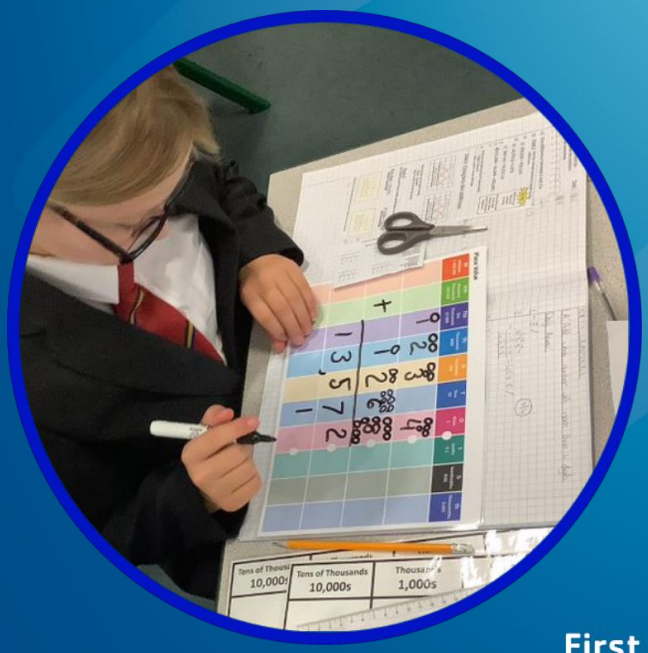
Bridge Learning Campus

Maths

Bridge Learning Campus Primary

Build Respect Inspire Dare Graft Empower



First Steps To Next Steps

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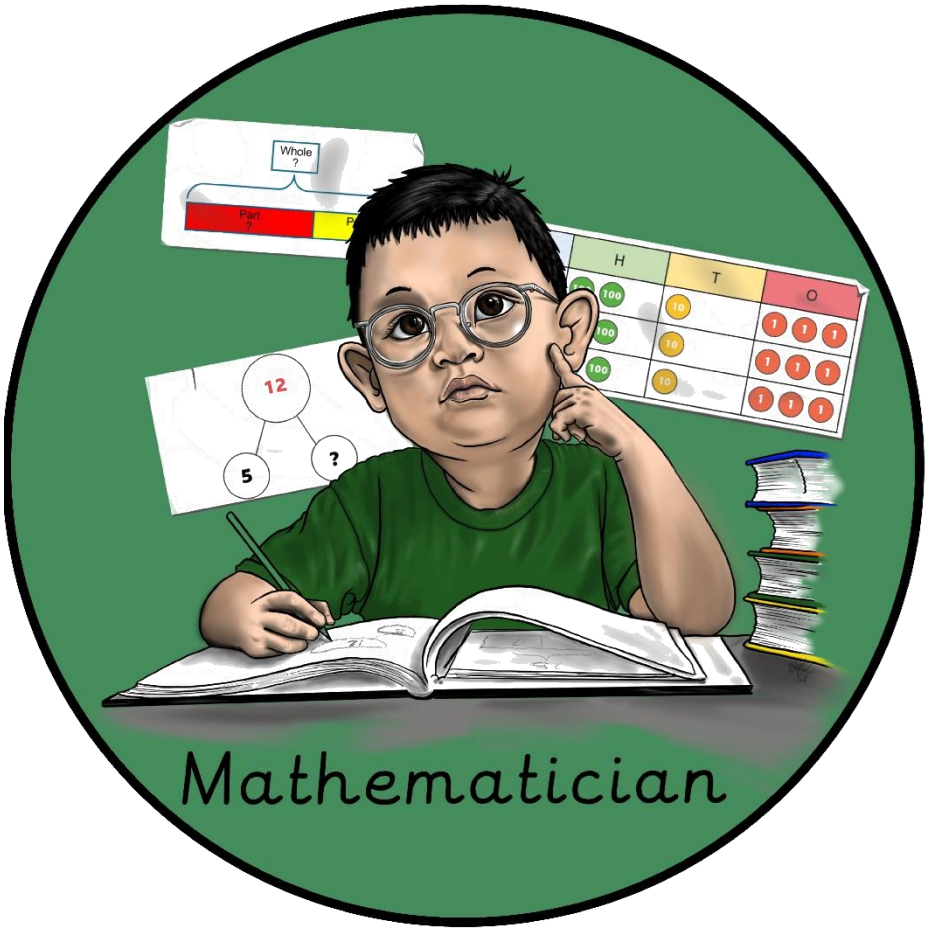
Contents

Curriculum Intent

At Bridge Learning Campus, the Mathematics curriculum enables students to be confident in numeracy, problem solving and reasoning.

Students can recognise the importance of Mathematics and are able to apply their skills and knowledge confidently in a range of different mathematical contexts.



Rationale

In the National Curriculum it states:

> *'Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.' (National Curriculum, Mathematics Programme of Study, 2014)*

At Bridge Learning Campus, we believe that mathematics is essential for everyday life and understanding our world. It enables the development of pupils' natural ability to think logically and solve puzzles and real-life problems.

Pupils will be confident and accurate in number skills and be able to apply these in everyday life. We believe that pupils at BLC will be confident in working with numbers and be able to apply their understanding to the modern world such as handling money effectively, analysing data, conversions of units, time and measurements etc. Being confident in numeracy is crucial for functioning within a community and being part of the working world

Pupils will conceptually understand mathematics and the reasons why procedures work rather than learning methods and tricks. They will draw on prior knowledge, making sense of relationships and apply this to new contexts to help solve problems. Pupils will understand the value of previous experience and knowledge and be able to relate it to something new. They will be able to approach new situations from different angles, drawing on previous life experience.

Pupils will be able to confidently communicate, explain and reason using mathematical language, which in turn will deepen their understanding of concepts. They will learn to listen to alternative ideas and to justify a choice with evidence. This will enable pupils to explain or form an opinion and justify their decision, as well as recognising weaknesses in other people's decisions. These skills link closely to the confidence they have in oracy.

Furthermore, pupils will gain the ability to solve problems logically and systematically in unknown and non-routine contexts. They will be able to use multiple methods and representations to do so, demonstrating resilience and critical thinking. Pupils will be able to explore, recognise patterns, hypothesise and generalise findings when faced with wider problems such as managing money, finding the best deals in shops, analysing data etc. These transferable skills will also help them solve nonmathematical problems.

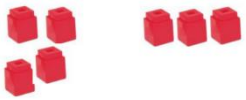
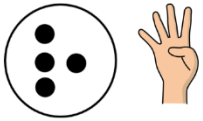
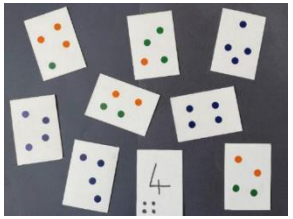
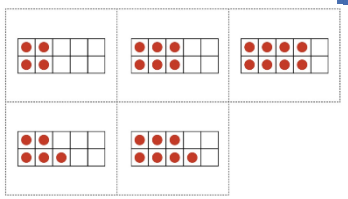
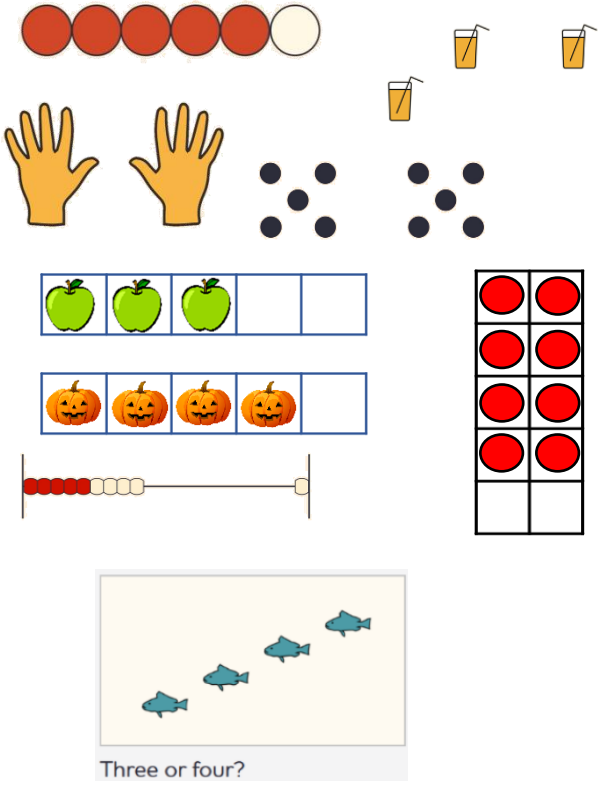
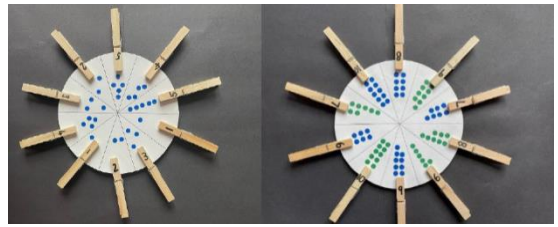
Representation Guidance

Addition	**Combining numbers using pictures and concrete objects**	**Number lines** 17 + 5 = Jo has 13 prize tokens. She wins 5 more. How many prize tokens does Jo have now? Show your calculation on the number line.	**Place Value Counters** Hundreds Tens Ones 384 + 237 621	**Part, Part, Whole** 7 7 = 4 + 3 7 = 3 + 4	**Bar Modelling** Complete the bar model. 477 283 194 176 40 8547 ? ? ?
Subtraction	**Pictures and concrete objects** Complete the number sentence 7 - 2 = □ Create a story to represent the calculation.	**Number Lines** 22 – 7 =	**Place Value Counters**	**Part, Part Whole** (using a variety of representations) Complete the part whole models below: 10 6 100 40	**Bar Modelling** 12 4 ? 8547 ? 3984
Multiplication	**Pictures and Objects**	**Number Lines**	**Place Value Counters** Jo uses place value counters to work out 24 × 3 Tens Ones	**Arrays**	**Bar Modelling** Build the array shown with counters. Complete the sentences. There are ___ apples in each row. There are ___ rows. ___ + ___ + ___ = ___ There are ___ apples altogether. There are 7 tricycles in the playground. How many wheels are there altogether? Compete the bar model to find the answer.
Division	**Pictorial representations** e.g drawing circle There are 15 pieces of fruit. They are shared between 3 bowls equally. How many pieces of fruit in each bowl? Children use cubes to represent fruit and share between bowls. 15 ÷ 3 = __	**Using known facts for larger numbers**	**Bar Modelling** How many equal groups of 2 can you make with the mittens? There are ___ groups of 2 mitten If you had 10 mittens, how many equal groups of 2 mittens could you make?	**Bar Modelling** Y3 18 ÷ 3 = 6 and 18 ÷ 6 = 3 18 6 6 6 18 3 3 3 3 3 3	
Fractions	**Pictorial Representations** A whole apple Half an apple 1 whole 3/10 3/10 3/10	**Concrete resources** 1/2	**Number lines** Fractions less than one whole have a numerator smaller than the denominator.	Bar Modelling 7/12 − 1/4 = 7/12 + 1/4 = Make sure your bar model has fewer equal parts than the original fraction.	

EYFS

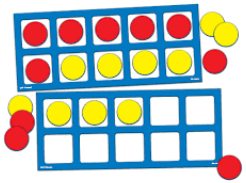
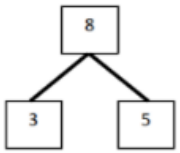
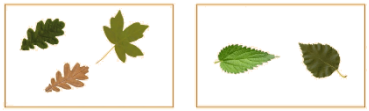
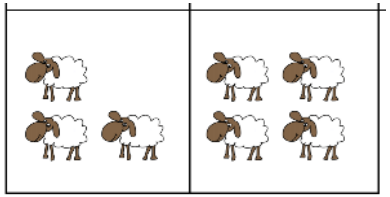
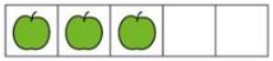
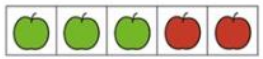
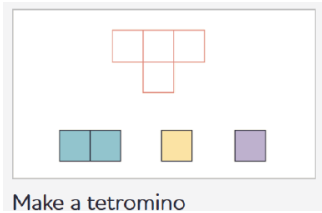
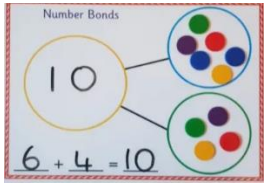
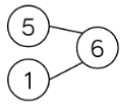
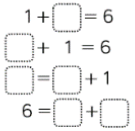
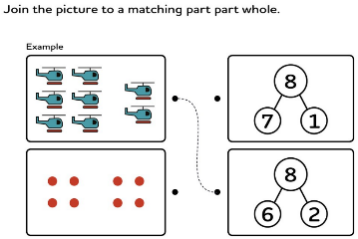
Cardinality and Counting

The cardinal value of a number refers to the quantity of things it represents, e.g. the numerosity, 'howmanyness', or 'threeness' of three. When children understand the cardinality of numbers, they know what the numbers mean in terms of knowing how many things they refer to. Counting is one way of establishing how many things are in a group, because the last number you say tells you how many there are. Children enjoy learning the sequence of counting numbers long before they understand the cardinal values of the numbers. Subitising is another way of recognising how many there are, without counting.

	Concrete	Pictorial	Abstract
Cardinality & Subitising	   How many dots?  Show the number on your fingers.     Subitising with tens frames 	 Three or four?	Does the numeral match the tens frame? Tick or cross. Example 8 × 9 4 3 5 1 4 5 7 

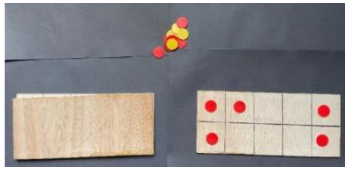
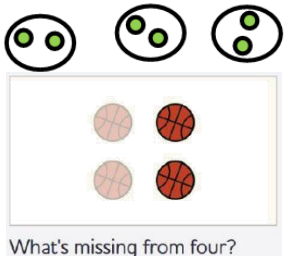
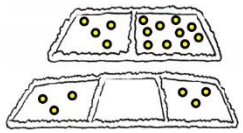
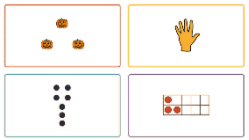
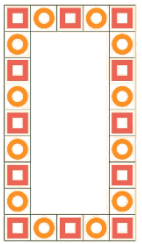
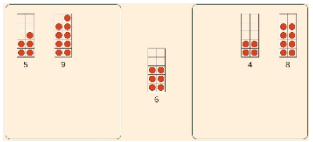
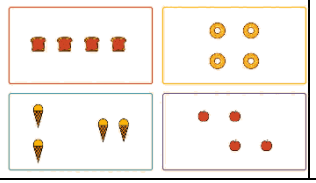
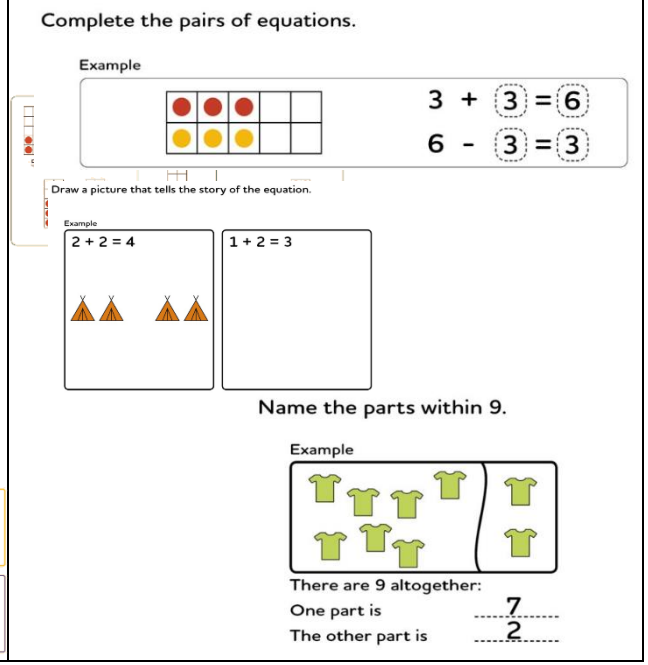
Partitioning and Composition

Knowing numbers are made up of two or more other smaller numbers involves 'part–whole' understanding. Learning to 'see' a whole number and its parts at the same time is a key development in children's number understanding. Partitioning numbers into other numbers and putting them back together again underpins understanding of addition and subtraction as inverse operations.

	Concrete	Pictorial	Abstract
Partitioning & Composition	    Use of cubes to represent number stories: part/part/whole and as a number sentence.   	      Make a tetromino	 First there were 5 people on a bus, then 3 people got off the bus. How many people are on the bus now? Then 7 people got on the bus. Now how many people are on the bus?  Fill in the missing numbers.   Number sentences are written e.g. 2 + 3 = 5 Number sentences are written e.g. 6 – 2 = 4 

Comparison & Numerical Patterns

Knowing numbers are made up of two or more other smaller numbers involves 'part–whole' understanding. Learning to 'see' a whole number and its parts at the same time is a key development in children's number understanding. Partitioning numbers into other numbers and putting them back together again underpins understanding of addition and subtraction as inverse operations.

	Concrete	Pictorial	Abstract
Comparison & Numerical Patterns	Copying arrangements   Making 7 in different ways    Odds and evens  Number bonds to 5 – finding what is missing. Set of 4 (or 5, or 3). How many are hidden? A practical context for practising 'number bonds to 5' and assessing children's number bond knowledge. Add some puppets, make a story context.	Recognising when one quantity is greater than, less than or the same as the other quantity. Halving and doubling, making inverse links.   Matching Pairs  Repeating patterns   Odds and Evens  Equal Distribution 	Comparing two numbers, using a range of comparative language: greater than, bigger than, larger than, smaller than, less than and equal to  

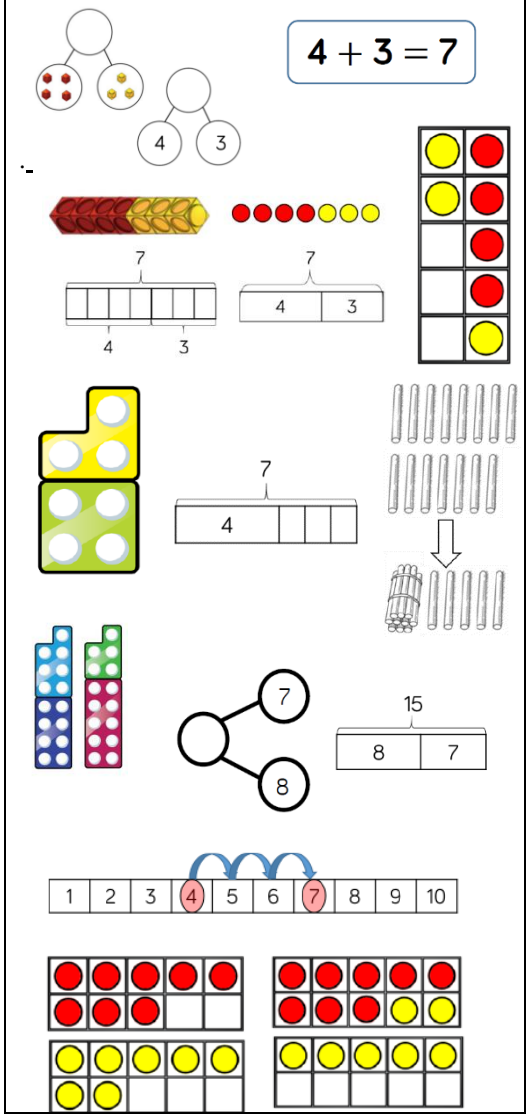
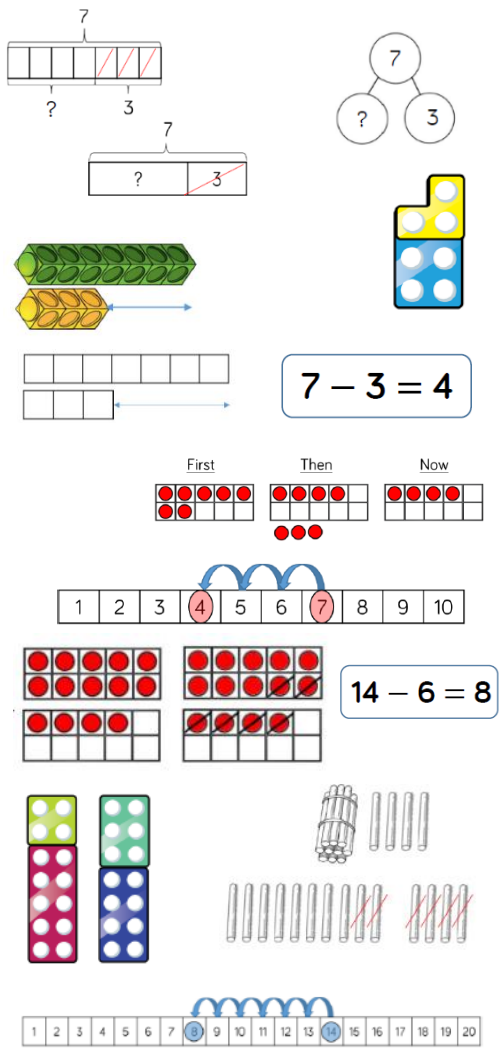
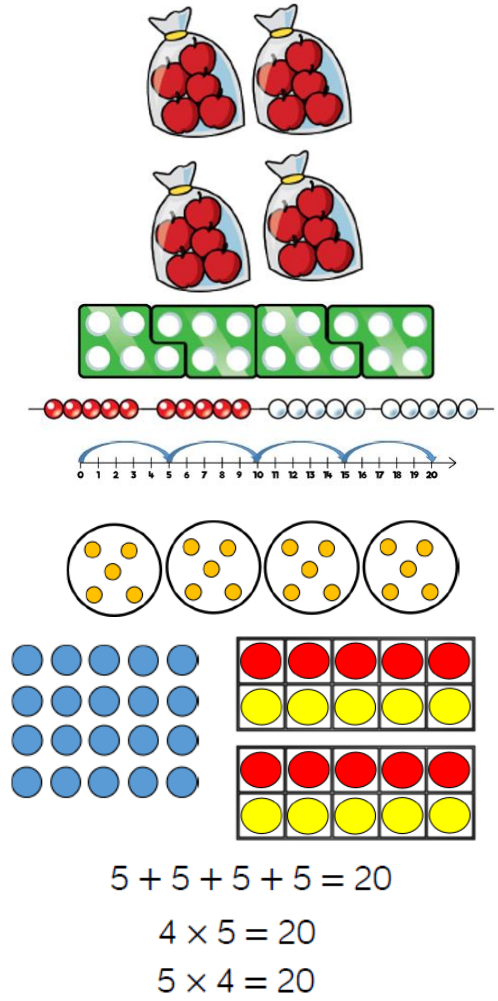
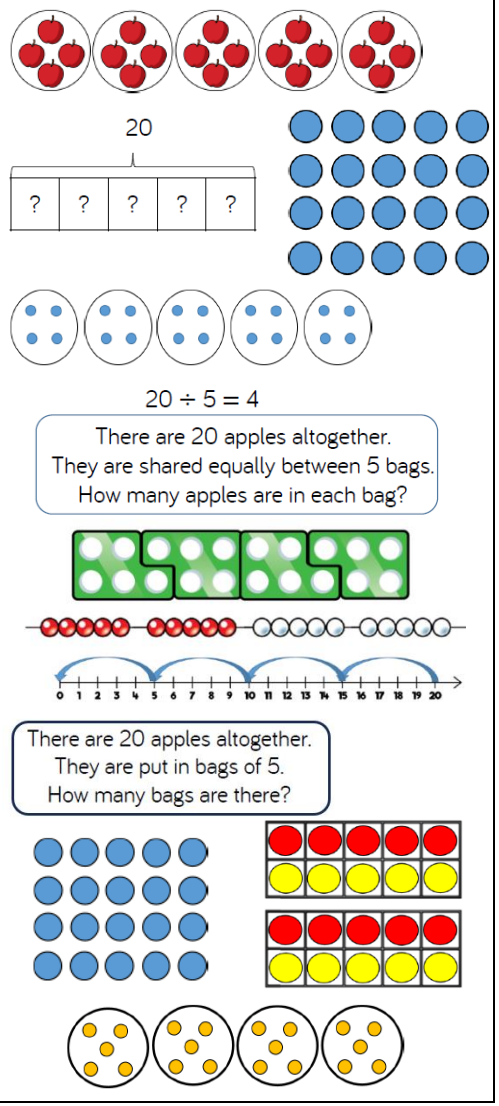
Y1 – NC Objectives

