary 1 mathematics curriculum framework:

1. Introduction to problem solving
2. Applying problem solving
3. Introduction to differentiation
4. Applying differentiation

For more information on our Professional Development for this course, please click here to visit the website, or you can email our Professional Development team at: international.training@oup.com
About Complete Mathematics
Useful links and contacts

Cambridge Secondary 1 Mathematics Curriculum Framework

www.oxfordsecondary.co.uk/checkpointmaths
For more information on Complete Mathematics, including sample chapters and ordering details.

http://www.oup.com/oxed/international/contactus/
Find your dedicated Educational Consultant.

To find out more about in-school training, empowering you to bridge the gap between Cambridge Secondary 1 and Cambridge IGCSE, email training.international@oup.com