Year 5 and 6 Maths Workshop

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Aims for today

- To get an insight into how Maths is taught at Albrighton
- Expectations for each year group
- SATs
- Ideas on how to support your children at home

How maths is taught in upper key stage 2

- Children are split into year groups for maths lessons as this means lessons can be tailored to the specific needs of that year group.
- Maths lessons are taught every morning with an additional maths lesson a Tuesday afternoon and Thursday afternoon for year 6.

Aims of the curriculum

Upper key stage 2 – years 5 and 6

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

- Extend maths knowledge to larger numbers (up to 7 digits) and make connections between their multiplication and division knowledge and fractions, decimals, percentages and ratio.
- Extend their ability to reason and problem solve mathematically to a wider range of complex problems – introducing algebra as a method in year 6.
- By the end of year 6 children should be fluent in written methods for all 4 operations.

Good practice in maths

- All children need to learn to apply maths in a real life context. As well as knowing 7x7=49. Children need to be able to apply it for example:

There are 7 fields, each field has 7 sheep in them. How many sheep are there in total?

- Children need to be able to explain how they have calculated or solved a problem. We often use sentence stems to encourage them to talk about their thought process. For example

Show me how you know this, prove it, I know this _____ so this must mean _____, etc..

Teddy saves £10 a week.

How many weeks will it take him to save £120?

How do you know?

Is the statement true or false?

$5 \times 30 = 3 \times 50$

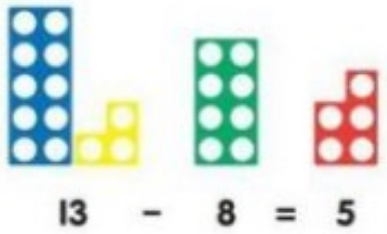
Explain your answer.

White rose maths

- At Albrighton we teach the curriculum using White Rose Scheme – this helps us to incorporate the key aims of the curriculum.

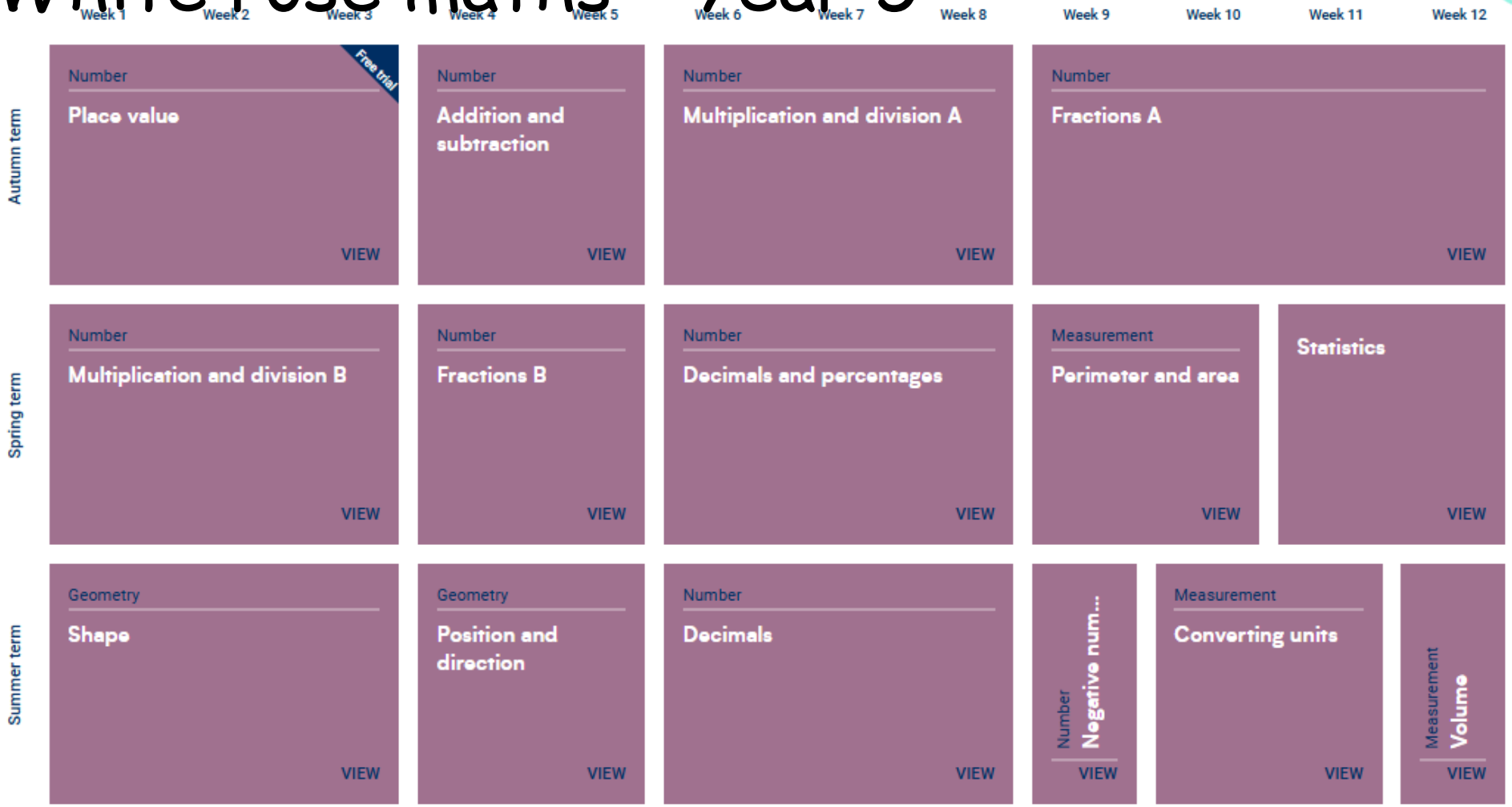
- The children start with concrete – using practical resources. *For example how many ways can you make 14 using the resources on your tables?*

