THE ST. MARY'S PARTNERSHIP

Maths Curriculum



The Quality of Education Subject Pathway

ST MARY'S CE PRIMARY SCHOOL

Nurture • Grow • Achieve
MASON MOOR PRIMARY SCHOOL

VALENTINE PRIMARY SCHOOL

Bitterne CE Primary

MATHS CURRICULUM

Intent

The St Mary's Partnership is dedicated to providing a robust and enriching mathematics curriculum that empowers our students to become confident and skilled mathematicians. Our curriculum is thoughtfully designed to align with the principles of the Concrete, Pictorial, Abstract (CPA) model, ensuring a deep and meaningful mathematical education.

Concrete: We begin by offering students hand-on, concrete experiences in mathematics. Through the use of manipulatives and real-world applications, our students gain a solid foundation in mathematical concepts. These tangible experiences allow them to connect abstract ideas to practical, everyday scenarios.

Pictorial: As students progress, they transition to representing mathematical concepts through visual aids and diagrams. This stage encourages them to visualise problems, identify patterns, and develop strong problem-solving skills Visual representations help bridge the gap between concrete and abstract thinking.

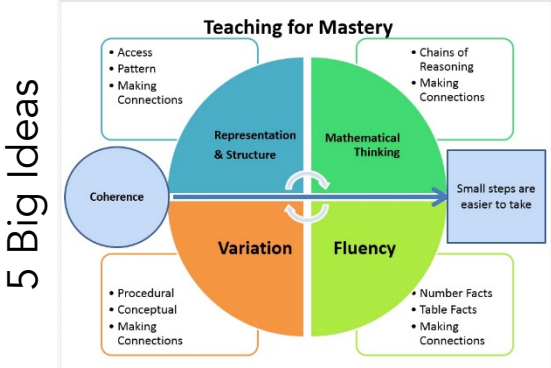
Abstract: Our curriculum culminates with students applying mathematical concepts independently and symbolically. They develop fluency in calculations, mathematical reasoning, and problem-solving, ensuring they are well-prepared for more advanced mathematical challenges.

Our long-term plan, adapted from the Lion Academy Trust overview, serves as the cornerstone of our curriculum. It is a cyclical model that spans the academic year, enabling us to systematically build upon the National Curriculum mathematical concepts across each term. This approach reinforces student' understanding and facilitates a deepening of their mathematical knowledge over time.

We utilise Ark Maths Mastery as an invaluable tool to enhance our lessons and content. This supportive resource aligns perfectly with our commitment to fostering a love for mathematics and ensuring all students succeed. Ark Maths Mastery will provide our educators with the tools and materials needed to deliver high-quality lessons that engage and inspire our young mathematicians. We believe that every child can excel in mathematics. Our curriculum designed to develop not only mathematical proficiency but also a genuine passion for the subject. We strive to instil in our students the confidence and skills they need to excel academically and thrive in their future pursuits. Through our mathematics curriculum, we are nurturing the mathematicians of tomorrow.

Mastery

Mastery can be defined as: *A range of classroom practice and school organisation that combine to give pupils the best chances of mastering mathematics. Mastering maths means acquiring a deep, long term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that's been taught to enable children to move onto more advanced material (NCETM).*



Incorporating the wisdom of the National Centre for Excellence in the Teaching of Mathematics (NCETM), our curriculum centres on five big ideas: Variation, Fluency, Mathematical Thinking, and Representation & Structure. We recognize that mathematical learning thrives when students embrace the diversity of mathematical concepts, developing fluency not just in calculations but in the profound understanding of these concepts. Encouraging mathematical thinking allows our students to explore, question, and solve problems creatively. Additionally, we emphasize the importance of effectively representing and structuring mathematical ideas, enabling students to communicate and connect mathematical knowledge across various domains, ultimately fostering a profound mastery of mathematics.

"The only way to learn mathematics is to do mathematics"

Paul Halmos

Teaching

Within the Partnership, we are dedicated to delivering a personalised and effective mathematics education, tailored to the diverse needs of our students. We employ a thoughtful ability grouping system across year groups, creating ability-based classes. This ensures instruction aligns with each child's unique learning style and abilities. In our smaller schools, such as Mason Moor, the same principles for planning and instruction exist – but employed in a whole-class environment.

Regular assessments, including utilising data from the previous key stage to measure progress, guides placement into streamed classes and supports quality first teaching. This data-driven approach allows us to design tasks precisely, providing advanced content for high achievers and additional support for those needing it. By grouping students by ability, we foster a supportive, inclusive, and motivating environment where every child can excel in mathematics.

In mathematics, teachers design lessons around precise cumulative knowledge gains, to ensure that learning is built sequentially and fluently over time.

To further enhance this precision teaching approach, we utilise targeted strategies and resources to address gaps in understanding and common misconceptions – this includes:

Therapies for providing precise, additional targeted support

We implement therapies designed to plug gaps in mathematical competence and improve outcomes for all pupils:

- Planned units break down complex concepts for pupils not on track to achieve age-related expectations. They can be delivered through:
    - Teaching Assistant-led small-group sessions.
    - Starter/"Do Now" activities in lessons.
    - Pre-teaching or re-teaching opportunities within terms.

We also use technology tools to assess student progress and track understanding, ensuring that misconceptions are identified and addressed quickly.

Teaching and Learning

Mathematics education within the Partnership begins in the Early Years Foundation Stage – typically reception (nursery in some of our settings), where number knowledge is embedded in diverse, engaging contexts such as role-play, outdoor activities, and focus groups. Our curriculum is deliberately designed with linear and progressive plans, revisiting concepts regularly to support retention and deeper understanding over time.

We adopt a holistic teaching approach that includes a mathematics bookmark to guide students in developing fluency (conceptual and procedural variation) and practical application skills. This bookmark encourages reasoning and problem-solving in context, ensuring students acquire both mathematical knowledge and the ability to apply it effectively.

Key lesson pedagogy tools include:

- **"Do Now" Activities**: Immediate engagement to activate prior knowledge.
- **Learning Intentions (LI) & Success Criteria (SC)**: Clear objectives that help students understand their goals and the steps to achieve them.
- **"Star Words"**: Expanding mathematical vocabulary to deepen comprehension and articulation.
- **"Talk Time" Sessions**: Encouraging confident verbal reasoning, aligned with our Voice 21 journey.

We incorporate digital tools such as interactive whiteboards, online math games, and virtual manipulatives to reinforce concepts and engage students in dynamic ways.

Problem-Solving Development

Problem-solving is embedded throughout our lessons to build stamina, resilience, and confidence. Year-group-specific resources, such as **Problem-Solving Therapies**, provide tools to help students persevere through challenges. We also use strategies like **Unlocking Word Problems** to break down complex multi-step problems, focusing on modelling and step-by-step guidance. Students learn to interpret challenging vocabulary, identify the correct operations, and work through problems independently, fostering both competence and confidence.

