

Mathematics at St Cleopas



Our School Vision is inspired by this bible verse:

John 13:34 “As I have loved you, so you must love one another, then everyone will know that you are my disciples”.

St Cleopas is an inclusive community that nurtures and develops opportunities for lifelong learning on our journey walking alongside Jesus, opening our eyes and hearts to all.

Our School Values: At St Cleopas, we aim to develop all pupils so that they achieve and succeed. This happens in a caring, welcoming and loving environment based firmly on our Christian values:

Friendship – Respect – Joy – Compassion – Forgiveness – Courage

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What Maths looks like at St Cleopas

Our school uses a variety of teaching and learning styles in maths lessons. Our main aim is to develop children's knowledge, skills and understanding of maths.

This is achieved by:

- A daily maths lesson which includes whole class and group directed teaching
- The use of mathematical equipment and hands on resources to encourage the use of the CPA approach
- Pre-assessment tasks so learning can be adapted to the need of the child
- Extension and challenge tasks to move learning on and give the children the opportunity to reason and explain
- Flexible intervention if a child has struggled on an aspect of maths
- Basic skills session 3x weekly (KS2) planned based on arithmetic assessments
- Number Sense sessions 3x weekly (KS1)
- Number Sense times table scheme
- The use of consistent working walls highlighting key vocabulary and stem sentences

White Rose Maths

As a school, we follow the White Rose Maths scheme. They aim to transform education through innovative approaches leveraging technology and collaboration to ensure that every individual, regardless of background or location, has access to world-class educational opportunities.

As well as using the White Rose scheme of work, we use:

- 1-minute maths app (this can also be accessed at home)
- <https://whiteroseeducation.com/resources/digital-tools>

(a range of manipulative tools that follow the representations used in their materials)

- Barvember (a celebration of bar modelling)



Number Sense

Number Sense programmes build a deep understanding of number and number relationships and develop fluency in addition, subtraction, multiplication and division facts and concepts. The comprehensive training supports teachers to implement the programmes and to achieve the best outcomes for their children.

- **Number facts fluency programme** <https://numbersensematics.com/nff>

A scheme of work focused entirely on number facts teaching. The 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. The programme is suitable both for whole class teaching and for interventions in KS1 and beyond.

- **Times Table fluency programme** <https://numbersensematics.com/ttf>

A scheme of work focused entirely on times tables. The highly visual, research informed programme provides the structure and depth to times tables teaching that children need to achieve fluency in essential multiplication and division facts and concepts. A true Mastery programme, designed to achieve fluency for every child without exception.

Stage 1: Programme Foundations	Unit 1 Doubles						
Stage 2: Essential Facts Set 1 (21 facts)	Unit 1 2 Times Table	Unit 2 Square Times Table	Unit 3 5 Times Table	Unit 4 Consolidation			
Stage 3: Essential Facts Set 2 (15 facts)	Unit 1 Recap	Unit 2 3 Times Table	Unit 3 4 Times Table	Unit 4 6 Times Table	Unit 5 7 Times Table	Unit 6 8 Times Table	Unit 7 9 Times Table
Stage 4: MTC preparation	Unit 1 More squares	Unit 2 10 & 11 Times Tables	Unit 3 12 Times Table	Unit 4 MTC Preparation			
Stage 5: Consolidation	Unit 1 Consolidation to 9 x 9	Unit 2 Consolidation to 12 x 12					

	Autumn			Spring							Summer															
Year 3				Doubles		2 Times Table		Square Times Table			5 Times Table		Consolidation													
				5 weeks		5 weeks (8 facts)		5 weeks (7 new facts)			5 weeks (6 new facts)		3-5 weeks 21 out of 36 facts learnt by end of Year 3													
Year 4	Recap	3 Times Table	4 Times Table	6 Times Table	7 Times Table	8 TT	9 TT	More squares	10&11 TT	12 Times Table	MTC Prep	MTC	Consolidation													
	3 weeks		5 weeks (5 new facts)		5 weeks (4 new facts)		3 weeks (3 new facts)		3 weeks (2 new facts)		2 weeks (1 new fact)		2 weeks (0 new facts)		1 wk (Remaining facts needed for MTC learnt)		1 wk		4 weeks		3 weeks		1 wk		3-5 weeks	
	30 out of 36 facts learnt by end of Autumn Term			All 36 facts learnt by mid Spring 2																						
Year 5	Daily consolidation			Weekly consolidation (weekly fluency session and weekly conceptual animation)																						
Year 6	Weekly consolidation																									



Maths Policy

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solutions 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 2014).

At St Cleopas CE Primary Academy, we want all our pupils to experience deep, sustained understanding so that they become happy and confident mathematicians, throughout their learning and into their adult life.

Through a positive, caring environment, we will nurture confidence in the subject and a love of mathematics, to enable every child to reach their full potential. We promote a 'can do' attitude to maths without a fear of making mistakes. Children will be given time, support and resources to develop a depth of understanding where children can express ideas fluently and talk about the subject using appropriate mathematical language. Mathematics equips pupils with the uniquely powerful set of tools and understanding. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is important in everyday life. It is integral to all aspect of life, and we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them.

Intent

Our intent in Maths is to produce confident learners who can see and make connections between the different areas of Mathematics. We believe all should achieve their true potential and develop in all areas, including socially, morally, culturally etc.

Implement

The implementation of this is through our teaching of the National Curriculum. Maths is delivered daily through quality first teaching in a variety of contexts. We teach discretely; however, we aim to apply this across the curriculum through subjects such as graphs/statistics in geography and science to maximise cross-curricular learning. All maths lessons require children to work fluently and apply this in reasoning and problem-solving contexts which is weave into all our lessons alongside sustaining prior learning. In addition to lessons, children have basic skills sessions to master and embed basics in four operations and arithmetic through schemes such as Number Sense. Our school uses White Rose Maths as a guide to develop small steps of progression to ensure all learners are working at year group expectations.

