

Autumn
Scheme of learning

Year 6

**White
Rose
Maths**

#MathsEveryoneCan

The White Rose Maths schemes of learning

Teaching for mastery

Our research-based schemes of learning are designed to support a mastery approach to teaching and learning and are consistent with the aims and objectives of the National Curriculum.

Putting number first

Our schemes have number at their heart. A significant amount of time is spent reinforcing number in order to build competency and ensure children can confidently access the rest of the curriculum.

Depth before breadth

Our easy-to-follow schemes support teachers to stay within the required key stage so that children acquire depth of knowledge in each topic. Opportunities to revisit previously learned skills are built into later blocks.

Working together

Children can progress through the schemes as a whole group, encouraging students of all abilities to support each other in their learning.

Fluency, reasoning and problem solving

Our schemes develop all three key areas of the National Curriculum, giving children the knowledge and skills they need to become confident mathematicians.

Concrete – Pictorial – Abstract (CPA)

Research shows that all children, when introduced to a new concept, should have the opportunity to build competency by following the CPA approach. This features throughout our schemes of learning.

Concrete

Children should have the opportunity to work with physical objects/concrete resources, in order to bring the maths to life and to build understanding of what they are doing.



Pictorial

Alongside concrete resources, children should work with pictorial representations, making links to the concrete. Visualising a problem in this way can help children to reason and to solve problems.



Abstract

With the support of both the concrete and pictorial representations, children can develop their understanding of abstract methods.

An abstract representation of the addition problem 5 + 7. The equation is written inside a yellow rectangular box with a slight 3D effect.

If you have questions about this approach and would like to consider appropriate CPD, please visit www.whiterosemaths.com to find a course that's right for you.

Teacher guidance

Every block in our schemes of learning is broken down into manageable small steps, and we provide comprehensive teacher guidance for each one. Here are the features included in each step.

Notes and guidance that provide an overview of the content of the step and ideas for teaching, along with advice on progression and where a topic fits within the curriculum.

Things to look out for, which highlights common mistakes, misconceptions and areas that may require additional support.

Year 5 | Autumn Term | Block 1 – Place Value | Step 1

Roman numerals to 1,000

Notes and guidance

In Year 4, children learned about Roman numerals to 100. In this small step, they explore Roman numerals to 1,000, and the symbols D (500) and M (1,000) are introduced. Children explore further the similarities and differences between the Roman number system and our number system, learning that the Roman system does not have a zero and does not use placeholders. Children use their knowledge of M and D to recognise years using Roman numerals. Asking children to write the date in Roman numerals is one way to reinforce the concept daily.

Things to look out for

- Children may mix up which letter stands for which number.
- Children may add the individual values together instead of interpreting the values based on their position, for example interpreting CD as 600 instead of 400
- It is often more difficult to convert numbers that require large strings of Roman numerals.
- Children may think that numbers such as 990 can be written as XM instead of CMXC.

Key questions

- What patterns can you see in the Roman number system?
- What rules do we use when converting numbers to Roman numerals?
- What letters are used in the Roman number system? What does each letter represent?
- How do you know what order to write the letters when using Roman numerals?
- What is the same and what is different about representing the number “five hundred and three” in the Roman number system and in our number system?

Possible sentence stems

- The letter ____ represents the number ____
- I know ____ is greater than ____ because ____

National Curriculum links

- Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals

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Key questions that can be posed to children to develop their mathematical vocabulary and reasoning skills, digging deeper into the content.

Possible sentence stems to further support children’s mathematical language and to develop their reasoning skills.

National Curriculum links to indicate the objective(s) being addressed by the step.

Teacher guidance

A **Key learning** section, which provides plenty of exemplar questions that can be used when teaching the topic.