Technology plays a key role in supporting problem-solving, with digital platforms providing interactive problem sets, real-time feedback, and progress tracking for both students and teachers.

This multifaceted approach to lessons ensures students of all abilities are supported and challenged, promoting a love for mathematics and equipping them with essential skills for future success.

Experiential learning

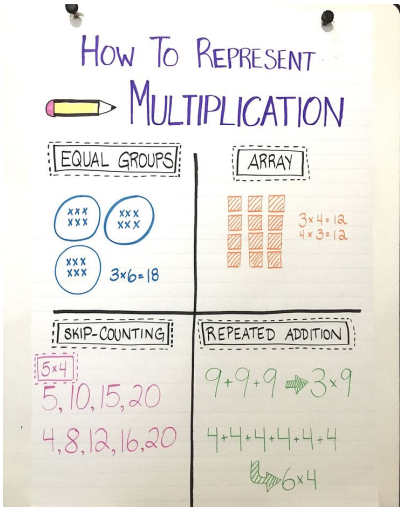


Within the Partnership, experiential learning is integral to our mathematics curriculum, particularly in the Early Years Foundation Stage (EYFS). In EYFS, mathematics is seamlessly integrated into everyday activities, such as role play, building with blocks, and outdoor exploration, helping children develop a natural curiosity for numbers and shapes. Practical tasks, such as sorting objects or exploring patterns in the environment, lay the foundation for mathematical thinking.

Across all year groups, we emphasise "learning by doing" to ensure students explore and internalise mathematical concepts. Lessons are broken into manageable learning units, allowing children to engage deeply with the material. Hands-on activities demonstrate the practical relevance of mathematics while enhancing problem-solving abilities. This approach ensures students develop a comprehensive understanding of mathematical principles, going beyond memorisation to true conceptual mastery.

In EYFS and beyond, we use apps and online resources that support interactive learning experiences, allowing students to engage with math concepts at their own pace.

Importance of Multiplication Facts



Multiplication facts are crucial building blocks in pupils' mathematical development. Learning multiplication facts fluently must be seen as non-negotiable and an entitlement of all pupils. Pupils can become anxious if they are not taught using a structured approach that breaks down the learning of facts into manageable chunks. Secure and fluent recall of multiplication and associated division facts has a significant positive impact on pupil outcomes.

Diagnosis

Diagnostic tests are conducted to forensically identify specific gaps in pupils' knowledge and understanding of multiplication facts.

Therapy (Progression to Expert Level)

The focus is on methods that lead to instant recall of facts rooted in conceptual understanding. This includes using multiple representations, practising little and often, and keeping the stakes low to minimise emotional stress and anxiety. Times tables facts are broken down into manageable chunks, and pupils only progress to the next set of facts when they have reached Expert Level.

Testing and Revisiting

After teaching each times table, pupils are assessed to ensure they have reached Expert Level, demonstrating security in their knowledge and understanding. This approach leads to increased confidence and greater success in assessments and real-life applications. Pupils will be able to apply their knowledge of times tables in other areas of mathematics and in test situations.

Teaching Strategies

Multiplication tables are explicitly taught following the times tables planner. The use of multiplication and division symbols is introduced or reinforced, and all associated vocabulary is reinforced using the Key Vocabulary sheet and PiXL Unlock strategy and resources. Visuals or practical resources are used to reinforce understanding, and associated division and fraction facts are explicitly taught.

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	Count in steps of 2, 3, 5, 10 Double and halve	Multiplication and division facts for 2 and 10	Multiplication and division facts for 5 1 x 5 4 x 5 2 x 5 5 x 5 3 x 5 6 x 5	Multiplication and division facts for 5 7 x 5 10 x 5 8 x 5 11 x 5 9 x 5 12 x 5	Summer 1A Mixed practice multiplication and division facts for 2, 5, 10	Summer 2A Multiplication and division facts 7 x 3 10 x 3 8 x 3 11 x 3 9 x 3 12 x 3
Year 3	Multiplication and division facts 1 x 4 4 x 4 2 x 4 5 x 4 3 x 4 6 x 4	Multiplication and division facts 7 x 4 10 x 4 8 x 4 11 x 4 9 x 4 12 x 4				

Year group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	Multiplication and division facts Autumn 1A 1 x 9 4 x 9 2 x 9 5 x 9 3 x 9 6 x 9 Autumn 1B 7 x 9 10 x 9 8 x 9 11x 9 9 x 9 12 x 9	Multiplication and division facts Autumn 2A 1 x 7 4 x 7 2 x 7 5 x 7 3 x 7 6 x 7 Autumn 2B 7 x 7 10 x 7 8 x 7 11x 7 9 x 7 12 x 7	Multiplication and division facts Spring 1A 1 x 12 4 x 12 2 x 12 5 x 12 3 x 12 6 x 12 Spring 1B 7 x 12 10 x 12 8 x 12 11 x 12 9 x 12 12 x 12	Multiplication and division facts Spring 2A 1 x 11 4 x 11 2 x 11 5 x 11 3 x 11 6 x 11 Spring 2B 7 x 11 10 x 11 8 x 11 11 x 11 9 x 11 12 x 11	Mixed practice multiplication and division facts for up to 12 x 12	Mixed practice multiplication and division facts for up to 12 x 12 DfE Multiplication Table Check
Year 5 Year 6	Once pupils are secure in the above, a suggested progression would be: • Consolidation and ongoing practice of all multiplication and division facts up to 12 x 12. • Differentiated programme of support to address gaps in multiplication tables knowledge. • Use of multiplication and division facts to derive associated facts. For example, if 8 x 6 = 48, what other facts can we derive? • Development of multiplicative reasoning – links between Multiplication and Division, and Fractions and Ratio.					

Mental Agility Tests – Assessment of Multiplication and Calculation knowledge

The Mental Agility Tests for Years 1 to 6 are designed to support the development of mental agility and form a crucial first step in preparing pupils for the Multiplication Times Tables Check (MTC). By starting with these tests, teachers can establish a strong foundation in rapid recall and automaticity, which are essential for success in the MTC.

The tests include audio files and answer booklets, providing a structured approach that incorporates technology to enhance engagement and accessibility. Pupils are given limited response times for mental math calculations, helping to build their confidence and resilience while enabling teachers to measure their progress effectively.

Technology is further leveraged to provide immediate feedback, allowing pupils to track their improvement and address any gaps in real-time. The mental agility tests are integrated into the Rhythm of the Year to ensure consistent coverage and enable leaders to monitor pupils' progress in mathematical fluency. These tests not only develop speed and accuracy but also ensure that pupils are well-prepared to apply their knowledge effectively during the MTC and other mathematical tasks. By combining structured practice with technological support, the mental agility tests play a pivotal role in building the skills required for both classroom success and real-world application.

Early Years Foundation Stage – the start to a child's discovery of maths!