Each class is highly resourced through experienced LSAs and HLTAs in each phase. In addition, we value the positive impact of concrete manipulatives which demonstrate key representations and structure, and we endeavour to use these in all lessons so that all children can see the mathematics beyond being able to do it. Some of these include: numicon, cuisenaire rods, place value counters, etc. To ensure all learners are working at the same pace, our school uses flexible interventions to

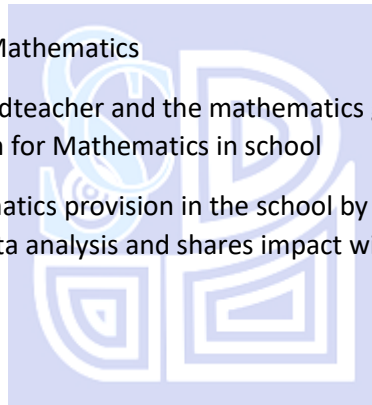
address misconceptions where children have additional support before the next lesson – this allows most learners to be broadly in line with their peers.

Impact

The impact of our design is demonstrated through our recent data. Our progress and attainment is broadly in line with national averages. Most importantly, our children leave us entering secondary level as confident and efficient mathematicians, ready for the future.

Role of the Subject Leader

- Ensures teachers understand the requirements of the National Curriculum and offers support where needed
- Leads by example by setting high standards in their own teaching
- Prepares, organises and leads CPD and joint professional development
- Works with the SENDCo to ensure accessibility in maths for those children with additional needs
- Observes colleagues with a view to identifying the support they need
- Identifies CPD opportunities for staff
- Keeps parents informed about Mathematics
- Discusses regularly with the Headteacher and the mathematics governor the progress of implementing National Curriculum for Mathematics in school
- Monitors and evaluates mathematics provision in the school by conducting regular work scrutiny, learning walks and assessment data analysis and shares impact with governors



Calculation Policy

Addition

Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square

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

Skill: Add 1-digit numbers within 10

Year: 1

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.

$4 + 3 = 7$

Skill: Add 1 and 2-digit numbers to 20

Year: 1/2

When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

$8 + 7 = 15$

Skill: Add three 1-digit numbers

Year: 2

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.

$7 + 6 + 3 = 16$

Skill: Add numbers with up to 3 digits

Year: 3

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.

$265 + 164 = 429$

Skill: Add numbers with up to 4 digits

Year: 4

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.

$1,378 + 2,148 = 3,526$

Skill: Add with up to 3 decimal places

Year: 5

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.

$3.65 + 2.41 = 6.06$

Skill: Add numbers with more than 4 digits

Year: 5/6

Place value counters or plain counters on a place value grid are the most effective concrete 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.

$104,328 + 61,731 = 166,059$

Subtraction

Skill	Year	Representations and models	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead string (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters Column addition

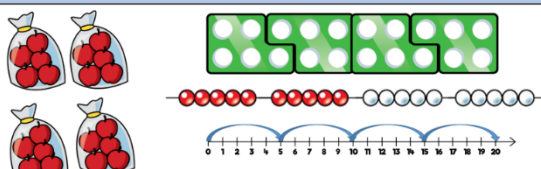
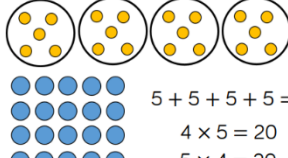
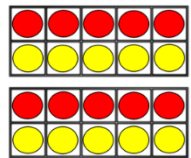
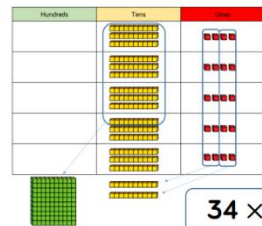
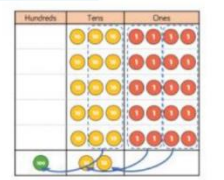
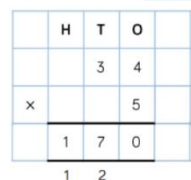
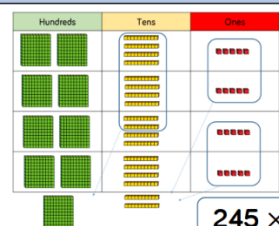
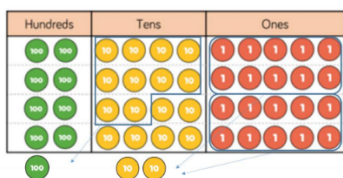
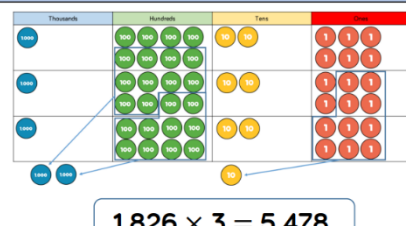
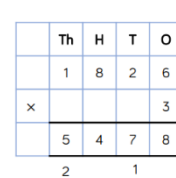
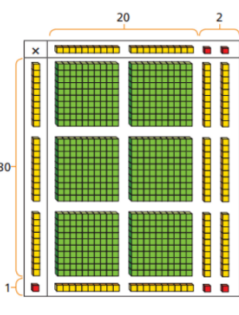
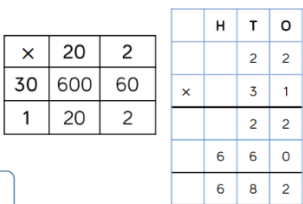
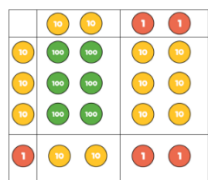
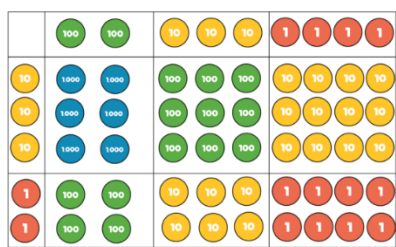
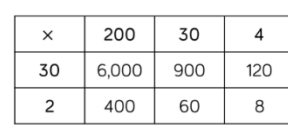
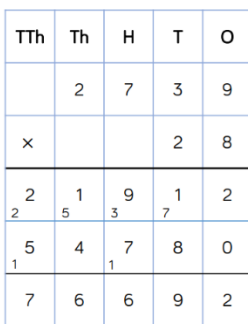
Skill	Year	Representations and models	
Subtract with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Subtract with more than 4 digits	5	Part-whole model Bar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

