Somerdale
Educate
Together

Mathematics in Year Three

A guide for parents

Learn Together to Live Together

This guide is designed to inform families of how Maths is taught and how to support at home. It has been created using guides from White Rose Mathematics to support.

What is our approach to mathematics?

At Somerdale Educate Together, we use a scheme called White Rose Maths. This is a mastery-based approach aligned to the aims and objectives of the National Curriculum. It is rooted in the belief that all children can achieve in Mathematics.

Putting Number First

The White Rose scheme has number at its heart, and a significant amount of time is spent reinforcing number so that children can confidently access the rest of the curriculum.

Depth before Breadth

We ensure that children have a deep understanding of concepts, rather than rushing on. Opportunities to revisit previously learned skills are built into later blocks of learning.

Fluency, reasoning and problem solving

The White Rose scheme develops these three areas to ensure children have the knowledge and skills they need to become confident mathematicians.

Concrete, Pictorial, Abstract

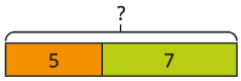
Research shows that all children, when introduced to a new concept, should have the opportunity to build competency using the concrete, pictorial, abstract approach. This features throughout the schemes of learning.

Concrete

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

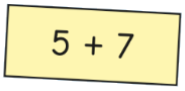
Pictorial

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



Abstract

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



<u>This Booklet</u>

The aim of this booklet is to give you, as parents, a better understanding of the key concepts your child will be learning and how they are taught. It provides ideas and resources so you can support your child at home. This booklet is available to download from the curriculum section of our website, with elements hyperlinked so you can easily access the resources.

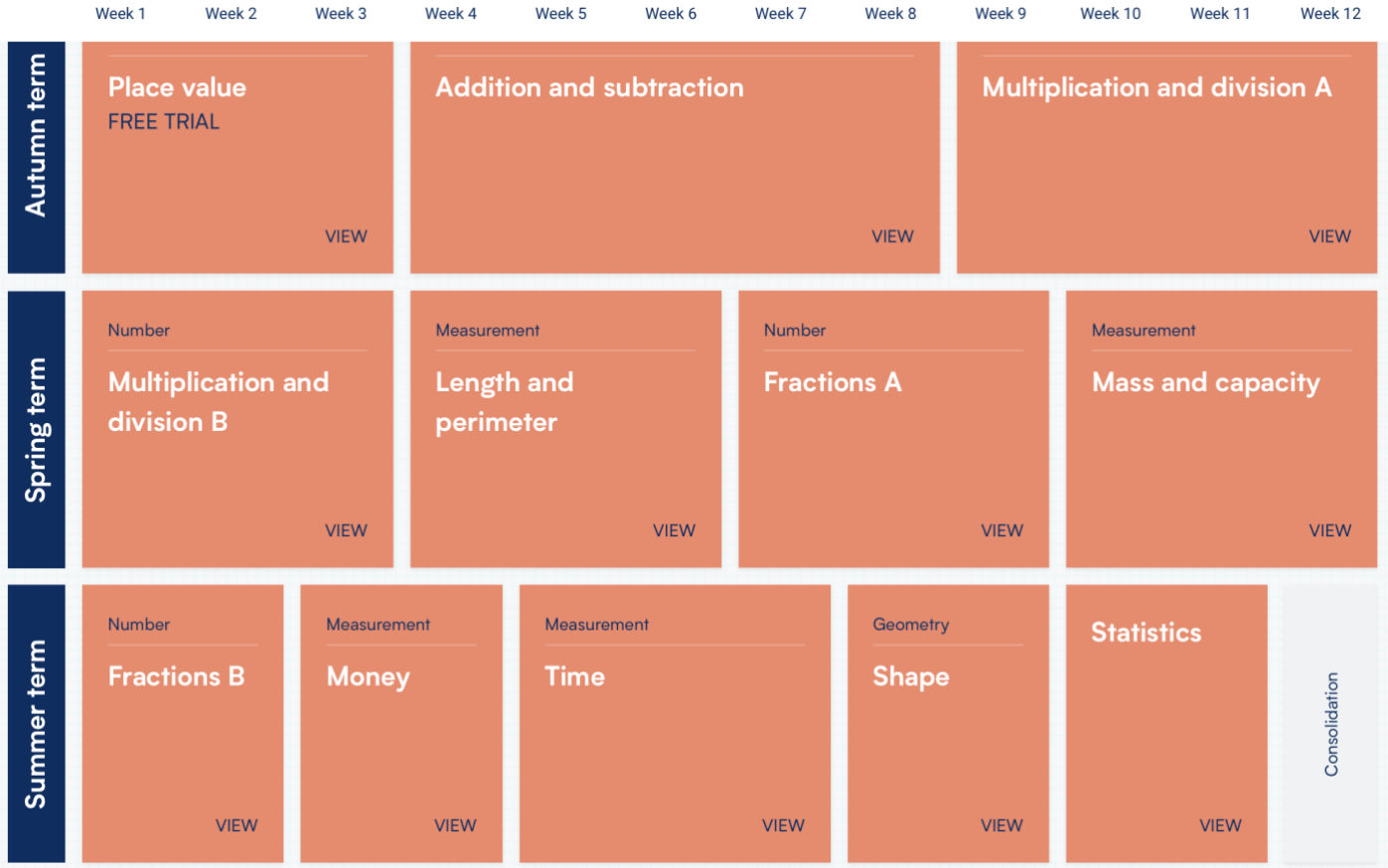
<u>What will my child learn in mathematics this year?</u>