In the Early Years Foundation Stage (EYFS), precise cumulative Maths knowledge is cultivated through deliberate teaching strategies that align with the Lion Academy Trust framework objectives. Teachers in both Nursery and Reception deliver these objectives through carefully planned, teacher-led sessions designed to build foundational skills progressively. In Nursery, the teacher conducts a guided taught Maths session with each child once a week, focusing on practical activities that introduce and reinforce key concepts. This learning is further supported by intentional provision in the Maths area, both indoors and outdoors, where children independently engage with manipulatives and resources that reflect the taught skills. In Reception, lessons transition from practical to pictorial approaches as the year progresses, with small, guided groups ensuring targeted support and extension opportunities. Throughout, teachers continuously assess the impact of these sessions by observing children during play and provision activities. This assessment informs future planning, ensuring Maths provision is tailored to challenge children who excel and support those requiring further development. Such a reflective and intentional approach ensures a strong foundation for mathematical understanding, fostering confidence and curiosity in all children.

Our Maths curriculum extends seamlessly into our outdoor learning environment, providing both Nursery and Reception children with opportunities to engage in mathematical exploration during free-flow time. A dedicated Maths space within the outdoor area is intentionally designed to revisit and consolidate framework objectives delivered during teacher-led sessions. Support staff play a vital role in this space, using guided interactions to assess the impact of taught skills and address individual learning needs. Beyond the designated Maths area, mathematical concepts are intentionally embedded across other outdoor learning zones. For instance, in the mud kitchen, children explore capacity through hands-on, contextual play. This purposeful approach is mirrored indoors, where provision areas reinforce mathematical learning; for example, the Nursery reading corner features counting rhymes, such as "Five Speckled Frogs," paired with manipulatives to deepen understanding. By embedding Maths across all areas of learning, we ensure that children experience a broad, practical, and engaging Maths curriculum that builds their confidence, enjoyment and foundational skills, with clear intent, thoughtful implementation, and measurable impact.

Our Nursery mathematics curriculum is designed with the intent to ensure that children develop a secure understanding of foundational mathematical concepts, fostering positive attitudes towards the subject. Through carefully implemented activities, children will progress from reciting numbers to 5 and recognising objects up to 3, to linking numerals with corresponding amounts. They will compare objects based on size, length, weight, and capacity, while exploring patterns to build their spatial reasoning skills. Communication and language development are integral to our approach, as children utilise mathematical concepts to enhance their oracy skills. This focus on number sense and spatial reasoning lays a crucial

foundation for later achievement, ensuring children are confident and capable in their mathematical journey as they leave Nursery ready to begin Reception and beyond to Year 1.

In Reception the intent of our Maths curriculum is to ensure that children in Year R develop a deep understanding of numbers to 10, including the recall of number bonds, to establish a strong foundation for their mathematical journey. This knowledge is carefully implemented through engaging, connected learning experiences that allow children to explore and verbalize counting to 20, compare quantities, and understand the composition and decomposition of numbers. Recognizing that shapes, like numbers, can be composed and decomposed, children are guided to identify shapes within shapes, laying the groundwork for more complex spatial reasoning in Year 1. The impact of this approach is evident as children transition into Year 1 with a secure grasp of number concepts, enabling them to confidently extend their understanding to numbers up to 100 and further develop their comprehension of shapes and patterns.



Representation, manipulatives and technology



Mathematics manipulatives are tangible objects—such as counters, blocks, or beads—that children can handle to explore and understand mathematical concepts. Their use is particularly beneficial in developing counting skills and applying mathematical ideas.

Enhancing Counting Skills

Manipulatives provide a concrete way for children to visualize numbers and quantities. By physically grouping and counting objects, children can better grasp the concept of quantity and the relationships between numbers. This hands-on experience lays a solid foundation for understanding more abstract mathematical ideas.

All schools within our partnership benefit from an enhanced IT offer – including VR (virtual reality), interactive boards and visualiser software.

Integrating technology such as Virtual Reality (VR) and interactive whiteboards into mathematics education offers several advantages that enhance teaching and learning experiences:

Enhanced Engagement and Motivation

VR immerses students in interactive environments, making abstract mathematical concepts more tangible and engaging. For example, VR math applications allow students to visualize and manipulate 3D geometric shapes, fostering a deeper understanding of spatial relationships.

Improved conceptual understanding

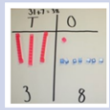
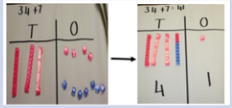
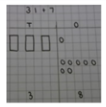
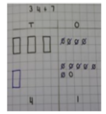
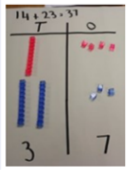
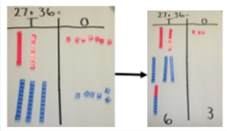
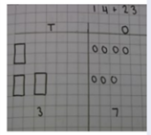
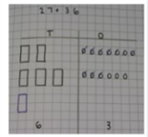
Interactive whiteboards enable teachers to present information in multiple formats—visual, auditory, and kinesthetic—catering to diverse learning styles and reinforcing understanding.

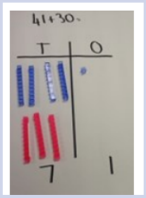
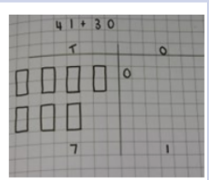
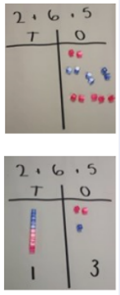
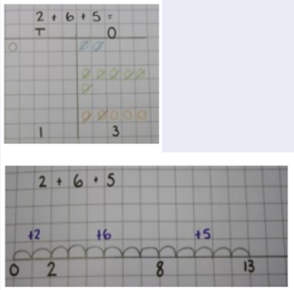
Calculation Policy Year 1