	Addition	Subtraction	Multiplication	Division	Fractions
Y1	➢ **Add two 1-digit numbers to 10** ➢ **Add 1 and 2-digit numbers to 20** ➢ Combining two parts to make a whole: part whole model. ➢ Starting at the bigger number and counting on- using cubes. ➢ Regrouping to make 10 using ten frame.	➢ **Subtract two 1-digit numbers to 10** ➢ **Subtract 1 and 2-digit numbers to 20** ➢ Taking away ones ➢ Counting back ➢ Find the difference ➢ Part whole model ➢ Make 10 using the ten frame	➢ **Solve one-step problems** ➢ Recognising and making equal groups. ➢ Use arrays ➢ Doubling ➢ Counting in twos, fives and tens ➢ Use Base 10, cubes, Numicon and other objects in the classroom	➢ **Solve one-step problems** ➢ Sharing objects into groups ➢ Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups? ➢ Use cubes and draw round 3 cubes at a time.	➢ **Recognise, find and name a half as one of two equal parts of an object, shape or quantity** ➢ **Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity**

Y1 – Skills

Addition	➢ When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track all support augmentation. ➢ When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on. From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps.
Subtraction	➢ Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this. ➢ Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient.
Multiplication	➢ Children represent multiplication as repeated addition in many different ways. ➢ Children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.
Division	➢ Children solve problems by sharing amounts into equal groups. ➢ Children use concrete and pictorial representations to solve problems. They are not expected to record division formally. ➢ Children solve problems by grouping and counting the number of groups. ➢ Grouping encourages children to count in multiples and links to repeated subtraction on a number line. ➢ They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Y1 - Different models and images that could be used to effectively teach each concept.

Addition	Subtraction	Multiplication	Division
			

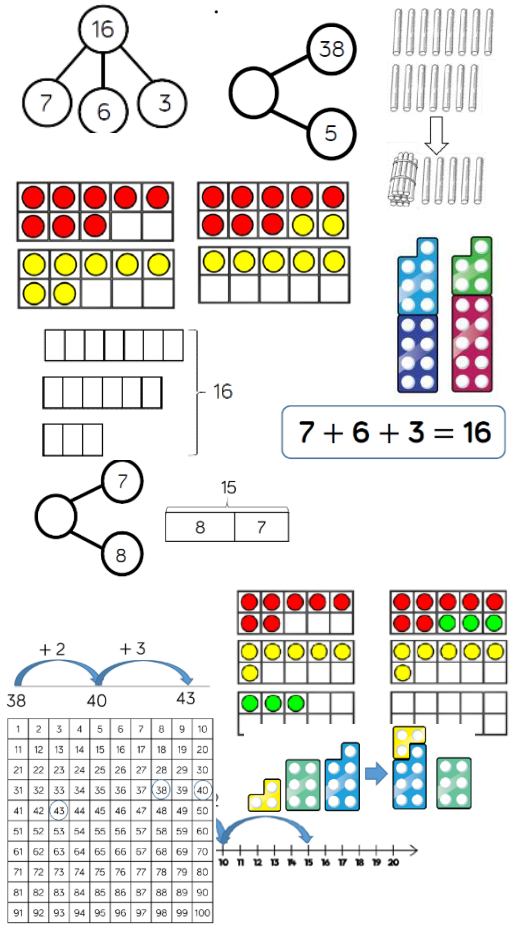
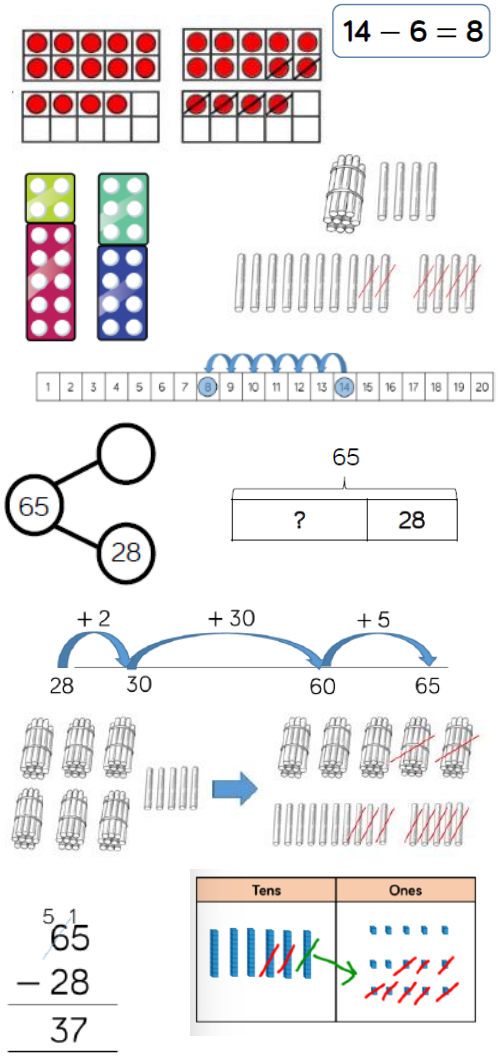
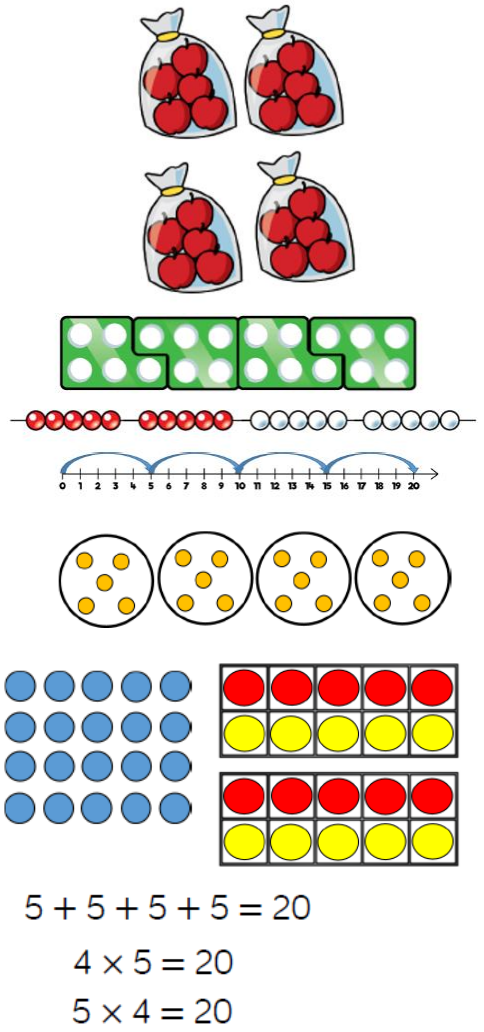
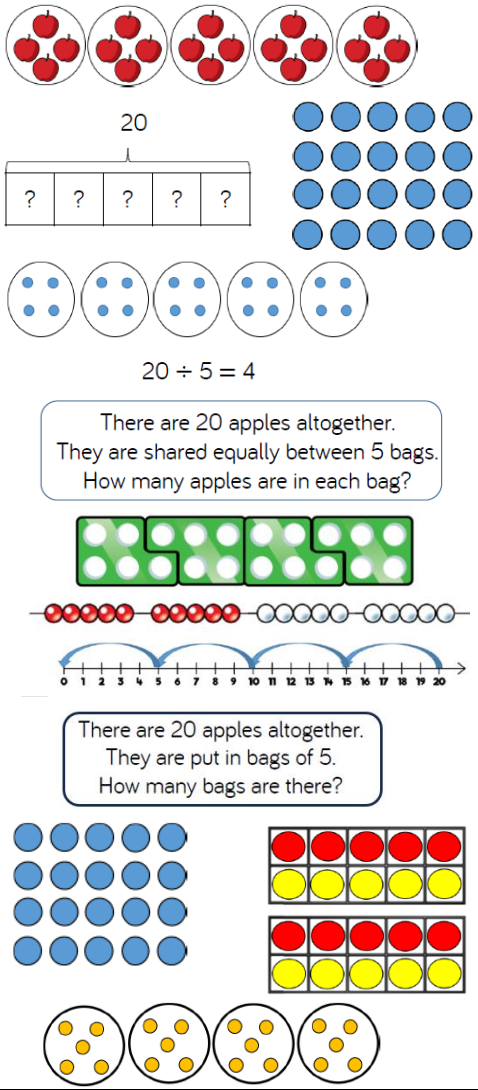
Y2 – NC Objectives

	Addition	Subtraction	Multiplication	Division	Fractions
Y2	➢ **Add 1 and 2-digit numbers to 100** ➢ **Add two 2-digit numbers** ➢ **Add three 1-digit numbers** ➢ Use of base 10 to combine two numbers.	➢ **Subtract 1 and 2-digit numbers to 100** ➢ **Subtract two 2-digit numbers** ➢ Counting back ➢ Find the difference ➢ Part whole model ➢ Make 10 ➢ Use of base 10	➢ **Solve one-step problems** ➢ **Recall and use multiplication facts for the 2, 5 and 10 times tables.** ➢ Arrays- **show commutative multiplication** ➢	➢ **Solve one-step problems** ➢ **Recall and use division facts for the 2, 5 and 10 times tables.** ➢ Division as grouping ➢ Division within arrays- linking to multiplication ➢ Repeated subtraction	➢ **Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity** ➢ **Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$**

Y2 - Skills

Addition	➢ When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on. From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps. ➢ 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. ➢ When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. ➢ They should also apply their knowledge of number bonds to add more efficiently e.g. 8 +5 =13 so 38 +5 =43. ➢ Hundred squares and straws can support children to find the number bond to 10.
Subtraction	➢ Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this. ➢ Children can also use a blank number line to count back to find the difference. ➢ Encourage them to jump to multiples of 10 to become more efficient.
Multiplication	➢ Children represent multiplication as repeated addition in many different ways. ➢ In Year 2, children, are introduced to the multiplication symbol.
Division	➢ Children solve problems by sharing amounts into equal groups. ➢ Children use concrete and pictorial representations to solve problems. They are not expected to record division formally. ➢ Children solve problems by grouping and counting the number of groups. ➢ Grouping encourages children to count in multiples and links to repeated subtraction on a number line. ➢ In Year 2, children are introduced to the division symbol. ➢ They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Y2 - Different models and images that could be used to effectively teach each concept.

Addition	Subtraction	Multiplication	Division
			

Y3 – NC Objectives

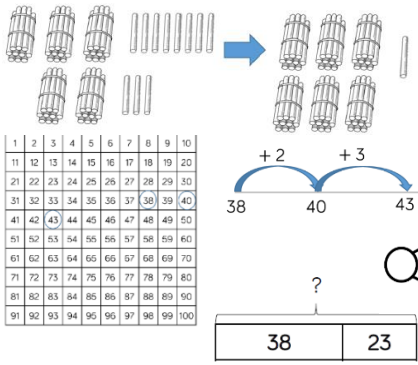
	Addition & Subtraction	Multiplication & Division	Fractions
Y3	**Addition** ➢ **Add numbers up to three digits using formal method** ➢ **Add numbers mentally, including** - **A three-digit number and ones** - **A three-digit number and tens** - **A three-digit number and hundreds** ➢ Column method- regrouping. ➢ Using place value counters **Subtraction** ➢ **Subtract numbers up to three digits using formal method** ➢ **Subtract numbers mentally, including** - **A three-digit number and ones** - **A three-digit number and tens** - **A three-digit number and hundreds** ➢ Column method with regrouping. ➢ Subtracting 3-digits using place value counters	**Multiplication** ➢ **Recall and use multiplication facts for 3, 4 and 8 times tables** ➢ **Solve problems involving multiplication** ➢ Arrays ➢ 2-digit × 1-digit numbers using base 10, place value counters and written methods **Division** ➢ **Recall and use division facts for 3, 4 and 8 times tables** ➢ **Solve problems involving division** ➢ Divide 2-digits by 1-digit (no exchange sharing) ➢ Divide 2-sigit by 1-digit (sharing with exchange) ➢ Divide 2-digits by 1 digit (sharing with remainders)	➢ **Count up and down in tenths;** ➢ **recognise that tenths arise from dividing an object into 10 equal parts** ➢ **Recognise, find and write fractions of a discrete set of objects: unit fractions and non unit fractions with small denominators** ➢ **Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators** ➢ **Recognise and show, using diagrams, equivalent fractions with small denominators** ➢ **Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]** ➢ **Compare and order unit fractions, and fractions with the same denominators**

Y3 - Skills

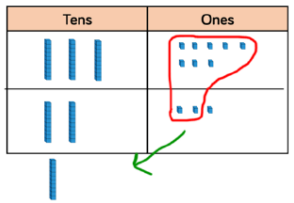
Addition	➢ When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. ➢ They should also apply their knowledge of number bonds to add more efficiently e.g. 8 +5 =13 so 38 +5 =43. ➢ Hundred squares and straws can support children to find the number bond to 10. ➢ Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits. ➢ Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. ➢ Plain counters on a place value grid can also be used to support learning.
Subtraction	➢ Encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient. ➢ Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits. ➢ Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. ➢ Plain counters on a place value grid can also be used to support learning.
Multiplication	➢ Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4. ➢ Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.
Division	➢ **When dividing larger numbers**, children can use manipulatives that allow them to partition into tens and ones. ➢ Straws, Base 10 and place value counters can all be used to share numbers into equal groups. ➢ Part-whole models can provide children with a clear written method that matches the concrete representation. ➢ **When dividing numbers involving an exchange**, children can use Base 10 and place value counters to exchange one ten for ten ones. ➢ Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows. ➢ Flexible partitioning in a part-whole model supports this method. ➢ **When dividing numbers with remainders**, children can use Base 10 and place value counters to exchange one ten for ten ones. ➢ Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made. ➢ Flexible partitioning in a part-whole model supports this method.

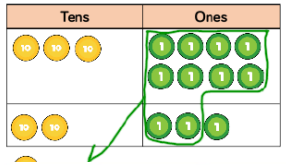
Y3 - Different models and images that could be used to effectively teach each concept.

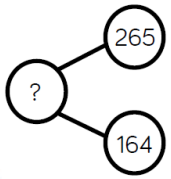
Addition

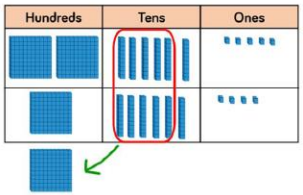


38
+ 23
61
1



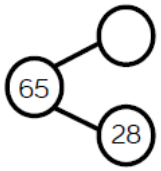


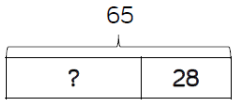


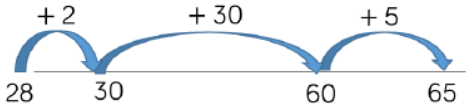


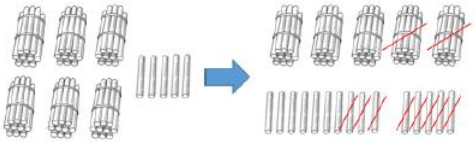
265
+ 164
429
1

Subtraction

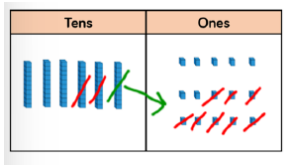


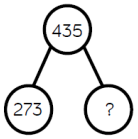


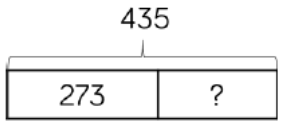


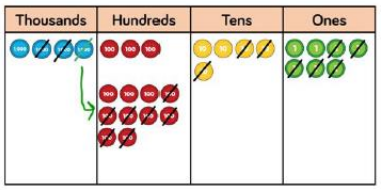


5 1
65
− 28
37

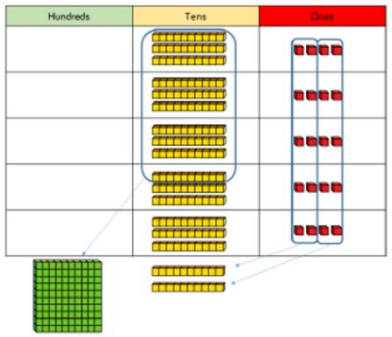




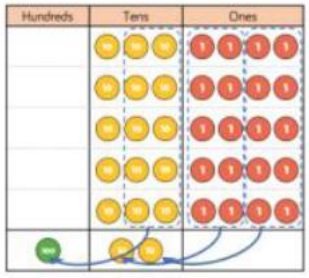




Multiplication

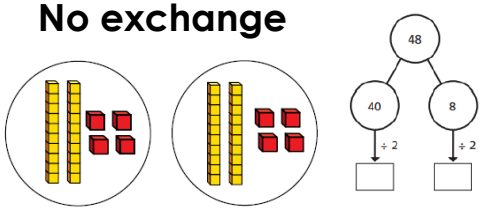


	H	T	O	
		3	4	
×			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	



Division

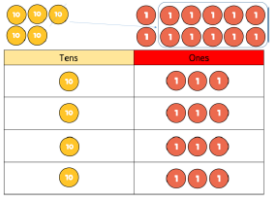
No exchange

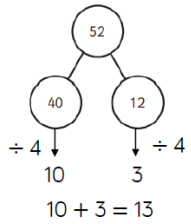


Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1

48 ÷ 2 = 24

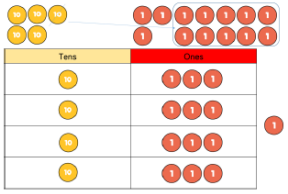
Sharing with exchange

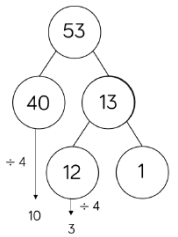




10 + 3 = 13

Sharing with remainders





Y4 – NC Objectives

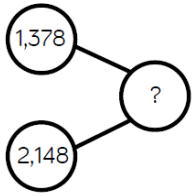
Y4	**Addition** ➢ **Add up to 4-digits using the formal written methods** ➢ **Solve addition two-step problems** ➢ Column method- regrouping. **Subtraction** ➢ **Subtract up to 4-digits using the formal written methods** ➢ Column method with regrouping. (up to 4 digits)	**Multiplication** ➢ **Recall multiplication facts up to 12 x 12** ➢ **Recognise and use known facts to multiply** ➢ **Solve problems to multiply two digit numbers by one digit** ➢ **2 and 3-digit × 1-digit numbers** using base 10, place value counters and written methods ➢ **Use formal written methods** **Division** ➢ **Recall division facts up to 12 x 12** ➢ **Recognise and use known facts to divide** ➢ **Solve problems to divide two digit numbers by one digit** ➢ **Use formal written methods** ➢ Divide 2-digits by 1 digit (sharing with remainders) ➢ Divide 2-digits by 1 digit (grouping) ➢ Divide 3-digits by 1 digit (grouping)	➢ **Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10** ➢ **Recognise, find and write fractions of a discrete set of objects: unit fractions and non unit fractions with small denominators** ➢ **Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators** ➢ **Recognise and show, using diagrams, equivalent fractions with small denominators** ➢ **Add and subtract fractions with the same denominator within one whole for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$** ➢ **Compare and order unit fractions, and fractions with the same denominators** ➢ **Recognise and write decimal equivalents of any number of tenths or hundredths** ➢ **Recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$**

Y4 - Skills

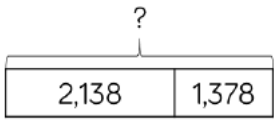
Addition	➢ Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits. ➢ Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. ➢ Plain counters on a place value grid can also be used to support learning.
Subtraction	➢ Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits. ➢ Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. ➢ Plain counters on a place value grid can also be used to support learning.
Multiplication	➢ Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4. Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge. ➢ When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method. ➢ Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.
Division	➢ **When dividing numbers involving an exchange**, children can use Base 10 and place value counters to exchange one ten for ten ones. ➢ Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows. ➢ Flexible partitioning in a part-whole model supports this method. ➢ **When dividing numbers with remainders**, children can use Base 10 and place value counters to exchange one ten for ten ones. ➢ Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made. ➢ Flexible partitioning in a part-whole model supports this method. ➢ Part-whole models can provide children with a clear written method that matches the concrete representation. ➢ Children can continue to use place value counters to share 3-digit numbers into equal groups. ➢ Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. ➢ Flexible partitioning in a part-whole model supports this method.