Overleaf is an overview of the maths that your child should be learning at any point in the year. You'll notice that the White Rose scheme spends lots of time building strong number skills in Key Stage 1 and Key Stage 2. These essential core skills lay a solid foundation for more complicated learning later on.

Sometimes the class might be a little behind or ahead of the scheme schedule. That's fine; White Rose deliberately build flexibility into their schemes to allow for this. You can check the year group medium term planner on the class page for further information.

Year Three Overview

Click the image below to link to the White Rose website. This will give you more information on the small steps that are taught in each of these blocks.



Progression of Skills

White Rose is a very carefully planned scheme of work. Overleaf, you can see an overview of how key skills are taught for addition, subtraction, multiplication and division. It follows the same concrete, pictorial, abstract approach.

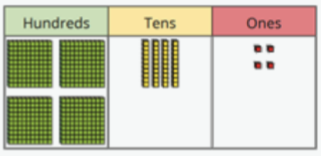
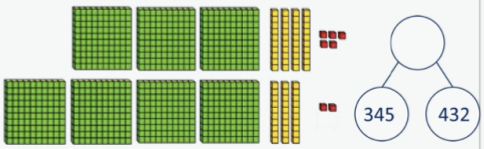
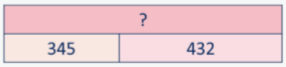
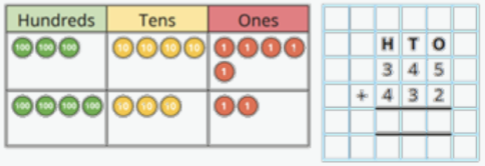
It also includes some sentence stems and key questions that we use to help children.

You may also find the 'Maths with Michael – Parent Guide' videos and downloadable parent guides on the White Rose website useful. These give a broad overview for parents of place value, subtraction, multiplication, division, fractions and algebra.

Addition

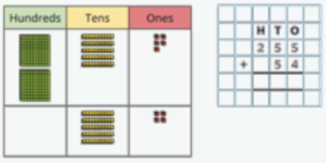
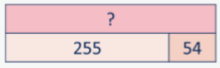
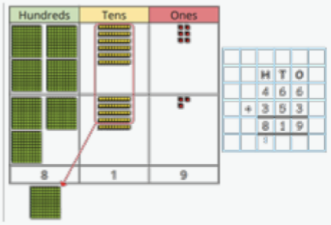
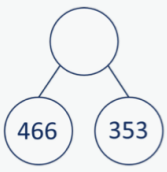
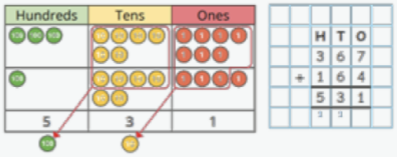
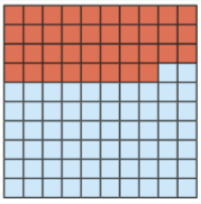
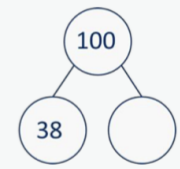
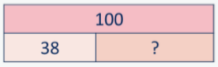
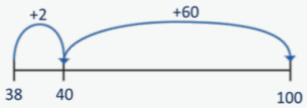
White Rose MATHS