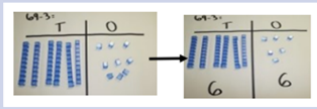
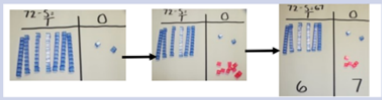
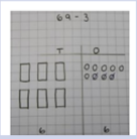
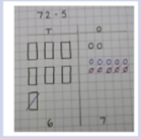
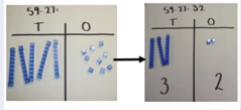
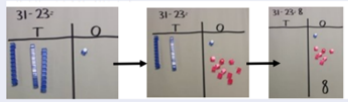
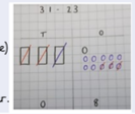
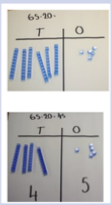
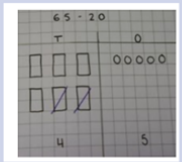
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Add one-digit and two-digit numbers to 20 including 0 Children become familiar with numbers 1-20 before learning how to add. All children begin using concrete objects to conceptually understand the process of addition in a variety of representations. Children then move on to using pictorial versions of these representations.	Children use number beads and physical objects. Counting one group of 8, one group of 5 and combine these to make 13. Counting on, 'make ten' or regrouping ten ones to make ten strategies can be used with both methods. Children use physical objects to add using the part-part-whole model. Children use physical objects to add using the bar model. Progressing from the concrete method, to using number lines to show the adding of the two numbers together, making a jump when a number is added. Progressing from the concrete method, children represent each physical object with crosses/circles. Counting them altogether to find the total.
Subtract one-digit and two-digit numbers to 20 including 0 Children become familiar with numbers 1-20 before learning how to subtract. All children begin using concrete objects to conceptually understand the process of subtraction in a variety of representations. Children then move on to using pictorial versions of these representations.	Children use number beads and physical objects. They count a group of 13 then take away a group of 5 away and count how many are left. Counting back, 'make ten' or regroup a ten into 10 ones strategies can be used with both methods. Children use physical objects to subtract using the part-part-whole model. Children use physical objects to subtract using the bar model. Progressing from the concrete method, to using number lines to show the subtracting of the two numbers, making a jump when a number is subtracted. Progressing from concrete method. Children represent physical object with crosses/circles using the part-part-whole model and bar model.

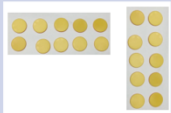
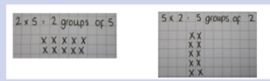
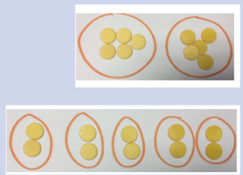
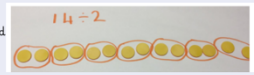
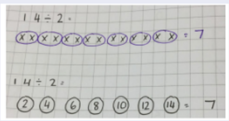
NC statement and guidance	CPA
Solve one-step problems involving multiplication Children become familiar with both concrete and pictorial methods of multiplication. Children understand multiplication as making equal groups.	Children use concrete objects to multiply whether this be using counters, counting objects or bead string. They understand multiplying as making equal groups. They draw 4 equal groups and put two in each group. There are 8 in total. Repeated addition can be used to support with this. Children, with support, represent multiplication using arrays. They understand this as 4 equal rows of 2 and count the total. Children move onto pictorial representation of the concrete method. They draw 4 equal groups and put two in each group. They then count how many there are in total. Again repeated addition can be used to support. Children, with support, represent a concrete array using a pictorial method.
Solve one-step problems involving division Children become familiar with both concrete and pictorial methods of division. They understand the difference between making groups and sharing.	Children use counters or counting objects to answer divisions. They begin by getting the correct number of counters, in this case 8. Then split these into groups of 2 When sharing, children begin by getting the correct number of counters. They then share these between the number of groups. In this case, 8 shared between 2 groups. Moving on from the concrete method, children draw crosses rather than use counters then group these into the correct amount. In this case, groups of 2. When sharing children draw the number of circles then share the amount between these circles. Children move on to represent the division using a bar model.

Calculation Policy Year 2

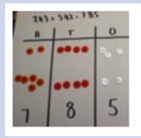
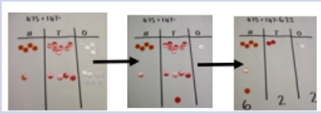
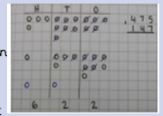
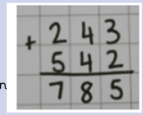
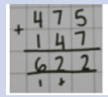
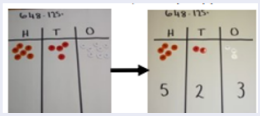
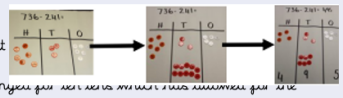
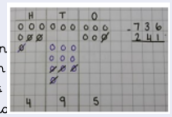
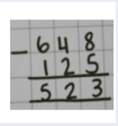
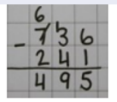
NC statement and guidance	CPA
Add a two-digit number and a one-digit number Children progress to a more formal concrete method of addition using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of addition as well as addition crossing the tens boundary.	Children begin by addition one digit numbers where the answer does not cross the tens boundary. In the example to the left, 31 is represented in pink and 8 in blue. Children count the number of units and the number to tens to find the answer. Beginning in the units column.  Children progress into adding where the calculation crosses the tense boundary. In the example below children can use ten ones to make a new tower of ten.  When moving to pictorial methods, children use a written variation of the base ten used previously. Each number is drawn into the place value chart. Children begin by adding the units and then the tens.  Children progress into crossing the tens boundary. In the example to the left, both values have been drawn. It is recognised that there are more than ten units in the ones column and so these are crossed out (as seen in purple) and a new tower of ten is drawn.  Children then count the remaining units first and then the tens.
Add two two-digit numbers Children progress to a more formal concrete method of addition using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of addition.	Children begin by adding two two-digit numbers that do not cross the tens boundary. In the example to the left, 14 is represented in pink and 23 is represented in blue. The number of units are counted followed by the number of tens in order to calculate the total.  Children progress into adding two-digit numbers where the answer crosses the tens boundary. The two numbers are represented in pink and blue. It has been recognised that there are more than ten ones and so a new tower of ten can be made.  The remaining ones and the tens are counted to calculate a total. When moving into a pictorial method, children use a written variation of base ten. Children draw both numbers into the place value chart.  They begin by adding the units and then adding the tens to find a total. Children progress into a pictorial method of adding two-digit numbers where the answers crosses the tens boundary. The two numbers are drawn into the place value grid. It has been recognised that there are more than ten ones so 10 of these have been crossed out (in purple) and a new tower of ten has been drawn.  The remaining ones and the tens are counted to calculate a total.

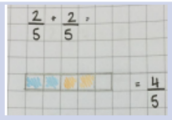
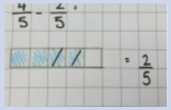
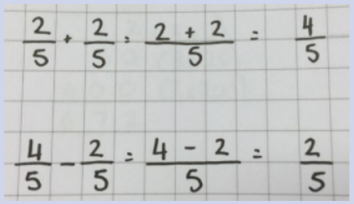
NC statement and guidance	CPA
Add a two-digit number and a multiple of ten Children become familiar with both concrete and pictorial methods of multiplication. Children understand multiplication as making equal groups.	Children are shown how to complete this calculation using base ten equipment.  41 and 30 are represented with the blue and pink base ten. Children count the ones and the tens column to find a total. Children progress into using a pictorial representation of base ten. They draw each value into their place value grid and then add the tens and the units. 
Add three one-digit numbers Children learn to add three one-digit numbers. Children should learn that they can add the three numbers in any order due to the commutative nature of addition.	Children are shown how to complete this calculation using base ten equipment.  2, 6 and 5 are all drawn into the ones column of the place value grid. It is recognised that there are more than ten ones so these are grouping together to make a tower of ten. Children count the remaining ones and the number of tens that they have. Children progress into using a pictorial version of base ten. Each of the one-digit numbers are presented in a different colour. It is recognised that there are more than ten ones and so these are crossed out to make a tower of ten. As an alternative method, children may use a number line to add the three numbers. Starting at zero then making the correct amount of jumps. 

