Teaching for Mastery

The National Centre for Excellence in the Teaching of Mathematics describes teaching for mastery as **'the range of elements of classroom practice and school organisation that combine to give pupils the best chances of mastering mathematics'**.*

The teaching for mastery approach follows these principles:

- **All pupils can achieve high standards in mathematics**
- **Pupils are taught as a whole-class and progress through the mathematical content at the same pace**
- **Same-day intervention is given for those struggling to grasp a concept**
- **Lessons should be interactive and contain practice and consolidation**
- **Questioning should be used to regularly assess pupils' conceptual and procedural knowledge**

Mastery is evident when a child can show deep, secure and fluent understanding of mathematical concepts and when they can apply their knowledge to various problems.

To find out more about a mastery approach to teaching visit our mastery hub: **www.collins.co.uk/MathsMastery**

Is your school eligible for DfE match funding?

If your school is taking part in the DfE's Teaching for Mastery Programme you could be one of the schools receiving £2,000 of matched funding to spend on approved primary maths mastery textbooks.

Real Shanghai Mathematics will be submitted to the DfE for the next round of evaluation.

For more information visit our mastery hub: **www.collins.co.uk/MathsMastery**

*Definition from: www.ncetm.org.uk/resources/49450

The Shanghai Pedagogy

The Shanghai method of teaching is a whole-class approach that builds thorough understanding, develops higher-order thinking and is supported by the use of high-quality textbooks. The Shanghai pedagogy is based on:

A step-by-step approach that emphasises the development of basic knowledge, skills and thorough mastery of concepts

Whole-class teaching where teachers reinforce that every pupil can achieve a high standard in maths

Skilful questioning within lessons to promote conceptual understanding. Problems are used as a starting point for teaching

Identifying and rapidly acting on misconceptions which arise through same-day intervention

Understanding is promoted through a variety of representations

A Shanghai maths teaching framework usually follows this lesson structure:

1 Using problems as a starting point for teaching

2 Guiding students through exploratory activities

3 Establishing variation in practice

4 Summarising

5 Modifying based on teaching objectives

'The Shanghai approach – with children taught as a whole class, building depth of understanding of the structure of mathematics, supported by the use of high-quality textbooks – is proving a hit in those schools in the country where it's been tried. And standards of maths in these schools are rising rapidly.'
Nick Gibb, Minister of State for Schools

www.collins.co.uk/RealShanghaiMathematics

The Real Shanghai Mathematics Programme

Real Shanghai Mathematics is a collaboration between Collins and Shanghai Century Publishing Group (SCPG) to produce a translation of SCPG's leading primary maths textbook programme. It consists of two Teacher's Books, Pupil Textbooks and Practice Books for each year (1-6), and embodies the essence of a high-quality maths textbook programme: small steps of carefully planned progression; a strong focus on visual representations of mathematical concepts; and procedural variation.
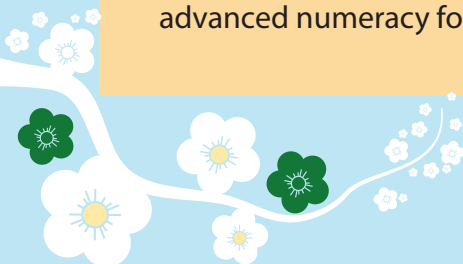
The programme is translated from Chinese into English with no adaptation or dilution, meaning the structural integrity of the programme is preserved.
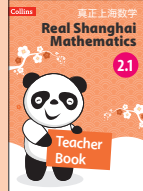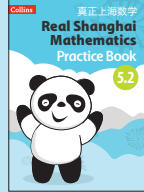
A note from Collins' Primary Publishing Manager, Fiona McGlade:

"We are so excited to publish **Real Shanghai Mathematics**, a complete programme for primary mathematics which has been directly translated from Shanghai's leading primary mathematics programme. Shanghai is recognised as one of the leading jurisdictions in maths teaching and learning, and this programme has been used with great success in Shanghai for more than ten years. The textbooks have already been used as exemplar resources by the National Centre for Excellence in the Teaching of Mathematics (NCETM) in their teacher training, and we will seek endorsement for the translated textbooks on the Teaching for Mastery Programme run by the Department for Education.