Year 3	• Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Add numbers with up to three digits, using formal written methods of columnar addition. • Add fractions with the same denominator within 1 whole. • Calculate the time taken by particular events or tasks.

Progression of skills	Key representations
Add 1s, 10s or 100s to a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will increase by …   444 + 5 = 444 + 50 = 444 + 500 = 777 + 2 = 777 + 20 = 777 + 200 = What patterns do you notice? 235 + 3 = 235 + 30 = 235 + 300 = 604 + 20 = 604 + 50 = 604 + 90 = 111 + ☐ = 118 111 + ☐ = 181 111 + ☐ = 811
Add two numbers (no exchange) Mental strategies and introduction of formal written method.	… ones + … ones = … ones … tens + … tens = … tens … hundreds + … hundreds = … hundreds   

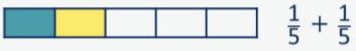
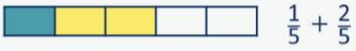
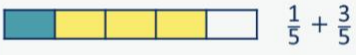
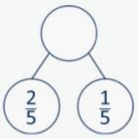
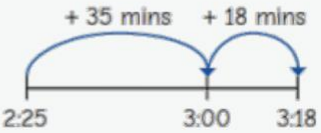
Addition

White Rose MATHS

Progression of skills	Key representations
Add two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.	There are … ones, so I do/do not need to make an exchange. There are … tens, so I do/do not need to make an exchange. … ones = … ten and … ones. … tens = … hundred and … tens.     
Complements to 100 Pairs of numbers which total 100	… plus … is equal to 100    	I add … to get to the next 10, then … to get to 100  38 + 62 = 100 62 + 38 = 100 100 = 38 + 62 100 = 62 + 38

Addition

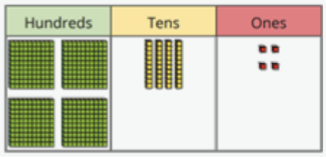
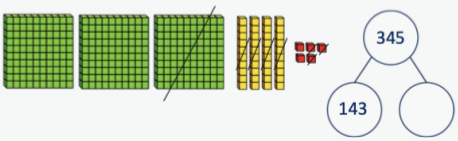
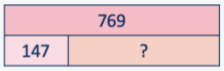
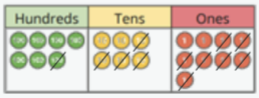
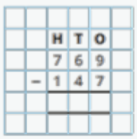
White Rose MATHS

Progression of skills	Key representations
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths  $\frac{1}{5} + \frac{1}{5}$  $\frac{1}{5} + \frac{2}{5}$  $\frac{1}{5} + \frac{3}{5}$  
Calculate the duration of events Find durations of time between a given start and end point. Children will need to calculate complements to 60	From ... to ... o'clock is ... minutes. From ... o'clock to ... is ... minutes. The total time taken is ... minutes.  start finish  start finish  + 35 mins + 18 mins 2:25 3:00 3:18

