Addition
at
Mount Hawke

The Mathematics Mastery Approach

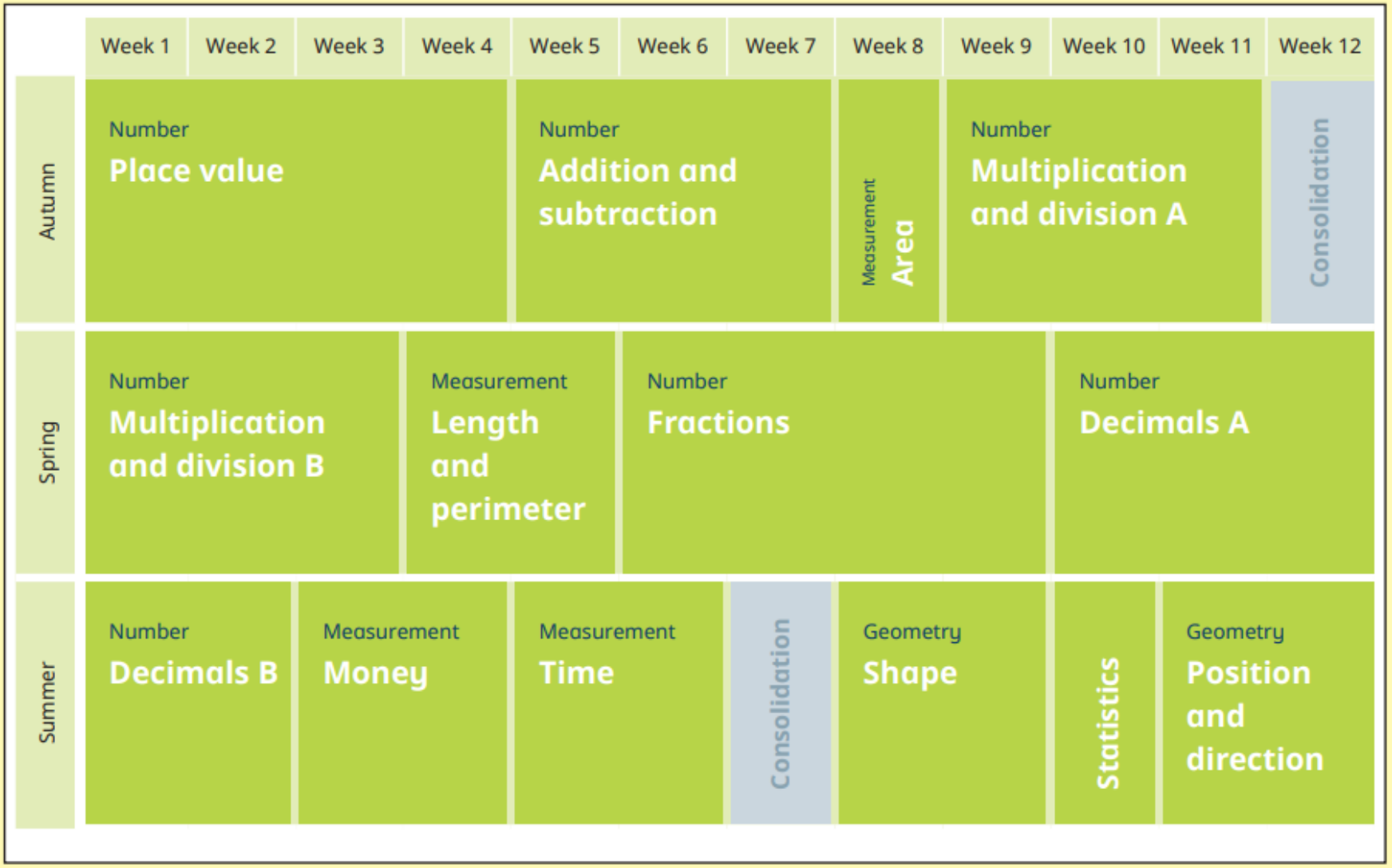
- Mastery – when a concept or skill can be applied over time in a multiple of ways and to an unfamiliar setting
- Depth before breadth – a rigorous and systematic programme that is developed to ensure every child can achieve excellence. We reinforce knowledge again and again.
- Children are kept together to work on the same concept and have the same opportunities. Encourages collaboration: children can progress through the schemes as a group, supporting each other as they learn.
- Differentiation is achieved through support and depth and breadth of questions
- A child's mindset is more important than prior attainment.