Year 2 | Autumn Term | Block 1 - Place Value | Step 1

Numbers to 20

Key learning

- Complete the number tracks.
 - 0 1 2
 - 10 11 12
 - 7 8 13
- What numbers are shown?
 -
 -
 -

Give your answers in numerals and words.
- What number is shown on each Rekenrek?
 -
 -

Give your answers in numerals and words.
- What numbers are shown?
 -
 -
 -
 -

Give your answers in numerals and words.
- Use words to complete the sentences.
 - The number after four is _____
 - The number before eight is _____
 - The number after nine is _____
- Make each number in three different ways.
 - 19
 - fifteen
 - 16
 - eleven

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Activity symbols that indicate an idea can be explored practically

Reasoning and problem-solving activities and questions that can be used in class to provide further challenge and to encourage deeper understanding of each topic.

Year 3 | Autumn Term | Block 1 - Place Value | Step 4

Hundreds

Reasoning and problem solving

I am going to count in 100s from zero.

Dora

Write two numbers that Dora will say.

any two multiples of 100

No

Mo is counting in hundreds.

... 8 hundred, 9 hundred, 10 hundred

Mo should have said 1 thousand, 10 hundreds is equal to 1 thousand.

How should Mo have said the last number?

Dora will say the number 160

Tiny

Is Tiny correct? How do you know?

Balloons come in bags of 10

Rosie has 300 balloons.

Rosie has 30 bags of balloons.

How many bags does she have?

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Answers provided where appropriate

Activities and symbols

Key Stage 1 activities

Key Stage 1 includes more hands-on activities alongside questions.

An activity to be led by the teacher



Use a Rekenrek in the ready position.

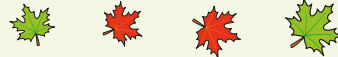


Ask children to show a number on their Rekenrek.

An outside activity or one that uses resources from nature



Find some seeds and leaves to represent Autumn.



Ask children to sort the objects in three different ways and then compare their answers with a partner.

An activity introduced by a reading from an appropriate fiction or non-fiction book



Read *The Button Box* by M Reid.

Give children a selection of buttons and ask them to sort the buttons in as many different ways as they can.

Encourage them to think about size, shape, colour and number of holes.

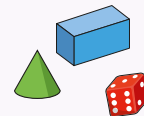


An investigation



Give children a selection of 3D shapes.

Ask children to sort the objects into two groups and then challenge a partner to say how the objects have been sorted.



Key Stage 1 and 2 symbols

The following symbols are used to indicate:



concrete resources might be useful to help answer the question



a bar model might be useful to help answer the question



drawing a picture might help children to answer the question



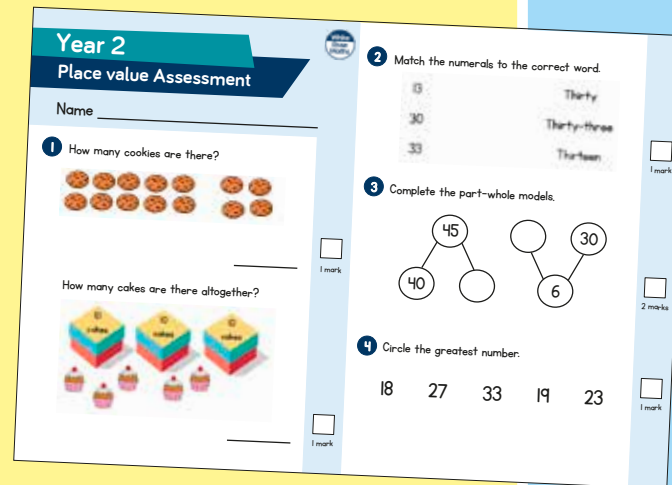
children talk about and compare their answers and reasoning



a question that should really make children think. The question may be structured differently or require a different approach from others and/or tease out common misconceptions.


Free supporting materials


End-of-block assessments to check progress and identify gaps in knowledge and understanding.



