Supporting your child with Maths Calculation

A Guide for Parents

RAWMARSH
SANDHILL PRIMARY
RS

WICKERSLEY
PARTNERSHIP
TRUST.

Our Maths Intent: Why we teach it this way.

Our Goal: To send every young person into the world able and qualified to play their full part in it. We want students to be confident and competent to deal with any mathematical problem.

Real World Focus: Maths isn't just for the classroom. We use it for budgeting, timing sports events, and telling the time.

Key Attributes: We encourage children to be resilient, take risks, and work together.

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RAWMARSH SANDHILL PRIMARY

Maths: National Curriculum Intent.

Fluency, reasoning and problem-solving

Clear progression across number, calculation, fractions and geometry

Children learn to explain their thinking mathematically.

Maths at Sandhill Primary Academy.

Concrete, pictorial and abstract approach

Daily opportunities for reasoning and discussion

Careful assessment to remove barriers to learning

Real-life maths links and practical problem solving

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How we teach: Building Blocks of Learning.

Chunking: We don't teach everything at once.
We break learning into small "chunks“

The Cycle: For every new skill, we use:
My Turn: Teacher shows how.

Our Turn: We do it together.

Your Turn: Child tries independently.
Why? This prevents "overloading" the brain and helps us catch mistakes early.

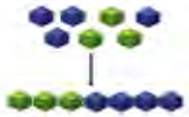
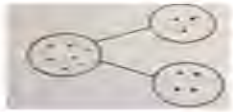
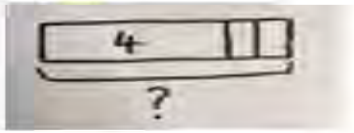
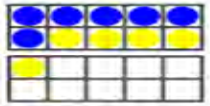
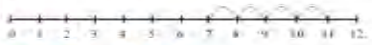
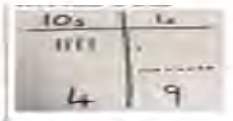
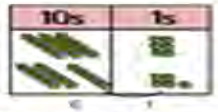
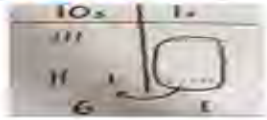
Addition-From objects to columns.

Stage 1 (Concrete): We start by combining physical objects (like teddy bears or counters) to make larger groups.

Stage 3 (Number Lines): Children use empty number lines to "jump" in tens and ones.
Example: Jumping 10 is a bigger jump than jumping 1.

Stage 5 (Column Addition): We move to formal written methods.
Vocabulary: We use the term "Crossing Boundaries" (e.g., when the ones column adds up to more than 10, we carry over)

Addition-From objects to columns.

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Recognise that two sets of objects may be combined to make a larger group.	**Recognise that more than two sets of objects may be combined to make a larger group.** **Recognise that addition can be done in any order.**	**Recognise a value & locate on a number line then add further values by counting up/on -begin to record as a number sentence.** **Recognise that addition can be done in any order & manipulate addends to demonstrate this.**	**Use empty number lines to manipulate and combine own values – this should be more than 2 amounts as well as combining two values- begin to use some tens numbers by partitioning.** **Record working on the number line and as a number sentence**	**Partition into place values and recombine – initially partitioning into tens and ones for all numbers but then maintaining one number and portioning the other addend to add larger to smaller place values -see below.** **Use increasingly larger place values**
Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars).  Use bar models for combination of objects (aggregation)  And for counting on (augmentation)  Children present the cubes using circles or crosses. They could put each part on a part whole model too. 	  A bar model which encourages children to count on, rather than to count all. **4 + 2 = ?**  **Or**  **number line** What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? 4 + 2 = ? 	Regrouping to make 10 using ten frames and counters/cubes or numicon e.g. 6 + 5 =  Children can draw and colour a ten frame  Recognise that prepared number lines or tracks can be used to count on  **7 + 4 = 11**  children to develop an understanding of equality $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$	Tens + Ones using base 10. Continue to develop understanding of partitioning and place value. 41 + 8  Children to represent the base 10 e.g. lines for tens and dot/crosses for one **41 + 9 =**  **On a number line** 31 + 12  41 + 8 	TO + TO using base 10. Continue to develop understanding of partitioning and place value. 36 + 25  **56 + 53 = ?** **Step 1** Partition both numbers and recombine using arrow cards to support e.g. 36 + 53 = 50 + 3 + 30 + 6 = 80 + 9 = 89 **Step 2** Refine to partitioning the second number only using number lines to support e.g. 36 + 53 = 53 + 30 + 6 = 83 + 6 = 89 Children to represent the base 10 in a place value chart **36 + 25 = 61**  **or** **36 + 25 = 61**

Addition-From objects to columns.