Skill: Subtract 1-digit numbers within 10

Multiplication

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

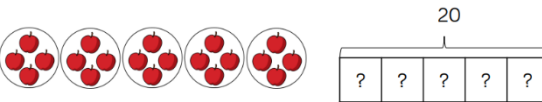
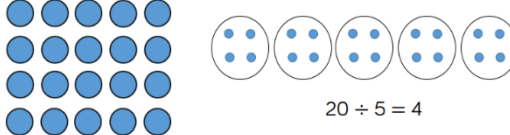
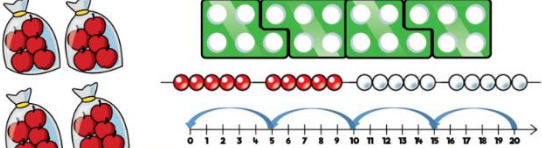
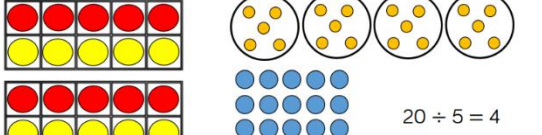
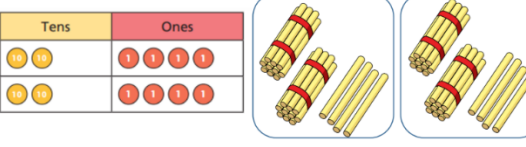
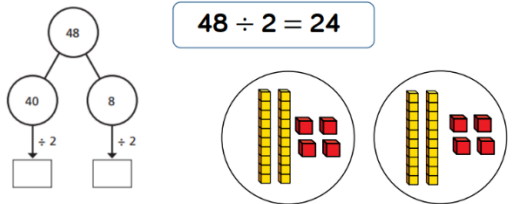
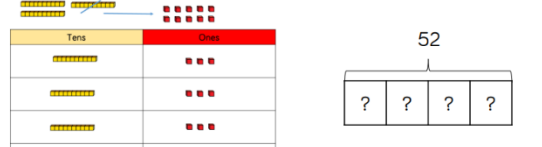
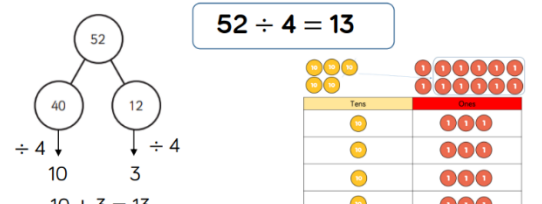
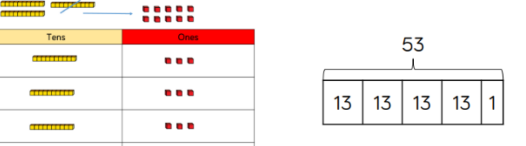
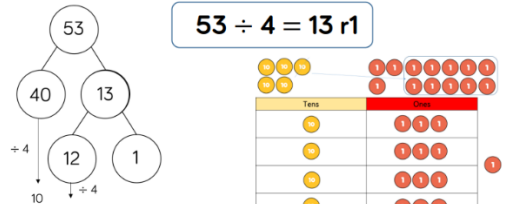
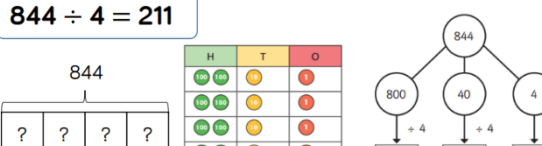
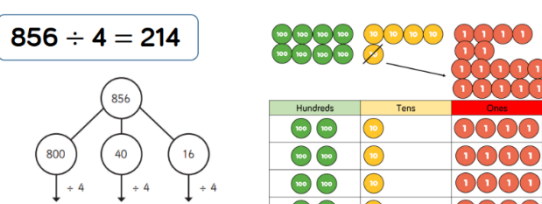
Skill	Year	Representations and models	
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	

Skill: Solve 1-step problems using multiplication  One bag holds 5 apples. How many apples do 4 bags hold?  $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$	Year: 1/2 Children represent multiplication as repeated addition in many different ways. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally. In Year 2, children are introduced to the multiplication symbol.	Skill: Multiply 2-digit numbers by 1-digit numbers  $34 \times 5 = 170$ 	Year: 3/4 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.
Skill: Multiply 3-digit numbers by 1-digit numbers  $245 \times 4 = 980$ 	Year: 4 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.	Skill: Multiply 4-digit numbers by 1-digit numbers  $1,826 \times 3 = 5,478$ 	Year: 5 When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.
Skill: Multiply 2-digit numbers by 2-digit numbers  $22 \times 31 = 682$ 	Year: 5 When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.	Skill: Multiply 3-digit numbers by 2-digit numbers  $234 \times 32 = 7,488$ 	Year: 5 Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers. Children should now move towards the formal written method, seeing the links with the grid method.
Skill: Multiply 4-digit numbers by 2-digit numbers  $2,739 \times 28 = 76,692$	Year: 5/6 When multiplying 4-digits by 2-digits, children should be confident in using the formal written method. If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method. Consider where exchanged digits are placed and make sure this is consistent.		