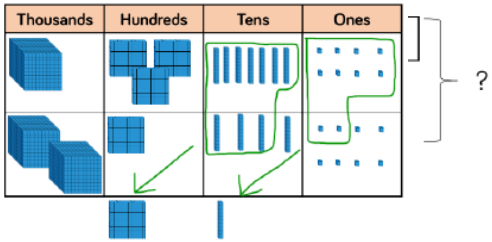
Y4 - Different models and images that could be used to effectively teach each concept.

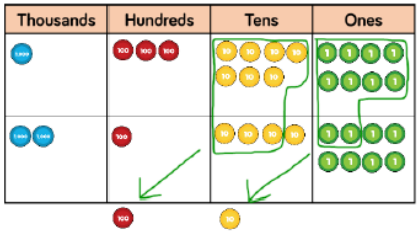
Addition



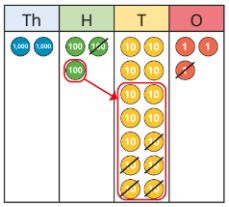
	Th	H	T	O
	4	6	7	3
+	1	5	1	8
	6	1	9	1
	1		1	



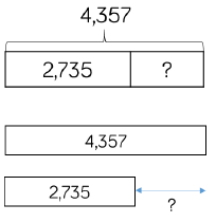


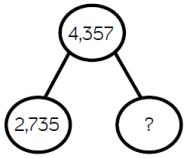


Subtraction

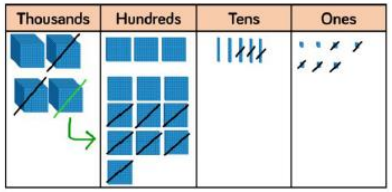


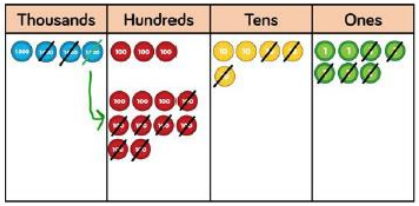
	Th	H	T	O
	2	$^{2}\not{3}$	$^{1}4$	3
−		1	5	1
	2	1	9	2



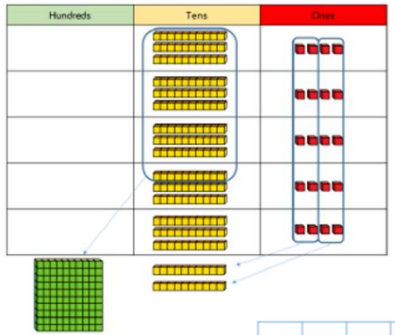


$$4{,}357 - 2{,}735 = 1{,}622$$



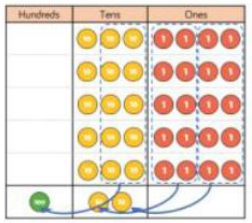


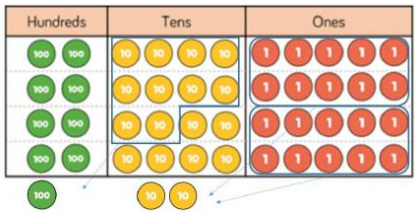
Multiplication



	H	T	O
		3	4
×			5
	1	7	0
	1	2	

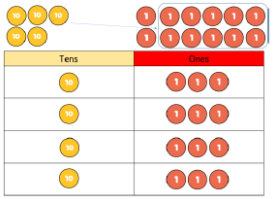
	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

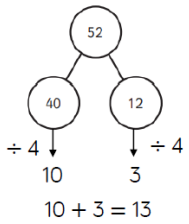




Division

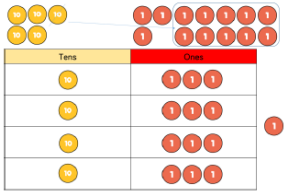
Sharing with exchange

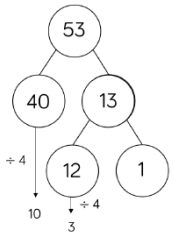


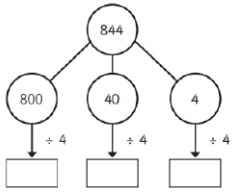


10 + 3 = 13

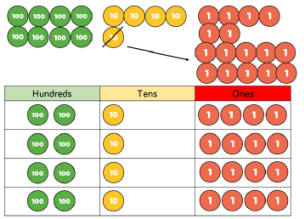
Sharing with remainders







divide 3-digit by 1-digit



Y5 – NC Objectives

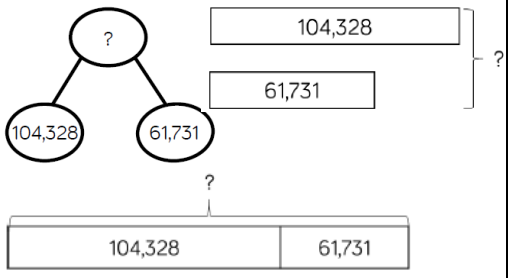
	Addition & Subtraction	Multiplication & Division	Fractions
Y5	**Addition** ➢ **Use the formal written method** ➢ **Add with up to 4 digits** ➢ **Add with more than 4 digits** ➢ **Add larger numbers mentally** ➢ **Solve multi-step addition problems** ➢ Column method - regrouping. ➢ Use of place value counters for adding decimals. **Subtraction** ➢ **Use the formal written method** ➢ **Add with more than 4 digits** ➢ **Subtract larger numbers mentally** ➢ **Solve multi-step subtraction problems** ➢ Subtract with up to 3 decimal places ➢ Abstract for whole numbers. ➢ Start with place value counters for decimals - with the same amount of decimal places.	**Multiplication** ➢ **Multiply 4 digit by 1 digit** ➢ **Multiply 2-digit by 2-digit numbers** ➢ **Multiply 2-digt by 3-digit numbers** ➢ **Multiply 2-digit by 4-digit numbers** ➢ Column multiplication ➢ Abstract only but might need a repeat of year 4 first (up to 4 digit numbers multiplied by 1 or 2 digits) **Division** ➢ **Divide 3 digit by 1 digit (grouping)** ➢ **Divide 4-digits-digit by 1-digit (grouping)** ➢ Short division ➢ Up to 4-digits by a 1-digit number including remainders)	➢ **Compare and order fractions whose denominators are all multiples of the same number** ➢ **Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths** ➢ **Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1$ and $\frac{1}{5}$]** ➢ **Add and subtract fractions with the same denominator and denominators that are multiples of the same number.** ➢ **Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams**

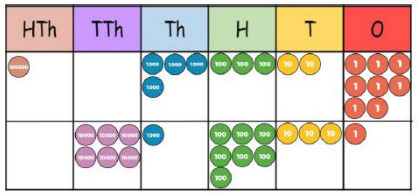
Y5 - Skills

Addition	➢ 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. ➢ 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	➢ 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. ➢ Children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently. ➢ 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	➢ 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. ➢ Children should now move towards the formal written method. ➢ When multiplying 4 digits by 2 digits, children should be confident in using the formal written method. ➢ Consider where exchanged digits are placed and make sure this is consistent.
Division	➢ 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. ➢ 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. ➢ 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.

Y5 - Different models and images that could be used to effectively teach each concept.

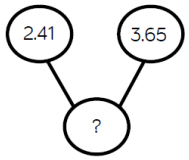
Addition



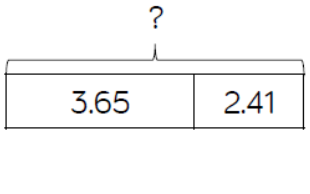


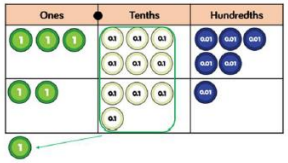
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9

1

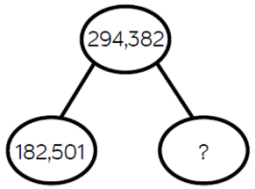


3.65
+ 2.41
6.06
1



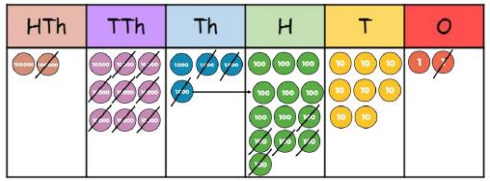


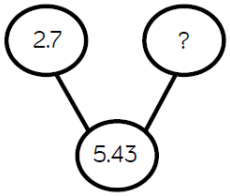
Subtraction

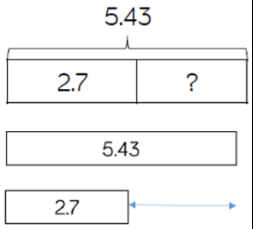


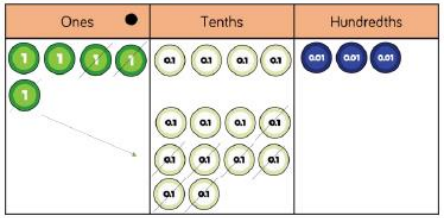
2	9	3 4	1 3	8	2
1	8	2	5	0	1
1	1	1	8	8	1

294,382

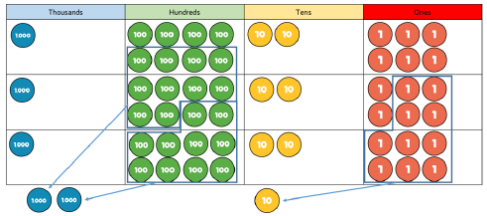








Multiplication



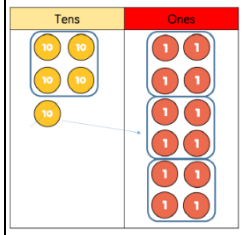
	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

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

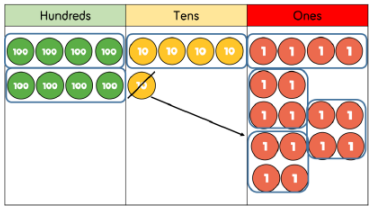
Th	H	T	O
	2	3	4
×		3	2
	4	6	8
1 7	1 0	2	0
7	4	8	8

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

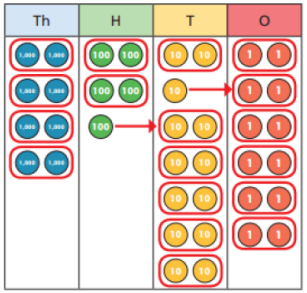
Division



		1	3	
	4	5	1 2	



		2	1	4
	4	8	5	1 6



	4	2	6	6
2	8	5	1 3	1 2

Y6 – NC Objectives

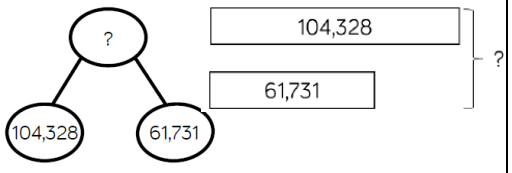
Y6	**Addition** ➢ **Solve addition multi-step problems** ➢ Place value counters to be used for adding decimal **Subtraction** ➢ **Solve subtraction multi-step problems** ➢ **Column method** with regrouping. ➢ Abstract methods. ➢ Place value counters for decimals- with different amounts of decimal places.	**Multiplication** ➢ **Multiply up to 4 digits by a two-digit whole number using the formal written method of long multiplication** ➢ **Identify common factors, common multiplies and prime numbers** **Division** ➢ **Interpret remainders as whole numbers, fractions or by rounding** ➢ **Divide up to 4 digits by a two-digit whole number using the formal written method** ➢ Divide multi-digits by 2 digits (short division) ➢ Divide multi-digits by 2-digits (long division) ➢ Long division with place value counters ➢ Up to 4 digits by a 2 digit number ➢ Children should exchange into the tenths and hundredths column too	➢ **Use common factors to simplify fractions; use common multiples to express fractions in the same denomination** ➢ **Compare and order fractions, including fractions > 1** ➢ **Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions** ➢ **Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4}$ x $\frac{1}{2}$ = $\frac{1}{8}$]** ➢ **Divide proper fractions by whole numbers [for example, $\frac{1}{3}$ ÷ 2 = $\frac{1}{6}$]** ➢ **Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]**

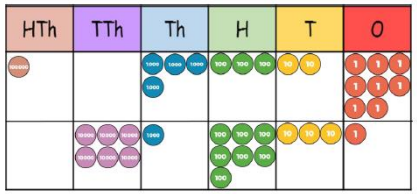
Y6 - Skills

Addition	➢ 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. ➢ Children should be encouraged to work in abstract, using the column method to add larger numbers efficiently. ➢ 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	➢ 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. ➢ 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	➢ When multiplying 4 digits by 2 digits, children should be confident in using the formal written method. ➢ 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	➢ 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 can also divide by 2-digit numbers using long division. ➢ 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 or decimal. This will depend on the context of the question. ➢ 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. ➢ 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.

Y6 - Different models and images that could be used to effectively teach each concept.

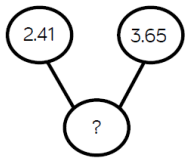
Addition



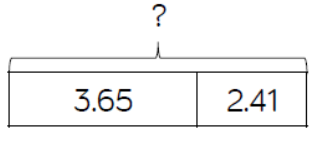


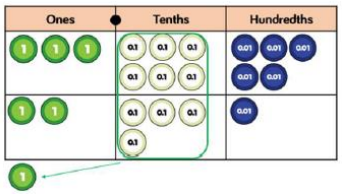
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9

1

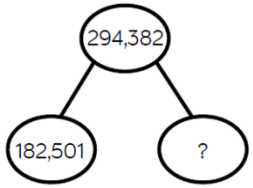


3.65
+ 2.41
6.06
1



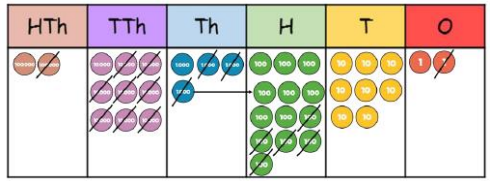


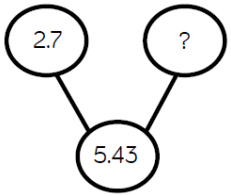
Subtraction



2	9	3 ~~4~~	1 3	8	2	
1	8	2	5	0	1	
1	1	1	8	8	1	

294,382





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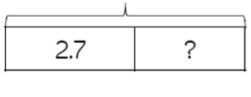
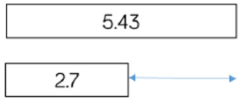
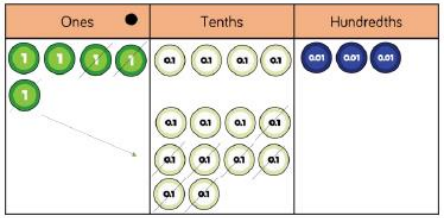






Multiplication

	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8

2 1

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

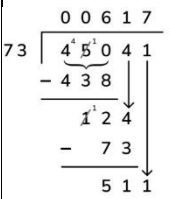
	Th	H	T	O
	2	3	4	
×		3	2	
	4	6	8	
1 7	1 0	2	0	
7	4	8	8	

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

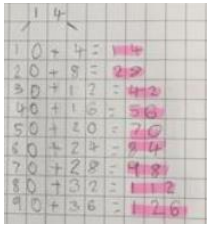
Division

		0	4	8	9
15	7	7 3	13 3	13 5	

15	30	45	60	75	90	105	120	135	150



73
146
219
292
365
438
511
584
657



When listing multiples beyond 12, these can be partitioned e.g.

7,335 ÷ 15 = 489

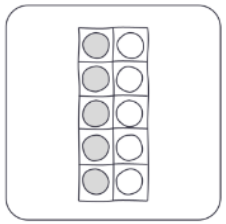
			2	4	r	1	2
1	5	3	7	2			
	–	3	0	0			
			7	2			
	–		6	0			
			1	2			

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

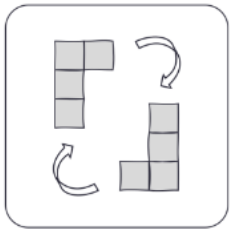
			2	4	$\frac{4}{5}$
1	5	3	7	2	
	–	3	0	0	
			7	2	
	–		6	0	
			1	2	

Number Sense Maths

As a school, we teach maths in EYFS through a programme called Number Sense Maths which builds a deep understanding of quantity and of numbers to 10.



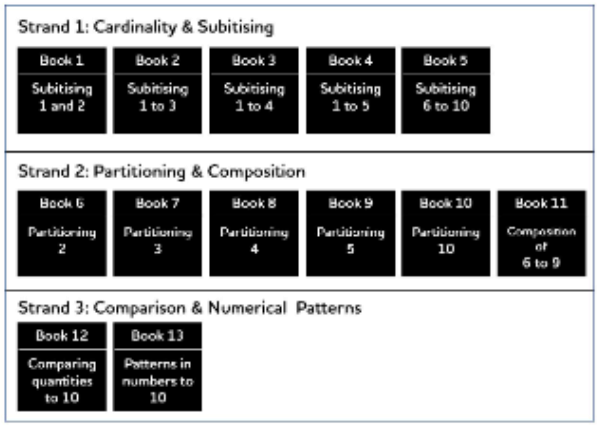
We are born with an innate ability to process small quantities visually. The Early Years Number Sense programme meets children at this starting point of subitising one and two, and develops a deep understanding of all the quantities to ten. The programme develops subitising, manipulating, and partitioning of numbers to 10, and supports children to see their different properties. It covers all the number elements of the 2021 statutory framework except counting, and it supports assessment of the Early Learning Goals for Number and Numerical Patterns. Designed for Reception, some animations are also used in Nursery.



Subitising is a visuospatial skill, and this programme helps to develop children's understanding of number and spatial awareness hand in hand. The programme materials expose the different ways that small quantities can be arranged and manipulated, and teaches children to see quantities within quantities. The programme supports children to develop their own visual images of quantities to ten.

The programme is structured around 95 teaching animations which provide starting points for whole class number sense discussions. The animations provide mathematically rich images that are a stimulus for regular whole class number sense discussions.

The programme's systematic approach provides a coherent teaching sequence to develop a deep understanding of numbers to 10. The structure of the programme materials means they can be used as the central structure and resource for the teaching of number and as highly visual resources that tie in with your existing curriculum sequence.



In Reception, we follow Number Sense Maths' suggested progression for mathematics teaching as the central resource for teaching number. To support the teaching of Spatial Awareness, we use White Rose Maths.

As suggested we follow a three key element in our Reception curriculum to deliver both number and non-number teaching:

- Daily mathematical routines
- Daily whole class sessions
- Other mathematical provision through the week

This is the yearly overview for Reception:

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1				Non-number		Number: Subitising quantities to 3	
				Spatial reasoning *Construction and 3D shapes*	Spatial reasoning *Construction 3D shapes*	**Book 1:** Subitising 1 - 2	**Book 2:** Subitising 1 – 3
				Continue spatial reasoning for rest of term through provocations in continuous provision			
Autumn 2	Non-number		Number: Subitising quantities to 5				
	Spatial reasoning *2D shapes and shape puzzles*	Spatial reasoning *2D shapes and shape puzzles*	**Book 3:** Subitising 1 - 4	**Book 3:** Subitising 1 - 4	**Book 4:** Subitising 1 - 5	**Book 4:** Subitising 1 – 5 (tens frames)	
	Continue spatial reasoning all term through provocations in continuous provision →						

Spring 1	Non-number		Number: Enumerating between 6 and 10 items			
	Pattern	Pattern	**Book 5:** Subitising 6 - 10	**Book 5:** Subitising 6 - 10	Counting out up to 10 items from a collection (not covered by EYNS)	
	Continue pattern all term through provocations in continuous provision →					
Spring 2	Non-number	Partitioning 2, 3, 4, 5 and 10 and 'number bonds' for these number				
	Spatial reasoning *Symmetry (incl. shape puzzles & construction)*	**Books 6 & 7:** Partitioning 2 and 3	**Book 8:** Partitioning 4	**Book 9:** Partitioning 5	**Book 10:** Partitioning 10	**Book 10:** Partitioning 10
	Continue spatial reasoning all term through provocations in continuous provision →					

Summer 1	Non-number		Composition of 6 – 9, and comparison of numbers to 10				
	Measures	Measures	**Book 11:** Composition of 6 - 9	**Book 11:** Composition of 6 - 9	**Book 12:** Comparing numbers to 10	**Book 12:** Comparing numbers to 10	
	Continue measures all term through provocations in continuous provision →						
Summer 2	Patterns in numbers to 10			Non-number			
	Book 13: Patterns in odd and even numbers	Book 13: Patterns in doubles	Book 13: Equal distribution	Pattern	Spatial reasoning *Maps and plans*	Measures	

Number Sense Maths Y1 – Y3

In Y1, Y2 and Y3, we use the Number Sense Maths' scheme of work which focuses entirely on number facts teaching. The systematic and structured programme builds confidence and flexibility with number, it ensures children develop visual models of number, a deep understanding of number and number relationships, and fluency in addition and subtraction facts. We use the programme for whole class teaching and for interventions.