- They move onto pictorial – using pictures to help support their learning. *For example*

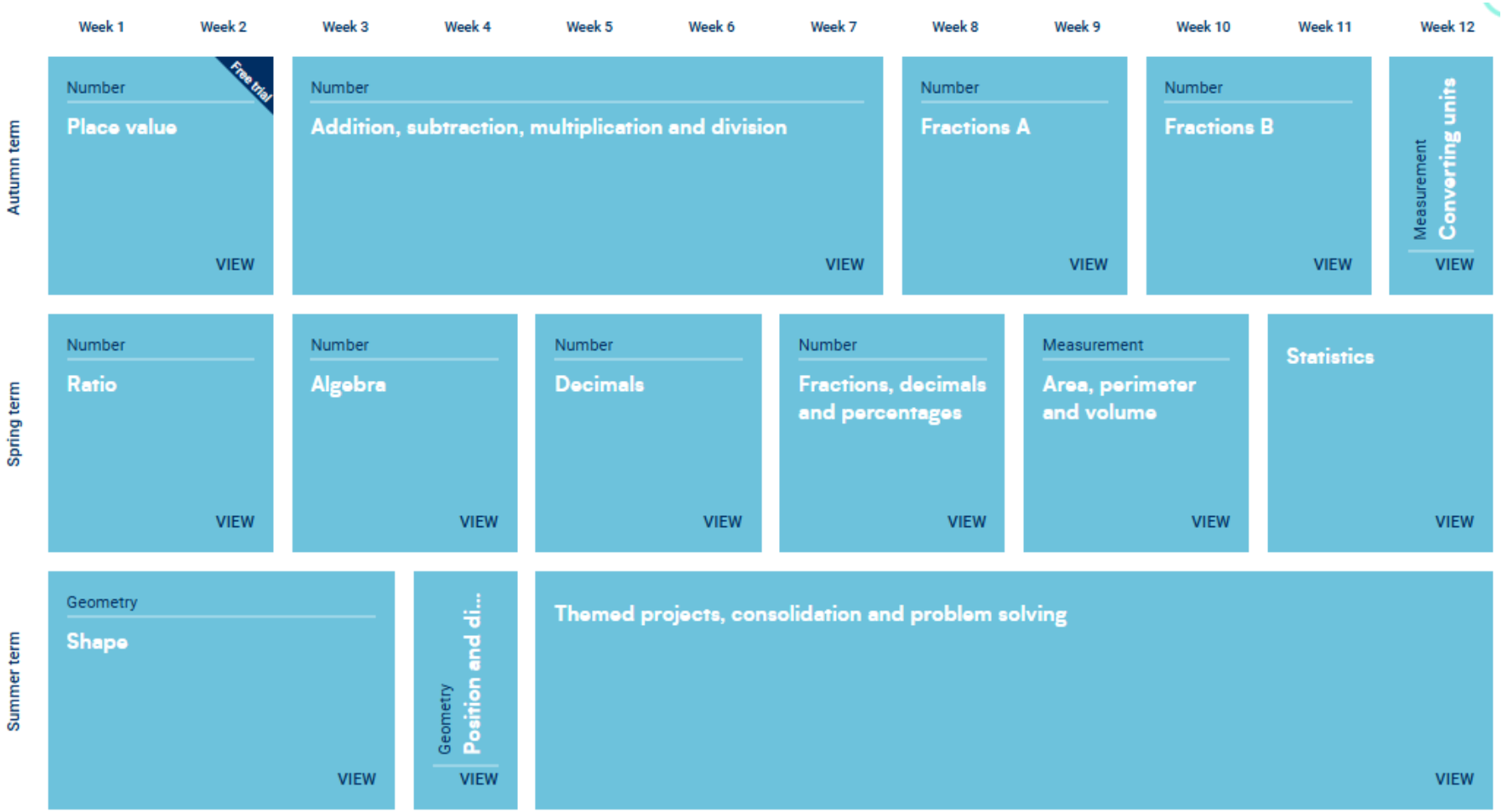


- Finally we go onto abstract which involves the children just seeing the mathematical sum to answer. *For example 155 – 35 = ?*