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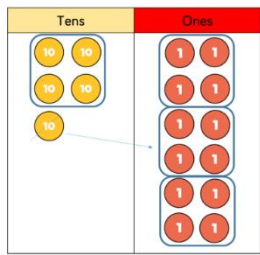
Division

Skill	Year	Representations and models	
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects	Arrays Counters
Solve one-step problems with division (grouping)	1/2	Real life objects Number shapes Bead strings Ten frames	Number lines Arrays Counters
Divide 2-digits by 1-digit (no exchange sharing)	3	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (sharing with exchange)	3	Straws Base 10 Bar model	Place value counters Part-whole model
Skill	Year	Representations and models	
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange)	4	Base 10 Bar model	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Skill	Year	Representations and models	
Divide 4-digits by 1-digit (grouping)	5	Place value counters Counters	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division	List of multiples
Divide multi-digits by 2-digits (long division)	6	Written long division	List of multiples

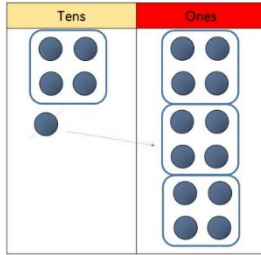
Skill: Solve 1-step problems using multiplication (sharing)  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?  $20 \div 5 = 4$	Year: 1/2 Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. In Year 2, children are introduced to the division symbol.	Skill: Solve 1-step problems using division (grouping)  There are 20 apples altogether. They are put in bags of 5. How many bags are there?  $20 \div 5 = 4$	Year: 1/2 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.
Skill: Divide 2-digits by 1-digit (sharing with no exchange)  $48 \div 2 = 24$ 	Year: 3 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.	Skill: Divide 2-digits by 1-digit (sharing with exchange)  $52 \div 4 = 13$ 	Year: 3/4 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.
Skill: Divide 2-digits by 1-digit (sharing with remainders)  $53 \div 4 = 13 \text{ r}1$ 	Year: 3/4 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.	Skill: Divide 3-digits by 1-digit (sharing) $844 \div 4 = 211$  $856 \div 4 = 214$ 	Year: 4 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.

Skill: Divide 2-digits by 1-digit (grouping)

Year: 5



		1	3
4	5	1	2



$$52 \div 4 = 13$$

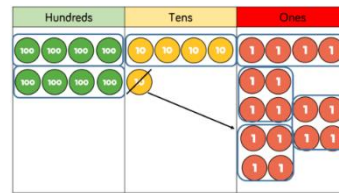
When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

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

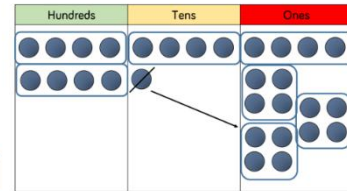
Remainders can also be seen as they are left ungrouped.

Skill: Divide 3-digits by 1-digit (grouping)

Year: 5



		2	1	4
4	8	5	1	6



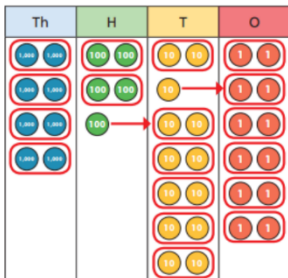
$$856 \div 4 = 214$$

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

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

Skill: Divide 4-digits by 1-digit (grouping)

Year: 5



	4	2	6	6
2	8	5	1	3

$$8,532 \div 2 = 4,266$$

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

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

Skill: Divide multi digits by 2-digits (short division)

Year: 6

		0	3	6
12	4	3	7	2

$$432 \div 12 = 36$$

	0	4	8	9
15	7	3	13	13

$$7,335 \div 15 = 489$$

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

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

Skill: Divide multi-digits by 2-digits (long division)

Year: 6

		0	3	6
1	2	4	3	2
-		3	6	0
			7	2
-			7	2
				0

$12 \times 1 = 12$
 $12 \times 2 = 24$
 $12 \times 3 = 36$
 $12 \times 4 = 48$
 $12 \times 5 = 60$
 $12 \times 6 = 72$
 $12 \times 7 = 84$
 $12 \times 8 = 96$
 $12 \times 9 = 108$
 $12 \times 10 = 120$

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

	0	4	8	9
15	7	3	3	5
-	6	0	0	0
	1	3	3	5
-	1	2	0	0
		1	3	5
-		1	3	5
			0	0

$1 \times 15 = 15$
 $2 \times 15 = 30$
 $3 \times 15 = 45$
 $4 \times 15 = 60$
 $5 \times 15 = 75$
 $10 \times 15 = 150$

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

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

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

Skill: Divide multi digits by 2-digits (long division)

Year: 6

$$372 \div 15 = 24 \text{ r}12$$

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

$1 \times 15 = 15$
 $2 \times 15 = 30$
 $3 \times 15 = 45$
 $4 \times 15 = 60$
 $5 \times 15 = 75$
 $10 \times 15 = 150$