Stage 6 - Formal Algorithms -column addition

6a.	6b.	6c.	6d. add decimals using the column algorithm.
Add two amounts where no exchanging is required (number of digits is irrelevant as this only requires knowledge of number bonds to 10 however, in the interests of building confidence it is often better to begin with adding two 2 digit numbers) **Add more than two amounts – again with no exchanging** Method - **Column addition**	**Add two numbers where exchanging is needed from ones to tens – follow up with adding more than 2 amounts.** **Exchange in units** **Exchange In tens**	**Add two or more numbers where exchanging is required on two or more place values. Use increasingly larger numbers.**	*(not to be attempted until serious practise of counting on and back in decimals and partitioning of decimal numbers has occurred)* Initially discuss addition of decimals using money as the vehicle for learning however, this unravels with numbers with 3 or more decimal places and therefore measures are better as demonstration tools. **STEPS** **1**.Add decimals with no exchanging **2**. Add with exchanging in one place **3**. Add with exchanging on more than one place value.

21 + 54 = ?

HTU
e.g. 124
312+

10241
12131
45306+

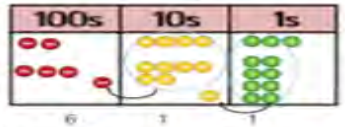
Missing digit problems:

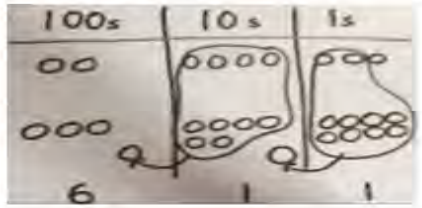
10s	1s
	?
?	5

3047
1105 +

21102
10102
13006
21110 +

Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.





243
+368
611
1 1

e.g. 3.1472
2.7206+

12.94
48.72
50.11+

Subtraction-Taking Away & Finding the Difference

Two Concepts:

Taking Away: Physically removing items
(e.g., crossing out pictures).

Finding the Difference: Comparing two amounts
(e.g., "How many more does Hamza have?").

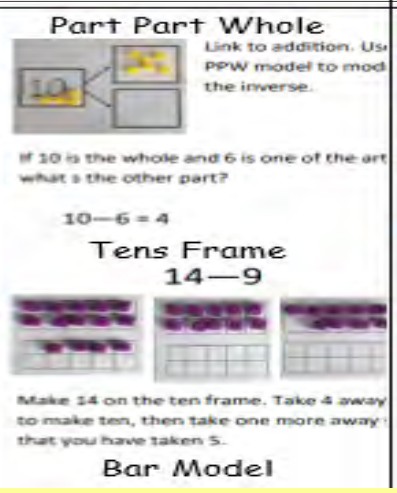
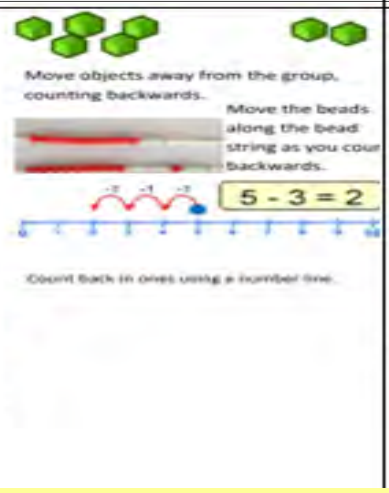
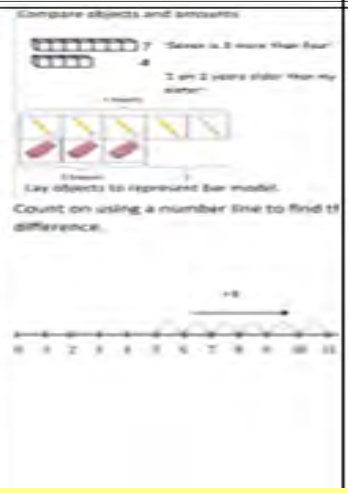
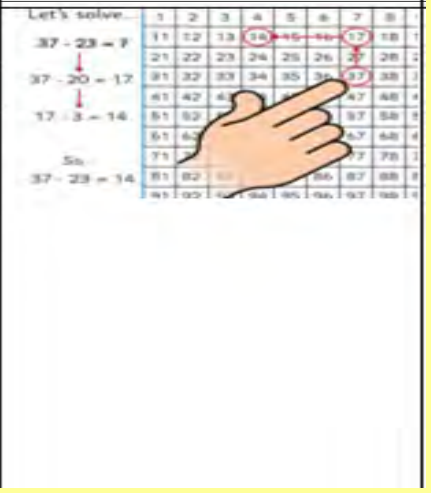
The Methods:

We use Number Lines to jump backwards. We use 100 Squares to subtract 10 by moving down a row.

Formal Method: We introduce "Exchanging" (moving a ten to the ones column).

We avoid the word "borrowing" because we aren't giving it back.

Subtraction-Taking Away & Finding the Difference

Stage 1		Stage 2			
Using songs and number rhymes	Subtraction using pictures	Subtraction using a number line	Subtraction finding the difference	Introducing a hundred square	More complex subtraction using a number square
Subtraction vocabulary will be introduced. This includes 'take away', 'less than' and 'subtract'. Children will be initially taught that, when subtracting, the answer is smaller than the starting number.	The formal method of recording will be introduced. The children will continue to develop their understanding of the vocabulary associated with subtraction.	Children will develop their ability to subtract (by 'taking away'). This will involve them jumping backwards on a number line. This will prepare them to deal with larger quantities, and it will also become more time efficient.	After having experienced subtraction as 'taking away', the children will be introduced to subtraction as 'finding the difference'.	Children will use a hundred square to 'jump back' particular amounts. They will then move to a more efficient method of subtracting 10 to a number (jumping vertically rather than horizontally).	Prior to using the hundred squares below the children will need to have a secure understanding of the value of each digit in a number, as determined by its position (place value).
					

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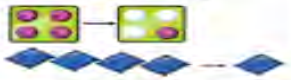
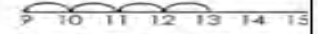
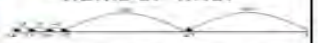
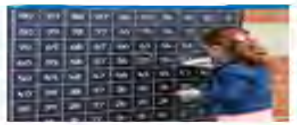
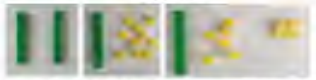
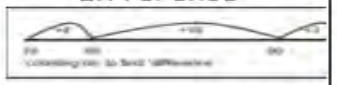
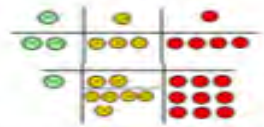
Begin to assign number symbols and numbers spoken to practical equipment. Count back on a number line and one less.  Physically taking away objects from the whole. 	Use physical objects, counters, cubes etc to show how objects can be taken away. 	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.  Use counters and move them away from the group as you take them away counting backwards as you go. 	Compare amounts and objects to find the difference.  Use basic bar models with items to find the difference. 	Jumping on a carpet 100 square. 	Children can use playground chalks to physically subtract. 	Children use play value counters and a place value grid. 
How many bears are there now? Pictorial moving to aid efficiency. 	Cross out drawn objects to show what has been taken away.  Bar Model  5—2 = 3	Count back on a number line or number track.  Start at the bigger number and count back the smaller number showing the jumps on the number line.  This can progress all the way to	Count on to find the difference.  Draw bar models to find the difference between 2 numbers. 	Counting on and back using a 100 square  		Children will use a place value grid and draw circles to represent ones/tens in order to subtract. 