Subtraction

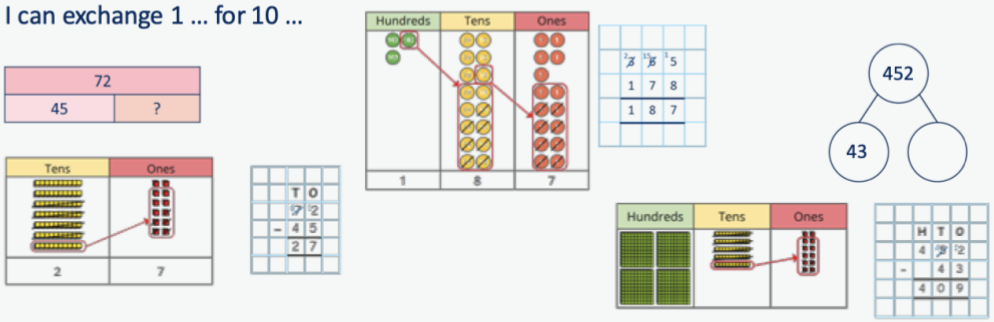
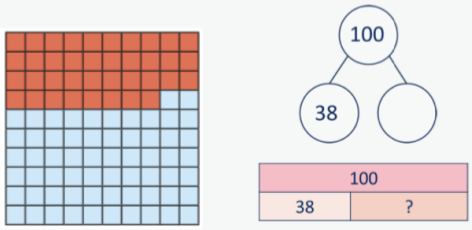
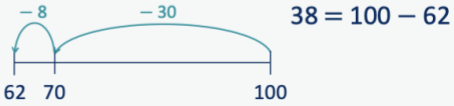
White Rose MATHS

Year 3	• Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Subtract numbers with up to three digits, using formal written methods. • Subtract fractions with the same denominator within 1 whole.

Progression of skills	Key representations	
Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease by ...   444 − 2 = 444 − 20 = 444 − 200 = 777 − 4 = 777 − 40 = 777 − 400 =	What patterns do you notice? 235 − 3 = 235 − 30 = 235 − 300 = 624 − 20 = 654 − 50 = 694 − 90 = 118 − ☐ = 111 181 − ☐ = 111 811 − ☐ = 111
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.	... ones − ... ones = ... ones ... tens − ... tens = ... tens ... hundreds − ... hundreds = ... hundreds     	

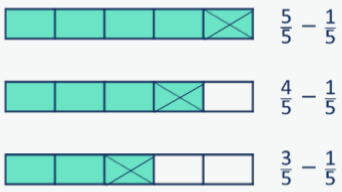
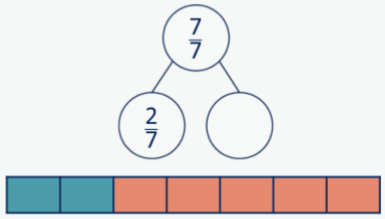
Subtraction

White Rose MATHS

Progression of skills	Key representations
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.	I need to subtract ... ones. I do/do not need to make an exchange. I need to subtract ... tens. I do/do not need to make an exchange. I can exchange 1 ... for 10 ... 
Complements to 100 Focus on subtraction facts. Encourage children to notice patterns.	100 minus ... is equal to ... 
	I subtract ... tens, then I subtract ... ones.  $100 - 38 = 62$ $100 - 62 = 38$ $62 = 100 - 38$ $38 = 100 - 62$

Subtraction

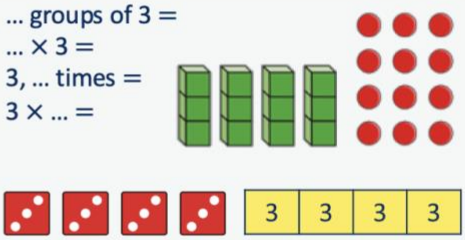
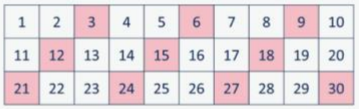
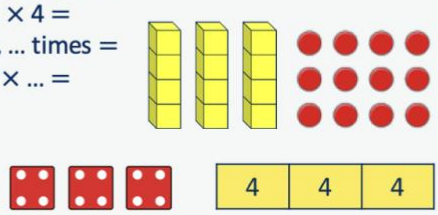
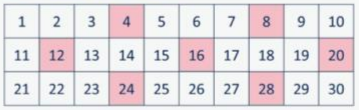
White Rose MATHS

Progression of skills	Key representations
Subtract fractions with the same denominator within 1 whole Make links with known facts.	When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths − ... fifths = ... fifths  