$$372 \div 15 = 24 \frac{4}{5}$$

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

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

Whole school curriculum map

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	-Colours -Sorting and Matching -Numbers 1&2 (counting and subitising) Patterns		-Numbers 3,4,5 (numerals, 1:1 counting, subitising, composition, shapes) -Introducing tens frame -Length, height, mass and capacity		-More than/fewer than -One more/less -2D shapes -3D shapes -Composition of 5 revisited -Day and Night -Positional Language	
Reception	-Match, sort and compare -Talk about measure and patterns -It's me 1, 2, 3 -Circles and triangles -1, 2, 3, 4, 5 -Shapes with 4 side		-Alive in 5 -Mass and capacity -Growing 6, 7, 8 -Length, height and time -Building 9 and 10 -Explore 3D shapes		-To 20 and beyond -How many now? -Manipulate, compose and decompose -Sharing and grouping -Visualise, build and map -Make connections	
Year 1	-Place value (within 10 – recap and extend)	-Addition and subtraction (within 10) -Geometry - shape	-Place value (within 20) -Addition and subtractions (within 20)	-Place value (within 50) -Length and height -Mass and Volume	-Multiplication and division -Fractions -Geometry – position and direction	-Place value (within 100) -Measurement – money -Measurement – time
Year 1/2	Y1 -Place value (within 20) -Addition and subtraction (within 20 inc. recognising money) -Place value and multiplication (within 50) Y2		Y1 -Division and consolidation -Place value (within 100) -Measurement – length and height	Y1 -Shape and consolidation -Fractions and consolidation Y2	Y1 -Geometry – position and direction -Time	Y1 -Weight and volume -Consolidation and investigations Y2

Year 2	-Place value (numbers to 200) -Addition and subtraction (within 100 inc. money) -Multiplication		Y2 -Division -Statistics -Measurement – length and height	-Properties of shape -Fractions	-Problem solving and efficient methods Y2 -Geometry – position and direction -Time -Problem solving and efficient methods	-Mass, capacity and temperature -Consolidation and investigations
	-Place value -Addition and subtraction -Shape		-Money -Multiplication and division	-Length and height -Mass, capacity and temperature	-Fractions -Time	-Statistics -Position and direction -Consolidation
	-Place value -Addition and subtraction -Multiplication and division (A)		-Multiplication and division (B) -Length and perimeter	-Fractions (A) -Mass and capacity	-Fractions (B) -Money -Time	-Shape -Statistics -Consolidation
	Y3&4 -Place value -Addition and subtraction -Multiplication and division		Y3&4 -Multiplication and division -Length, perimeter and area	Y3 -Fractions -Mass and capacity Y4 -Fractions -Decimals	Y3&4 -Decimals (inc. money) -Time	Y3 -Statistics -Properties of shape Y4 -Statistics -Position and direction
	-Place value -Addition and subtraction	-Multiplication and division (A) -Fractions (A)	-Multiplication and division (B) -Fractions (B)	-Decimals and percentages -Perimeter and area -Statistics	-Shape -Position and direction -Decimals	-Negative numbers -Converting units -Volume

Year 5/6	Y5&6 -Place value -Four operations	Y5&6 -Fractions	Y5 -Fractions -Decimals and percentages Y6 -Ratio -Decimals and percentages -Algebra	Y5&6 -Converting units -Perimeter, area and volume -Statistics	Y5&6 -Properties of shape -Position and direction Y6 SATS	Y5&6 -Investigations and consolidation
	Year 6 -Place value -Four operations	-Fractions (A) -Fractions (B) -Converting units	-Ratio -Algebra -Decimals	-FDP -Area, perimeter and volume -Statistics	-Shape -Geometry	-Themed projects, investigations and consolidation



Key vocabulary progression

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and Place Value	Answer Count Equals Equal to Fewer How many? Less than Lots More More than Number Number line Numbers 0-20 One less One more Order Read Same Write	Backwards Calculate Digit Even First Fives Forwards Identify Least Most Multiples Numbers 0-100 Numerals Odd Ones Pattern Pictorial Practical Represent Second Tens Third Twos	Compare Concrete Count in steps Determine Estimate Greater than > Less than < Nearest ten Number facts Partition Place Value Problems Solve Threes Two- digit Value	Decreasing Hundreds Increasing Numbers 0-1000 One hundred Ten less Ten more Three-digit	Decimal Decimal place Four- digit Integer One thousand Placeholder Nearest hundred Nearest thousand Negative Roman numeral Rounding Tenths Thousands Whole number	Context Decimal Equivalents Hundredths Hundred thousand Interpret Linear number sequence Millions Numbers 0- 1,000,000 Powers of ten Steps of powers Ten thousand Thousandths Two decimal places	Degree of accuracy Intervals across zero Numbers 0- 10,000,000 Three decimal places Thousandths
Addition and Subtraction	Add Adding Altogether Answer Check Count back Count on Number Number bonds Object Subtract Subtracting Take away	Addition Combine Concrete Equals = Fact family Interpret Mental Mentally Minus Missing number Operations Ones One-digit	Apply Calculation Columnar/ column Difference Formal written method Inverse Measures Mental method Method Missing number problems Operation	Estimate Hundreds Number facts Three-digit	Addends Context Four-digit Two- step problems	Accuracy Commutative Determine Multi-step problems Rounding	Associative Mixed operations Multi- digit

Multiplication and division	Total	One- step problem Pictorial representation Problem Read Signs Single digit Subtraction Tens Two-digit	Order Partitioning Quantities Relationship Solve problems Sum Whole number				
	Amount Double Doubling Equal Grouping Half Halving Pattern Same Share Sharing	Answer Arrays Concrete Divide Division Equally Equals Fives Multiplication Multiples Multiply Object One step problem Pictorial representation Quantities Repeated addition Tens Twos	Calculate Commutative Division facts Even numbers Inverse Mental methods Multiplication facts Multiplication tables Odd numbers Times Times tables	Associative Calculation Connected Contexts Estimate Formal written method Integer Inverse Mathematical statement Missing number problem One- digit Recall Related facts Scaling Two- digit	Appropriate operation Corresponds Derived facts Distributive Dividend Divisor Factor pairs Factors Multiplicand Multiplier Product Quotient Scaling problems Short division Short multiplication Three-digit	Common factors Common multiples Composite numbers Context Cube number Cubes Decimals Equivalence Four-digit Fraction Index number Indices Interpret Long multiplication Non- integer notation Powers of ten Prime factors Prime numbers Rates Remainders Rounding Square number Squares To the power of	Long division Mixed operations Scale factor Whole number
Fractions, decimals and percentages	Half Halving Share Sharing	Combine Find Fraction Equal parts	Denominator Equivalence Equivalent Non- unit fraction	Add Compare Diagram Integer	Common equivalent fractions Decimal	Convert Improper fraction Mathematical statements	Common factors Common multiples Decimal fraction Inverse