Real Shanghai Mathematics is a rigorous primary mathematics programme, with textbooks at its centre, which emphasises complete mastery of basic numeracy knowledge and skills to allow vastly accelerated progression through to advanced numeracy for all children."

How is Real Shanghai Mathematics structured?

	Pupil Textbooks		Practice Books		Teacher's Books		1 Year subscription to Collins Connect
Year 1	Real Shanghai Mathematics 1.1 Pupil Textbook	Real Shanghai Mathematics 1.2 Pupil Textbook	Real Shanghai Mathematics Practice Book 1.1	Real Shanghai Mathematics Practice Book 1.2	Real Shanghai Mathematics 1.1 Teacher Book	Real Shanghai Mathematics 1.2 Teacher Book	Collins Connect
Year 2	Real Shanghai Mathematics 2.1 Pupil Textbook	Real Shanghai Mathematics 2.2 Pupil Textbook	Real Shanghai Mathematics Practice Book 2.1	Real Shanghai Mathematics Practice Book 2.2	Real Shanghai Mathematics 2.1 Teacher Book	Real Shanghai Mathematics 2.2 Teacher Book	Collins Connect
Year 3	Real Shanghai Mathematics 3.1 Pupil Textbook	Real Shanghai Mathematics 3.2 Pupil Textbook	Real Shanghai Mathematics Practice Book 3.1	Real Shanghai Mathematics Practice Book 3.2	Real Shanghai Mathematics 3.1 Teacher Book	Real Shanghai Mathematics 3.2 Teacher Book	Collins Connect
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www.collins.co.uk/RealShanghaiMathematics

Teacher Support

Teacher's Books

Teacher's Books support the teacher in delivering a mastery approach to primary mathematics, with clear guidance on planning and teaching within a structured programme. Each page correlates to the pages in the pupil textbook, and provides a clear teaching sequence with guidance for teaching and assessing.

Facsimiles are provided to show the correlating Pupil Textbook page

Each Unit of study is clearly introduced with the teaching goals for the Unit listed

The 'Advice for Teaching' section gives the teacher guidance for planning and delivering the lessons. It provides a step-by-step structure clearly covering each question within the Pupil Textbook

Unit Two: Addition and subtraction of numbers up to 10

TEACHING GOALS

Knowledge and skills

1. Know the meaning of additions with realistic examples of the combining model and the adding model. State the name of each component in an addition number sentence.
2. Begin to understand that even if two addends change places, the sum will not change.
3. Know the meaning of subtractions with realistic examples of the finding-remainder model and the part–whole model. State the name of each component in a subtraction number sentence.
4. Explore and perceive the relationship between addition and subtraction in real situations and on the number line: subtraction is the inverse operation of addition.
5. Explore and master additions and subtractions of numbers up to 10.
6. Use realistic examples to write down expressions like □ + a = 10, and find the addend; use realistic examples to write down expressions like 10 – □ = b, and find the subtrahend.
7. Calculate adding or subtracting two numbers up to 10, and use two-step mixed operations with numbers up to 10.

Process and method

1. Begin to know the meaning of additions with realistic examples of the combining model and the adding model. Begin to know the meaning of subtractions with realistic examples of the finding-remainder model and the part–whole model.

2. Explore the different results of splitting numbers up to 10 with two-sided counters, and gain experience from mathematical exploration activities.
3. Experience the mathematical process of abstracting simple mathematics problems from real-life contexts, getting the result, then going back to the real-life context.
4. Improve the accuracy of calculation in learning addition and subtraction of numbers up to 10.

Emotional attitude and value

1. Feel the connection between mathematics and life, and perceive that mathematics is useful and interesting. Begin to know the value of mathematics.
2. During the learning and application of maths, stimulate interest, and develop a good learning attitude in mathematical learning. Have curiosity about mathematical phenomena in real life and the surrounding environment and a desire to explore mathematics.

DESIGN FOR TEACHING

Based on Unit One 'Numbers up to 10', learn addition and subtraction of numbers up to 10.

When learning addition and subtraction, it's very important for pupils to know the meaning of addition and subtraction. Regarding making ten, which is very important in the future, the textbook is arranged as 'combine and split' and 'games with 10' to help pupils study better.