White rose maths - Year 5



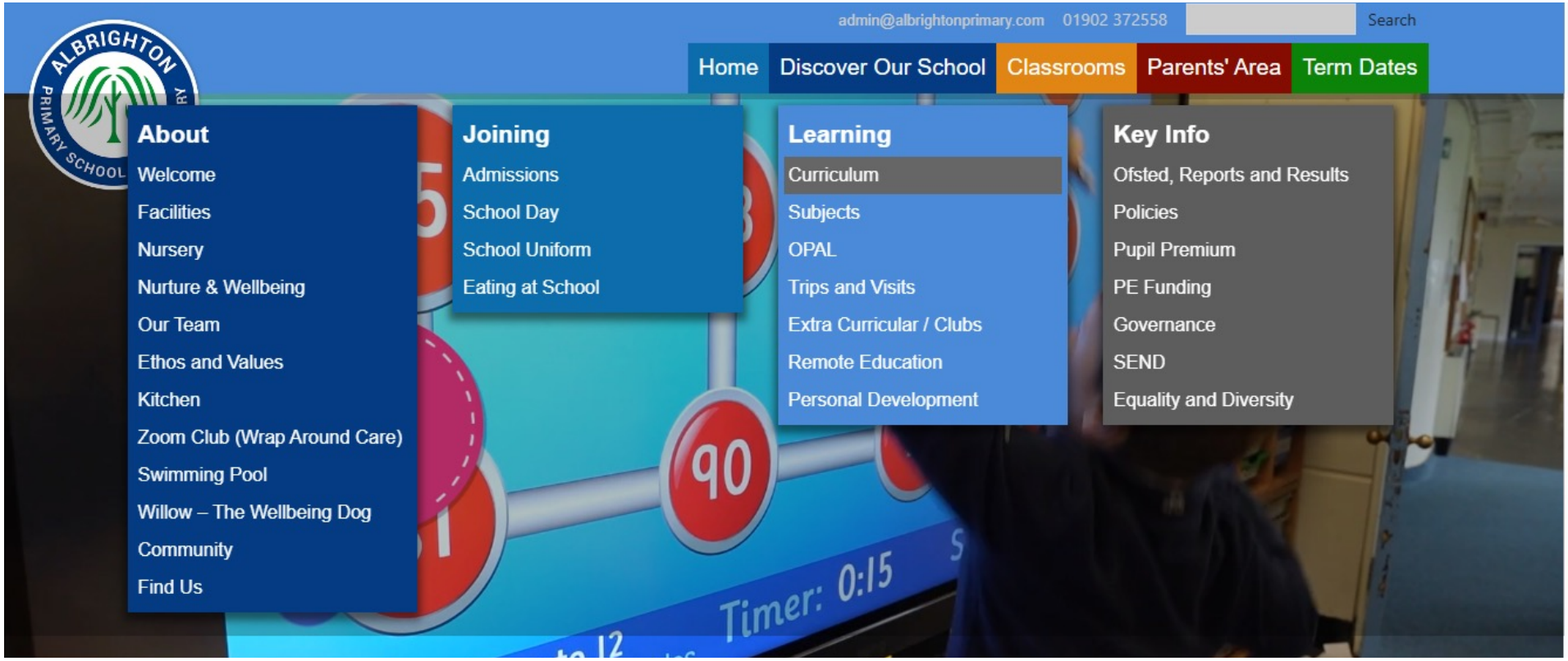
White rose maths - Year 6



Calculation policy

- Consistent delivery of Maths teaching.
- Calculation procedures are taught so they can be seamlessly built upon year after year.
- White Rose Maths.
- The use of concrete resources and visuals underpins this calculation policy

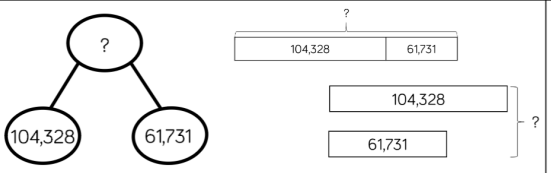
- *The Calculation policies can be found on the school websites under Curriculum -> Subjects -> Maths*


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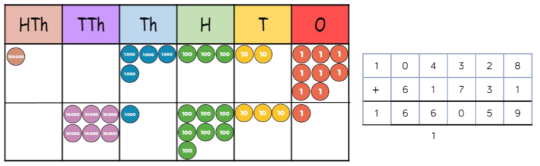
Addition

Skill	Year	Representations and models	
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters Column addition