How Maths is taught at Mount Hawke

- Maths is taught in blocked units
- These units of work are broken down into small steps of learning

How Maths is taught at Mount Hawke

- Maths is taught in blocked units



- Children will experience a range of fluency, reasoning and problem solving questions to embed, extend understanding and give children the skills they need to become competent mathematicians.
- Puts numbers first: Our curriculum has number at its heart, because we believe confidence with numbers is the first step to competency in the curriculum as a whole.
- It provides a deep understanding of the subject through a Concrete, Pictorial and Abstract approach.

- There are many aspects to the understanding of addition
- Addition is split into different strands

EYFS

Composition

Part-whole – identifying smaller numbers within a number
Inverse operations – partitioning and recombining groups to make the same total
A number can be partitioned into different pairs of numbers
A number can be partitioned into more than 2 numbers
Number bonds – knowing which pairs make a given number (up to 5)

Comparison

More than/less than
Identifying groups with the same number of things
Comparing numbers and reasoning
Knowing the 'one more than/one less than, relationship between counting numbers

NUMBER BONDS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
represent and use number bonds and related subtraction facts within 20 Autumn 2 Spring 1	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Autumn 2				
MENTAL CALCULATION					
add and subtract one-digit and two-digit numbers to 20, including zero Autumn 2 Spring 1	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and ones • a two-digit number and tens • two two-digit numbers • adding three one-digit numbers Autumn 2	add and subtract numbers mentally, including: • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds Autumn 2 & 3		add and subtract numbers mentally with increasingly large numbers Autumn 2	perform mental calculations, including with mixed operations and large numbers Autumn 2

read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) Autumn 2 Spring 1	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot Autumn 2				use their knowledge of the order of operations to carry out calculations involving the four operations Autumn 2

WRITTEN METHODS

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation) Autumn 2 Spring 1		add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction Autumn 2 Spring 4	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate Autumn 2	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Autumn 2	

INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS

	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. Autumn 2	estimate the answer to a calculation and use inverse operations to check answers Autumn 2 Summer 5	estimate and use inverse operations to check answers to a calculation Autumn 2	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy Autumn 2	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy. Autumn 2

PROBLEM SOLVING

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9 Autumn 2 Spring 1	solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods Autumn 2	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction Autumn 2 Spring 4 Summer 4	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why Autumn 2	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Autumn 2	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Autumn 2
	solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)				Solve problems involving addition, subtraction, multiplication and division

The Calculation policy shows the progression in the teaching of efficient written methods

EYFS

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INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS					

Calculation Policy

- Our calculation policy shows the clear progression of calculations for addition, subtraction, multiplication and division.
- The methods follow a clear thought process and show visually how each method should be carried out.
- Children will be encouraged to use mental methods & informal jottings when appropriate, but for calculations where they cannot do this, they use an efficient written method accurately.

Calculation Policy

- We use the principle of the concrete-pictorial-abstract (CPA) approach [Make it, Draw it, Write it] for children to have a true understanding of a mathematical concept which is why you can see three different methods for each objective.

- Research shows that when children are introduced to a new concept, working with concrete physical resources and pictorial representations leads to a better understanding of abstract concepts.

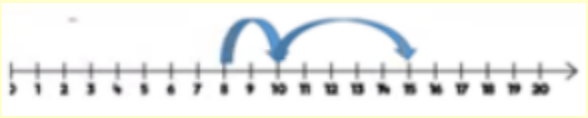
Calculation Policy

- We use CPA throughout our curriculum.
- We would ask that when you are supporting your child with Mathematics at home that you use these methods.