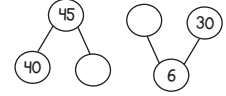
Year 2
Place value Assessment

Name _____

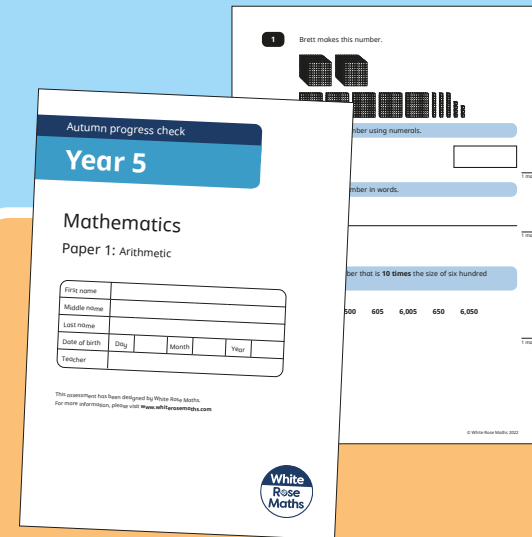
1 How many cookies are there?

_____ 1 mark

How many cakes are there altogether?

_____ 1 mark

2 Match the numerals to the correct word.
13 Thirty
30 Thirty-three
33 Thirteen
_____ 1 mark

3 Complete the part-whole models.

_____ 2 marks

4 Circle the greatest number.
18 27 33 19 23
_____ 1 mark



Autumn progress check
Year 5
Mathematics
Paper 1: Arithmetic

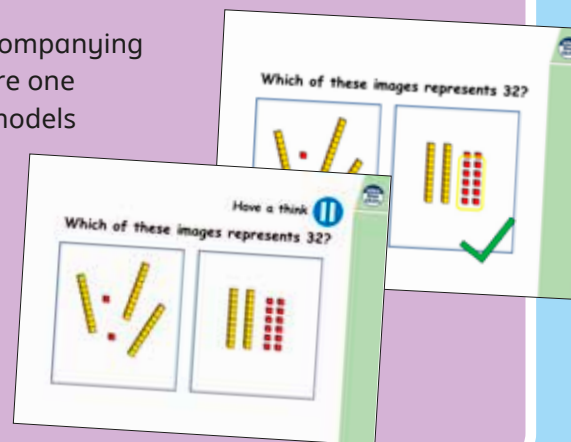
First name _____
Middle name _____
Last name _____
Date of birth Day _____ Month _____ Year _____
Teacher _____


This assessment has been designed by White Rose Maths.
For more information, please visit www.white-rose-maths.com


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End-of-term assessments for a more summative view of where children are succeeding and where they may need more support.

Each small step has an accompanying **home learning video** where one of our team of specialists models the learning in the step. These can also be used to support students who are absent or who need to catch up content from earlier blocks or years.



Which of these images represents 32?


Have a think
Which of these images represents 32?


Free supporting materials

Primary Progression – Place Value						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	<ul style="list-style-type: none"> count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number Count numbers to 100 in numerals; count in multiples of twos, fives and tens <p>Autumn 1 Autumn 4 Spring 2 Summer 4</p>	<ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward <p>Autumn 1</p>	<ul style="list-style-type: none"> count from 0 in multiples of 4, 8, 50 and 100, find 10 or 100 more or less than a given number <p>Autumn 1 Autumn 3</p>	<ul style="list-style-type: none"> count in multiples of 6, 7, 9, 25 and 1000 count backwards through zero to include negative numbers <p>Autumn 1 Autumn 4</p>	<ul style="list-style-type: none"> count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 count forwards and backwards with positive and negative whole numbers, including through zero <p>Autumn 1</p>	

National Curriculum progression to indicate how the schemes of learning fit into the wider picture and how learning progresses within and between year groups.