Add with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Skill: Add numbers with more than 4 digits — **Year: 5/6**



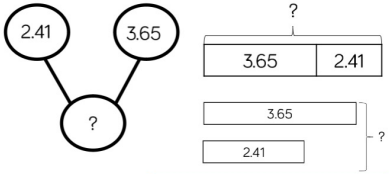
104,328 + 61,731 = 166,059



Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

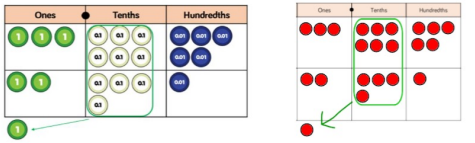
At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

Skill: Add with up to 3 decimal places — **Year: 5**



3.65
+ 2.41
6.06
1

3.65 + 2.41 = 6.06



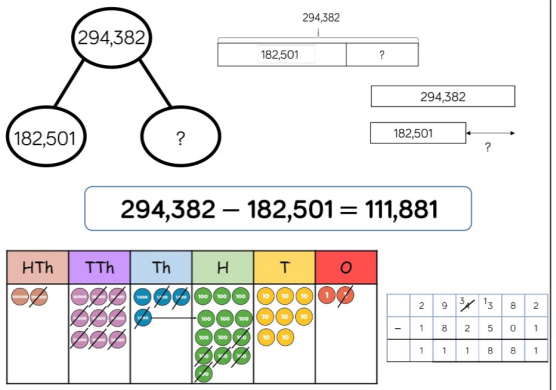
Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Subtraction

Skill	Year	Representations and models	
Subtract with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Subtract with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

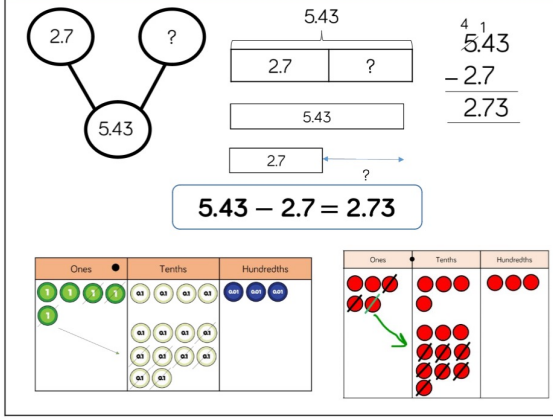
Skill: Subtract numbers with more than 4 digits — **Year: 5/6**



Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Skill: Subtract with up to 3 decimal places — **Year: 5**



Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

Multiplication

Skill	Year	Representations and models	
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Place value counters Base 10	Short written method Expanded written method
Multiply 3-digit by 1-digit numbers	4	Place value counters Base 10	Short written method
Multiply 4-digit by 1-digit numbers	5	Place value counters	Short written method
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	

Skill: Multiply 4-digit numbers by 1-digit numbers — **Year: 5**



1,826 × 3 = 5,478

	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method.
If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.

Skill: Multiply 2-digit numbers by 2-digit numbers — **Year: 5**

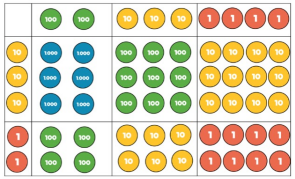


	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

22 × 31 = 682

The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

Skill: Multiply 3-digit numbers by 2-digit numbers — **Year: 5**



	Th	H	T	O
		2	3	4
×			3	2
		4	6	8
1	7	1	0	0
	7	4	8	8

×	200	30	4
30	6,000	900	120
2	400	60	8

234 × 32 = 7,488

Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers. (SEN)

Encourage children to move towards the formal written method, seeing the links with the grid method.

Skill: Multiply 4-digit numbers by 2-digit numbers — **Year: 5/6**

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2	1	9	1	2
5	4	7	8	0
7	6	6	9	2

2,739 × 28 = 76,692

When multiplying 4-digits by 2-digits, children should be confident in the written method.

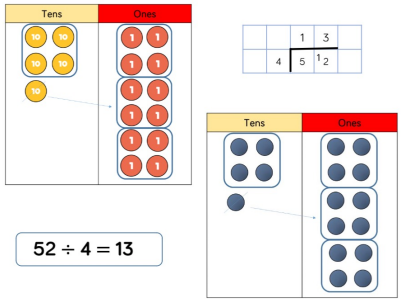
If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.

Division

Skill	Year	Representations and models	
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange)	4	Base 10 Bar model	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 4-digits by 1-digit (grouping)	5	Place value counters Counters	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division	List of multiples
Divide multi-digits by 2-digits (long division)	6	Written long division	List of multiples

Skill: Divide 2-digits by 1-digit (grouping) — **Year: 4/5**



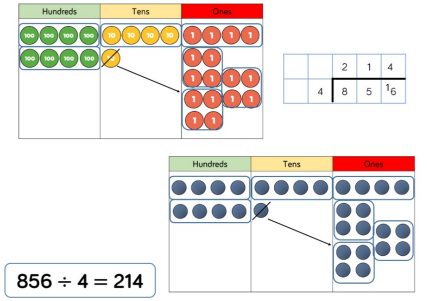
52 ÷ 4 = 13

When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

Remainders can also be seen as they are left ungrouped.

Skill: Divide 3-digits by 1-digit (grouping) — **Year: 5**

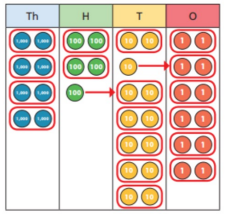


856 ÷ 4 = 214

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

Skill: Divide 4-digits by 1-digit (grouping) — **Year: 5**



8,532 ÷ 2 = 4,266

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

Skill: Divide multi digits by 2-digits (short division) — **Year: 6**

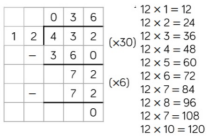
432 ÷ 12 = 36

7,335 ÷ 15 = 489

15	30	45	60	75	90	105	120	135	150

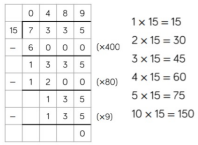
When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Skill: Divide multi-digits by 2-digits (long division) — **Year: 6**



12 × 1 = 12
12 × 2 = 24
12 × 3 = 36
12 × 4 = 48
12 × 5 = 60
12 × 6 = 72
12 × 7 = 84
12 × 8 = 96
12 × 7 = 108
12 × 10 = 120

432 ÷ 12 = 36



1 × 15 = 15
2 × 15 = 30
3 × 15 = 45
4 × 15 = 60
5 × 15 = 75
10 × 15 = 150

7,335 ÷ 15 = 489

Children can also divide by 2-digit numbers using long division.