At the core of the programme are the Addition and Subtraction Fact Grids. These essential facts are the equivalent of times tables for addition and subtraction. Just as all multiplication and division calculations use root times table facts, all future addition and subtraction calculations use these root addition and subtraction facts. All grid facts are taught comprehensively on the path to fluency.

Addition Grid Facts

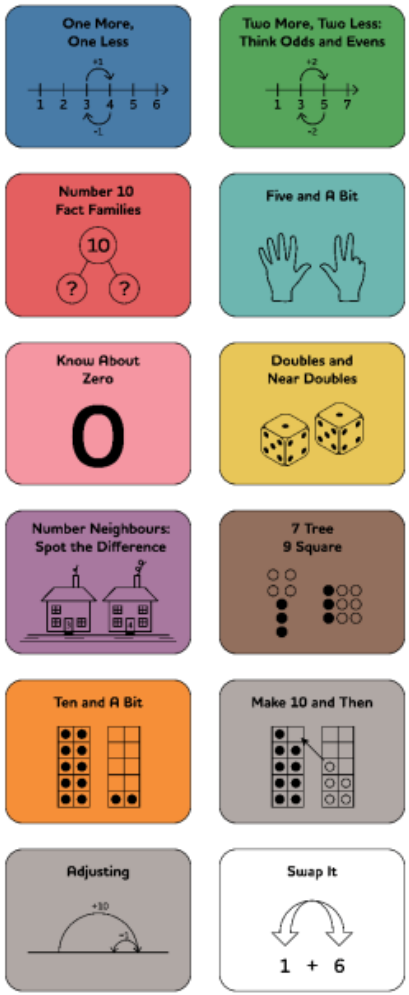
+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	1+10
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9	2+10
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9	3+10
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9	4+10
5	5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9	5+10
6	6+0	6+1	6+2	6+3	6+4	6+5	6+6	6+7	6+8	6+9	6+10
7	7+0	7+1	7+2	7+3	7+4	7+5	7+6	7+7	7+8	7+9	7+10
8	8+0	8+1	8+2	8+3	8+4	8+5	8+6	8+7	8+8	8+9	8+10
9	9+0	9+1	9+2	9+3	9+4	9+5	9+6	9+7	9+8	9+9	9+10
10	10+0	10+1	10+2	10+3	10+4	10+5	10+6	10+7	10+8	10+9	10+10

Subtraction Grid Facts

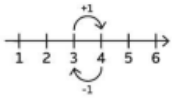
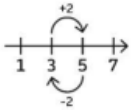
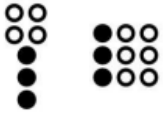
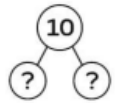
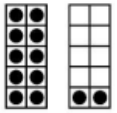
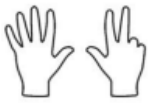
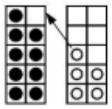
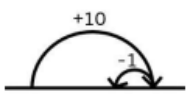
–	0	1	2	3	4	5	6	7	8	9	10
0	0–0										
1	1–0	1–1									
2	2–0	2–1	2–2								
3	3–0	3–1	3–2	3–3							
4	4–0	4–1	4–2	4–3	4–4						
5	5–0	5–1	5–2	5–3	5–4	5–5					
6	6–0	6–1	6–2	6–3	6–4	6–5	6–6				
7	7–0	7–1	7–2	7–3	7–4	7–5	7–6	7–7			
8	8–0	8–1	8–2	8–3	8–4	8–5	8–6	8–7	8–8		
9	9–0	9–1	9–2	9–3	9–4	9–5	9–6	9–7	9–8	9–9	
10	10–0	10–1	10–2	10–3	10–4	10–5	10–6	10–7	10–8	10–9	10–10
11		11–1	11–2	11–3	11–4	11–5	11–6	11–7	11–8	11–9	11–10
12			12–2	12–3	12–4	12–5	12–6	12–7	12–8	12–9	12–10
13				13–3	13–4	13–5	13–6	13–7	13–8	13–9	13–10
14					14–4	14–5	14–6	14–7	14–8	14–9	14–10
15						15–5	15–6	15–7	15–8	15–9	15–10
16							16–6	16–7	16–8	16–9	16–10
17								17–7	17–8	17–9	17–10
18									18–8	18–9	18–10
19										19–9	19–10
20											20–10

The core facts are taught alongside 12 calculation strategies. Learning and applying these strategies gives children a deep understanding of number and number relationships. Using these strategies children can then "use what they know to work out what they don't know". Explicit teaching of derived fact strategies is an effective route to fluency in addition and subtraction facts for all children, including lower attainers. The images on the next page provide a description of each strategy.

Calculation Strategies



NSM Number Facts Calculation Strategies

One More, One Less 	When we add one, we get the next counting number. When we subtract one, we get the previous counting number (e.g. 5 – 1 = 4).	**Number Neighbours: Spot the Difference** 	Adjacent numbers have a difference of 1. Adjacent odds and evens have a difference of 2. Spot number neighbours (adjacent, odds or evens) to solve subtractions of adjacent numbers (e.g. 5 – 4 = 1), of adjacent odds (e.g. 9 – 7 = 2) or adjacent evens (e.g. 6 – 4 = 2)
Two More, Two Less: Think Odds and Evens 	If we add two to a number, we go from odd to next odd or even to next even. If we subtract two from a number, we go from odd to previous odd or even to previous even.	**7 Tree and 9 Square** 	Use these visual images to remember addition and subtractions fact families that children can find tricky. For example, visualising the 7 tree helps remember that 7 – 3 = 4. Visualising the 9 square helps remember that 3 + 6 = 9.
Number 10 Fact Families 	Go beyond just recalling the pairs of numbers that add to 10. Make sure that we can also spot additions and subtractions which we can use number bonds to 10 to solve.	**Ten and A Bit** 	The numbers 11 – 20 are made up of 'Ten and a Bit'. Recognising and understanding the 'Ten and a Bit' structure of these numbers enables addition and subtraction facts involving their constituent parts (e.g. 3 + 10 = 13, 17 – 7 = 10, 12 – 10 = 2).
Five and A Bit 	The numbers 6, 7, 8 and 9 are made up of 'five and a bit'. This can be shown on hands, and supports decomposition of these numbers into their five and a bit parts (e.g. 5 + 3 = 8, 9 – 5 = 4).	**Make Ten and Then...** 	Additions which cross the 10 boundary can be calculated by 'Making Ten' first, and then adding on the remaining amount (e.g. 8 + 6 can be calculated by thinking '8 + 2 = 10 and 4 more makes 14'). The same strategy can be applied to subtractions through 10.
Know about 0 	When we add 0 to or subtract 0 from another number, the total remains the same. If we subtract a number from itself, the difference is 0.	**Adjust It** 	Any addition and subtraction can be calculated by adjusting from a fact you know already, (e.g. 6 + 9 is one less than 6 + 10).
Doubles and Near Doubles 	Memorise doubles of numbers to 10, using a visual approach. Then use these known double facts to calculate near doubles and hidden doubles. Once we know 6 + 6 = 12 then 6 +7 and 5 + 7 is easy.	**Swap It**  1 + 6	When the order of two numbers being added (addends) is exchanged the total remains the same. E.g. 1 + 8 = 8 + 1. Sometimes reversing the order of the two addends makes addition easier to think about conceptually.

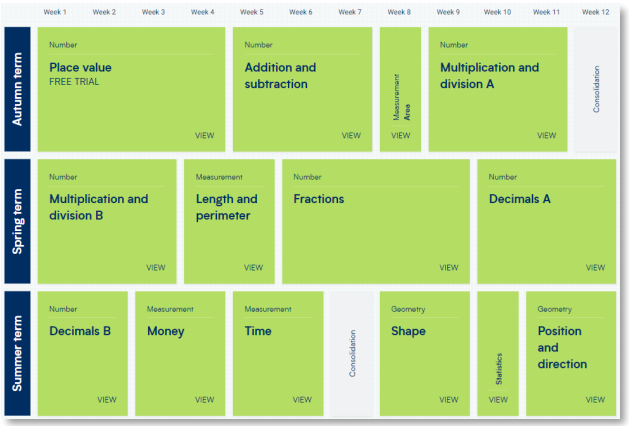
White Rose Maths

As a school, we use a scheme called White Rose which is a mastery approach to maths teaching. This is a research-driven teaching and learning method that meets the goals of the National Curriculum.

What does it mean in practice? In summary, a mastery approach…

- **Puts numbers first**: The schemes have number at their heart, because it is believed that confidence with numbers is the first step to competency in the curriculum as a whole.
- **Puts depth before breadth:** knowledge is reinforced again and again.
- **Encourages collaboration**: children can progress through the schemes as a group, supporting each other as they learn.
- **Focuses on fluency, reasoning and problem solving:** it gives children the skills they need to become competent mathematicians.

For each year group, the scheme of learning includes an overview of the maths which will be taught at any point in the year.

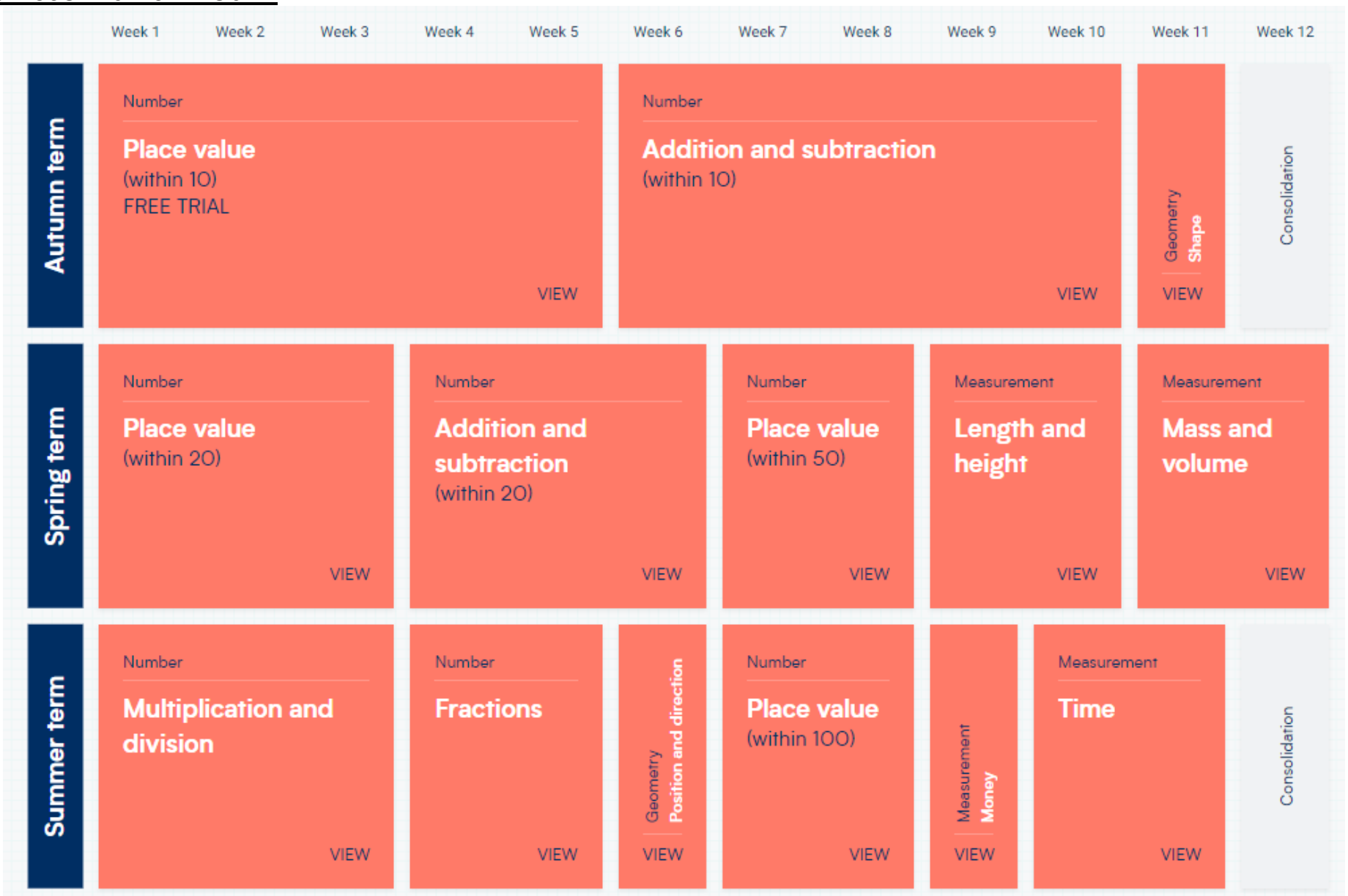


Each year is split into three terms (autumn, spring and summer), and each term comprises individual blocks of learning about a particular topic. So the Year 4 overview looks like the picture, and Autumn Block 2, for example, focuses on addition and subtraction.

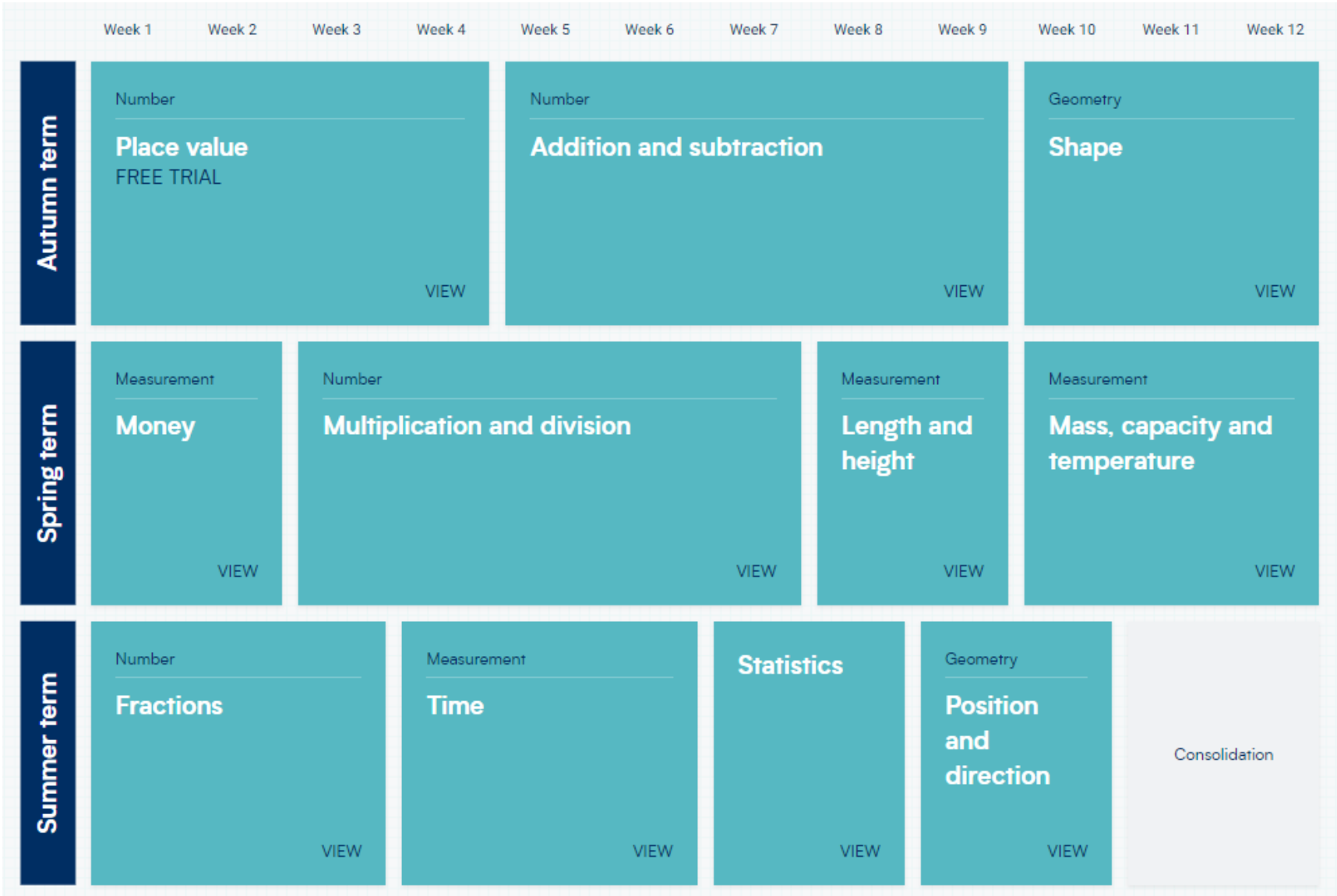
You'll notice that White Rose Maths spend lots of time building strong number skills in Key Stage 1, Key Stage 2 and early secondary years. These essential core skills lay a solid foundation for more complicated learning later on.

