

PictureMaths

Sample materials

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- Engage children in mathematics through pictures, interesting contexts and puzzles
 - Ideal for small group work and intervention
 - Detailed teaching guidance to support teaching assistants

**Sample
activities
inside**

Years 1-6

How to use Picture Maths

The objective of the *Picture Maths* series is to engage the children in mathematics through pictures, interesting contexts and puzzles.

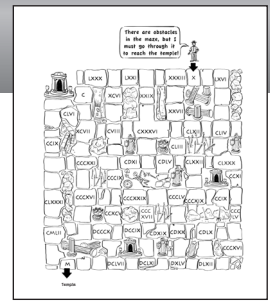
Each activity is spread over two pages of the book and a related picture on the CD-ROM. The first page offers guidance on how the activity can be introduced, supported and expanded where time is available. The second is a photocopiable page which provides ten progressive questions related to one or more mathematics curriculum objectives that are answered using information in the picture.

For each activity the guidance page includes a whole class introduction that can provide informal assessment about the children's prior learning and introduces the children to the picture. There are suggestions for how teachers can support the children during the activities and opportunities for the children to dig deeper into the mathematics if there is time.

The questions are designed to be progressive and are split into sections (1-3, 4-6, 7-9) aimed at differing abilities. They can be used flexibly; teachers may choose to let the children work through as many questions as possible in the time, or give differentiated groups of children the section of questions according to their ability. Question 10 in each activity is designed to be an investigative or open-ended question to promote problem-solving skills. These could be tackled as a class, or in groups.

Being introduced to the context of the mathematical activities through pictures and discussion gives the children the confidence to start the problem, supporting the children with lower levels of English or reading. The children are required to use a variety of thinking skills and problem solving approaches, and there are lots of opportunities for them to talk about their mathematics and use mathematical language. Encourage the children to ask questions about the contexts and the problems, then step back to allow space for independent work.

There is an activity for every area of primary mathematics, each carefully written to match the age group of the book. Many of the pictures form stories or links to other curriculum subjects that could be the basis of a longer project. The answers to all the problems are given in a solutions box on the guidance pages. All *Picture Maths* units and images are available to view, edit, print and download on the CD-ROM, along with electronic versions of the extra mathematics classroom resources. When printing from the CD-ROM, it is advised to check your printer is set to print without scaling, to ensure any measurements print correctly.



4. Roman Adventure

Objectives

- ☉ Read Roman numerals to 1000 (M) and recognise years written in Roman numerals

I can

- ☉ Read Roman numerals to 1000
- ☉ Convert Roman numerals to the numbers in our number system
- ☉ Solve problems involving Roman numerals

Resources

- ☉ Pictures or artefacts with Roman numerals on them are useful for the introduction
- ☉ Children may need a table of conversions between Roman numerals and Arabic numbers

Introduction

- ☉ You could talk through the history of the Roman number system, how it developed and how our current number system evolved.
- ☉ Show the children some pictures or artefacts that have Roman numerals on them.
- ☉ Recap the meanings of the symbols and how they are arranged for different numbers. Explain that, when smaller values precede larger values, the smaller values are subtracted from the larger values, e.g. IX is 9, one less than ten.

- ☉ Ask the children to write their birthday and house/flat number in Roman numerals and challenge a partner to work out the numbers.
- ☉ Ask the children what might be happening in the picture. After discussion, explain that the heroic adventurer, Matt McTitian, has to find his way through the maze to get to the treasures in the temple.

During the activity

1. When the children are trying to convert Roman numerals into Arabic numbers, encourage them to break the number down into parts.
2. If the children need support, provide them with, or get them to make, small cards with the separate symbols on them so that they can separate and combine the numbers.
3. In question 3, encourage the children to think about how many hundreds they need to make one thousand (or how many Cs in M).

If you have time...

1. The children could make their own maze using Roman numerals. Encourage them to make up their own rule for finding a safe way through it.

Maths words

Roman numerals

Solutions

1. 33 or 66, 2. 71, 29, 27, 154, 3. XXXIII [33], LXXI [71], XCVI [96], CVIII [108], CCCIX [309], CCCXVI [316], CMLII [952], M [1000] or XXXIII [33], LXXI [71], XCVI [96], CVIII [108], CXXXVI [136], CLIII [153], CLXXII [172], CCCXIX [319], CCCLV [355], CDXX [420], DXLV [545], DCLXI [661], DCCIX [709], DCCCX [810], CMLII [952], M [1000], 4. CCCXXIX, 5. CLXXXI, 6. 96, 411, 420, 512, 7. CXLV, CCL, DCLXXV, CDXV, 8. CCCXVI (316), CCCXXIX (329), CCCLV (355), 9. Answers will vary, 10. Answers will vary.

Roman Adventure

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1. At the entrance to the maze, Matt has a choice of 2 directions. What is the value of the first Roman numerals he could pass?
 2. What is the value of the Roman numerals he could pass straight after the first 2 numbers?
 3. The Roman numerals in the maze show the secret route to the temple. Matt can only move on to numbers higher than the one he has just passed. Otherwise the ancient traps will be activated! Find a safe path through the maze to the temple.
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4. Which number in the maze is the Roman equivalent for 329? Explain how you know.
 5. Which number in the maze is the Roman equivalent for 181? Explain how you know.
 6. What are these in our number system: XCVI, CDXI, CDXX, DXII?
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7. Change these numbers to Roman numerals: 145, 250, 675, 415
 8. Inside the temple some writing on a wall gives Matt instructions. To find the riches of the temple he must find 3 Roman numerals in the maze that are in a straight line that add up to M.
 9. There are at least 2 safe routes through the maze to the temple. Find the others that you didn't find the first time.
10. Find the total of all the Roman numerals Matt passes on one of the safe routes you found through the maze.

There are obstacles
in the maze, but I
must go through it
to reach the temple!