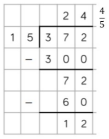
Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Skill: Divide multi digits by 2-digits (long division) — **Year: 6**

372 ÷ 15 = 24 r12

1 × 15 = 15
2 × 15 = 30
3 × 15 = 45
4 × 15 = 60
5 × 15 = 75
10 × 15 = 150



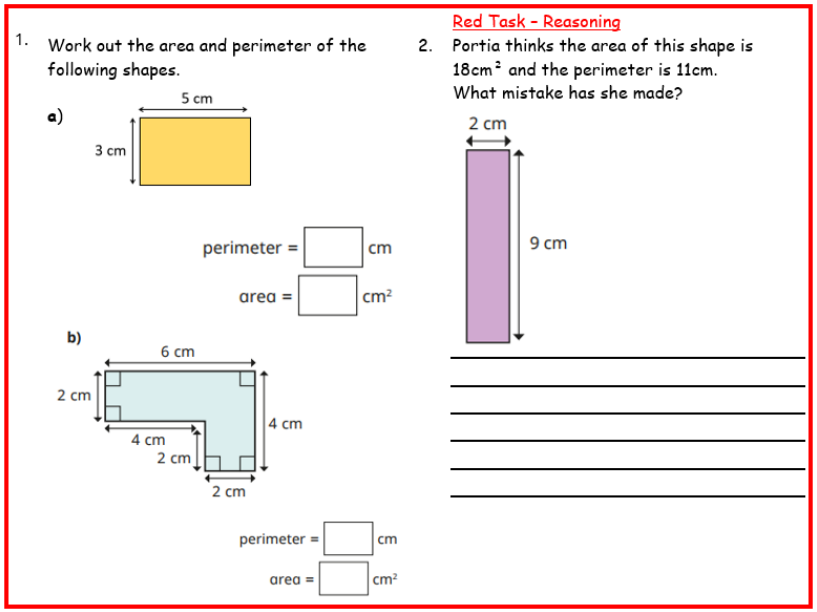
372 ÷ 15 = $24\frac{4}{5}$

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question.

Children can also answer questions where the quotient needs to be rounded according to the context.

Reasoning

Reasoning in maths is the process of applying logical and critical thinking to a mathematical problem in order to work out the correct strategy to use (and as importantly, not to use) in reaching a solution.



Red Task – Reasoning

1. Work out the area and perimeter of the following shapes.

a)

perimeter = ☐ cm

area = ☐ cm²

b)