Multiplication

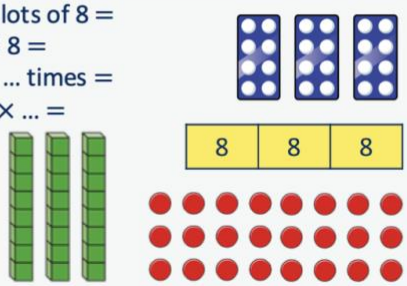
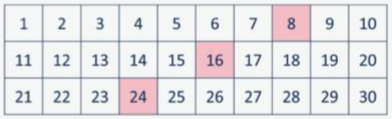
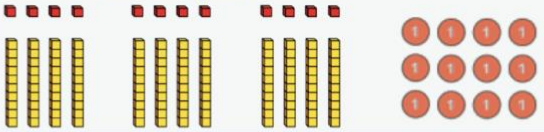
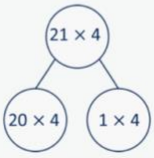
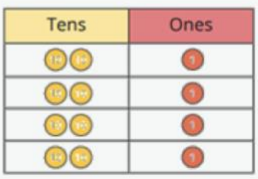
White Rose MATHS

Year 3	• Recall and use multiplication facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Progression of skills	Key representations	
The 3 times-table Encourage daily counting in multiples both forwards and back.	... groups of 3 = ... × 3 = 3, ... times = 3 × ... =  	... times 3 is equal to ...  4 × 3 = 12 12 = 4 × 3 
The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	... groups of 4 = ... × 4 = 4, ... times = 4 × ... =  	... times 4 is equal to ...  3 × 4 = 12 12 = 3 × 4 

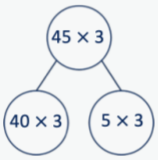
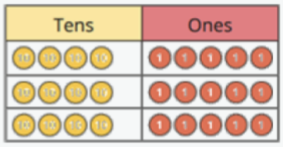
Multiplication

White Rose MATHS

Progression of skills	Key representations	
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	... lots of 8 = × 8 = 8, ... times = 8 × ... =  	... times 8 is equal to ...  3 × 8 = 24 24 = 3 × 8 
Related facts Use knowledge of multiplying by 10 to scale times-table facts.	... × ... ones is equal to ... ones so ... × ... tens is equal to ... tens.   3 × 4 = 12 3 × 40 = 120	
Multiply a 2-digit number by a 1-digit number - no exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones.  30 × 2 = 60 2 × 2 = 4 32 × 2 = 64   	

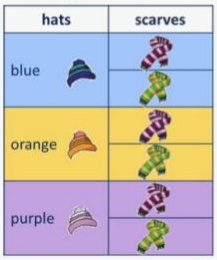
Multiplication

White Rose MATHS

Progression of skills	Key representations
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	… tens multiplied by … is equal to … tens. … ones multiplied by … is equal to … ones.  $20 \times 4 = 80$ $4 \times 4 = 16$ $24 \times 4 = 96$  
Scaling Children focus on multiplication as scaling (…. times the size) as opposed to repeated addition.	There are …. times as many … as …  There are 3 times as many triangles as circles.	… is … times the size of … … is … times the length/height of …   Miss Smith is twice the height of Jo.

Multiplication

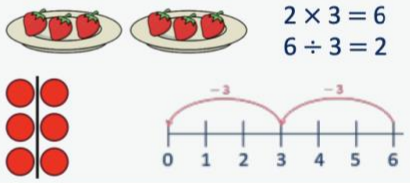
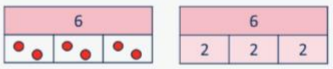
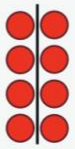
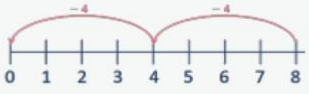
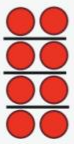
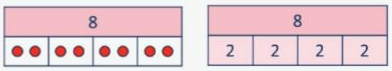
White Rose MATHS

Progression of skills	Key representations
Correspondence problems (How many ways?) Encourage children to work systematically to find all the different possible combinations.	For every … , there are … possible … There are … × … possibilities altogether.   For every hat, there are two possible scarves. $3 \times 2 = 6$ There are 6 possibilities altogether.