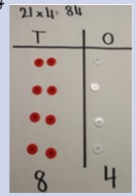
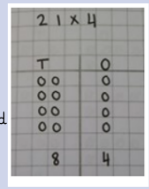
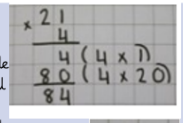
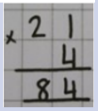
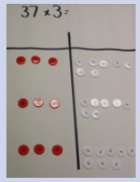
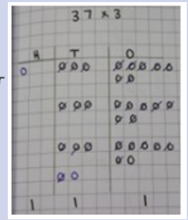
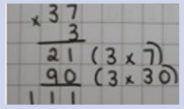
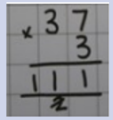
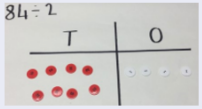
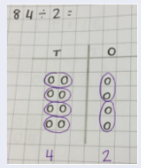
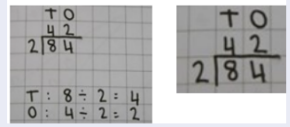
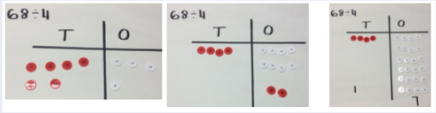
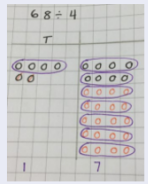
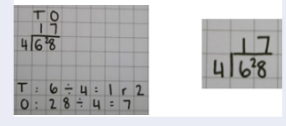
NC statement and guidance	CPA
Subtract a two-digit number and a one-digit number Children progress to a more formal concrete method of subtraction using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of subtraction as well as subtraction crossing the tens boundary.	Children begin by using base ten to subtract a one-digit number from a two-digit number which does not require exchange. In the diagram (right), children represent the starting value in the grid. They take the required number of ones and write the value that remains.  Children progress into exchange. They represent the starting value in the gird. It is recognised that there are only 2 ones and so we can not take the required 5 away.  As seen in pink, one ten is exchanged for ten ones. The 5 ones can be subtracted. The remaining ones and tens are counted to complete the answer. Children progress into a pictorial version of using base ten. Children draw the starting number into their place value grid. They cross out the required number of ones and write the amount that remains.  When exchange is required, children begin using the same process. They represent the starting number in their place value grid. It is recognised that there are not enough ones to take away. Children cross out one tower of ten and exchange this for ten ones (as seen in purple on the example). The required 5 can then be subtracted. 
Subtract two two-digit numbers Children progress to a more formal concrete method of subtraction using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of subtraction as well as subtraction crossing the tens boundary	Children begin by using base ten to subtract a two-digit number from a two-digit number which does not require exchange. In the diagram (right) children represent the starting value in the grid. They take the required number of ones away followed by the required number of tens to find the correct answer.  Children progress into questions where they need to exchange. In the diagram (right), children represent the starting value in the grid. It is recognised that they can not take away the required number of ones and therefore need to exchange a tower of tens (pink). They can take the required number of ones followed by the required number of tens to find the correct answer.  Children move into a pictorial method of subtraction. They draw the starting value into the grid. They subtract the required number of ones the required number of tens (purple). Then count the remaining ones and tens to find the answer.  Children move into a pictorial method where they need to exchange. They draw the starting value into the grid. They recognise that they can not subtract the required number of ones and so exchange a tower of ten (purple) they can subtract the correct number of ones and then tens (orange). Finally, they count the remainder to complete the answer. 
Subtract a two-digit number and a multiple of ten Children learn concrete and pictorial methods of subtracting a two-digit number and a multiple of ten. Children may progress and talk about how this calculation may be done mentally.	Children begin by using base ten to subtract a two-digit number and a multiple of ten. Children begin by representing the starting value using base ten then taking away the required number of tens.  Children progress int a pictorial method of base ten. They draw the starting value into the grid then cross the required number of tens to find the correct answer. 

NC statement and guidance	CPA
Calculate mathematical statements for multiplication within the multiplication tables using the multiplication symbol (x) and equals symbol (=) Children use concrete representations to support a range of pictorial methods to multiply. Children understand the commutative nature of multiplication and that their array will look different dependent upon the order of number within the multiplication.	Children use the counters, or other objects, to represent arrays. These are labelled correctly. In the first example 2 groups of 5 (2 x 5) and in the second example 5 groups of 2 (5 x 2).  Children can draw an array to solve a multiplication with the number of groups going horizontally down and the amount within the group vertically across as seen (right).  Children use concrete objects to multiply making equal groups.  Children can draw circles to show the number of groups and place dot/crosses within the circle to represent the amount within that group. They can then progress to writing the number in that group in digit form showing a running total. 
Calculate mathematical statements for division within the multiplication tables using the division symbol (÷) and equals symbol (=) Following on from initial understanding in Year 1, children understand the difference between sharing and grouping.	Children can use concrete objects to divide whether this be counters or counting objects. Children get the correct number of counters and share these into groups of 2 giving 7 groups.  Children move onto pictorial method. They draw the correct number of circles and the circle groups of 2 which gives 7 groups. They develop this pictorial method further by drawing groups and writing 2 in each group to reach 14. 

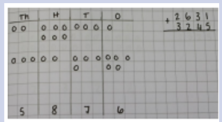
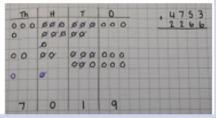
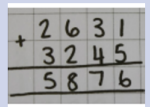
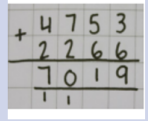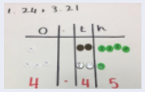
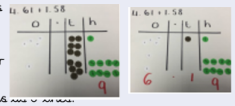
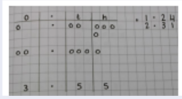
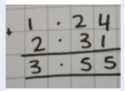
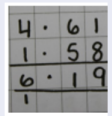
Calculation Policy Year 3