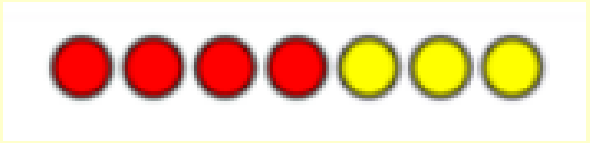
MHA Concrete Resources and Images

Cubes

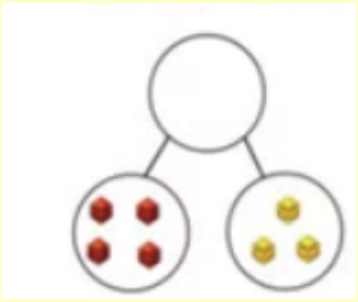
Number Lines

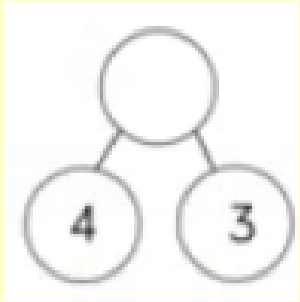


Counters

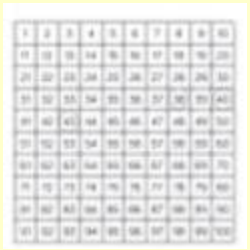


Part Part Whole

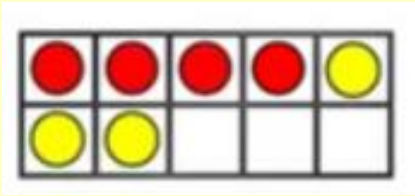




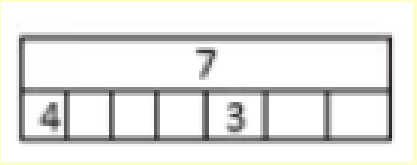
100 Square



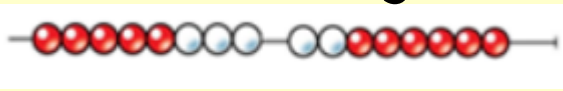
Tens Frame



Bar Model



Bead Strings



Base Ten

Place Value Counters

EYFS

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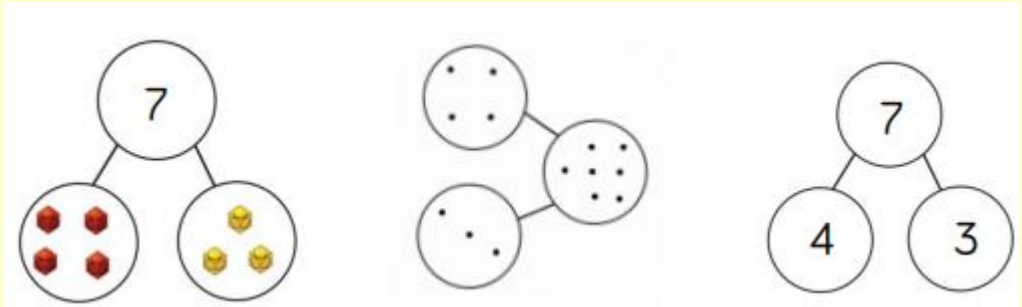
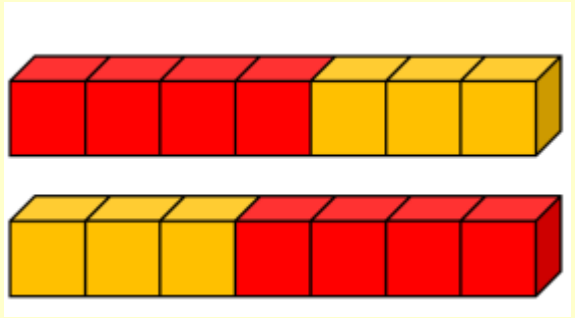
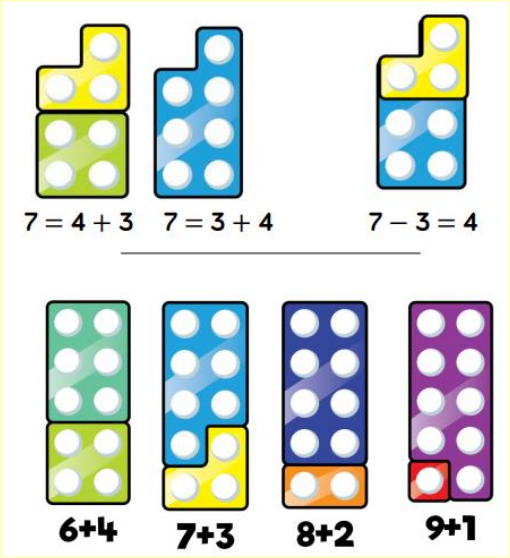
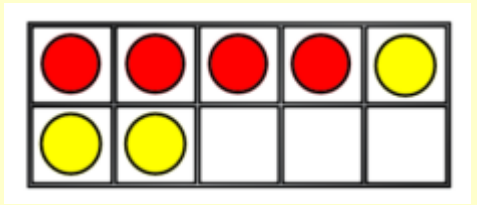
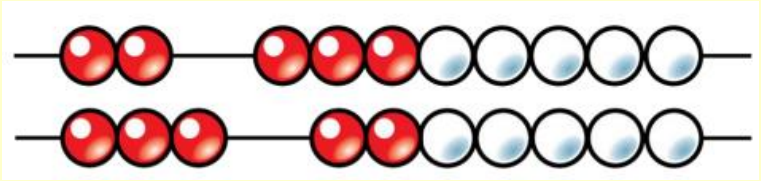
Concrete resources used in direct teaching, continuous provision and everyday routines