To find out further information, go to: https://whiteroseeducation.com/

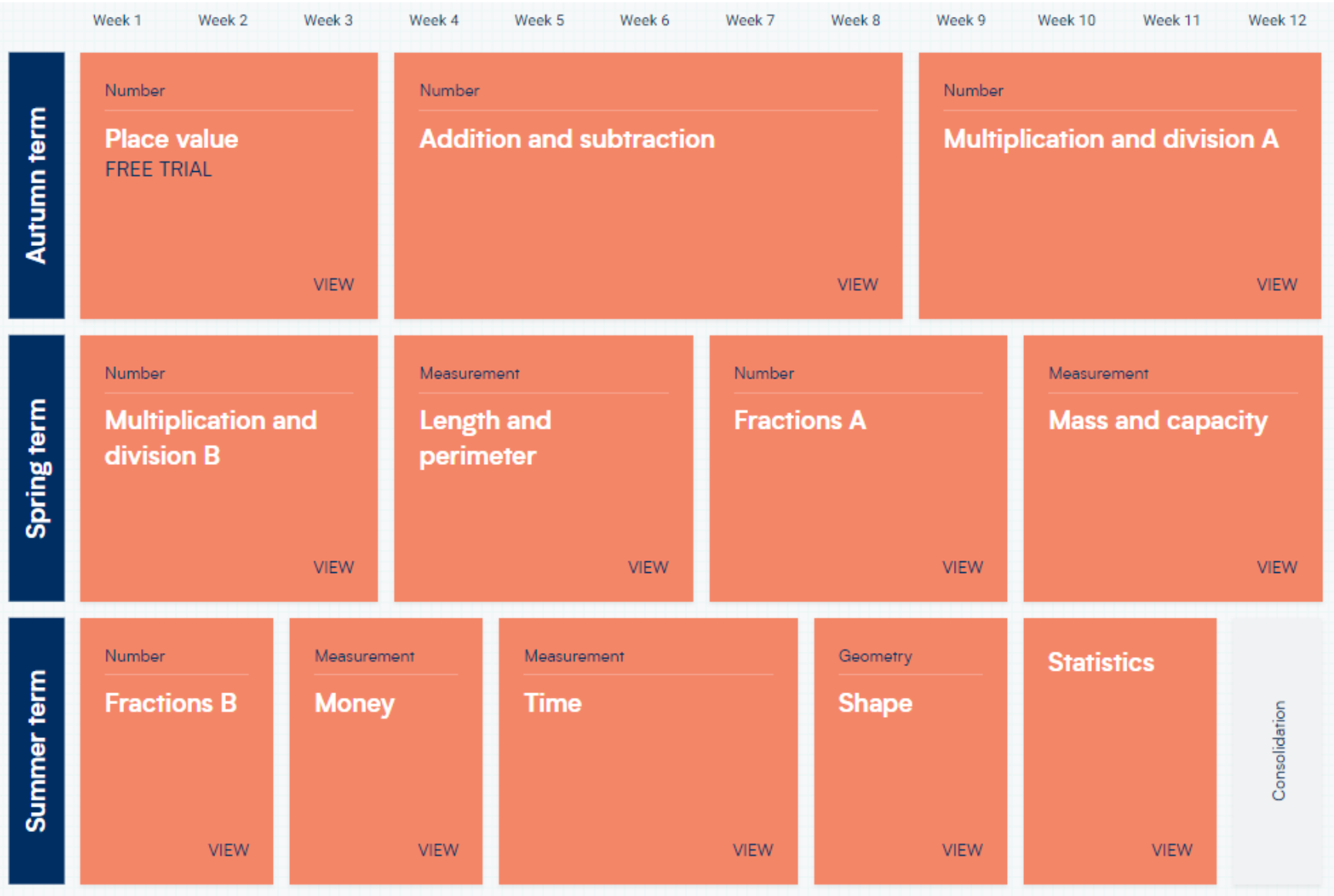
White Rose Maths – Year 1



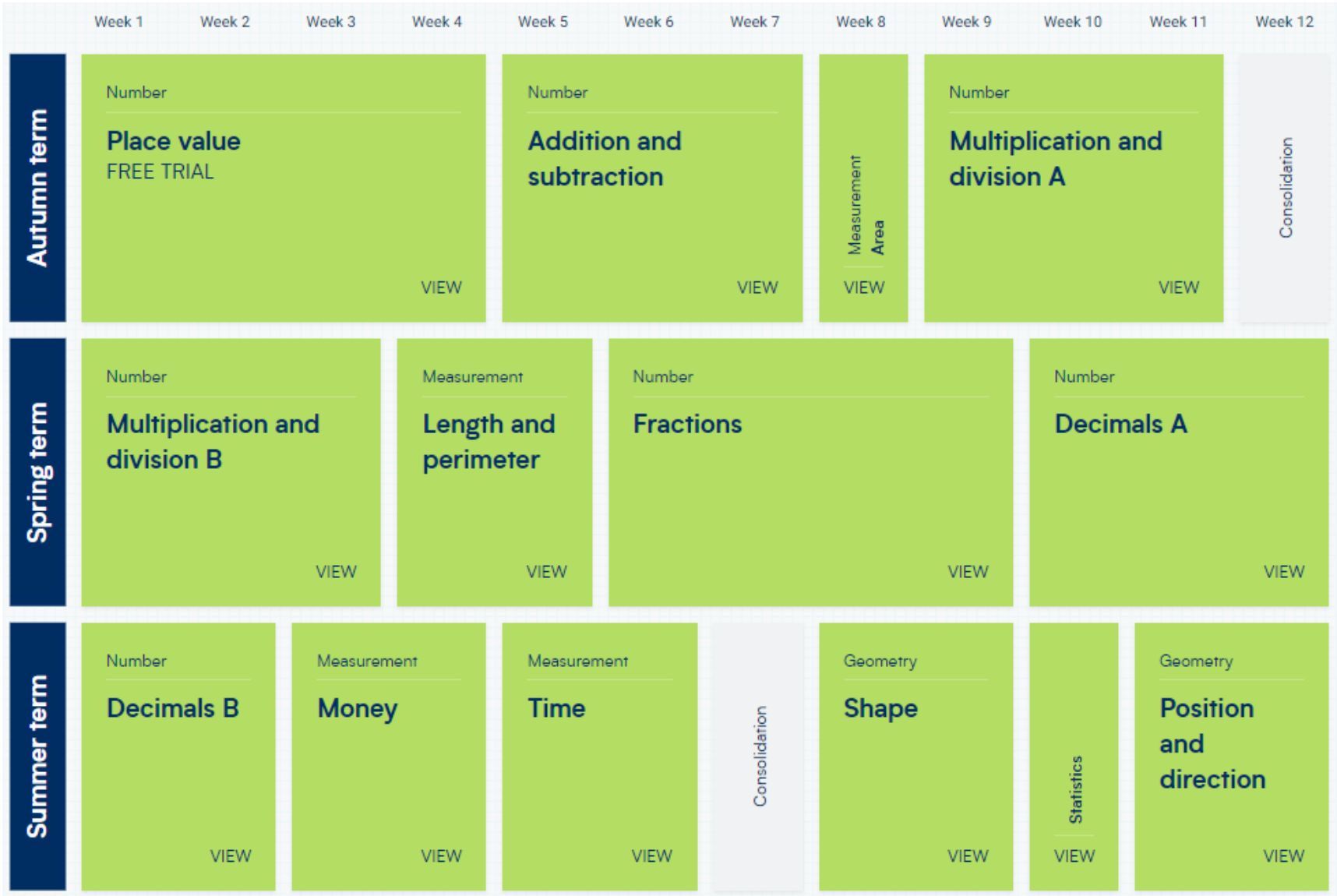
White Rose Maths – Year 2



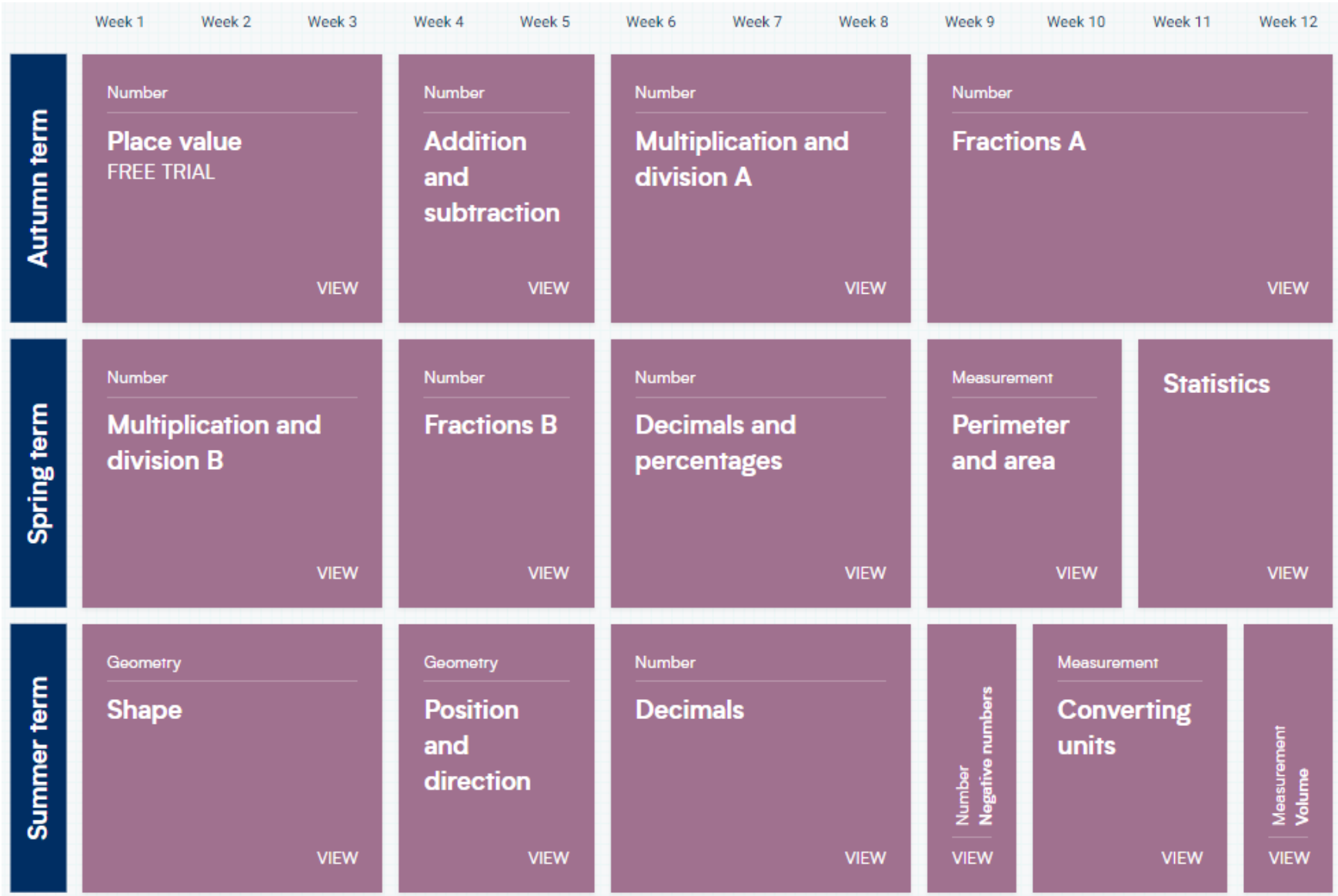
White Rose Maths – Year 3



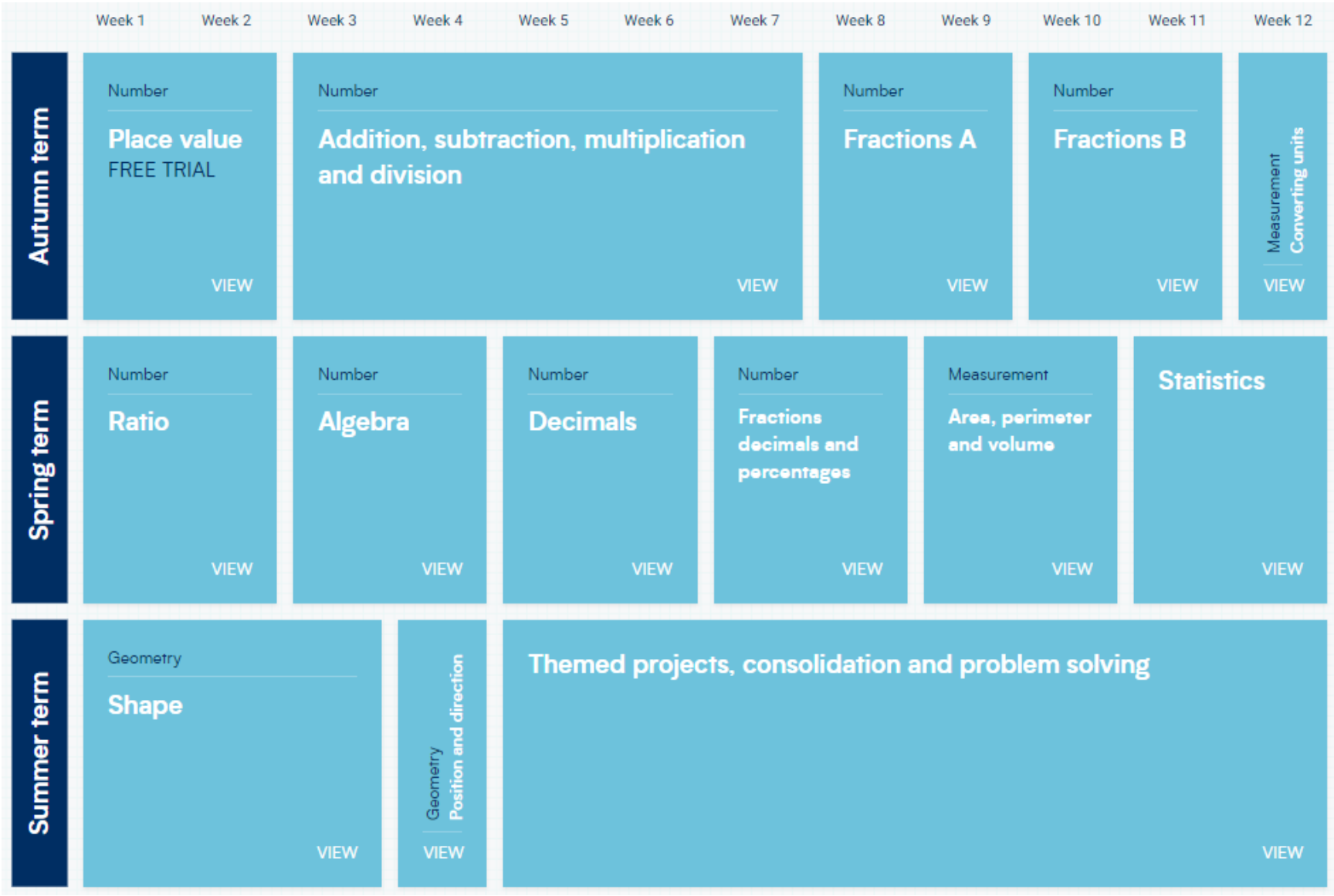
White Rose Maths – Year 4



White Rose Maths – Year 5



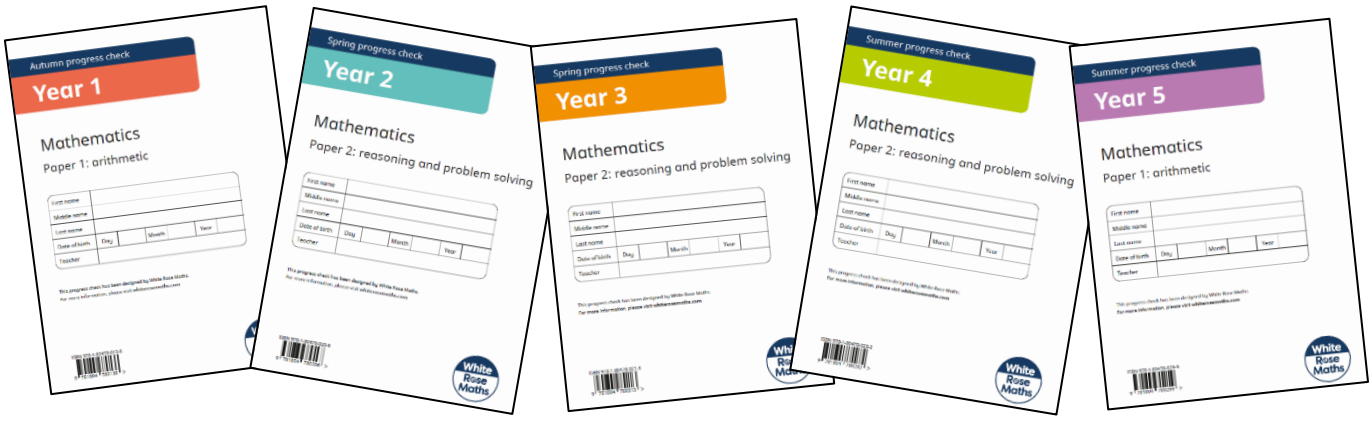
White Rose Maths – Year 6



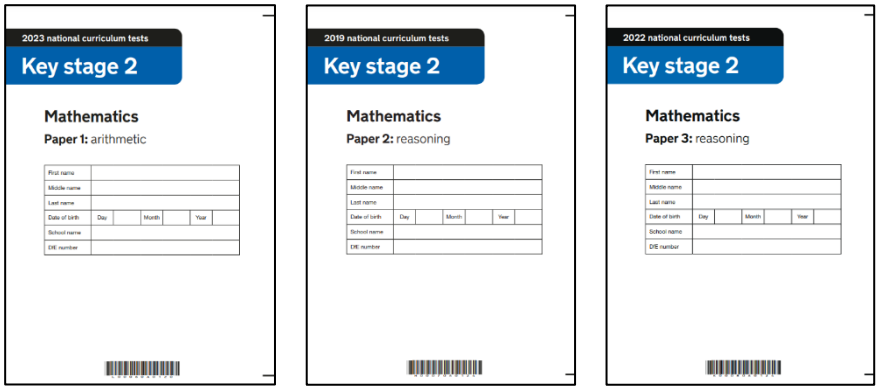
White Rose Assessments

At Bridge Learning Campus, we carry out regular and ongoing formative assessment which informs day-to-day teaching and learning and enables us to put in place the necessary support to enable all pupils to make progress. Pre-tests are completed before the start of each block. Pre learning tasks are a useful method to identify gaps in knowledge and understanding especially during this post lockdown year.

Each term, teachers in Year 1 to Year 5 complete a summative assessment, using the White Rose Tests; these tests are standardised and a scaled score calculated. This method enables teachers to see progress term on term and year on year. Children who are not making expected progress receive appropriate intervention support.



In Year 6, the children complete a previous Year 6 SATs paper at the end of each term. They will complete one arithmetic paper and two reasoning papers.

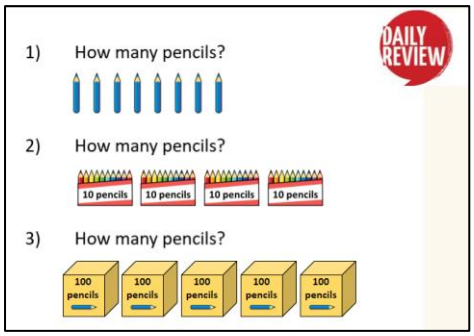


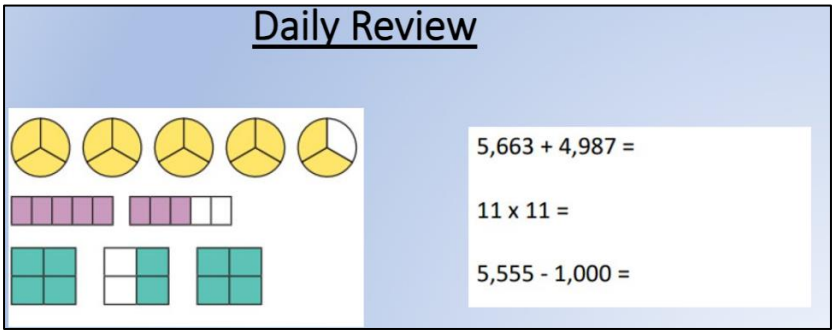
Daily Review

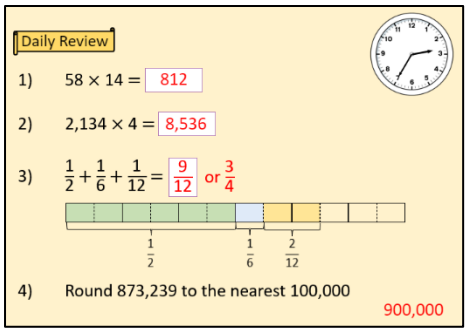
At the start of every lesson, all children complete a Daily Review. A Daily review is a process for activating prior learning in readiness to build on it during the lesson. We set a question or task that makes all of the children think about ideas they've encountered before, related to today's lesson, so that they can start to make new links; to continue to build their schema.

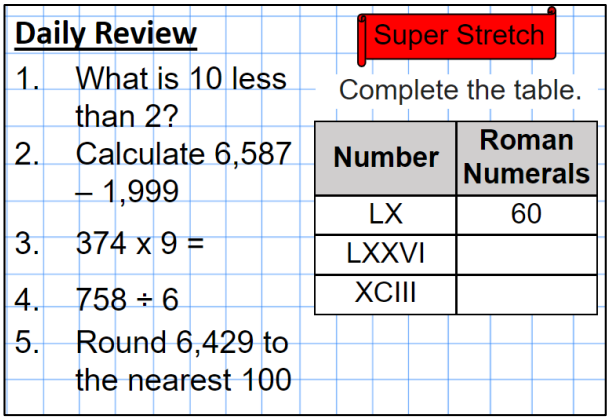
Weekly and monthly reviews are processes for ensuring that we are spacing practice over time, attenuating forgetting and strengthening retrieval. At the same time, by looking back, we'll be making links between areas of learning, deepening the children's understanding. It's likely that monthly review will span a wider content range than daily review, so that the learning is more synoptic and avoids the 'cue' effect. (If we 'cue' the review too much, signposting the solution type, we remove an important aspect of thinking and problem solving – 'what do I need to do here?')

Here are some examples:





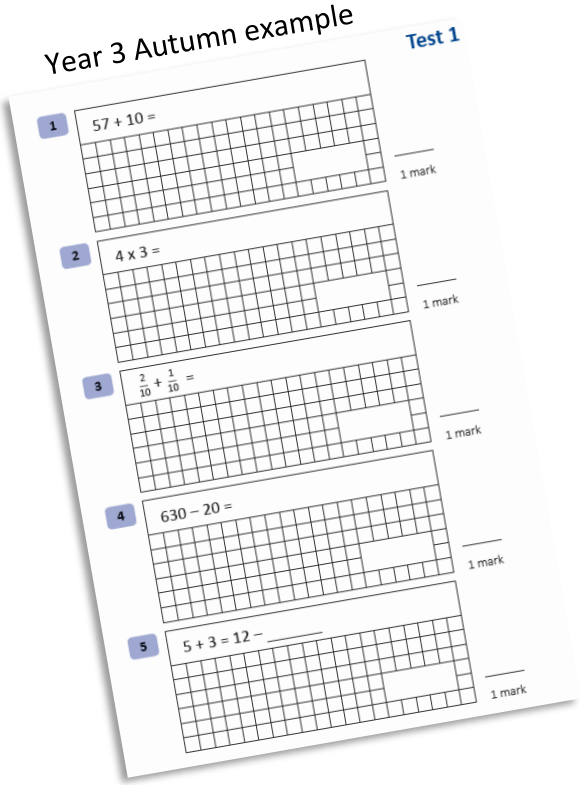




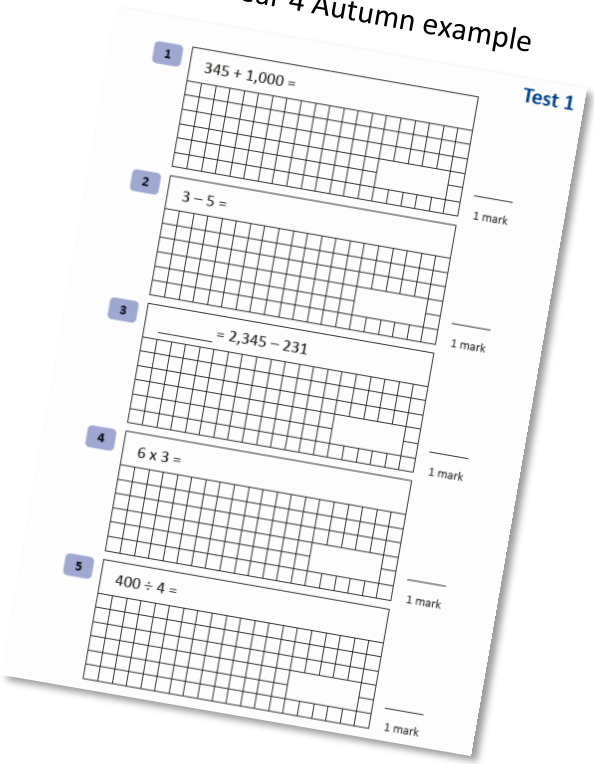
Arithmetic

In Key Stage 2, we use PiXL (https://www.pixl.org.uk) maths to support the teaching of arithmetic. Each year group has a set of ten weekly arithmetic tests for each long term. We use these for diagnostic and assessment purposes, as well as to provide weekly practice in working within a fixed time frame. They are ideal for regular practice as well as providing a context for pupils to demonstrate the skills they have learned.