Stage 3			Stage 4	
Subtraction using place value	Subtraction using a number line	Towards a formal written method without 'exchanging'	Formal written methods	Decimal numbers
An amount can be subtracted by first partitioning the starting number into 'tens' and 'units, and then removing a number of these according to the amount to subtract.	At this stage the children will learn how to subtract a two-digit number by subtracting the 'tens' and 'units' within this number using two number line jumps (rather than just jumping back in ones).	The children will subtract a two-digit number from another using a formal written method, which does not involve exchanging. The children will start with the ones digits. The placing of the operation on the right-hand side will reinforce this.	Once children have mastered the subtraction strategy involving two digit numbers without exchanging, children will develop the ability to exchange when necessary. Here they will draw upon their knowledge of partition into tens and units alongside their knowledge of partitioning in different ways.	Children will then progress to subtraction involving decimals and develop their understanding of place value. Ensuring that the columns are lined up correctly to obtain the correct answer.
Regroup a ten into tens ones  Use a PV chart to show how to change a ten into ten ones, use the term 'take and make' Partitioning to subtract without regrouping. 34—13 = 21  Use Dienes to show how to partition the number when subtracting without regrouping.	Finding the difference  Use a number line to count on to next t and then the rest. Counting back 1) Number line work Counting back in tens then the units.  84 - 33 = 51 -3 -10 -10 -10 51 54 64 74	Column subtraction without regrouping  Base representations to support understanding Column subtraction with regrouping  Tens Units Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange. 234 - 179  Model process of exchange using Numicon, base ten and then move to PV counters.	653 - 228 4 6 5 13 - 2 2 8 4 2 5	8706 - 2128 28,928 Use zeros for place-holders. 6800 · 0 - 372 · 5 6796 · 5 80,699 - 89,949 60,750 5 · 19 kg - 36 · 080 kg 69 · 339 kg

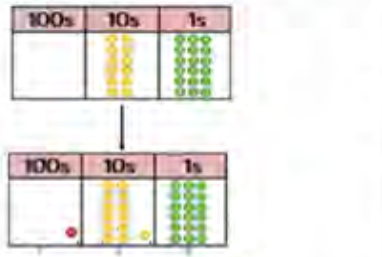
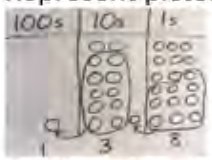
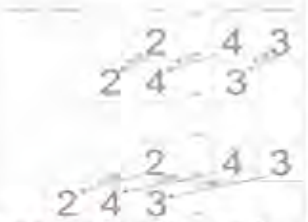
Multiplication- Groups, Arrays, and Efficiency.

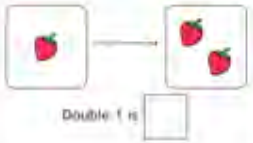
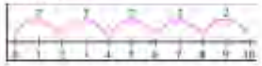
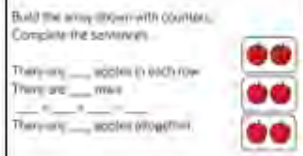
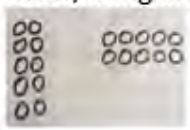
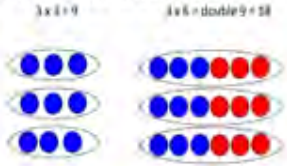
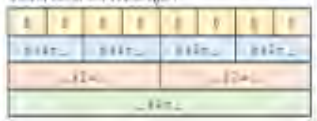
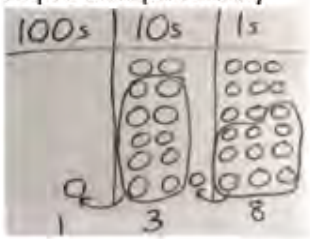
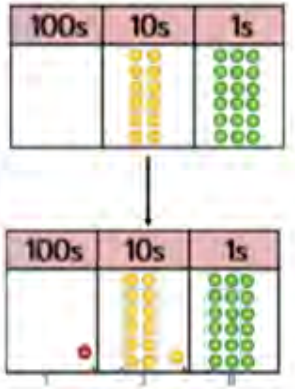
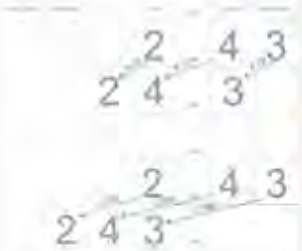
Early Stages:
We focus on "Equal Groups" and "Arrays".
Arrays (rows and columns) help children see that 3 x 4 is the same as 4 x3.