Number bonds

TEACHING GOALS

1. State all the different results of splitting 10.
2. Master all the different results of splitting 10 in order.

KEY TEACHING POINTS

Split 10.
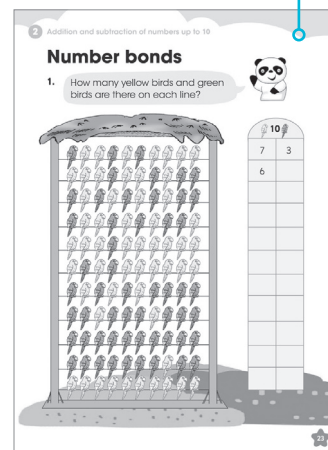
POTENTIAL BARRIERS

Splitting 10 in order.

NOTES FOR TEACHING

The aim of 'split and combine' is to find all the possible ways to split a given number into two numbers, and record them without missing any. This splitting is introduced using the scenario of 'green birds and yellow birds on perches'.

ADVICE FOR TEACHING

1. Question 1
   Show this question on the board.

   First, let pupils describe the bird cage: the birds are having a rest on the perches. The perches make up 11 floors. (11 doesn't appear in the textbook yet but pupils have experience of 11 in daily life.) There are 10 birds on each floor. Some are yellow and some are green. There is a table like a house. 10 is written on the roof. The number of yellow birds should be filled in the column below the yellow bird and the number of green birds should be filled in the column below the green bird. When pupils can understand the meaning of these, they can solve the problem independently. They can count yellow and green birds on each floor, then fill in the blanks. They can finish the 'splitting 10'.

2. Question 2
   This question is an exercise in 'splitting 10'. The key point is to find every possible result. Pupils can find each answer without missing any using two-sided counters by finding that the first answer is red (or blue), then decreasing by 1 red (or blue) every time, and increasing 1 blue (or red) every time, until all counters are blue (or red).

   Use a magnetic board to demonstrate the question: show 5 two-sided counters in one line. How many different ways can you show them? Every time a pupil shows them one way, then fill in the number of red ones and blue ones in each row in the number building.

② Addition and subtraction of numbers up to 10

Number bonds

1. How many yellow birds and green birds are there on each line?

33 34

Sample pages from Teacher's Book 1.1
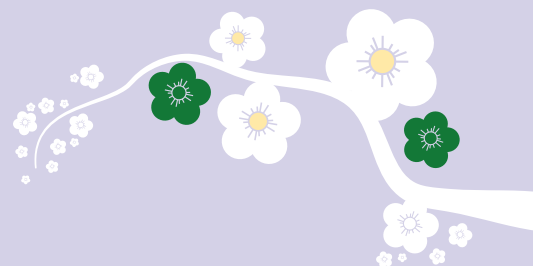
Digital Resources

Collins Connect

Digital support is also available via our innovative online learning platform, Collins Connect.

- **PDF and editable word versions** of the Teacher's Books provide flexibility allowing you to tailor resources to suit your pupils' needs
- **Book view** enables you to display the Pupil Textbooks on the whiteboard, ideal for front-of-class teaching
- Plan lessons effectively using the **Planning Tool**
- Engage your pupils through **interactive maths tools, slides and images**
- Keep track of your pupils' progress using the **Record-Keeping Tool**

Pupil Resources

Pupil Textbooks

High-quality Pupil Textbooks support every child, enabling them to master objectives with an engaging, clear and structured design. Each carefully constructed page aids understanding and mathematical development, with varied models and images, clear exemplars and concise mathematical explanations.

Promotes conceptual understanding of the mathematics

Contains small steps of carefully planned progression

Makes use of a wide range of visual representations to explain mathematical concepts

Provides opportunities for pupils to make connections, reason and solve problems

Is carefully written and designed to be accessible to all pupils

Sample pages from *Pupil Textbook 1.1*

Each practice exercise links to the corresponding page in the Pupil Textbook

Exercises have been carefully written and refined to ensure that they promote optimal procedural and conceptual understanding within carefully structured questions

A wide variety of exercises provide pupils with the opportunity to practice intelligently, make conjectures, hypothesise, investigate, interpret, reason and solve problems within engaging and interesting contexts

Practice Books

The Practice Books contain exercises which link precisely to the teaching and learning in the corresponding Unit in the Teacher's Book and Pupil Textbook. Intelligent practice is at the heart of these exercises, with each activity designed to encourage children to make connections, reason, conjecture and generalise.

Sample pages from *Practice Book 1.1*

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