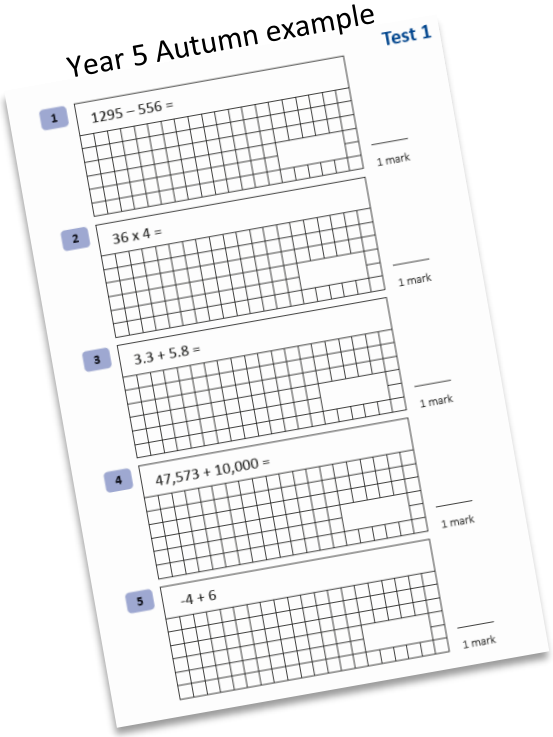
Year 3 Autumn example



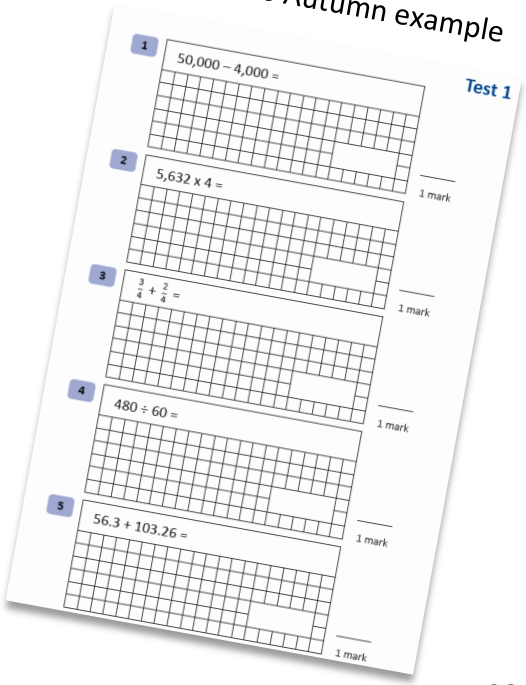
Year 4 Autumn example



Year 5 Autumn example



Year 6 Autumn example

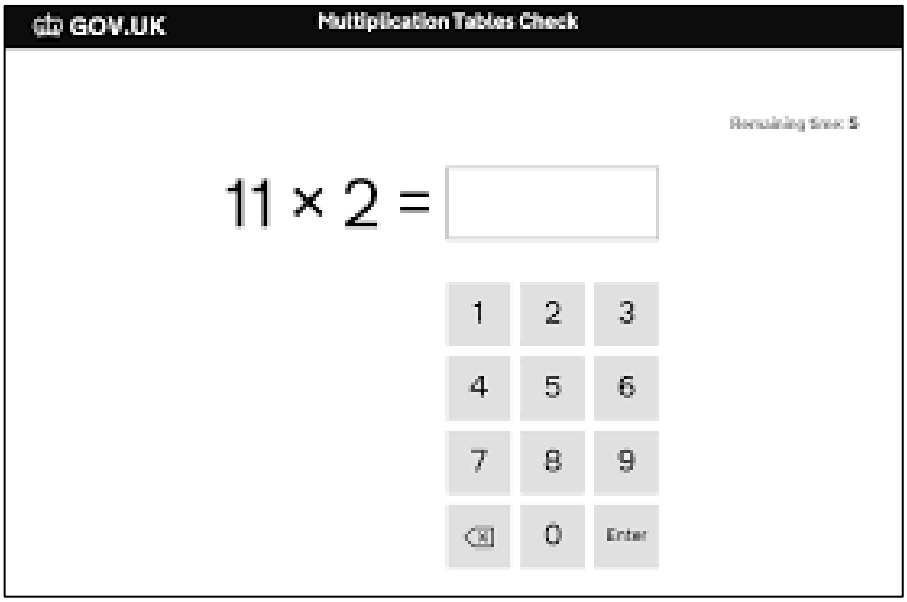


Multiplication Times Table Check

The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help us to identify pupils who have not yet mastered their times tables, so that additional support can be provided.

We administer the MTC to all eligible year 4 pupils between during June.

The MTC is an on-screen check consisting of 25 times table questions. The pupils will be able to answer 3 practice questions before taking the actual check. They will then have 6 seconds to answer each question. On average, the check should take no longer than 5 minutes to complete.

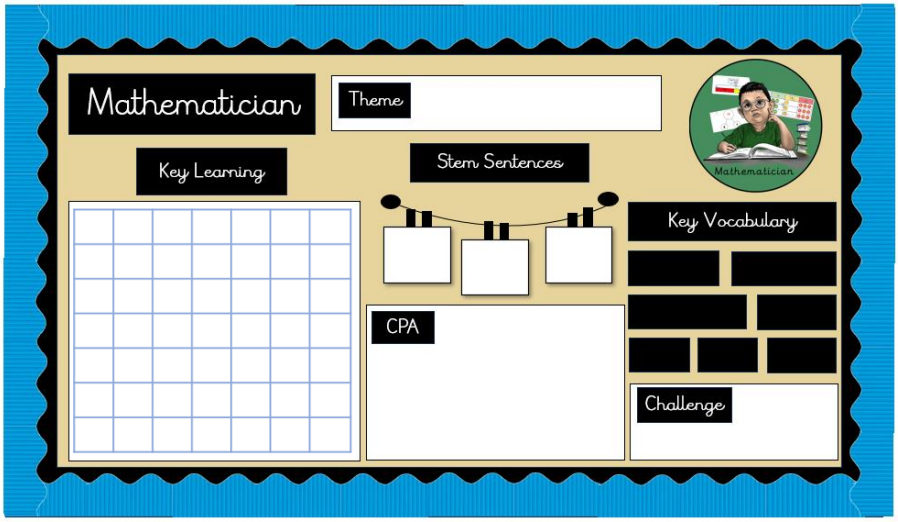


This is last year's information booklet produced by the Standards and Testing Agency - https://shorturl.at/sQRV0

Maths Working Walls

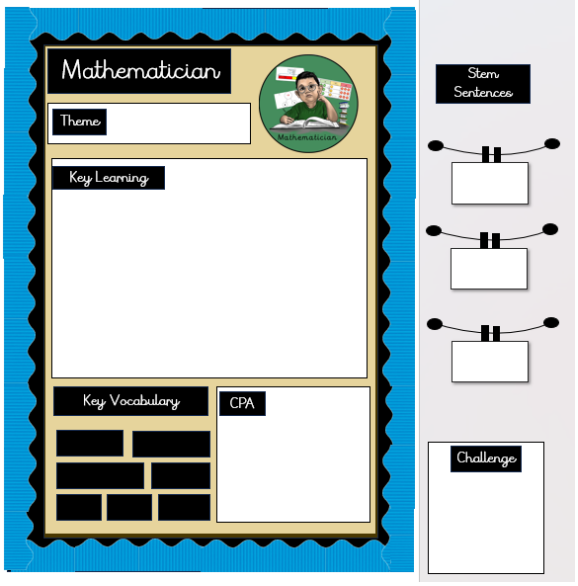
Every class will have a maths working wall which is used to support the children's learning.

- **Key vocabulary**
- **Sentence stems**
  - varied examples
- 'I do' model (worked example)
  - varied fluency
- **Key learning** and examples of methods on flip chart paper
- Squared paper
- WW should be visible to all
- Visual – **models using CPA**
- Success criteria / steps to succeed e.g. word problems
- Present learning / most relevant
- Varied appropriate **representations** e.g.
  - CPA (concrete, pictorial, abstract)
  - use of part, part whole model
  - bar models
  - formal written methods
- 'The basics' e.g. number line, 1-10
- Examples of **reasoning** questions
- Exemplification of **children's work**
- Symbols
- Common misconceptions



Working walls should be easy to update and will need to be updated frequently to support the current learning. They should be used to support children's understanding and developed and created as part of **Wave One** teaching.

Modelled examples from the previous lesson or earlier in the lesson can be used as a point of reference to support children's working memory so that they don't have to hold everything in their heads at once. Flipcharts or sugar paper are great for this.



Include **language** which is relevant to current teaching. This should include the use of stem sentences too.

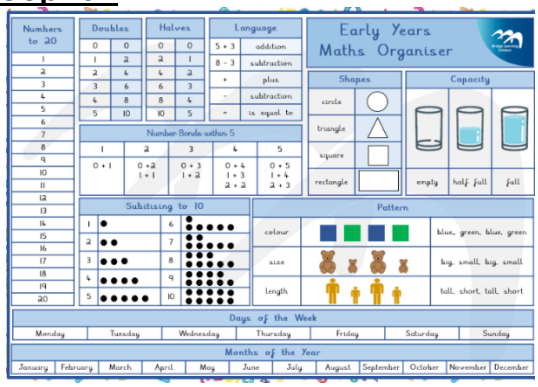
Maths working walls should be used interactively during lessons. Pointing out useful information and prompts, demonstrating how we might use the wall ourselves by reviewing vocabulary and modelled examples will support the pupils to use it as an aid.

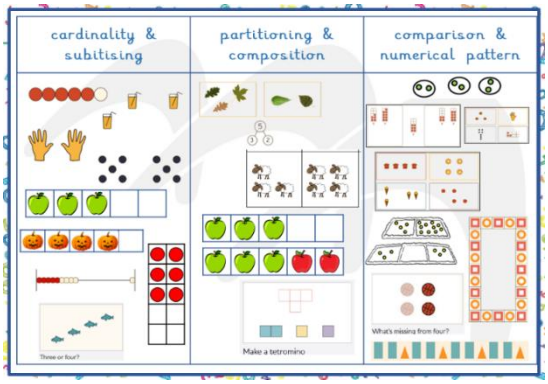
Knowledge Organisers

A knowledge organiser (KO) is a tool designed to clarify information, summarise and streamline the key facts of a particular subject, and encourage learners to retain this knowledge beyond the classroom. The purpose of a KO is to "organise all the most vital, useful and powerful knowledge on a single page", thereby providing both clarity for teachers and an effective memory aid for learners. Streamlining and sequencing the information in this way is not only designed to help learners revise, but also to maximise their ability to retain this knowledge on a long-term basis.

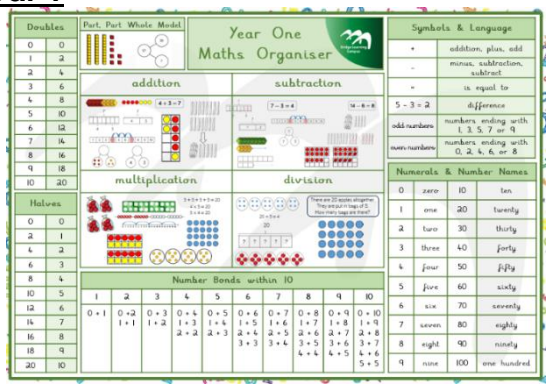
Knowledge Organisers at BLC

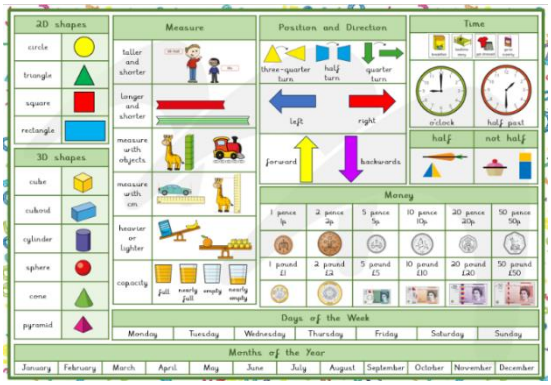
Reception



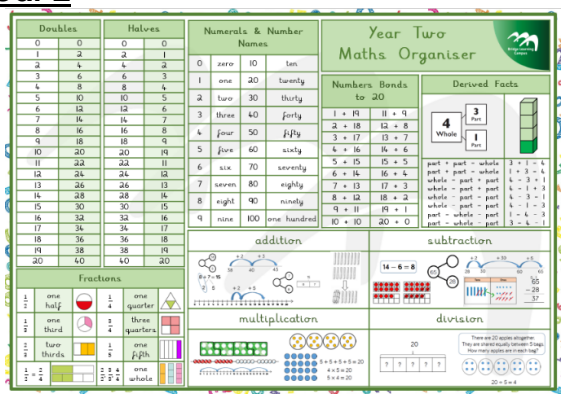


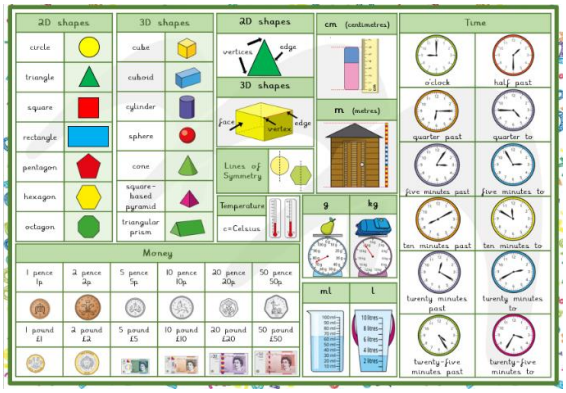
Year 1



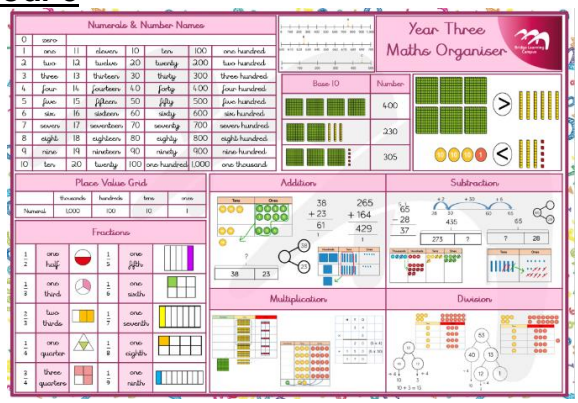


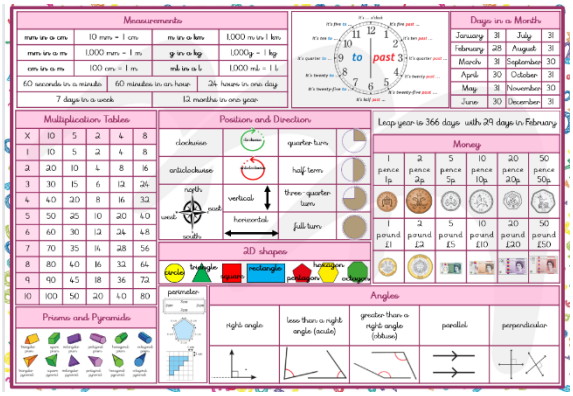
Year 2



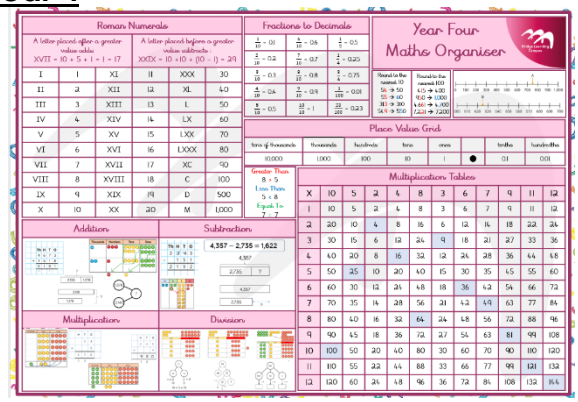


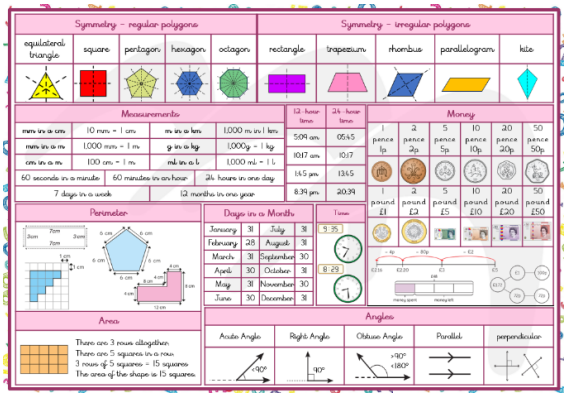
Year 3



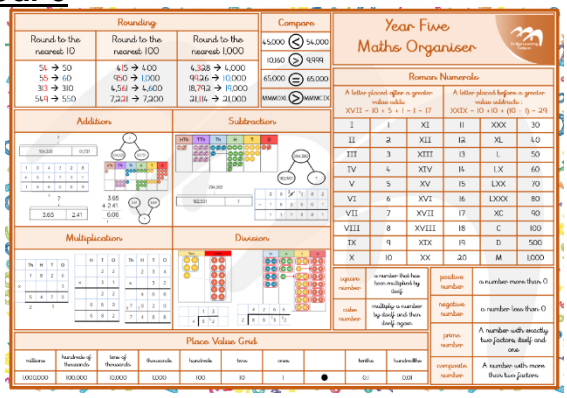


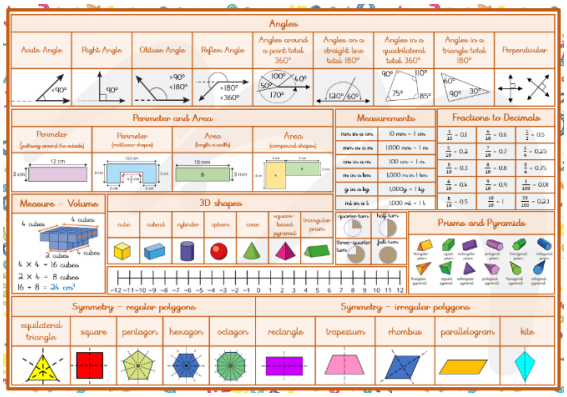
Year 4



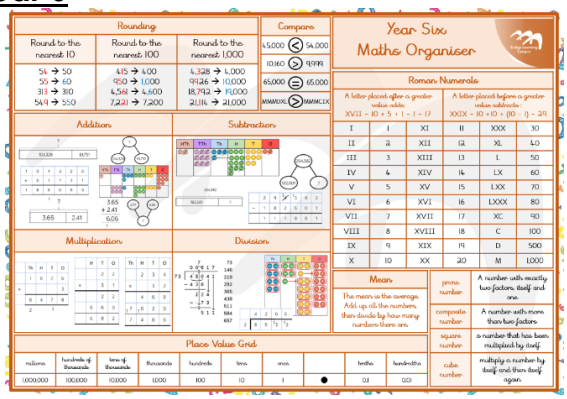


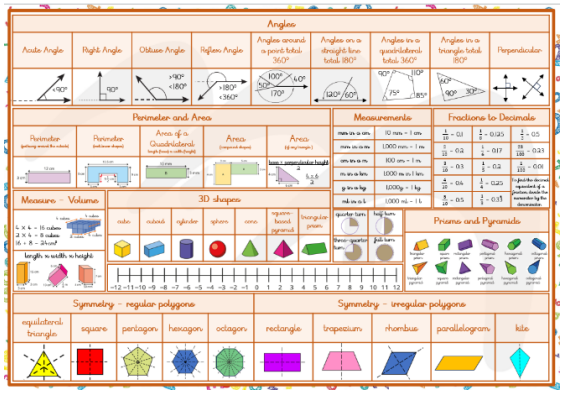
Year 5





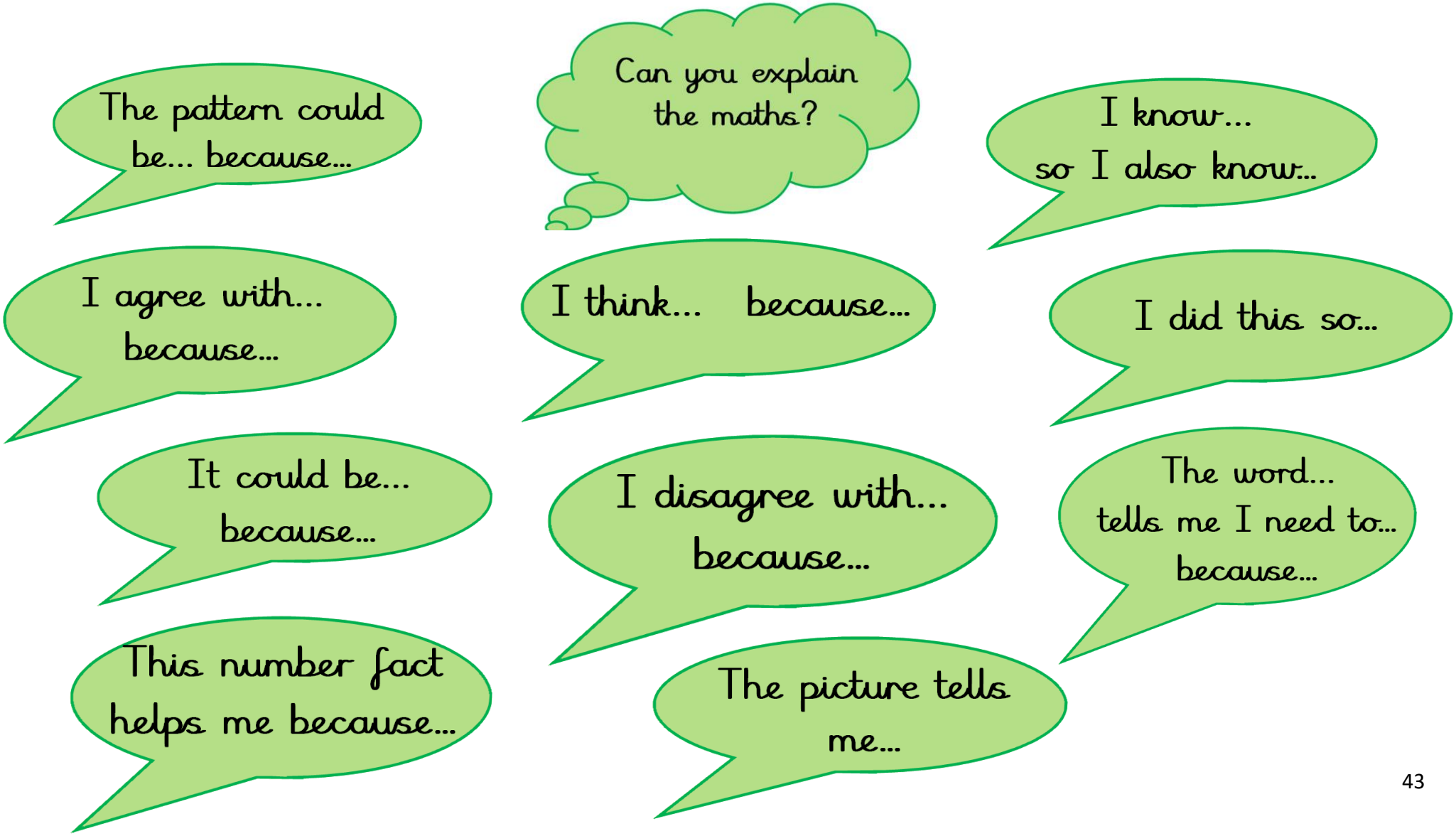
Year 6





Vocabulary & Sentence stems

Sentence stems are displayed in all classrooms. Although there are specific sentences stems for each year group (see following pages), the sentence stems below are more generic and can be used for most mathematical work.