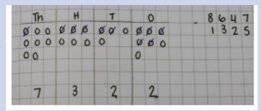
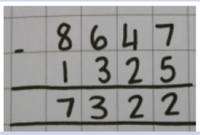
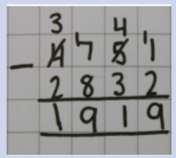
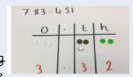
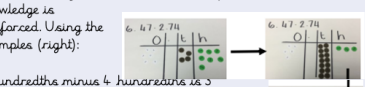
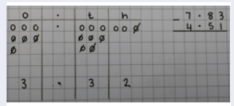
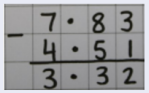
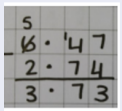
NC statement and guidance	CPA
Use the formal written method of addition to add numbers with up to three digits. Children make the transition to formal written methods of calculation. Children need to have secure conceptual understanding of concrete and pictorial methods in order to do this. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Prior to using place value counters, children may use base ten (see Year 2) to help support their understanding. Children begin addition by calculating examples that do not require them to cross the tens boundary. Each number is represented in the place value grid before children find the total starting in the ones column.  Children progress to questions which require regroupings. It is recognised that there are more than ten ones therefore children group together ten and regroup them to make one ten in the tens column. It is then recognised that there are more than 10 tens which are regrouped to make a hundred. Children then count what remains to find their answer. Note: when teaching this method progress carefully through the level of regrouping required.  Children begin addition by calculating examples that do not require them to cross the tens boundary. Each number is represented in the grid before children find the total starting in the ones column.  Children progress to questions which require regrouping. It is recognised that there are more than ten ones therefore children group together ten and regroup them to make one ten in the tens column. It is then recognised that there are more than 10 tens which are regrouped to make a hundred. This can be seen with jottings. Children then count what remains to find their answer. Note: when teaching this method progress carefully through the level of regrouping required.  Children finally progress onto a formal written method of addition beginning with examples that do not require them to cross the tens boundary. The pictorial representation and the abstract representation are modelled alongside each other to develop conceptual understanding. Examples are taught where children need to use their place value knowledge to line up digits correctly.  Children progress to questions which require regrouping. It is recognised that there are more ten ones therefore children group together ten and regroup them to make one ten in the tens column (seen to the right). It is then recognised that seven tens and four tens make eleven tens altogether leaving one ten in the tens column regrouping the ten tens into the hundred column. This can be seen in the jottings. Note: when teaching this method progress carefully through the level of regrouping required. 
Use the formal written method of subtraction to subtract numbers with up to three digits. Children make the transition to formal written methods of calculation. Children need to have secure conceptual understanding of concrete and pictorial methods in order to do this. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Prior to using place value counters, children may use base ten (see Year 2) to help support their understanding. Children begin subtraction by calculating examples that do not require them to exchange. Each number is represented in the place value grid before children find the answer starting in the ones column.  Children progress to questions which require exchange. It is recognised that they are to subtract one from the ones column but unable to subtract 4 tens from the tens column.  One hundred has been exchanged for ten tens which has allowed for the subtraction of the four needed. Two hundreds are then subtracted. Children then count what remains to find their answer. Note: when teaching this method progress carefully through the level of exchanged required. Children begin subtraction by calculating examples that do not require them to exchange. Each number is represented in the place value grid before children find the answer starting in the ones column.  Children progress to questions which require exchange. It is recognised that they are able to subtract one from the ones column but unable to subtract 4 tens from the tens column. One hundred has exchanged for ten tens which has c of the four needed. two hundreds are then subtracted. This can be seen in the crossings out above. Children then count what remains to find their answer. Note: when teaching this method progress carefully through the level of exchange required.  Children finally progress onto a formal written method of subtraction beginning with examples that do not require them to exchange. The pictorial representation and the abstract representation are modelled alongside each other to develop concepi understanding. Examples are taught where children need to use their place value knowledge to line up digits correctly.  Children progress to questions which require exchange. It is recognised that one unit can be subtracting from six units to leave five. Four hundreds can not be taken from three hundreds and so one hundred is exchanged for ten tens which can be seen in the jottings above. Children may then do six hundreds take away two hundreds leaving four. This can be seen in the jotting example. Note: when teaching this method progress carefully through the level of regrouping required. 

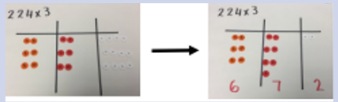
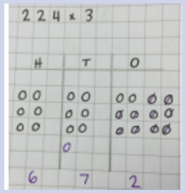
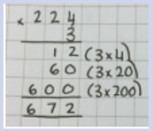
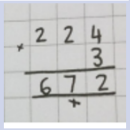
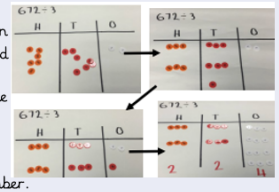
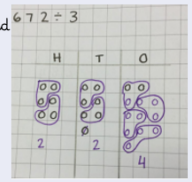
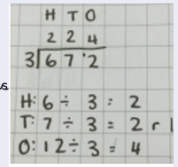
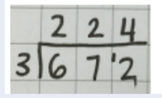
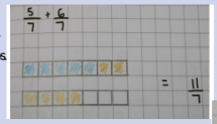
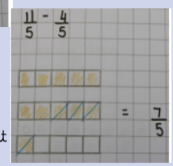
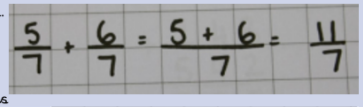
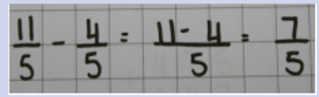
NC statement and guidance	CPA
Add and subtract fractions with the same denominator Children begin to look at addition of fractions through pictorial method established in other fraction areas of learning.	Children begin adding and subtracting fractions with the same denominator using fraction bars. As seen in the first example children draw 2/7s. They then shade in 3 more to give a total of 5/7. When subtracting, children begin by shading the correct amount. They then cross out the required number and count the remainder.   Once secure, children move onto using a more abstract method. Children recognise that when adding and subtracting fractions with the same denominator the denominator stays the same (as the sizes of the pieces are the same) we can then add or subtract the numerators. 