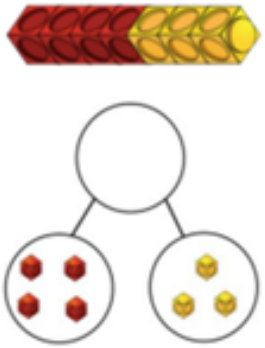
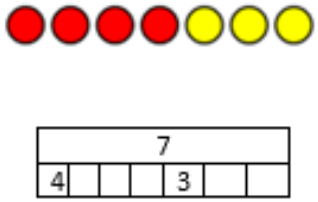
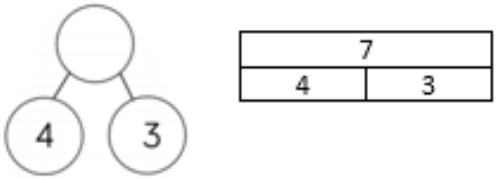
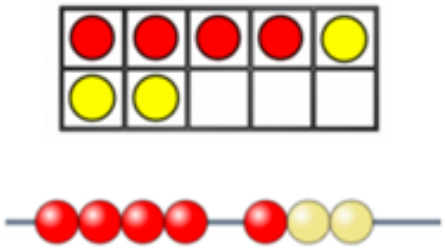
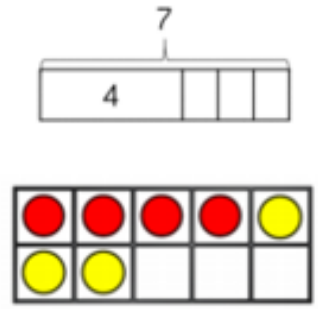
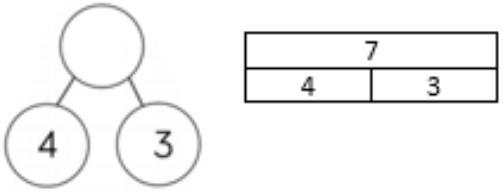


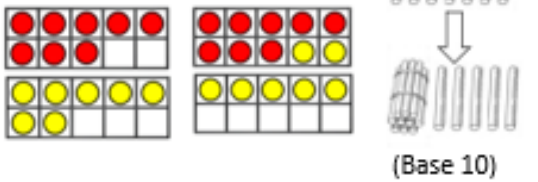
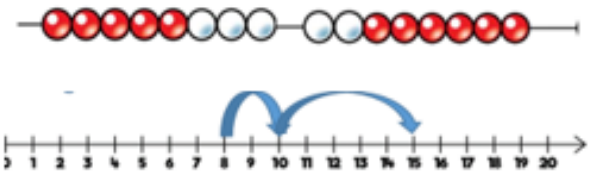
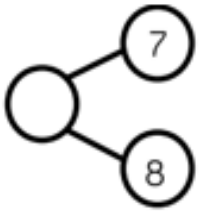
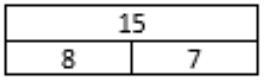