Vocabulary & STEM Sentences - Year 1 Mathematician

Number and Place Value	Number Facts	Addition and Subtraction	Multiplication and Division	Fractions	Geometry
One part is _____. The other part is____. The whole is _____.	One more than _____ is _____.	_____ add _____ is equal to _____.	____ groups of ___ are equal to _____.	Half of ___ is equal to _____.	A circle has one curved side.
____is the whole. ____is the part and ____ is a part.	One less than _____ is _____.	_____ subtract ____ is equal to _____.	____ shared equally into groups of ____ makes _____ groups.	When I halve a number, it makes two equal parts.	A square has 4 straight sides and 4 vertices.
The parts are _____ and _____. The whole is _____.	The number pattern is increasing by_____.	When we subtract, we start with the whole.	I shared _____ into ____ equal groups. There are _____ in each group.	There are _____ equal parts. _____ are shared. This is equal to _____.	A triangle has 3 straight sides and 3 vertices.
___ is equal to ____.	The number pattern is decreasing by_____.	The whole is ____ and the parts are ___ and _____.	The pattern is increasing by _____.		A ____ has ____ sides and _____ vertices.
I can partition ____ into ____ and ____.	_____ plus_____ is greater than_____ because_____.	To find the unknown part/whole, I need to _____.	The pattern is decreasing by _____	Measurement	
This represents _____because ____.	If I know _____ then I know_____ because _____.	The difference between_____ and___ is _____.	There are _____ groups of ten. There are _____ groups of ones.	There are 7 days in a week.	
_____ is greater than _____.	I know _____ add ____ is equal to ____ so I know that ____ add ____ is also equal to_____.	_____ is greater than _____.	_____ groups of ten are equal to_____.	There are 12 months in a year.	There are 60 seconds in a minute.
_____is less than _____.	_____ and _____ are equal to_____.	____ and _____ have a difference of _____.	_____ groups of two are equal to _____.	There are 12 months in a year.	One pound is equal to one hundred pennies.
			There will be in ____ in each group.		

Vocabulary & STEM Sentences - Year 2 Mathematician

Number and Place Value	Number Facts	Addition and Subtraction	Multiplication and Division	Fractions	Geometry
One part is _____. The other part is____. The whole is _____.	The numbers are increasing/decreasing because_____.	_____ add _____ is equal to _____.	____ groups of ___ are equal to _____.	Half/a quarter/a third of ___ is equal to _____.	A ____ has ____ sides and _____ vertices.
There are ____ tens and _____ ones. There are _____ altogether.	If I know _____ then I know_____.	_____ subtract ____ is equal to _____.	____ shared equally into groups of ____ makes _____ groups.	When I halve/quarter/third a number, it makes ____ equal parts.	A ____ has ____faces and _____ sides and _____ vertices.
The digit _____ has a value of ____ tens/ones.	I know _____ so I also know _____.	The parts ____ are known. The whole is not known.	I shared _____ into ____ equal groups. There are _____ in each group. ___ divided by ___ is equal to _____.	There are _____ equal parts. _____ are shared. This is equal to _____.	This shape is a _____ because _____.
___ is equal to ____.	I can double _____ then add _____.	____ ones/tens add____ ones/tens is equal to_____.	_____ multiplied/divided by _____ is equal to _____.	One half is equal to two quarters.	A ____ has ____ sides and _____ vertices.
The number is written as _____. These words represent the number_____.	I can make ten by adding _____.	To find the unknown part/whole, I need to _____.	The pattern is decreasing by _____	Measurement	
This represents _____because ____.	Ten more/less than _____ is _____.	The difference between_____ and___ is _____.	There are _____ groups of ten. There are _____ groups of ones.	One pound is equal to one hundred pennies.	There are 7 days in a week.
_____ is greater than _____.	I know _____ add ____ is equal to ____ so I know that ____ add ____ is also equal to_____.	When we subtract, we start with the whole.	Numbers in the _____ multiplication table of _____ always _____.	There are 100 centimeters in one metre.	There are 60 seconds in a minute.
_____is less than _____.	_____ and _____ are equal to_____.	____ and _____ have a difference of _____.	This array represents _____ groups of _____. This is equal to _____.	There are 1000 milliletres in one litre.	The time is ____ past/to_____.
_____is equal to _____.		I can partition		There are a 1000 grams in a kilogram.	There are 24 hours in a day.

Vocabulary & STEM Sentences - Year 3 Mathematician

Number and Place Value	Number Facts	Addition and Subtraction	Multiplication and Division	Fractions	Geometry
One part is _____. The other part is____. The whole is _____.	____ times_____ is equal to _____.	The calculation tells me that I need to add/subtract the numbers.	To find ten times as many, multiply by ten.	If ____ is the whole, then _____ is part of the whole.	Quadrilaterals are shapes that have four sides.
The digit _____ has a value of ____ hundreds/tens/ones.	To compare three-digit numbers, we need to compare the hundreds digits.	If the column total is equal to ten or more, we must regroup.	_____ is a multiple of ____ because_____.	The whole has been divided into _____ equal parts. _____ of the parts have been shaded.	A _____ is a shape with ____ equal sides and _____ equal angles.
There are ten hundreds on one thousand.	I know _____ then I also know _____.	I will regroup one hundred for ten tens.	_____ multiplied/divided by _____ is equal to _____.	The denominator is _____ because the whole is divided into _____ equal parts.	If two lines never meet this is called a parallel line.
I can partition ____ into____ hundreds ____ tens and ____ ones.	I can double _____ then add _____.	____ ones/tens/hundreds add____ ones/tens/hundreds is equal to_____.	Products in the ____ time table are also in the _____ times table.	When the numerator and denominator are the same, the fraction is equivalent to one whole.	A ____ has ____ sides and _____ vertices.
_____ is between _____ and _____	I can make ten by adding _____.	When we subtract, we start with the whole.	When we multiply, the parts are known but the whole is unknown.	Measurement	We measure angles in degrees.
The previous multiple of one hundred is _____. The next multiple of one hundred is _____.	We can exchange one ten/hundred for tens ones/tens.	____ and _____ have a difference of _____.	When we divide, the whole is known and the number or parts is known.	There are three hundred and sixty degrees in a full circle/complete turn.	A ___ has____ faces, ___ edges and ____ vertices.
_____ is greater than _____.	If the _____ digits are the same, we need to compare the _____ digit.	When we subtract, we start with the whole.	___ x____ is the same as ____ groups of ____.	____ pence is equal to ____ pound and ____ pence.	A right angles is ninety degrees, this is a quarter turn.
_____is less than/greater than _____.			This array represents _____ groups of _____.		The perimeter is the distance around the outside of the shape.

Vocabulary & STEM Sentences - Year 4 Mathematician

Number and Place Value	Number Facts	Addition and Subtraction	Multiplication and Division	Fractions	Geometry
One part is _____. The other part is____. The whole is _____.	____ times_____ is equal to _____.	The calculation tells me that I need to add/subtract the numbers.	When zero is a factor, the product is zero.	The line is divided into ____ equal parts. This allows us to count in_____.	The perimeter of a square is four times the length of one of the sides.
The digit _____ has a value of ____ thousands/ hundreds/tens/ones.	One tenth can be written as 0.1, so ____ tenths can be written as _____.	If the column total is equal to ten or more, we must regroup.	For every group of one twelve, there are two groups of six.	When a whole number is multiplied by a unit fraction, it makes the whole number smaller.	The find the area of a rectangle, multiply the length by the width.
There are ten hundreds in one thousand.	I know _____ then I also know _____.	I will regroup one hundred for ten tens.	All multiples of tens have a one digit of zero.	The denominator is _____ because the whole is divided into _____ equal parts.	The distance around the edge of the _____ is its perimeter.
I can partition ____ into____ hundreds ____ tens and ____ ones.	_____ is the previous whole number. _____ is the next whole number.	____ ones/tens/hundreds/tho usands add____ ones/tens/hundreds/tho usands is equal to_____.	Products in the ____ time table are also in the _____ times table.	When comparing fractions with the same denominator, the greater the numerator, the greater the fraction.	If two lines never meet this is called a parallel line.
_____ is between _____ and _____	One thousand more/less than ____ is_____.	When we subtract, we start with the whole.	The remainder is always less than the divisor.	Measurement	A _____ has _____sides and _____ vertices.
The previous multiple of one thousand is _____. The next multiple of one thousand is _____.	We can exchange one ten/hundred/thousand for tens ones/tens/thousand.	_____ tenths/hundredths plus _____ tenths/hundredths is equal to_____.	When we divide, the whole is known and the number or parts is known.	One centimetre is one hundredth of a metre, so we can write one centimetre as a zero-point-zero-one.	A ___ has____ faces, ___ edges and ____ vertices.
The whole is divided into one hundred equal parts; ____ parts is _____ hundredths.	If the hundreds digit is four or less we round down. If the hundreds digit is five or more we round up.	_____ tenths/hundredths minus_____ tenths/hundredths is equal to_____.		Ten centimetres is one tenth of a metre so we can write ten centimetres as a zero point one.	Ten groups of ten pence is equal to one pound, so ten pence is one tenth of a pound. One hundred groups of one penny equal to one pound, so one penny is one hundredth of a pound. Ten groups of one penny is equal to ten pence, so one penny is one tenth of ten pence.

Vocabulary & STEM Sentences - Year 5 Mathematician

Number and Place Value	Number Facts	Addition and Subtraction	Multiplication and Division	Fractions	Geometry	Measure
I can estimate the answer to be _____ because ____. Decimals are part of a whole number. _____ is more than _____ because negative numbers get lower as they get bigger. 0.0 ____ is ____ thousandths. Thousandths are a tiny part because they are a thousand of one. The next whole number is _____. Ten one thousands make ten thousand. One hundred hundreds make ten thousand. One hundred hundreds make ten thousand. Negative numbers are below/less than zero. Positive numbers are above/greater than zero.	_____ is greater/less than ____ because I know_____ is than _____ _____ is getting 10/100/1000 times smaller/larger. _____ rounded to the nearest whole number is _____ The midpoint of ____ and _____ is _____, so the midpoint of ____ thousand and _____ thousand is _____ thousand. The value of the expressions on each side of an equal symbol must be the same. _____times____ ones is equal to_____ ones, so _____ times _____ hundredths is equal to _____ hundredths.	The most efficient way to add these numbers is by _____ because _____ _____ tens plus the _____ we already have, gives us _____ To subtract _____ from _____ I can partition _____ into _____ The calculation tells me I need to add/subtract the numbers. If the column total is equal to ten or more we must regroup. Whole minus/subtract a part is equal to the difference. I will regroup one hundred for ten ones. _____ thousandths plus _____ thousandths is equal to _____ _____ Thousandths minus _____ thousands is equal to _____.	_____ is not in simplest form, because _____ is a common factor of _____ _____is a factor/multiple of _____ because ____x_____ =_____ Numbers that more than two factors are composite numbers, Numbers that only have two factors are called prime numbers. _____ is not prime because it has the factors _____ _____ is prime because it only has two factors; 1 and itself. If I multiply ____ by two, I must divide ____ by two for the product to stay the same.	The denominator tells is its split _____ parts. The numerator tells us how many parts we have. There are ____ halves in four/six/eight/ten ____ _____ is a whole number and a fraction, which is _____ as an improper fraction _____ The parts are _____ and _____. The total or whole is _____. When comparing fractions with the same denominator, you add the numerators. _____ and _____ are related fractions because the denominator _____ is a multiple of the other denominator_____. If the numerators are the same, the bigger the denominator, the smaller the fraction.	When we move a shape sideways, up or down, we call it translation. The x/y co-ordinate has changed to ____ because it has moved _____ Perpendicular lines meets at a right angle. This polygon is a _____ because it has _____ corners and _____ straight sides. It is/is not a polygon because_____. It is/is not a regular shape because_____ If one angle is _____ the other angles will be _____ I know that angles in a triangle always add up to 180 so the missing angle is _____	I know ____ ml is equivalent to _____L because there are 1000ml in 1L. ____ m is ____km because there are 1000m in 1km. There are ____ centimetres in ____ meters. There are _____ grams in _____ kilograms There are _____millilitres in _____ litres. The amount of space that _____ takes up is its volume. The _____ has a larger volume than the _____ because it occupies more space. The volume of a cuboid can be found by multiplying the length by the width by the height.

Vocabulary & STEM Sentences - Year 6 Mathematician

Number and Place Value	Number Facts	Addition and Subtraction	Multiplication and Division	Fractions	Geometry	Measure
I know that _____ is larger/smaller/equal to ____ because_____. _____ tenths have the same value as _____ hundredths. I need ____ 0.1's to exchange for a whole one. I know that _____ is bigger than _____ because_____. I estimate that the answer will be larger than ____ because_____. We can partition this number into _____, _____ and _____. I know that ___ (decimal) is more/less/equal to_____ (fraction) because_____. One million is on thousand thousandths. The _____ represents_____. The value of _____ is _____.	There are _____ tenths/hundredths/ Thousandths in this number. The value of the digit _____ each time it moves to the left/right. To find 50% if a number, halve it. To find 10% of a number, divide it by 10. To find 1% of a number, divide it by one hundred. ____ is between ____ and _____. The previous multiple of one million is _____ The next multiple of one million is _____ _____ is _____ when rounded to the nearest million. I can convert tenths to hundredths by multiplying the denominator by _____.	When there are no brackets, division is completed before addition and subtraction. The mean is the size of each part when a quantity is shared equally. The mean is the total of the numbers divided by how many numbers there are. The most efficient way to add these numbers is by ____ because _____ The calculation tells me I need to add/subtract numbers. If the column total is equal to ten or more, we must regroup. _____ million plus _____ million is equal to _____. _____ million minus _____ million is equal to _____.	If ____% of my number is ____, then I need to multiply it by ___ to find the full amount. When a number is multiplied by _____ the digits move ____ places to the _____ I know that 3 ones divided by 3 is _____ ones. I know that if I divide ____ by _____ there will be ____ whole ones ad ____ left over. When a number is multiplied by one thousand, the digits move three places to the left. When a number is divided by one thousand, the digits move three places to the left. If one factor is made ten times the size, the product will be ten times the size. If I double/halve one factor, I must double/halve the product. If I multiply/divide one factor by _____, I must multiply the product by____.	I know that ____ fifths are equivalent to _____% because I know _____ In order to convert a percentage to a fraction, I must first convert it to a fraction with a denominator of _____ When a whole is divided into a hundred equal parts, each part is one hundredth of the whole. When a number is divided by _____ the digits move ____ places to the _____. When multiplying unit fractions, multiply the denominators. To multiply fractions, we can multiply the numerators and multiply the denominators. _____ is equivalent to _____ I can convert a fraction to a decimal by _____ In order to convert a percentage to a fraction first convert it to a fraction with a denominator of 100	A _____ is a parallelogram because _____ A parallelogram is a quadrilateral with opposite sides that are parallel and equal in length. If the scale factor is greater than one, the shape is made larger. We can say the shape is enlarged. If the scale factor is equal to one, the shape is the same size. If the scale factor is less than one, the shape is made smaller. We can say the shape is reduced. When we move a shape sideways, up or down, we call it translation. I know that angles in triangle always add up to 180 so the missing angle is _____	To find the area of a rectangle, multiply the length by the width. To find the area of a parallelogram multiply the base by the perpendicular height To find the area if a triangle, multiply the base by the perpendicular height and then divide by two. The length of one of the sides of the squares is_____. _____ times the length of one of the sides gives us the perimeter. The ratio of the dimensions of shape _____ to the dimensions of shape _____ is equal to _____ to _____. There are ____ centimetres in _____ meters. There are ____ grams in _____ kilograms. There are _____ millilitres in ____ Litres. The volume of a cuboid can be found by multiplying the length by the width of the height.

Times Tables – Systematic Approach

At Bridge Learning Campus, we are passionate about delivering high quality, effective and challenging teaching. We want our children to **LOVE** maths and **SUCCEED** within the maths curriculum. Therefore we felt it important to introduce a way to teach times tables that would give children the freedom and fluency in maths without being a burden to learn.

Progression of Times Tables

Order of skip counting before learning times tables facts.

Year 1	2	5	10								
Year 2	2	5	10	3							
Year 3	2	5	10	3	6	4	8				
Year 4	2	5	10	3	6	4	8	7	9	11	12

Order of times table facts taught

Year 2	Year 3	Year 3	Year 3	Year 4	Year 4	Year 4	Year 4	Year 4	Year 4	Year 4
X2	X3	X4	X5	X6	X7	X8	X9	X10	X 11	X 12
2X2									2x11	2x12
3X2	3X3								3x11	3x12
4X2	4X3	4X4							4x11	4x12
5X2	5X3	5X4	5X5						5x11	5x12
6X2	6X3	6X4	6X5	6X6					6x11	6x12
7X2	7X3	7X4	7X5	7X6	7X7				7x11	7x12
8X2	8X3	8X4	8X5	8X6	8X7	8X8			8x11	8x12
9X2	9X3	9X4	9X5	9X6	9X7	9X8	9X9		9x11	9x12
								10x10		
								11x10	11x11	
								12x10	12x11	12X12
8 facts	7 facts	6 facts	5 facts	4 facts	3 facts	2 facts	1 fact	3 facts	10 facts	9 facts

Timeline for Learning

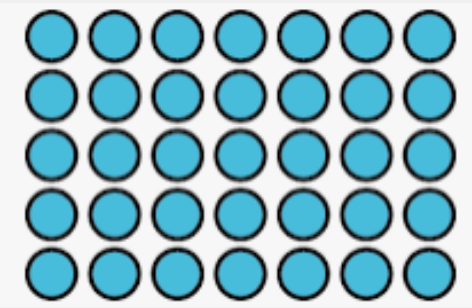
By the end of Key stage 1, children should have an understanding of multiplication as repeated addition.

e.g. 7 x 5 = 35

7 groups of 5 = 35

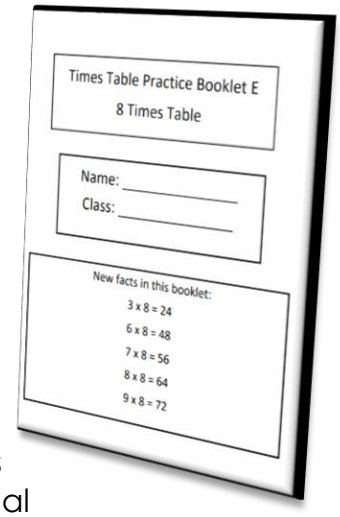
5 + 5 + 5 + 5 + 5 + 5 + 5 = 35

7 fives are 35



- Year 2 Summer Term – maths challenge is introduced
  Children become fluent in x2 (learn 8 facts)
- Year 3 – revise Year 2 content
  Children become fluent in x3, x4, x5 (learn 18 facts)
- Year 4 – Revise Year 3 content
  Children become fluent in x6, x7, x8, x9 (learn 10 facts)
  x10, x11, x12 (Learn 21 facts)

Maths Challenge



- For every new times table taught, each child will have a booklet which has the new facts being learnt on the front.
- The new facts will be displayed in the classroom.
- The children will have 2 minutes to complete 40 questions daily. Results may be low at first but they will make small improvements daily.
- The children will be encouraged to use the displayed facts to answer the questions. The children will begin to memorise the new facts learnt.
- Although questions will be varied and have division and mixed times tables, the marking is crucial as it is a teaching and learning point. Referring to the sound bite (see below), regardless of the question type, the marking will be consistent with the original sound bite learnt.

e.g.