Algebra Ratio		Fraction line Grouping Object One whole Part Quantity Quarter Shape Whole	Number line Numerator Third Unit fraction	Order Solve problems Subtract Tenths	Decimal equivalents Decimal notation Decimal place Dividing Hundredths Measure problems Money problems One decimal place Ones Round Simplify Two decimal places Whole number	Mixed numbers Multiples Multiply Percent Percentages Percentage and decimal equivalents Proper fraction Proportions Three decimal places Thousandths	Simplest form
		Calculate Check Chronological One -step problem Missing number problem Sequence Solve	Arrange Compare Inverse relationship Order Pattern		Algebra Algebraically Perimeter	Deduce Equation Properties Missing angles Missing lengths Rectangles Related facts	Combination Enumerate Expression Formulae Generalise Generate Linear number sequence Missing number Pairs Possibility Problem Variables
							Calculate Comparison Divide Division Fractions Grouping Integer Missing value Multiples Multiplication Multiply Percentage

Measurement							Problem Proportion Quantity Ratio Scale factor Sharing Size Solve Unequal
	Bigger Capacity Compare Empty Exactly Full High Larger Less than Little Long Low Measure Measurement More than Object Pour Problems Short Size Smaller Solve Tall Time Weight	After Afternoon Before Chronological Clock face Coins Dates Days Double Earlier Evening Events Fewer than First Half Half full Half past Hands Heavier than Heavy Height Hour Hours Later Length Light Lighter than Liquid Longer Mass Minutes	Celsius Centimetres Change Degrees Different combinations Direction Equals = Estimate Five past/ to Greater than > Grams Half past Intervals Kilograms Less than < Litres Metres Millilitres Money Pence (p) Pounds (£) Quarter past/ to Rulers Scales Standard units Symbols Tell the time Temperature Ten past/ to Thermometers	Add a.m. Analogue Duration kilometre Leap year Midnight Millimetres Nearest minute Noon Perimeter p.m. Record Roman numerals Seconds Subtract Time taken 2-D 12-hour 24-hour	Area Arrays Convert Estimate Metric Multiplication Rectilinear	Centimetres Conversions Cubic centimetres (cm ³) Cube numbers Cubes Cuboids Imperial units Inches Irregular shapes Metric units Pints Pounds Square centimetres (cm ²) Square metres (m ²) Volume	Cubic metres (m ³) Cubic Millimetre (mm ³) Cubic Kilometre (km ³) Decimal notation Decimal places Formulae Graphical representation Miles Negative integer Parallelogram Positive integer

Geometry – position and direction	Above	Around	Anti-clockwise		Axes	Parallel	Algebraically
	Backwards	Bottom	Arrange		Axis	Reflection	Four quadrants
	Behind	Close	Clockwise		Co-ordinates	Vertex	Parallelogram
	Below	Far	Order		Grid	Vertices	Rhombus
	Beside	Half turn	Right angle		Integer		
	Between	Left	Rotation		Plot		
	Direction	Middle	Sequence		Point		
	Distance	On top of	Straight line		Polygon		
	Down	Quarter turn			Quadrant		
	Forwards	Right			Spaces		
	In front of	Three-quarter turn			Scales		
	Move	Top			Translate		
	Movement	Whole turn			Translation		
	Patterns				Unit		
	Position				X- axis		
	Through				Y-axis		
	Under				2-D		
Up							
Geometry – properties of shape	Arch	Cone	Common	Acute	Classify	Angles at a point	Algebraically
	Corners	Cube	Compare	Angle	Dissect	Conjectures	Circumference
	Circle	Pyramid	Edges	Centimetres	Equilateral	Deduce	Diameter
	Cuboid	Sphere	Faces	Complete turn	Geometric shapes	Degrees	Dimensions
	Curved side	Two-dimensional	Heptagon	Decimals	Irregular	Diagonal	Nets
	Cylinder	Three-dimensional	Hexagon	Greater than	Isosceles	Distinguish	Radius
	Different	2-D Shapes	Kite	Half-turn	Lines of symmetry	Estimate	Vertically opposite
	Flat	3-D Shapes	Line symmetry	Horizontal lines	Parallelogram	Measure	
	Fold		Octagon	Less than	Regular	Missing angles	
	Pattern		Pentagon	Non- symmetrical	Scalene	Missing lengths	
	Rectangle		Polygon	Obtuse	Symmetric figure	Multiples	
	Repeated		Properties	Orientation	Trapezium	Point	
	Round		Quadrilateral	Parallel lines		Protractor	
	Same		Rhombus	Perpendicular		Regular	
	Shape		Square-based	Polyhedra		polygons	
	Sides		Pyramid	Quarter turn		Related facts	
	Square		Surface	Right angles		Irregular	
	Staircase		Triangular prism	Rounding		polygons	
	Straight		Triangular	Symmetrical		Reflex angle	
	Straight side		pyramid	Three quarters of a		Straight line	
Triangle		Vertex	turn		2-D		
		Vertical line			representation		

Statistics			Vertices				
			Answer Ask Block diagrams Category Chart title Collate Compare Construct Counting Data Horizontal Interpret Key Objects Pictogram Quantity Questions Record Simple tables Sort Tally chart Title Total Vertical x- axis y-axis	Accuracy Bar charts Fewer Graph Information One- step questions Present Presented Scales Solve Statistics Tables Two- step questions	Change over time Comparison Difference Problems Sum Time graphs	Line graph Timetables	Angles Average Calculate Conversion Draw Fractions Graphs Kilometres Mean Miles Percentages Pie chart Variables

SEND

Children with additional needs are supported by using practical resources and differentiated activities where needed. They are also further supported by additional support staff whenever possible. Where applicable, children's provision maps will incorporate suitable objectives from the National Curriculum or the EYFS curriculum and teachers keep these objectives in mind when planning work. In addition to quality first teaching, interventions also take place during the afternoons and focus on those children who may need more specific targeted input.