NC statement and guidance	CPA
Write mathematical statements using multiplication facts they know including multiplying two-digit number by a one-digit number. Children make the transition to formal written methods of calculation. Children need to have secure conceptual understanding of concrete and pictorial methods in order to do this. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Children may begin by using base ten to develop conceptual understanding before moving on to use place value counters.  Children make the number of groups in their place value grid. In this case, 4 groups of 21. Similar to addition they add the ones and the tens to find the total. Children move on to a pictorial representation of the concrete method. As seen in the example (right), children make the number of groups in their place value grid. Similar to addition they add the ones and the tens to find the total.  To support progression into a formal method, children first use an expanded written method. This is modelled alongside the pictorial method to support conceptual understanding. Once children are secure, they move onto the formal written method below.   Children move onto multiplication which require them to regroup. Children make three groups of 37 in their place value grid. They use their addition skills to find the total.  Children move onto multiplication which requires them to regroup. Children make three groups of 37 in their place value grid. They use their addition skills to find the total.  To support progression into a formal written method children first use an expanded written method. This is modelled alongside the pictorial method to support conceptual understanding. Once children are secure, they move onto the formal written method on the right. Children will need to recognise that 3 x 7 = 21 which is two tens and one unit and therefore carry the two tens across.  
Dividing a two-digit number by a one-digit number progressing into formal methods. Children make the transition to formal written methods of calculation. Children need to have secure conceptual understanding of concrete and pictorial methods in order to do this. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Children may begin by using base ten to develop conceptual understanding before moving on to use place value counters. Children make the correct number in the place value grid. They group the 8 tens into groups of 2 and the 4 ones into groups of 2. There are 4 groups of ten and 2 groups of ones.  Children move onto pictorial method. They draw 82 into their place value grid. They group the 8 tens into groups of 2 giving 4 groups and the 4 ones into groups of 2 giving 2 groups.   Children move onto an abstract method, initially making informal jottings to support as seen in the examples on the left. Children move into examples where they need to regroup. Children make the correct number in the place value grid. They group the 6 tens into groups of 4. They can only make one group of 4 with two left over. They exchange these two tens into ones column. They group to 28 ones into groups of 4 giving 7 groups.  Children move onto examples where they need to regroup. They draw 68 into their place value grid. They group 6 tens into groups of 4. There is 1 group with 2 tens left over which they exchange into the ones column (in orange). The 28 28 ones are then grouped into groups of 4 giving 7 groups.  

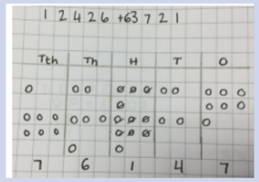
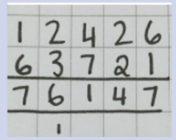
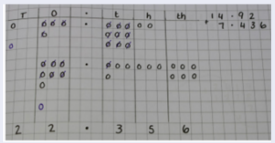
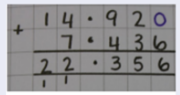
Calculation Policy Year 4

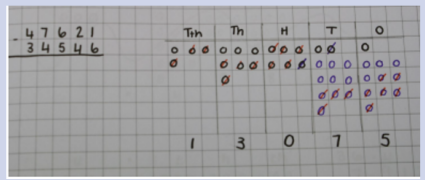
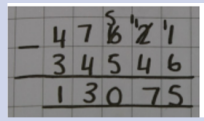
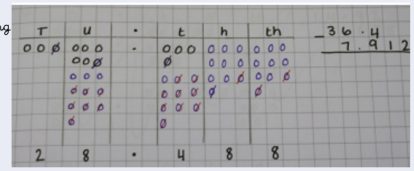
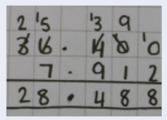
NC statement and guidance	CPA
Add four number up to four digits using the formal written method. Children build upon calculation skills developed in Year 3. Prior to the methods taught below, concrete methods (as modelled in Year 3) are used to support conceptual understanding. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Children use a pictorial method to aid conceptual understanding of addition of whole numbers up to four digits. This includes adding numbers with different amounts of digits. Examples are carefully structured to begin with those that do not require exchange. When modelling this method, children's place value knowledge is reinforced. Looking at the second example. 3 ones add 6 ones is 9 ones. 5 tens add 6 tens is 11 tens which make 1 hundred and 1 ten. We carry this 1 hundred into the hundred column. 7 hundreds plus 2 hundreds plus 0 hundreds is 10 hundreds which make 1 thousand which are added into the thousands column. 4 thousands plus 2 thousands plus 1 thousand is 7 thousands.   Once children are secure in concrete and pictorial methods, they move onto the formal written method. As with previous methods, children's place value knowledge is reinforced through the modelling of this method as demonstrated with the pictorial method. examples are carefully structured to support conceptual understanding.  
Add numbers with up to 2 decimal places using the formal written method In order in begin to add decimal numbers children progress carefully through concrete, pictorial and abstract method. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Children use place value counters (and/or base ten) to begin to add decimal numbers. Including examples which have different amounts of digits.  Examples are carefully structured beginning with questions that do not require exchange. When modelling this method children's place value knowledge is reinforced. Use the example below: 1 hundredth add 8 hundredths is 9 hundredths. 6 tenths add 5 tenths is 11 tenths we exchange 10 of these tenths for 1 one into the ones column. 4 ones plus 1 one plus 1 one gives  Children use visual maths to add numbers with up to two decimal places including number which have different amounts of digits. They use place holders where necessary. Examples are carefully structured beginning with questions that do not require exchange. When modelling this method, children's place value knowledge is reinforced as demonstrated in the concrete method.   Once children have a secure conceptual understanding of addition of decimals, they move onto a formal written method. As previous methods, children's place value knowledge is reinforced as demonstrated in the concrete method.  

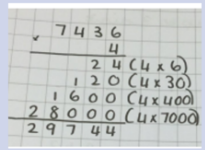
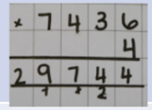
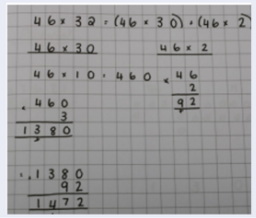
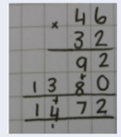
NC statement and guidance	CPA
Subtract number with up to four digits using the formal written method Children build upon calculation skills developed in Year 3. Prior to the methods taught below, concrete methods (as modelled in Year 3) are used to support conceptual understanding. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Children use a pictorial method to aid conceptual understanding of subtraction of whole numbers up to four digits. This includes subtracting numbers with different amounts of digits. Example are carefully structured to begin with those that do not require exchange. When modelling this method, children's place value knowledge is reinforced. Looking at the example (right). We can not do 1 one subtract 2 ones and therefore we exchange 1 ten from the tens column. 11 ones subtract 2 ones is 9 ones. The 4 remaining tens subtract 3 tens gives 1 ten. 7 hundreds subtract 8 hundreds we can not do so exchange 1 thousand for 10 hundreds. 17 hundreds subtract 8 hundreds gives 9 hundreds. The 3 remaining thousands subtract 2 thousands leaves 1 thousand.   Once children have a secure conceptual understanding of subtracting whole numbers, they move onto the formal written method. As with previous methods, children's place value knowledge is reinforced through the modelling of this method. With examples carefully structured to support conceptual understanding.  
Subtract numbers with up to 2 decimal places using the formal written method of subtraction In order to begin to subtract decimal numbers children progress carefully through concrete, pictorial and abstract method. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Children use place value counters (and/or base ten) to begin subtracting decimal numbers. Including examples which have different amounts of digits.  Examples are carefully structured beginning with questions that do not require exchange. When modelling this method children's place value knowledge is reinforced. Using the examples (right):  7 hundredths minus 4 hundredths is 3 hundredths. We can not do 4 tenths subtract 7 tenths and therefore we exchange 1 one for the 10 tenths which allow us to subtract 7 tenths. We can then subtract 2 ones from the 5 remaining units leaving 3 ones. Children use visual maths to subtract numbers with up to two decimal places including numbers which have different amounts of digits. They use place holders where necessary.  Examples are carefully structured beginning with questions that do not require exchange. When modelling this method, children's place value knowledge is reinforced. E.g. 3 hundredths take away 1 hundredth.  Once children have a secure conceptual understanding of subtraction of decimals, they move onto a formal written method. As with previous method, children's place value knowledge is reinforced through the modelling of this method.  