Division

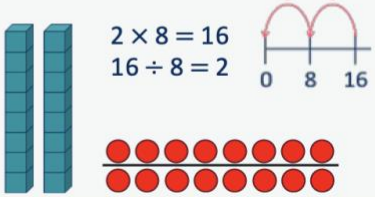
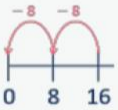
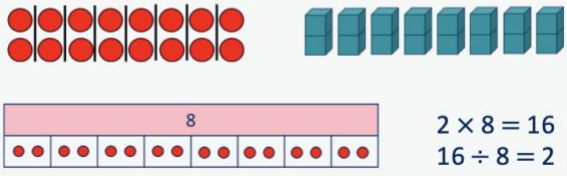
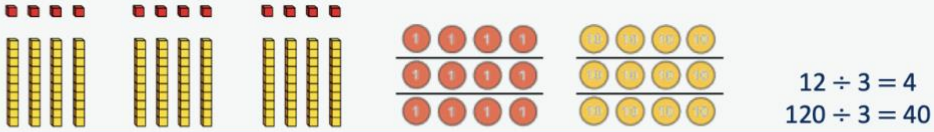
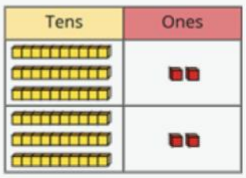
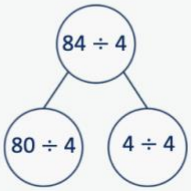
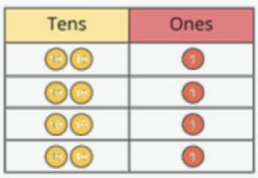
White Rose MATHS

Year 3	• Recall and use division facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

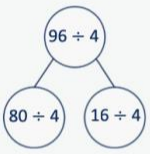
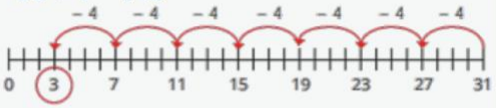
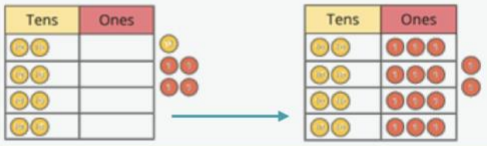
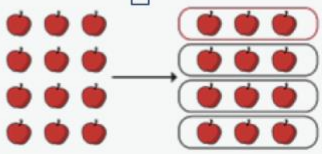
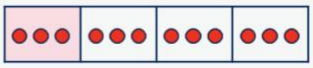
Progression of skills	Key representations	
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 3 in ... ... ÷ 3 =  2 × 3 = 6 6 ÷ 3 = 2 	... has been shared equally into 3 equal groups. ... ÷ 3 =  2 × 3 = 6 6 ÷ 3 = 2  
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 4 in ... ... ÷ 4 =  2 × 4 = 8 8 ÷ 4 = 2   	... has been shared equally into 4 equal groups. ... ÷ 4 =  2 × 4 = 8 8 ÷ 4 = 2  

Division

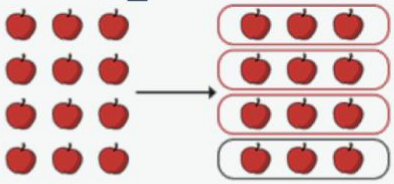
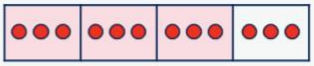
White Rose MATHS

Progression of skills	Key representations	
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 8 in ... ... ÷ 8 =  2 × 8 = 16 16 ÷ 8 = 2  	... has been shared equally into 8 equal groups. ... ÷ 8 =  2 × 8 = 16 16 ÷ 8 = 2
Related facts Link to known times-table facts.	... ÷ ... is equal to ..., so ... tens ÷ ... is equal to ... tens.  12 ÷ 3 = 4 120 ÷ 3 = 40	
Divide a 2-digit number by a 1-digit number - no exchange Partition into tens and ones to divide and then recombine.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.  60 ÷ 2 = 30 4 ÷ 2 = 2 64 ÷ 2 = 32   	