Interventions include:

- Pre-teach
- First class at number
- Numbersense (basic skills and multiplication)
- Third Space Learning
- Toe by Toe

Teachers and support staff receive up to date training to support children with SEND both in class and in interventions.

Parent Workshops

We provide parents/carers with a variety of workshops to support their children at home.



Greater depth learning

What Does Greater Depth Look Like In Maths?

Any discussions about what greater depth looks like in maths has to take into account the three R's of maths: **reflecting, representing and reporting**, and they are:

1. **Reflecting:** Children need the breathing space to reflect on an experience when deepening their knowledge and understanding. Pausing, probing and pondering all happen when children are not rushed or pressured. Slowing down allows children to take control of their learning and become aware of their own learning too.
2. **Representing:** Children need plenty of opportunities to represent their learning in an active way so deepening becomes memorable. This might be constructing a model, drawing a mathematical picture, using maths manipulatives or writing down their thoughts.
3. **Reporting:** Children have to engage in meaningful maths talk with others – maths has to involve lots of verbal back and forth. Pupils refine, consolidate and develop their understanding by entering into learning conversations with their peers and teacher(s). This type of reporting helps children to realise that their thoughts are valuable and by talking together they can clarify their understanding.

These 3 R's feed into depth and understanding and classroom activities must integrate them.

How Does Understanding Come Into Greater Depth?

A word about understanding: the goal of learning more about something in greater depth is to gain a greater understanding. But 'understanding' can express a fixed sense of closure and completeness which is not always the case in maths.

When we teach for mastery we 'work towards a fuller understanding' rather than a complete one, because there are always layers of complexity that feed into our learning. The maths journey is never complete.

It is worth remembering that the NCETM's definition of mastery includes having a "sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems" and that greater depth means to then go on and "independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics."

(Taken from Third Space Learning <https://thirdspacelearning.com/blog/greater-depth-maths-ks2/>)

Greater depth teacher assessment exemplification (KS1)

Working at greater depth

Statement	The pupil can read scales where not all numbers on the scale are given and estimate points in between.
Context	The pupils in a year 2 class went bird spotting in the school grounds. The data collected was put into a spreadsheet and a graph was created with a scale in twos. This pupil correctly identified how many birds of each type had been seen and wrote the totals above each bar on the graph. He then used the graph to generate questions.

What do you notice about this graph?



Statement	The pupil can recall and use multiplication and division facts for 2, 5 and 10 and make deductions outside known multiplication facts.
Context	In the example below, the pupil used their knowledge of multiplication facts and associated number patterns to rule out options, and identify a suitable answer for each of the 3 given multiplications. For the division, they recognised that a multiplication they knew, $4 \times 10 = 40$, could help them solve the problem. They then applied this knowledge to identify that 80 pupils put into groups of 4 would be 20 groups.

Reasoning about numbers

In each case choose a number that could reasonably be correct.

Then explain why you chose that number.

$19 \times 5 =$	84	<u>95</u>	93
Its 95 because it ends in a five or 0 when you count in fives.			
$19 \times 2 =$	35	33	<u>38</u>
Its 38 because if counting in 2s it should be even.			
$19 \times 10 =$	<u>190</u>	185	192
I think its 190 because when you count in tens its all ways ends in a 0.			

$19 \times 5 =$

Its 95 because it ends in a five or 0 when you count in fives.

$19 \times 2 =$

Its 38 because if counting in 2s it should be even.

$19 \times 10 =$

I think its 190 because when you count in tens its all ways ends in a 0.

Statement	The pupil can use reasoning about numbers and relationships to solve more complex problems and explain their thinking (e.g. $29 + 17 = 15 + 4 + \square\square$; 'together Jack and Sam have £14. Jack has £2 more than Sam. How much money does Sam have?').
Context	The pupil reasoned about the two sides of the equation to find the missing number. For example, in the first question, she recognised that 14 on the right hand side of the equation is 3 more than 11 on the left hand side of the equation, and therefore that the missing number had to be 3 more than 25 to keep the two sides the same. She then checked both calculations to show that they were the same.

L1. To solve missing number problems

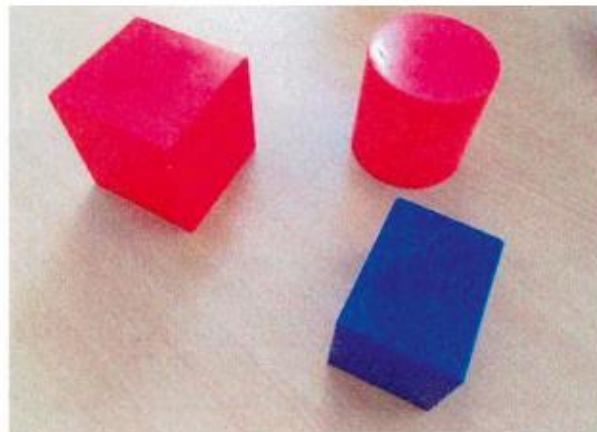
$$\boxed{29} + 11 = 25 + 14 \quad \checkmark$$