Written Methods:
Short Multiplication: For multiplying 2 and 3-digit numbers by a single digit.

Long Multiplication: For larger numbers and decimals.

Stage 1 Making & recognising equal groups	Stage 2 Repeated addition	Stage 3 Use objects, pictures and arrays.	Stage 4 Use known x table facts	Stage 5 Use other mental strategies and short multiplication	Stage 6 Mental decimal strategies and squared/cubed	Stage 7 Long Multiplication
Be able to recognise equal groups. Be able to sort objects into equal groups. Be able to find doubles with numbers up to 10.	Can use **repeated addition.** Be able to make arrays. Count in equal groups of 2, 5 and 10 Be able to find doubles with numbers up to 20.	Understand the **'x' symbo**l for multiplication and be able to record calculations using the x and = symbols. Be able to solve multiplication questions using **concrete objects, pictorial representations and arrays.** Understand multiplication is commutative (using arrays). Recall and use multiplication facts for 2,5 and 10.	Be able to solve multiplication calculations **using known times table facts.** Recall and use multiplication facts for the 3, 4 and 8. Use the inverse (division facts). Multiply 2 and 3 digits by a 1-digit number **(no exchanging)**	Be able to solve multiplication calculations mentally using: -**derived x table facts** (e.g. 3 x 4= 12 so 30 x 4 = 120) -doubling knowledge - **Place value** (multiply whole numbers by powers of 10) Multiply 2 and 3 digits by a 1-digit number using a formal method **(short multiplication) with exchanging**. Recall multiplication facts for multiplication tables up to 12 × 12	Multiply **whole numbers and decimals** numbers by powers of 10. Multiply decimals by whole numbers mentally using known facts (e.g. 0.07 x 3 = 0.21) Recognise and use square numbers and cube numbers. Use adjusting and estimation in terms of efficiency.	Multiply numbers up to 4-digits by a 2-digit number using a formal method (long multiplication). Multiply complex numbers involving decimals using mental methods and formal written methods.

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
	Making & recognising equal groups	**Repeated addition**	**Use objects, pictures and arrays.**	**Use known x table facts**	**Use other mental strategies and short multiplication**	**Mental decimal strategies and squared/cubed**	**Long Multiplication**
Models	Are the groups equal?  Doubling song 	Count pictures/ objects in multiples of 2, 5 and 10. 	Make and draw arrays (illustrate commutativity)    Bar model 	Use place value counters and Dienes to multiply 2 or3-digits by ones (no exchanging)  	Multiply whole numbers by powers of 10 using place value charts.  Using place value counters to show exchanging  Represent pictorially  Use formal written method 6 x 23 = 23 × 6 138 1 1	Multiply decimals by powers of 10 using place value charts.  Use unifix cubes and pictorial representations to explore squared and cubed numbers. 	Formal written method- long multiplication 124 × 26 becomes 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
	Making & recognising equal groups	**Repeated addition**	**Use objects, pictures and arrays.**	**Use known x table facts**	**Use other mental strategies and short multiplication**	**Mental decimal strategies and squared/cubed**	**Long Multiplication**
Pictorial Example	Are the groups equal?  How many equal groups of two can you make with the mittens?   	Count in multiples of 2, 5 and 10 using pictures.  Repeated addition through pictures.  Repeated addition through a number line.  Begin making arrays (only linking to repeated addition in this stage). 	Draw/using arrays.  Bar model  Make links to 2,5, 10 x table  	Use x table facts and relate to doubles.  Relate times tables facts and doubles 	Represent pictorially   	Multiply decimals by powers of 10 using place value charts. 	Place value counters model  Grid × 20 2 30 600 60 1 20 2

Division- Sharing vs Grouping

Sharing: "Share 20 sweets between 4 people." (One for you, one for me...).