Division

Progression of skills	Key representations	
Divide a 2-digit number by a 1-digit number - with remainders Encourage children to partition numbers flexibly to help them to divide more efficiently.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.   80 ÷ 4 = 20 16 ÷ 4 = 4 96 ÷ 4 = 24	There are ... groups of ... There are ... remaining. 31 ÷ 4 = 7 r3  94 ÷ 4 = 23 r2 
Unit fractions of a set of objects Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{1}{4}$ of 12 apples is 3 apples.	One ... of ... is ... $\frac{1}{4}$ of 12 is 3  $\frac{1}{3}$ of 36 is 12 

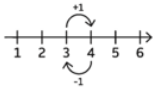
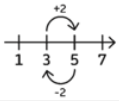
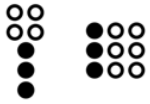
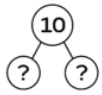
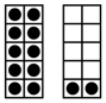
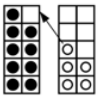
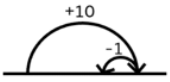
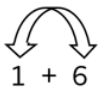
Division

Progression of skills	Key representations	
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{3}{4}$ of 12 apples is 9 apples.	$\frac{1}{\square}$ of ... is ..., so $\frac{\square}{\square}$ of ... is ... $\frac{3}{4}$ of 12 is 9  $\frac{2}{3}$ of 36 is 24 

Numbersense

Research tells us that gaps in knowledge around addition and subtraction facts can hamper children's progress and is at an expense of later ability to access the curriculum.

At Somerdale, we utilise a programme called 'Number Sense'. This systematic and structured programme ensures children develop visual models of number, a deep understanding of number and number relationships and fluency in addition and subtraction facts. It is taught daily. Children are taught core facts alongside 12 calculation strategies which aid the road to fluency:

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 **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.

Number Sense Maths

In Year 3, children review fluency facts in the Autumn term, before going onto times table fluency.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Autumn 1	Stage 5 Book 1 (review)	Stage 5 Book 2 (review)	Stage 5 Book 3 (review)	Stage 5 Book 4 (review)	Stage 5 Book 6	Stage 6 Book 6	Stage 6 Book 7
	Make Ten and Then: Addition	Make Ten and Then: Subtraction	More Doubles and Near Doubles	Adjusting	Make Ten and Then: Subtraction Part 2	Make Ten and Then: Subtraction Part 2	Strategy Selection Part 2
Autumn 2	Stage 6 Books 1 – 3 (review)	Stage 6 Books 3 – 5 (review)	Stage 6 Book 6	Stage 6 Book 6	Stage 6 Book 6	Stage 6 Book 6	
	Calculating with multiples of 10 Calculating with ones Calculating with tens	Calculating with tens Make the next 10 and then Make the previous 10 and then	Strategy Selection	Strategy Selection	Strategy Selection	Strategy Selection	

Times Table Fluency

We want all our children to love maths and succeed. Children who can recall facts enjoy and are able to secure the maths curriculum easier than the children who can't recall these facts.

There are not many facts: 36 'building block' facts (up to 9 x 9). There are roughly 39 weeks in a school year, equating to essentially 1 fact a week, every year. It is achievable for the vast majority of children to learn these facts.

We have a systematic, whole class approach to learning times tables which breaks down the learning of times tables into manageable chunks. We teach little and often, a two minute times table quiz, twice a day.

What we teach and when

In Year Three, we focus on the 2x, 3x and 5x tables.