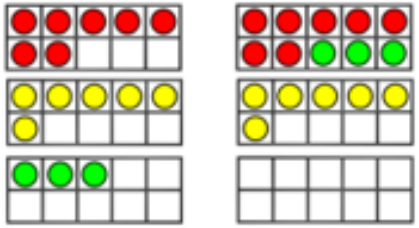
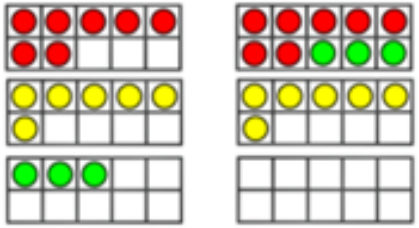
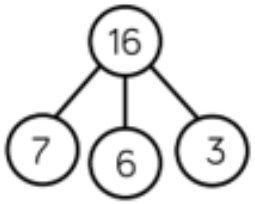


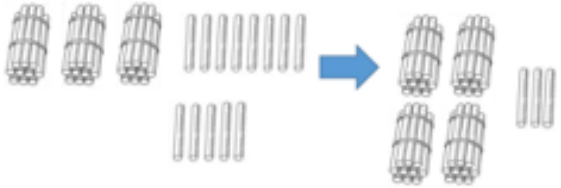
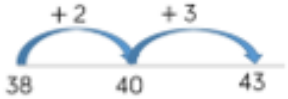
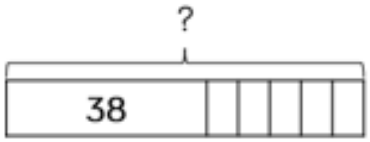
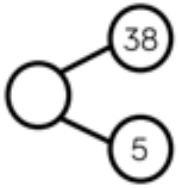


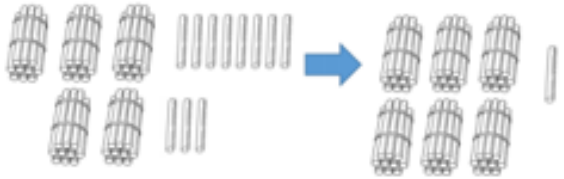
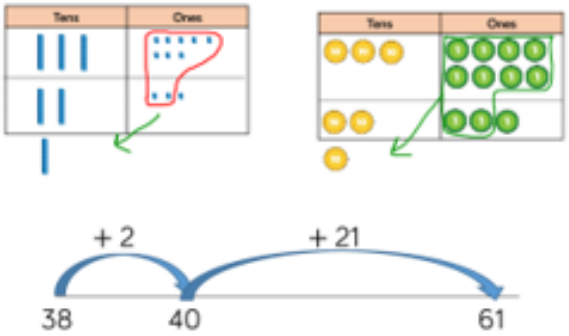
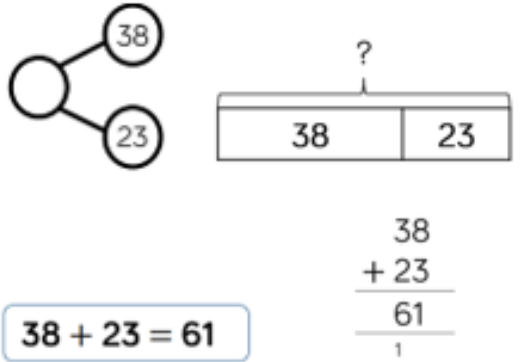


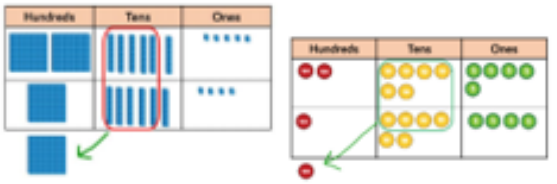
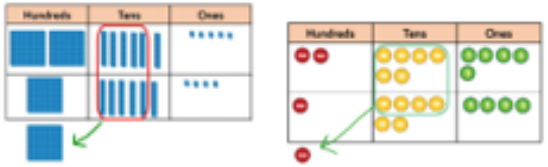
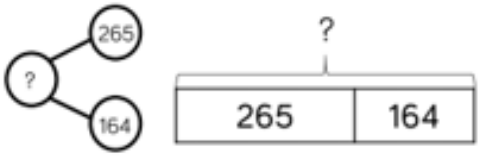
1`Year 1 - Addition	Add 1-digit numbers within 10 (aggregation)	
Concrete	**Pictorial**	**Abstract**
		 $4+3=7$
Year 1 - Addition	**Add 1-digit numbers within 10 (augmentation)**	
Concrete	**Pictorial**	**Abstract**
		 $4+3=7$