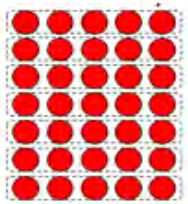
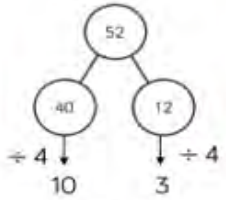
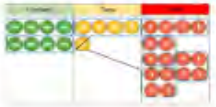
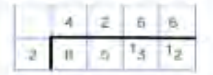
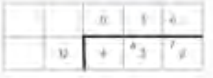
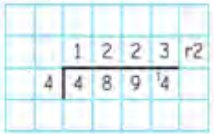
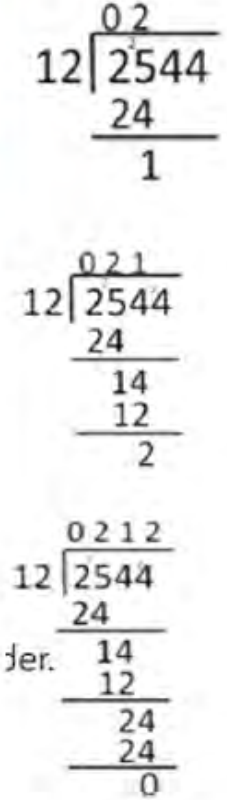
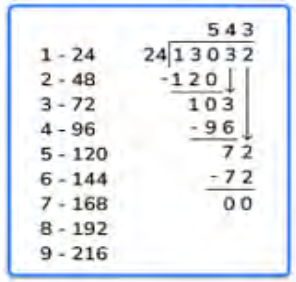
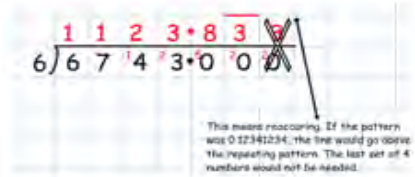
Grouping: "How many groups of 4 are in 20?“

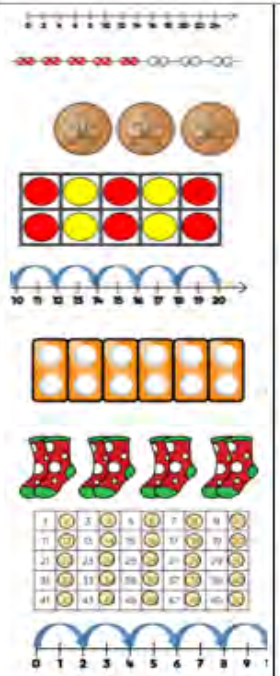
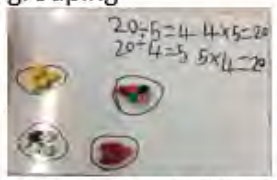
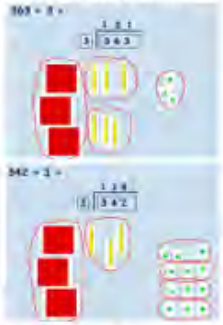
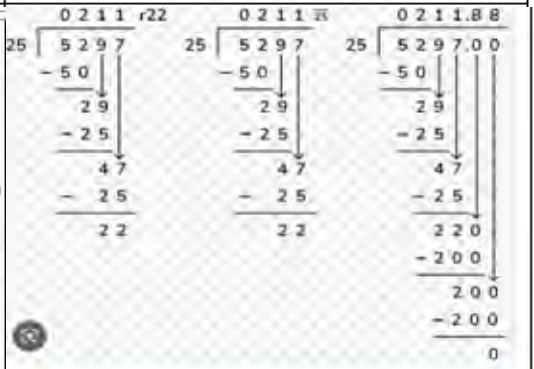
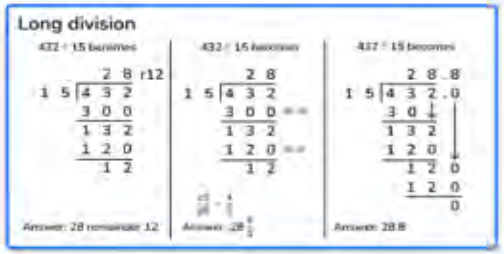
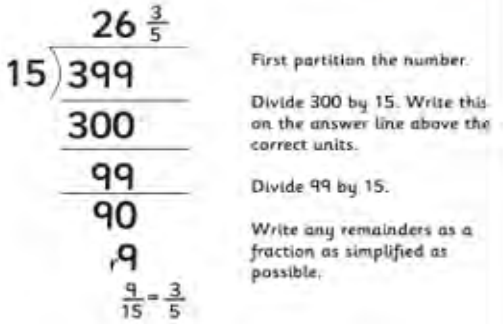
Progression: We use bar models and number lines to visualize the groups first.