Skill: Add three 1-digit numbers

Year: 2

When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

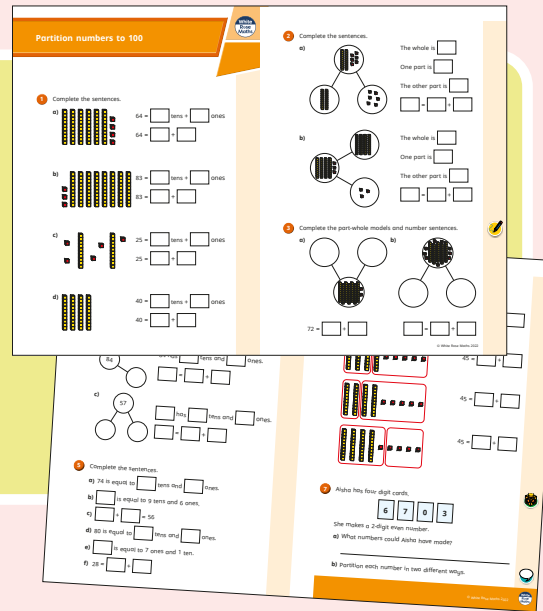
Calculation policies that show how key approaches develop from Year 1 to Year 6.

Ready to Progress – Number Facts Year 3			
	3NF-1	3NF-2	3NF-3
RTP Criteria	Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	Apply place-value knowledge to know additive and multiplicative number facts (scaling facts by 10).
White Rose Maths Small Steps	Autumn 2 Addition and Subtraction <ul style="list-style-type: none"> Add 3-digit and 1-digit numbers - crossing 10 Subtract a 1-digit number from a 3-digit number - crossing 10 Add 3-digit and 2-digit numbers - crossing 100 Subtract a 2-digit number from a 3-digit number - crossing 100 	Autumn 3 Multiplication and Division <ul style="list-style-type: none"> 2 times-table 5 times-table Divide by 2 Divide by 5 Divide by 10 Multiply by 4 Divide by 4 The 4 times-table Multiply by 8 Divide by 8 The 8 times-table 	Spring 1 Multiplication and Division <ul style="list-style-type: none"> Related calculations Scaling Spring 4 Measurement: Length and Perimeter <ul style="list-style-type: none"> Equivalent lengths (m and cm) Equivalent lengths (mm and cm)

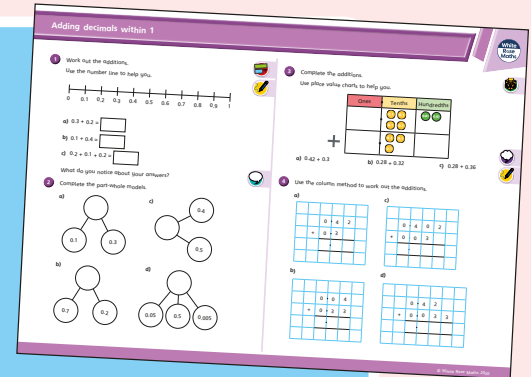
Ready to progress mapping that shows how the schemes of learning link to curriculum prioritisation.

Premium supporting materials

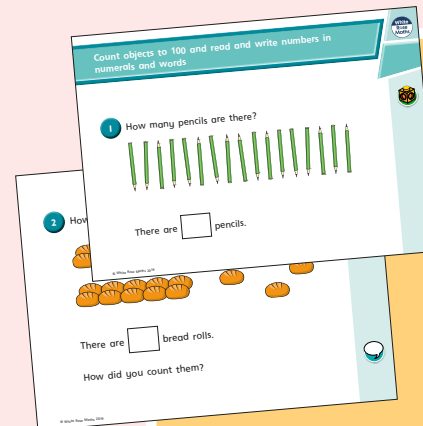
Worksheets to accompany every small step, providing relevant practice questions for each topic that will reinforce learning at every stage.



Display versions of the worksheet questions for front of class/whole class teaching.

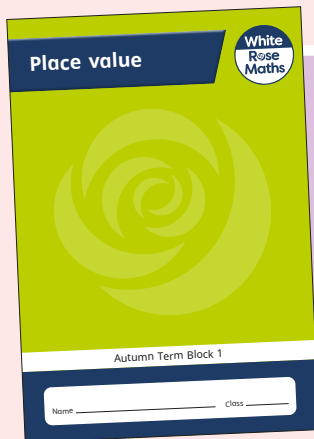


PowerPoint™ versions of the worksheet questions to incorporate them into lesson planning.



Answers to all the worksheet questions.