Year 1/2 - Addition	Add 1 and 2-digit numbers to 20	
Concrete	**Pictorial**	**Abstract**
The calculation is shown alongside the use of concrete resources  (Base 10)		  $8 + 7 = 15$
Key skills and concepts	When adding 1-digit numbers that cross 10: • Highlight the importance of **ten ones equalling one ten** • **Use different manipulatives to represent the exchange** • Use concrete resources **alongside** number lines to support children's understanding in how to partition their jumps	

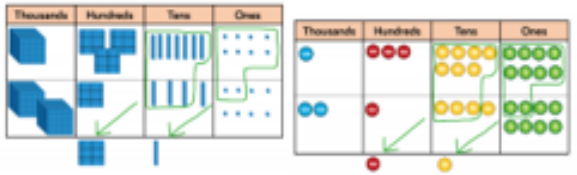
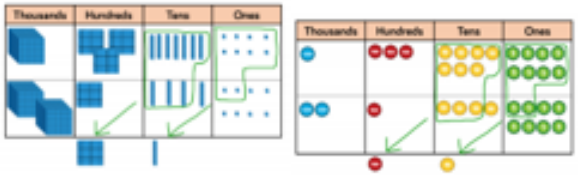
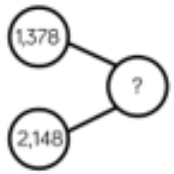
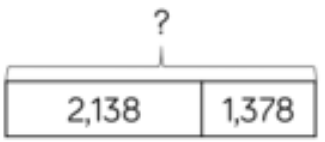
Year 2 - Addition	Add three 1-digit numbers	
Concrete	**Pictorial**	**Abstract**
 $7 + 6 + 3 = 16$ 10 The calculation is shown alongside the use of concrete resources	 $7 + 6 + 3 = 16$ 10 Alongside the use of concrete resources images and drawings of these resources are used.	 16 7 6 3 $7 + 6 + 3 = 16$
Key skills and concepts	When adding three 1-digit numbers: • Encourage children to look for **number bonds to 10** or **doubles** • This skill supports children's **understanding of commutativity** • Manipulatives that show number bonds to 10 are effective to use	

Year 2/3 - Addition	Add 1-digit and 2-digit numbers to 100	
Concrete	**Pictorial**	**Abstract**
 (Use Base 10)	  	  38 + 5 = 43
Key skills and concepts	When adding single digits to a two-digit number: • Encourage children to **count on from the larger number** • Apply their **knowledge of number bonds** to add efficiently e.g., 8 + 5 = 13 so 38 + 5 = 43 • Hundred square and base 10/straws can be used for support	

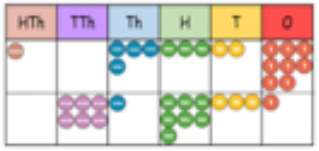
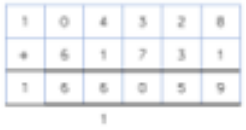
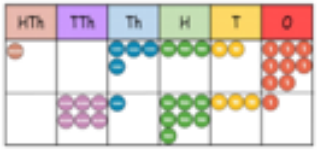
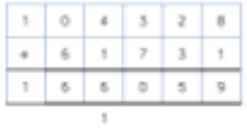
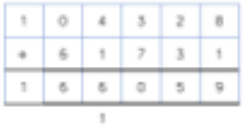
Year 2/3 - Addition	Add two 2-digit numbers to 100	
Concrete	**Pictorial**	**Abstract**
 (Use Base 10)		 **38 + 23 = 61**
Key skills and concepts	When adding two 2-digit numbers to 100: **Column method** • Encourage children to **use the formal method alongside straws, base 10 or place value counters** **Counting on** • **A blank number line** can be used **to count on** to find the total • Encourage children **to jump to multiples of 10** for efficiency	