6 X 5 = ___ six fives are 30, then children repeat six fives are 30

6 X 6 = ___ six sixes are 36, then children repeat six sixes are 36

18 ÷ 3 = ___ _____ threes are 18, then children repeat 6 threes are 18

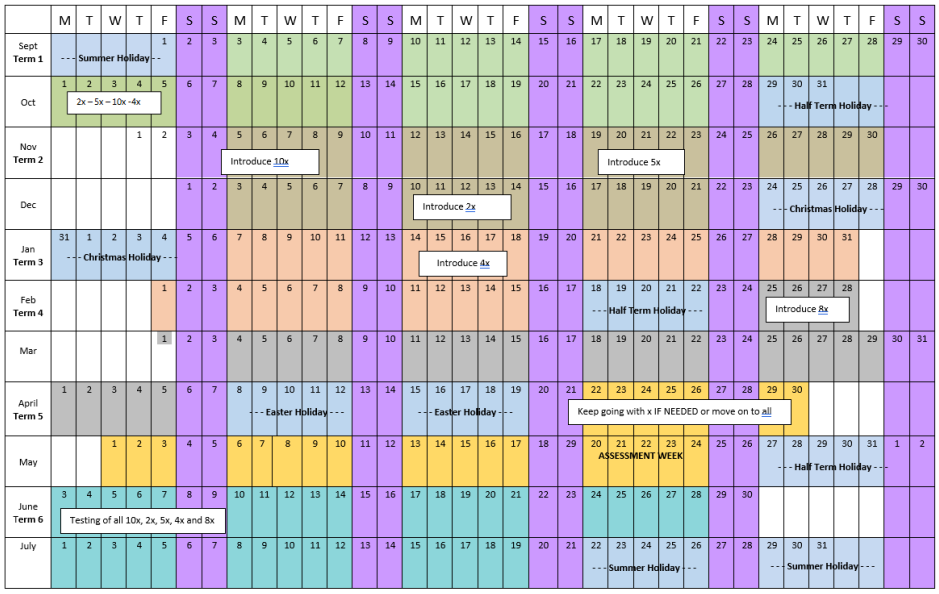
4 X 6 = ___ six fours are 24, then children repeat six fours are 24

6 X 2 = ___ six twos 12, then children repeat six two are 12

In Year 3, the children will begin the booklets in term 2.

They will learn times table facts in the following order:

- 10 times table
- 5 times table
- 2 times table
- 4 times table
- 8 times table



In Year 4, the children begin the year by revising the times tables they learned in Year 3.

At the end of term 1, children will start learning new times tables. These will be introduced as follows:

- 3 times table
- 6 times table
- 9 times table
- 7 times table
- 11 times table
- 12 times table

The children in Year 5 and Year 6 will complete a times table assessment at the end of each short term. This will enable them to be grouped according to their times table knowledge. The children who need to revisit a times table will work in a small with a member of staff.

When children are secure with all multiplication facts to 12 x 12, they will move on to the '99 Club'.

The 99 Club is a mental-oral starter which aims to raise standards in maths through encouraging pupils to improve their mental calculations when attempting quick-fire multiplication and division problems.

The idea is that with repeated practice, the scheme should result in increased speed and confidence when tackling mental maths problems, without relying on written workings and methods.

If all of the calculations are answered correctly three times, the child moves up to the next level!
The children will complete the following club sheets:

Bronze Club

Name: Date:

1	11 ÷ 11 =		35	3 × 2 =		68	24 ÷ 3 =	
2	8 x 12 =		36	9 × 2 =		69	6 ÷ 3 =	
3	63 ÷ 9 =		37	55 ÷ 5 =		70	7 x 4 =	
4	3 x 6 =		38	2 x 7 =		71	2 x 1 =	
5	8 ÷ 2 =		39	9 x 8 =		72	5 x 9 =	
6	2 x 5 =		40	7 x 6 =		73	24 ÷ 2 =	
7	7 x 8 =		41	22 ÷ 2 =		74	9 x 11 =	
8	72 ÷ 9 =		42	5 x 10 =		75	4 x 2 =	
9	10 x 8 =		43	7 x 2 =		76	3 x 4 =	
10	4 x 4 =		44	3 x 12 =		77	4 x 7 =	
11	15 + 3 =		45	6 x 3 =		78	10 x 1 =	
12	10 x 6 =		46	88 ÷ 8 =		79	2 ÷ 2 =	
13	77 ÷ 7 =		47	16 ÷ 8 =		80	2 x 9 =	
14	2 x 10 =		48	7 x 11 =		81	14 ÷ 7 =	
15	5 x 5 =		49	10 x 11 =		82	4 x 5 =	
16	6 ÷ 2 =		50	5 x 6 =		83	8 x 1 =	
17	80 ÷ 8 =		51	12 ÷ 4 =		84	15 ÷ 5 =	
18	32 ÷ 4 =		52	7 x 10 =		85	24 ÷ 4 =	
19	88 ÷ 11 =		53	3 x 10 =		86	55 ÷ 11 =	
20	30 ÷ 3 =		54	27 ÷ 3 =		87	3 x 3 =	
21	5 x 12 =		55	8 x 7 =		88	9 x 6 =	
22	10 x 5 =		56	99 ÷ 9 =		89	12 ÷ 12 =	
23	42 ÷ 6 =		57	66 ÷ 6 =		90	48 ÷ 6 =	
24	2 x 3 =		58	72 ÷ 12 =		91	3 x 7 =	
25	120 ÷ 12 =		59	110 ÷ 11 =		92	8 x 2 =	
26	4 x 1 =		60	6 x 10 =		93	30 ÷ 6 =	
27	132 ÷ 12 =		61	90 ÷ 5 =		94	54 ÷ 6 =	
28	6 x 4 =		62	7 x 1 =		95	144 ÷ 12 =	
29	4 x 12 =		63	10 x 12 =		96	40 ÷ 8 =	
30	84 ÷ 7 =		64	96 ÷ 8 =		97	35 ÷ 7 =	
31	9 x 4 =		65	10 x 3 =		98	45 ÷ 9 =	
32	72 ÷ 8 =		66	77 ÷ 11 =		99	84 ÷ 12 =	
33	8 x 10 =		67	54 ÷ 9 =		100	18 ÷ 9 =	
34	4 x 10 =							

Silver

Name: Date:

1	56 ÷ 8		34	96 ÷ 12		67	20 ÷ 4	
2	7 x 5		35	6 x 7		68	32 ÷ 48	
3	20 ÷ 2		36	5 x 4		69	18 ÷ 6	
4	36 ÷ 6		37	108 ÷ 12		70	75 - 39	
5	50 ÷ 5		38	34 ÷ 72		71	9 x 3	
6	64 - 39		39	61 - 32		72	24 ÷ 12	
7	61 + 99		40	8 x 4		73	6 x 11	
8	2 x 4		41	73 - 54		74	21 ÷ 7	
9	34 + 92		42	121 ÷ 11		75	6 x 6	
10	7 x 9		43	10 ÷ 2		76	9 x 12	
11	63 + 78		44	53 + 89		77	81 ÷ 9	
12	5 x 8		45	36 ÷ 9		78	9 x 9	
13	12 ÷ 6		46	33 ÷ 11		79	70 - 21	
14	14 ÷ 2		47	33 ÷ 11		80	99 ÷ 11	
15	4 x 6		48	60 ÷ 5		81	5 x 11	
16	24 ÷ 6		49	8 x 5		82	7 x 3	
17	91 + 24		50	5 x 3		83	6 x 8	
18	6 x 12		51	40 ÷ 4		84	21 ÷ 3	
19	132 ÷ 11		52	10 x 10		85	3 x 1	
20	4 x 8		53	2 x 6		86	6 x 2	
21	7 x 12		54	73 - 44		87	16 ÷ 4	
22	10 x 4		55	70 ÷ 7		88	48 ÷ 12	
23	40 ÷ 5		56	8 x 11		89	6 x 5	
24	45 ÷ 5		57	16 ÷ 2		90	3 x 9	
25	4 x 9		58	8 x 3		91	8 x 8	
26	9 x 5		59	74 + 46		92	44 ÷ 11	
27	3 x 5		60	25 ÷ 5		93	35 ÷ 5	
28	77 - 43		61	99 + 72		94	10 x 9	
29	6 x 9		62	2 x 3		95	48 ÷ 8	
30	6 x 1		63	12 ÷ 3		96	36 ÷ 12	
31	28 ÷ 4		64	5 x 7		97	85 + 42	
32	90 ÷ 9		65	10 x 2		98	8 x 6	
33	8 x 9		66	64 ÷ 8		99	60 ÷ 6	
						100	101 - 45	

Gold Club

Name: Date:

√400		15÷2		16 x 3	
7 x 8		50 x 17		10 x 18	
30 x 2		560 ÷ 7		9 x 1.5	
16 x ½		256÷80		10% of 11	
6 x 7		14(5)		13 x 12	
48÷16		28 x 0.25		135 ÷9	
256÷4		48 x 2		1280÷2	
¼ of 80		0.25 x 28		10^2	
5 x 2.2		560÷8		1.5 x 9	
20 x 3		2560÷80		½ x 16	
64 x 0.5		10^2		√25	
20^2		156÷13		1^3	
256÷8		9 x 1.5		2 x 48	
17 x 5		√100		2.2 x 5	
6 x 19		128÷64		7^2+15	
0.5 x 200		1^2		5 x 170	
½ of 200		0.5 x 17		2300÷1000	
95÷5		12 x 13		(6x2)÷8	
600÷2		28 x 0.5		280÷100	
128÷2		0.6 x 100		3 x 16	
¼ of 80		2^4+3^2		34 x 20	
2 x 30		½ of 80		50% of 200	
19 x 6		3 x 20		5(14)	
8 x 8		11 x 11		6+8x2	
300 x 11		68 x 5		210÷70	
660 ÷ 33		6^2 + 2^2		699 x 1	
20% of 72		1000÷100		54 x 3	
(7+2)x8		0.5x6		5 x 63	
660 ÷ 20		315÷63		100 x 10	
10% of 72		1000 ÷10		333÷1	
√81		0^3		2^3+6^2	
315÷5		333 ÷ 10		333÷10	
3 x 54		5^3 + 6^2		33 x 20	
4^2+5^2		20 x 33		699+1	
5^3		10 x 100		√36	
4^3		11 x 300		√64	

Platinum Club

Name: Date:

√625		25 ÷ 2		⅛ x 24	
8 x 13		¾ + ½		23 ÷ 100	
47 x 2		840 ÷ 7		12 x 1.5	
34 x ½		25% of 560		10% of 111	
[9 x 8] ÷ 16		19(5)		15 x 12	
76 ÷ 19		32 x 0.25		162 ÷ 9	
½ + ¼		20^2		7680 ÷ 2	
¾ of 48		√3600		LXVIII x II	
7 x 3.3		640 ÷ 8		2.5 x 9	
39 x 3		2¼ + 3¾		⅛ of 64	
76 x 0.5		XXVII - XIV		¾ x ¼	
90^2		168 ÷ 14		[96 ÷ 2] + 19	
512 ÷ 80		40% of 80		2 x 69	
27 x 5		- 7 + 12		2.2 x 6	
10% of 390		288 + 96		9^2 + 18	
0.5 x 350		0.5^2		5 x 190	
½ of 2.500		0.25 x 17		27 ÷ 1000	
95 ÷ 5		12 x 14		[8 x 3] + 9	
650 ÷ 2		32 x 0.5		0.27 ÷ 100	
- 1 + 3		0.6 x 300		3 x 27	
¼ of 96		4^2 + 3^2		48 x 20	
3 x 33		½ of 85		25% of 500	
1½ + 2¾		[redacted]		7[17]	
VIII x VII		XVII x II		35% of 50	
500 x 11		73 x 5		560 ÷ 70	
880 ÷ 22		11^2 + 2^2		978.235 x 1	
20% of 82		3000 ÷ 100		5.6 x 3	
[9 + 7] x 4		0.5 x 9		[redacted]	
¼ of 120		249 + 83		2.612 x 10	
10% of 91		100.000 ÷ 10		63.251 ÷ 1	
√121		0^4		2^3 + 5^2	
415 ÷ 5		555 x 10		652 ÷ 100	
[redacted]		5^2 + 12^2		45 x 20	
6^2 + 4^2		20 x 44		15% + 7½	
75% of 360		10 x 0.01		MC + MCLX	
9^3		1.1 x 300		√225	
VII + XIX		√169		- 36 + 45	
¼ of 120		1280 ÷ 80		5^2 + 3^3	
- 16 + 7		⅛ + ⅝		6n + 17 = 59	
[28 ÷ 4] x 9		5n + 7 = 67		√1.000.000	

Diamond Club

Name: Date:

1	161 - 19		34	80 – 23		67	√144	
2	50 x 9		35	440 ÷ 11		68	2 x 80	
3	6^3		36	2 x 8		69	7 x 80	
4	√196		37	60 x 40		70	155 ÷ (8 x 8)	
5	7^2		38	√400		71	70 x 500	
6	60 x 7		39	143 + 28		72	41 + 79	
7	360 ÷ 9		40	900 x 600		73	121 ÷ 11	
8	15 x 3		41	61 x 4		74	108 ÷ 9	
9	√1600		42	3^3 (4 x 5)		75	150 – 34	
10	2000 – 498		43	0.6 x 100		76	30 x 9	
11	91 x 100		44	Internal angles of a trapezium		77	$\frac{1}{2} \times \frac{1}{2}$	
12	12 x 8		45	109 – 64		78	423 ÷ 3	
13	75 ÷ (12 x 4)		46	24 x 51		79	13 x 1.7	
14	8475 ÷ 5		47	837 + 292		80	$\frac{3}{5} \div 4$	
15	$4\frac{1}{4} \times 2\frac{2}{5}$		48	6 x 4 + 1		81	Simplify 4a + 8c + 5a – 3c	
16	Simplify $\frac{a+a+a+a}{a}$		49	$\frac{3}{4} \div \frac{1}{12}$		82	442 + 1480	
17	$\frac{3}{5} - \frac{2}{5}$		50	82 – 59		83	45 + 29	
18	0.17 as a %		51	$\frac{3}{8}$ as a decimal		84	5 – 7	
19	9 + (-2)		52	8 – (-3)		85	95% of £30	
20	Simplify 3w + 2w + w		53	$1\frac{1}{4} \times \frac{2}{5}$		86	Y + 4 = 13, So, y =	
21	2w – 1 = 11 W =		54	$\frac{3}{4} \times \frac{2}{9}$		87	125 – 13	
22	21 + 44 + 18		55	Simplify 8 + 2w + 4w		88	64 + 285	
23	9 x 65		56	135 ÷ 5		89	36 x 4	
24	1.9 x 0.12		57	12 % of %500		90	841 – 318	
25	144 ÷ 8		58	-10 -2		91	81 x 6	
26	1725 ÷ 5		59	9823 – 834		92	$4\frac{3}{4} - 2\frac{2}{5}$	
27	34 + 92		60	Round 8.19 to 1dp		93	83 – 54	
28	$2\frac{2}{3} - 1\frac{1}{9}$		61	3 – 5		94	Simplify w + 2 + 4w + 10	
29	$\frac{3}{5}$ of 35		62	3 + 2 x 7		95	Decrease 60 by 5%	
30	72 ÷ 38		63	$\frac{1}{2}$ of 21		96	638 – 193	
31	58 x 3		64	155 + 418		97	20 ÷ 4 = 6 x ___	
32	20% of 70		65	If X = 10, 3x = ___		98	$\frac{3}{4} - \frac{8}{12}$	
33	125.6 x 10		66	20% of £35		99	11 + 1.1 + 0.11	

Sapphire Club

Name: Date:

1	___ -7 = -6		34	$\frac{12}{25}$ as a %		67	$\frac{6}{7} - \frac{3}{7}$	
2	$\frac{3}{4} - \frac{1}{4}$		35	$\frac{2}{3} \times 7$		68	9.3 x 100	
3	Simplify 4x + 3y – 2x + 5y		36	HCF of 24 and 36		69	10% of ___ = 4	
4	HCF of 30 and 18		37	$\frac{3}{4} - \frac{2}{5}$		70	6^3	
5	15 + 3 x 2		38	$\frac{2}{3} \times \frac{9}{10}$		71	3.4 ÷ 4	
6	$\sqrt{100}$		39	50% of ___ = 30		72	6x = 30	
7	$\frac{2}{7} \times \frac{1}{2}$		40	round 329.54 to nearest 10		73	$\frac{11}{4}$ as a mixed number	
8	8w = 48		41	3^3		74	0.447 ÷ 3	
9	round 7.873 to 2 dp		42	$\frac{7}{8} - \frac{1}{8}$		75	10% of £30	
10	$5^2 + 2^3$		43	$\frac{4}{7} \div \frac{2}{3}$		76	$\frac{4}{10} - \frac{1}{5}$	
11	12^1		44	26 x 142		77	10^1	
12	4 x 1.3		45	simplify 8m - 2m		78	5 x 10^2	
13	3 x (2 + 4)		46	0.8 x 1.2		79	increase £60 by 30%	
14	5.18 ÷ 7		47	5 x 7w		80	mean of 5 + 8 + 4 + 7	
15	$\sqrt{49}$		48	20% of 30		81	$\frac{2}{3} - \frac{2}{5}$	
16	$\frac{1}{7} + \frac{3}{8}$		49	0.4 as a fraction		82	65% of 80	
17	$\frac{3}{5} \times 27$		50	$\frac{1}{2} \times \frac{2}{5}$		83	0.3 x 0.2	
18	$\frac{5}{8}$ as a decimal		51	40% of 70		84	simplify 2a + 3a + a	
19	7.2 ÷ 5		52	round 6.434 to 1 dp		85	14% as a decimal	
20	$\frac{5}{6} - \frac{1}{2}$		53	$\frac{2}{3} \times \frac{12}{16}$		86	$\frac{2}{3} \div \frac{2}{5}$	
21	$\frac{4}{5} + \frac{1}{2} =$		54	___ ÷ 10 = 0.05		87	3y ÷ 4 = 22	
22	0.438 ÷ 3		55	5.18 ÷ 7		88	20% of 30	
23	$\frac{2}{5} + \frac{3}{12}$		56	42 x 32		89	$\frac{5}{7}$ of 168	
24	-7 x 2		57	53 ÷ 100		90	___ x 1,000 = 400	
25	which is larger? $\frac{5}{7}$ or $\frac{12}{20}$		58	write $1\frac{1}{2}$ as an improper fraction		91	mean of 5 + 9 + 3 + 5	
26	$\frac{2}{11} + \frac{1}{2}$		59	21 ÷ -7		92	$\frac{1}{4}$ of 700	
27	5^1		60	0.9 x 1.4		93	$3^3 - 4^2$	
28	simplify $\frac{36}{42}$		61	increase £6 by 5%		94	3% of £600	
29	12 ÷ 0.3		62	-2 x 6		95	simplify 6b - 4b	
30	$\frac{7}{10} - \frac{2}{5}$		63	round 8.271 to 1 dp		96	6 x 4	
31	Round 7.269 to the nearest whole number		64	$\frac{6}{7} \times \frac{1}{2}$		97	decrease £60 by 20%	
32	61% as a fraction		65	0.42 as a %		98	25% of ___ = 10	
33	$\frac{5}{6} - \frac{1}{2}$		66	47 x 23		99	simplify $\frac{25}{5}$	

Numbots & TTRockstars

All children from Reception have access to Numbots. NumBots is all about every child achieving the "triple win" of understanding, recall and fluency in mental addition and subtraction, so that they move from counting to calculating. Check out the 'Custom Shack'! This is where children can spend their in-game earnings to create their very own robot avatars.

With a huge selection of characters to choose between - from pirates to angels, dragonflies to ninjas - every child will be motivated to construct their dream robot. They can even mix up the parts to build their very own creations! Children can save their fabulous designs in their Scrapbook and even print them out.

New characters are added regularly to the Custom Shack. This encourages children to continue playing to earn coins, so that they can upgrade to the latest characters!

Times Tables Rock Stars (TTRS) is a maths programme that takes all the worry out of learning times tables and has a proven track record of boosting children's fluency and recall in multiplication and division.

TTRS boosts maths confidence and increases fluency and recall in multiplication and division, delivering better maths outcomes. It adapts to each user's unique learning needs and allows us to track their individual progress.

Children love earning virtual coins to personalise their rock avatars and move up the rock leaderboard from "New Artist" to "Rock Hero"!

During weekly assembly, children are awarded a new TTRS badge when they increase their studio speed and move to a new Rock Status from Grarage Rocker to Rock Hero.

Rock Status' are as follows:

- **Rock Hero** - 1 second per question or less (60+ correct answers a minute)
- **Rock Legend** - 2 seconds per question or less (30+ correct answers a minute)
- **Rock Star** - 3 seconds per question or less (20+ correct answers a minute)
- **Headliner** - 4 seconds per question or less (15+ correct answers a minute)
- **Support Act** - 5 seconds per question or less (12+ correct answers a minute)
- **Breakthrough Artist** - 6 seconds per question or less (10+ correct answers a minute)
- **Unsigned Act** - 7 seconds per question or less (9 correct answers a minute)
- **Gigger** - 8 seconds per question or less (8 correct answers a minute)
- **Busker** - 9 seconds per question or less (7 correct answers a minute)
- **Garage Rocker** - 10 seconds per question or less (6 correct answers a minute)
- Wannabe - more than 10 seconds per question (less than 6 correct answers a minute)
- New Artist - your rock status before you've played 10 Studio games.

Glossary

Addend – A number to be added to another.

Aggregation – Combining two or more quantities or measures to find a total.

Array – An ordered collection of counters, cubes or other item in rows and columns.

Augmentation – increasing a quantity or measure by another quantity.

Commutative – numbers can be added in any order.

Complement – in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

Difference – the numerical difference between two numbers is found by comparing the quantity in each group.

Dividend – division, the number that is divided

Divisor – In division, the number by which another is divided

Exchange – Change a number or expression for another of an equal value.

Factor – A number that multiples with another to make a product

Minuend – A quantity or number from which another is subtracted.

Multiplicand – In multiplication, a number to be multiplied by another

Partitioning – Splitting a number into its component parts.

Product – The result of multiplying one number by another

Quotient – The result of a division

Remainder – The amount left over after a division when the divisor is not a factor of the dividend

Reduction – Subtraction as take away.

Scaling – Enlarging or reducing a number by a given amount, called the scale factor

Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend – A number to be subtracted from another.

Sum – The result of an addition.

Total – The aggregate or the sum found by addition.