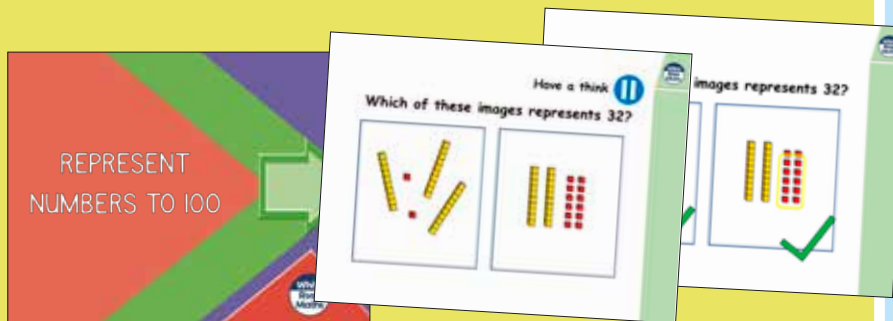
Question	Answer
1	There are 17 pencils.
2	There are 17 bread rolls. Children may have counted 3 tens and 3 rolls.
3	twenty-eight
4	sixty-two
5	4 tens and 5 ones
6	a) seventeen b) twenty-one c) thirty-five d) eighty-two
7	a) 12 b) 80 c) 100 d) 9 e) 27 f) 14
8	79, 80, 81, 82, 83, 85 70, 79, 66, 64, 63
9	Fox has 20 sweets. Fox's friend gives her 7 sweets.



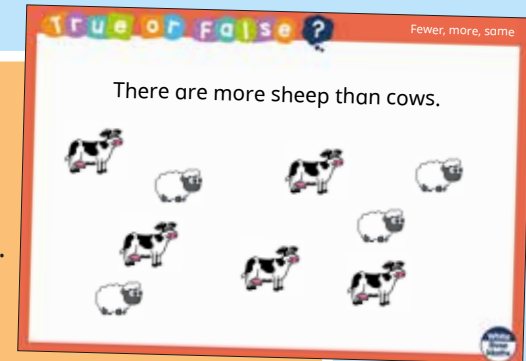
Also available as printed **workbooks**, per block.

Premium supporting materials

Teaching slides that mirror the content of our home learning videos for each step. These are fully animated and editable, so can be adapted to the needs of any class.



A **true or false** question for every small step in the scheme of learning. These can be used to support new learning or as another tool for revisiting knowledge at a later date.



Flashback 4 starter activities to improve retention. Q1 is from the last lesson; Q2 is from last week; Q3 is from 2 to 3 weeks ago; Q4 is from last term/year. There is also a bonus question on each one to recap topics such as telling the time, times-tables and Roman numerals.

Flashback 4 Year 4 | Week 5 | Day 1

- 1) Round 6,495 to the nearest 10, 100 and 1,000 5×2
6,500 6,500 6,000
- 2) Round 38 to the nearest 10 40
- 3) Complete the part-whole model.
- 4) Multiply 38 by 4 152



Topic-based CPD videos

As part of our on-demand CPD package, our maths specialists provide helpful hints and guidance on teaching topics for every block in our schemes of learning.

Meet the characters

Our class of characters bring the schemes to life, and will be sure to engage learners of all ages and abilities. Follow the children and their class pet, Tiny the tortoise, as they explore new mathematical concepts and ideas.

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Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number Place value		Number Addition, subtraction, multiplication and division				Number Fractions A		Number Fractions B		Measurement Converting units	
Spring	Ratio		Algebra		Number Decimals		Number Fractions, decimals and percentages		Measurement Area, perimeter and volume		Statistics	
Summer	Geometry Shape			Geometry Position and direction	Themed projects, consolidation and problem solving							

Autumn Block 1

Place value

Small steps

Step 1

Numbers to 1,000,000

Step 2

Numbers to 10,000,000

Step 3

Read and write numbers to 10,000,000

Step 4

Powers of 10

Step 5

Number line to 10,000,000

Step 6

Compare and order any integers

Step 7

Round any integer

Step 8

Negative numbers