Short Division: Often called the "Bus Stop" method.

Long Division: Used when larger numbers are divided by numbers with at least two digits and known facts are not used.

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
Stage Description	**Sharing**	**Grouping**	**Using known facts**	**Short division no remainders**	**Short Division with remainders**	**Long Division**	**Long Division with remainders as fractions and decimals**
Progression of skills and knowledge required	Recognise equal groups Make equal groups Understand that division is sharing out a quantity **equally** Understand that if we add back together (recombine) what has been shared out, we will have the starting amount again. e.g. 4 ÷ 2 = 2 2 + 2 = 4 Recognise that halving is the same as dividing by two	To be able to recognise and make equal lots by grouping objects. To be able to use knowledge of the 2 times table and divide by 2 using grouping. To be able to use knowledge of the 5 times table and divide by 5 using grouping. To be able to use knowledge of the 10 times table and divide by 10 using grouping.	To be able to recall multiplication and division facts for 2,5,10,3,6, 4- and 8-times tables. Understand that multiplication is commutative but division is not. To understand multiplying and dividing numbers by 10.	Be able to group equally Recall multiplication and associated division facts to 12 x 12 Be able to calculate unknown multiples eg 15 15, 30, 45, 60, 75, 90 etc.	Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Recall of multiplication and associated division facts to 12 x 12. To understand that the remainder is part of a whole (the divisor) and how to represent this at the end of a number.	Recall multiplication and associated division facts to 12 x 12 Be able to calculate any set of multiples e.g. multiples of 24 or 49 Be able to subtract mentally or use simple decomposition	Recall multiplication and associated division facts to 12 x 12 Be able to calculate any set of multiples e.g. multiples of 24 or 49 Be able to subtract mentally or use simple decomposition Use vertical subtraction Be able to round decimals in context

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
Stage Description	**Sharing**	**Grouping**	**Using known facts**	**Short division no remainders**	**Short Division with remainders**	**Long Division**	**Long Division with remainders as fractions and decimals**
Models	  	Grouping objects Here are 14 counters.  Put them into 2 equal groups. There are 2 equal groups of 7 14 ÷ 2 = 7 Grouping using a number line 12 ÷ 2 = 6  Bar Modelling 20 5 5 5 5 20 ÷ 5 = 4 Using arrays to identify groups 	 ÷ 4 ÷ 4 10 3 10 + 3 = 13 	     	 		  **Division with remainders as decimals:**  **Short division of decimals:**  **Long division with basic remainder, then remainder as a fraction and then as a decimal:**

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7
Stage Description	**Sharing**	**Grouping**	**Using known facts**	**Short division no remainders**	**Short Division with remainders**	**Long Division**	**Long Division with remainders as fractions and decimals**
Concrete Examples		Using Numicon for grouping  Using counters for grouping  Using cubes for grouping  10÷2= 5 Divide 10 into equal groups of 2. Use cubes, counters or objects to aid understanding. How many needs to be in each group? How many groups are there? 		Use Base 10 on a place value chart (complete abstract alongside this). Physically move to group and 'exchange' where needed.  Move on to use place value counters on a place value chart(complete abstract alongside this.- Physically move to group and 'exchange' where needed.			  399 ÷ 15 = ? 

Maths- Helping at home.

Use Real Objects: Pasta, buttons, or money are great for showing "grouping" and "sharing" on the kitchen table.

Use the Vocabulary: Try to use terms like Exchange (not borrow) and Partition (splitting numbers).

Real Life Maths: Involve them in shopping budgets, cooking weights, and telling the time.

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Questions
&
Thank You

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