Year 3	Year 3	Year 3	Year 4	Year 4	Year 4	Year 4	Year 4
2 x	5 x	3 x	4 x	6 x	7 x	8 x	9 x
2 x 2							
3 x 2	3 x 5	3 x 3					
4 x 2	4 x 5	4 x 3	4 x 4				
5 x 2	5 x 5						
6 x 2	6 x 5	6 x 3	6 x 4	6 x 6			
7 x 2	7 x 5	7 x 3	7 x 4	7 x 6	7 x 7		
8 x 2	8 x 5	8 x 3	8 x 4	8 x 6	8 x 7	8 x 8	
9 x 2	9 x 5	9 x 3	9 x 4	9 x 6	9 x 7	9 x 8	9 x 9
8 facts	7 facts	6 facts	5 facts	4 facts	3 facts	2 facts	1 fact
By end of Y3: 21 facts learnt 15 facts still to learn			By end of Y4 15 facts learnt to complete building blocks 21 more facts for times table check (see below)				

The Process

Children learn each number sentence as a memorised phrase by repeating the sound pattern out loud.

They learn each fact one way round only. We always state the larger number first. The children very quickly become attuned to this and it just helps in the learning process.

4 x 6 = becomes ‘six fours are twenty-four’.

We learn one new fact at a time. We will look at 6x6=36 one day, then 7 x 6 = the following day.

We don’t want children to think. We want them to become known facts. This is why, during the quiz, we have the times tables answers on the board.

<u>How we assess your child</u>

Each term, we use Times Tables Rockstars to help assess the gaps. The children take part in a ‘gig’, which then produces a heatmap. This shows us which facts the child knows well, and which they need to work on. We send this home to families so that the children can practice the facts they aren’t able to recall at home.

Children also get the chance to practise their facts on Times Table Rockstars once a week at school. This online resource is tailored to the individual child, and it’s algorithm will work out which facts your child knows, and which they need to practice more.

Click the image below to find out more about the different game types and how they support your child.

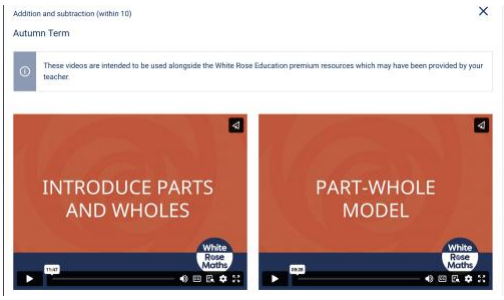
How to Support your child

There are a wide range of materials and resources available to support your child with their maths at home. In Year 3, the expectation is that children practice their addition/subtraction facts if they are not confident with them, and then to practice their times tables recall once we start to teach times tables fluency.

The medium term planner on the class page will support you with the current focus. Below are some ideas to support, as well as other resources that can be used if your child is finding an aspect of maths tricky. Pictures below are hyperlinked for ease.

White Rose Home Learning Videos

These are provided for each small step and are 8 – 10 minutes long. These can be useful to reconsolidate learning that your child may find tricky. Clicking on the individual block will then show you the different videos.



White Rose Home Workbooks

White Rose provide some printable workbooks for each block that can be used at home. They also have a Kindle edition.

White Rose One-Minute App

This app is great for short one-minute daily practice on adding, subtraction, subitising, multiplication and division skills. It is free to download on iOS, amazon and android devices.

Number Sense Home Learning Overviews

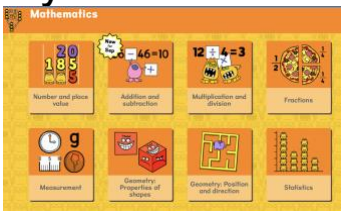
We have added the home learning overviews onto our Google Drive. Look at the year group medium term planner to see which book and stage they are currently working on. This provides lots of quick, fun activities you can do at home to support your child with the number facts they are currently learning.

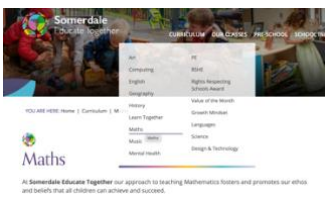
Times Tables Rockstars

Times Tables Rockstars (or TTRS), is highly individualised for each child to support them to practise the facts they need. It has a variety of timed and non-timed games.

Busy Things

As a school, we subscribe to Busy Things, an online resource which supports multiple areas of the curriculum. It has many games to support mathematics. If you need a reminder of the log-in details, please speak to your child's class teacher.





This booklet is available on our Maths page, under the curriculum tab. Images are hyperlinked to help you get direct to the resources mentioned in this guide.