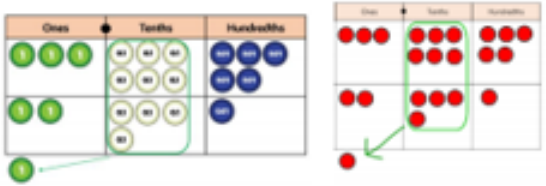
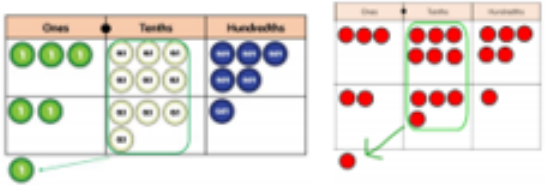
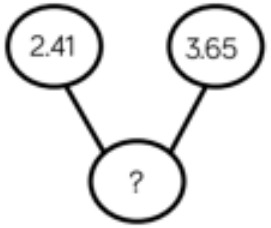
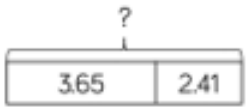
Year 3 - Addition	Add numbers with up to 3 digits	
Concrete	**Pictorial**	**Abstract**
 265 + 164 429 1 The calculation is shown alongside the use of concrete resources	 Alongside the use of concrete resources images and drawings of these resources are used.	 265 + 164 = 429 265 + 164 429 1
Key skills and concepts	When adding numbers with up to 3 digits: • **Base 10** and **place value counters** are the most effective manipulatives • As **number sizes increase place value counters** are more efficient • Children **write the calculation alongside any concrete resources** so the links to the written column method can be seen • **Plain counters** on a place value grid can be used as **concrete resources and for images and children's drawings**	

Year 4 - Addition	Add numbers with up to 4 digits	
Concrete	**Pictorial**	**Abstract**


`  1 3 7 8`
`+ 2 1 4 8`
`  3 5 2 6`
`  1 1`
The calculation is shown alongside the use of concrete resources
	
	Alongside the use of concrete resources images and drawings of these resources are used.
		
		 
		`  1 3 7 8`
		`+ 2 1 4 8`
		`  3 5 2 6`
		`  1 1`
		1,378 + 2,148 = 3,526

Key skills and concepts	When adding numbers with up to 4 digits: • **Base 10** and **place value counters** are the most effective manipulatives • As **number sizes increase place value counters** are more efficient • Children **write the calculation alongside any concrete resources** so the links to the written column method can be seen • **Plain counters** on a place value grid can be used as **concrete resources and for images and children's drawings**	

Year 5/6 - Addition	Add numbers with more than 4 digits	
Concrete	**Pictorial**	**Abstract**
  The calculation is shown alongside the use of any concrete resources	  Alongside the use of concrete resources images and drawings of these resources are used.	 104,328 + 61,731 = 166,059 
Key skills and concepts	When adding numbers with more than 4 digits: • **Place value counters or plain counters on a place value grid** are the most effective manipulatives • At this stage **children should be encouraged to work in the abstract, using the column method** to add larger numbers efficiently	

Year 5 - Addition	Add numbers with up to 3 decimal places	
Concrete	**Pictorial**	**Abstract**
 3.65 + 2.41 6.06 1 The calculation is shown alongside the use of any concrete resources	 Alongside the use of concrete resources images and drawings of these resources are used.	 3.65 + 2.41 6.06 1  $3.65 + 2.41 = 6.06$
Key skills and concepts	When adding numbers with up to 3 decimal places: • **Place value counters or plain counters on a place value grid** are the most effective manipulatives • Ensure children have experience of **adding decimals with a variety of decimal places** • Ensure children have experience **putting this skill into context** when **adding money and measures**	

Growth Mindset

- A belief that effort creates success
- A belief that skill and ability can be increased over time
- View mistakes as an opportunity to develop
- Are resilient – and don't give up easily
- Think about *how* they learn not just what
- A belief that natural talent is just a starting point and does not determine who has more or less potential to achieve. Everybody can achieve in maths.

What does it mean to master something?

- I know how to do it
- It becomes automatic and I don't need to think about it- for example driving a car
- I'm really good at doing it – painting a room, or a picture
- I can show someone else how to do it.
- I can make links and apply my understanding to solve unfamiliar problems

How you can support your child at home?

- Look for and talk about numbers in the environment
- Play games
- Shopping and giving change.
- Number bonds for 10, 20, 100
- Times tables
- Cooking
- Telling the time and reading timetables

How to help at home

Play Games

• Playing number games, including board games like Snakes and Ladders, has been proven by research to increase children's understanding of relative number size as well as counting.

How to help at home

Times Tables Rock Stars

Sumdog

NumBots

Mathsframe

1-minute Maths

White Rose Maths