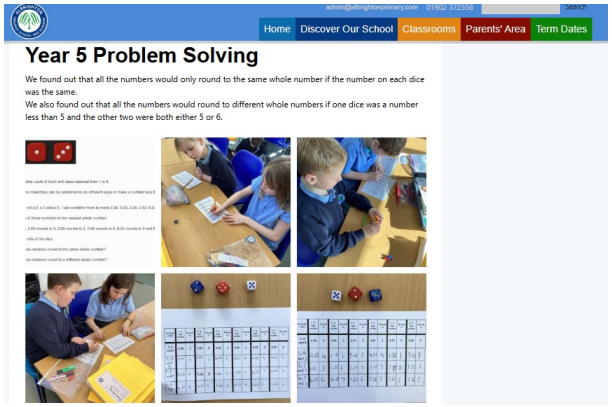
perimeter = ☐ cm

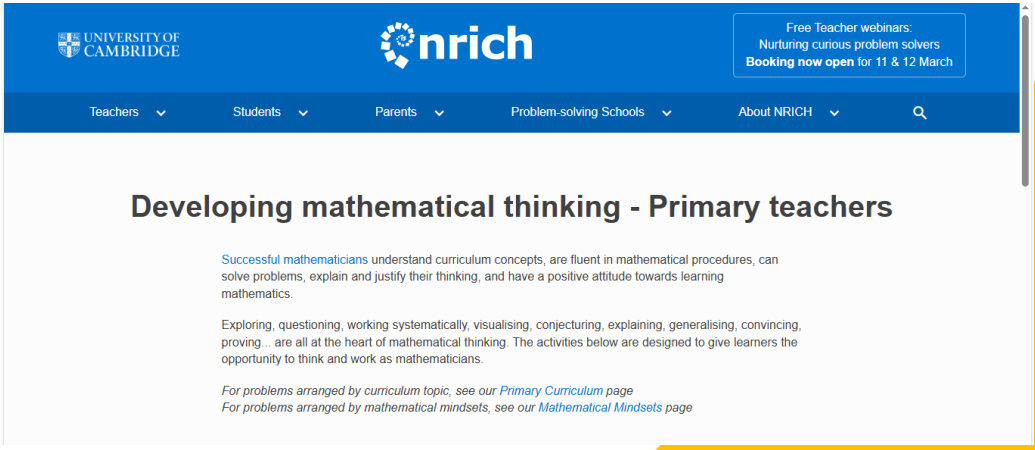
area = ☐ cm²

2. Portia thinks the area of this shape is 18cm² and the perimeter is 11cm. What mistake has she made?

Problem Solving

The act of defining the problem, diagnosing the problem's root cause, identifying and implementing a solution, and sustaining results.





Mastery Number

- Year 5 have a 15-minute Mastery Number session every day as part of their maths lesson.
- Mastery Number is a project that continues to develop fluency in multiplication and division facts continuing from year 4.
- It then introduces other multiplicative concepts to develop good number sense moving forward into secondary school. E.g. multiplying by fractions, identifying higher multiples of each times table, ratio.

Times tables

- When children come into year 5 they should be fluent in all their multiplication and division facts up to 12 x 12.
- Fluency and quick recall of these number facts is key to other aspects of maths across upper KS2 including written methods for multiplication and division, fractions and area.
- Poor recall of these number facts can affect the understanding of the more complex maths topics in upper KS2 and impact outcomes when timed conditions are in place such as during SATs.
- Year 5 have at least one session of maths per week dedicated to the fluent recall of times tables as well as other arithmetic concepts as well as having a times table song at the end of each maths lesson.
- Children still have access to Times Table Rockstars at home to practice further.

Arithmagicans

- Arithmagicans is used to improve the rapid recall of maths facts and is the next step on from Time Table Rockstars when children are fluent in their timetables.
- In year 5 children work through the practice section practicing specific arithmetic skills such as converting units, multiplying fractions and making the next multiple of 10, 100 and 1,000.
- By the time children reach year 6 they will be able to use the craft mode which combines all of the individual skills and has questions similar to those covered in the SATs arithmetic paper.
- The quicker the children become at answering the questions the higher they will go from being a rookie to a super genie.

SATs

- There are 3 maths papers during SATs week.
- An arithmetic paper (30 mins)
- Reasoning paper 1 (40 mins)
- Reasoning paper 2 (40 mins)

6 John buys one toy car and one pack of stickers.



£1.49



£1.64

He pays with a **£10** note.

How much change does John get?

Show your method

£

2 marks

9 Jack chose a number.

He multiplied the number by 7

Then he added 85

His answer was 953

What number did Jack choose?

Show your method

2 marks

9 × 41 =

1 mark

Homework

SATs Companion

- We use SATs companion to support the children in school as well as using it for homework.
- Each week the children will have a maths, reading and SPaG task linked to what we have been learning that week.
- The questions have been taken from past SATs papers and other resources aimed specifically at year 5 and 6.

How you can support at home

- Telling the time
- To use maths in a real-life context
- Cooking
- Shopping
- Practise times tables or arithmetic facts
- Support with homework using methods we've shown you
- Mathsbot

Let's have a go!

The password is:
Albrighton!2021

- Head to the laptops.
- Mathsbot should be open and ready on the screen.
- Have a go, with your child, at the arithmetic questions.