29		11	= 39
25		14	= 39

$$17 + 15 = \boxed{20} + 12 \quad \checkmark$$

17		15	= 32
20		12	= 32

Statement	The pupil can describe similarities and differences of 2-D and 3-D shapes, using their properties (e.g. that two different 2-D shapes both have only one line of symmetry; that a cube and a cuboid have the same number of edges, faces and vertices, but different dimensions).
Context	In this class, pupils could name the shapes and had a clear understanding of the geometrical language of 'edges', 'vertices', 'faces', 'curved' and 'straight'. They were working in a group of 4, to encourage interactive discussion about the shapes, but then worked independently to record the statements. The teacher observed the pupils' discussion and the way they handled the shapes and counted the properties. The pupils also used 'shape' language confidently and corrected each other if the wrong terminology was used. Along with the recorded evidence, the pupils' discussion showed a clear understanding of each shape's properties.



The cube has 8 vertices and so does the cuboid but the cylinder has none.
 The cuboid has 12 edges and the cube has 12 as well.
 The cylinder has 2 edges and its curved and the others have all straight edges.
 The cube has square faces there are six of them.
 The cuboid has 2 square faces and 4 rectangle faces.

The cube has 8 vertices and so does the cuboid but the cylinder has none.
 The cuboid has 12 edges and the cube has 12 as well.
 The cylinder has 2 edges and its curved and the others have all straight edges. The cube has square faces there are six of them.
 The cuboid has 2 square faces and 4 rectangle faces.

Prior Learning and Assessment

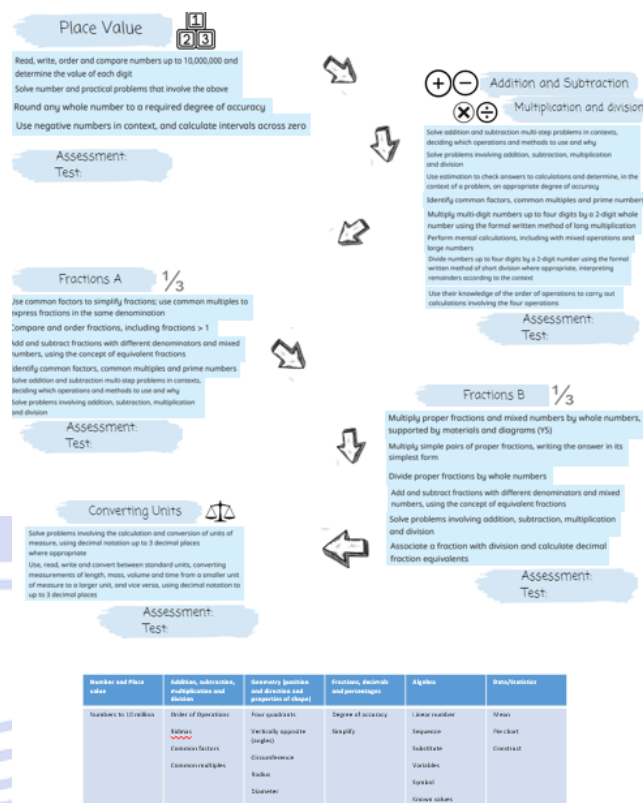
At St Cleopas, we understand the importance of assessing the children at the beginning of each teaching unit so we can adapt the learning to suit their needs. Whether this be by supporting them or stretching their learning further.

Every book has a progression map stuck in:

Children complete a pre-assessment (Assessment A from White Rose) before starting a new unit. We then record their result in the section called assessment.

We then plan accordingly based on what they already know. Pre teach intervention is used to support those who need it and flexible interventions where necessary. Some children will receive support from additional adults or use of resources during lessons and others may start on problem-based activities if they already show an understanding of the skill.

At the end of the unit, the children complete a different assessment (Assessment B from White Rose) and we record their progress.



NFER assessments are used termly in Year 1 to Year 5. These are used in addition to teacher assessment to track how the children are progressing and where any support is needed. Past SATs papers are used half-termly in Year 6 to track progress.

EYFS

Practical pre-assessment task (taken from White Rose) is used to assess any children who need any support or to be challenged more quickly.

Children are assessed throughout and evidence is uploaded to Tapestry.

Resources

- White Rose Maths <https://whiteroseeducation.com/resources>
- NCETM mastery documents
 - EYFS <https://www.ncetm.org.uk/in-the-classroom/early-years/>
 - Year 1 https://www.ncetm.org.uk/media/qjpctp24/mastery_assessment_y1.pdf
 - Year 2 https://www.ncetm.org.uk/media/dnobtk14/mastery_assessment_yr2.pdf
 - Year 3 https://www.ncetm.org.uk/media/oaqfcvjg/mastery_assessment_y3.pdf
 - Year 4 https://www.ncetm.org.uk/media/x45na0cs/mastery_assessment_y4.pdf
 - Year 5 https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf
 - Year 6 https://www.ncetm.org.uk/media/uitj1x5g/mastery_assessment_y6.pdf
- Third Space Learning <https://thirdspacelearning.com/>
- NRICH
 - EYFS <https://nrich.maths.org/teachers/early-years>
 - KS1 & KS2 <https://nrich.maths.org/teachers/primary>
- Numbersense <https://numbersensemaths.com/>
- My Mini Maths <https://myminimaths.co.uk/>
- BBC Bitesize <https://www.bbc.co.uk/bitesize/primary>
- Mr Barton Maths <https://mrbartonmaths.com/index.html>
- Maths starters https://www.transum.org/Software/SW/Starter_of_the_day/
- Number skill games <https://www.topmarks.co.uk/maths-games/hit-the-button>