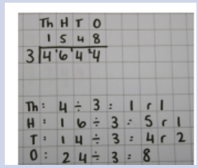
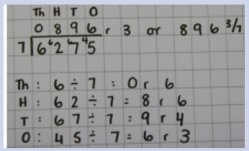
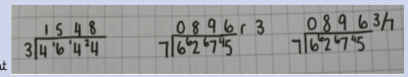
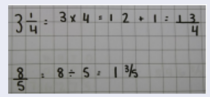
NC statement and guidance	CPA
Multiply a two-digit and a three-digit number by a one-digit number Children move on and secure method taught in Year 3 moving on to multiplying a three-digit number by a one-digit number. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Prior to this method, multiplication may be modelled using base ten equipment to begin initial conceptual understanding. Place value counters are then used. In the example above, 3 groups of 224 have been drawn. It is recognised that there are more than 10 ones and therefore 10 ones are regrouped to make 1 ten in the tens column. Examples are structured carefully beginning with those that do not require regrouping.  Children then move onto a pictorial representation. In the example (right), 3 groups of 224 have been drawn. Children then use their addition skills to find the total. Examples are structured carefully beginning with those that do not require regrouping.  Children then move onto a formal written method. They begin with an expanded method moving into the short method of multiplication.  Examples are structures carefully beginning with those that do not require regrouping. 
Divide a three-digit number by a one-digit number Progressing from Year 3, Year 4 bridge the gap between dividing a two-digit number by a one digit number and dividing a four-digit numbers by a one digit number. It is important that children progress carefully between concrete, pictorial and abstract methods. Note - as part of calculation, children are taught to estimate the answer to a calculation and use the inverse to check answers.	Prior to this method, division may be modelled using base ten equipment. Place value counters are used to represent the three-digit number.  Beginning in the hundreds column, the required amount of groups are then made (above). Starting in the hundreds column groups of 3 are made. When making groups of 3 in the tens columns there is 1 ten left over which is exchanged into the ones column. The 12 ones are then made into groups of 3. Examples are structured carefully beginning with those that do not have remainders. Once secure in the concrete method, children move onto a pictorial method by drawing the three-digit number that they are dividing. Beginning in the hundreds column, the required amount of groups are then made (right).  Examples are structured carefully beginning with those that do not have remainders. Finally, children move onto the formal written method first beginning with informal jottings.  The same place value conversations are modelled as in the previous methods. Examples are structured carefully beginning with those that do not have remainders. 
Add and subtract fractions with the same denominator Children progress into adding and subtracting fractions with the same denominator which go above a whole.	Children begin adding and subtracting fractions with same denominator using fraction bars.  As seen in the first example children draw 5/7s. They then shade in 6 more - they will recognise that in order to do this they would have to draw another fraction bar. Once the bar is drawn children can find a total. When subtracting children begin by shading the correct amount. They then cross out the required number and count the remainder.  Once secure, children move onto using a more abstract method.  Children recognise that when adding and subtracting fractions with the same denominator the denominator stays the same (as the sizes of the pieces are the same) we can then add or subtract the numerators. 

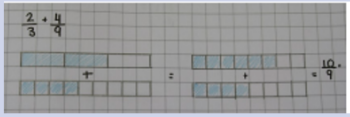
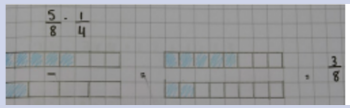
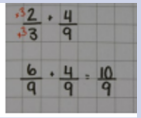
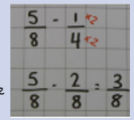
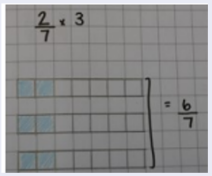
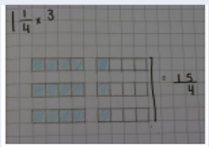
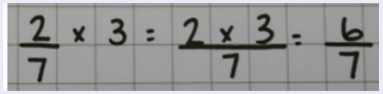
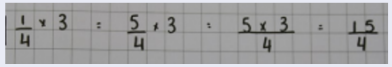
Calculation Policy Year 5

NC statement and guidance	CPA
Add whole numbers with more than 4 digits using the formal written method of addition Children develop their understanding of formal addition based methods taught in previous years. Concrete methods are used to develop conceptual understanding before moving on the pictorial and abstract methods used below. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children use a pictorial method to aid conceptual understanding of addition of whole numbers with more than four digits. Examples are carefully structured to begin with those that do not require regrouping. When modelled this method, children's place value knowledge is reinforced. E.g. 6 ones plus 1 one is 7 ones. 2 tens plus 2 tens is 4 tens.  Once children have a secure conceptual understanding of addition of whole numbers, they move onto the formal written. As with previous methods, children's place value knowledge is reinforced through the modelling of this method. 
Add decimals with up to 3 decimal places using the formal written method Children continue to building addition of decimals taught in Year 4. Concrete methods are used to develop conceptual understanding before moving on to the methods taught below. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children use visual maths to add numbers with up to three decimal places. They use place holders where necessary. Examples are carefully structured beginning with questions that do not require regrouping. When modelling this method, children's place value knowledge is reinforced. E.g. 0 thousandths plus 6 thousandths is 6 thousandths, 2 hundredths plus 3 hundredths is 5 hundredths, 9 tenths plus 4 tenths is 13 tenths. This is one unit and 3 tenths - we carry one unit over to the units column and so on.  Once children have a secure conceptual understanding of addition of decimals, they move onto a formal written method. As with previous methods, children's place value knowledge is reinforced through the modelling of this method. 

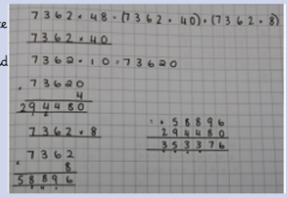
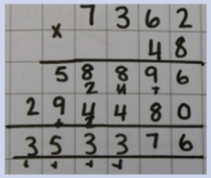
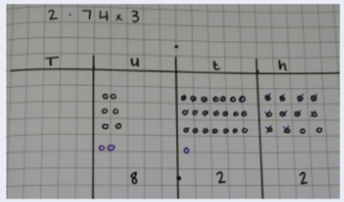
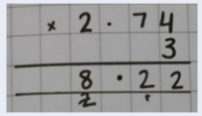
NC statement and guidance	CPA
Subtract numbers with more than four digits using the formal written method of subtraction Children develop their understanding of formal subtraction based on method taught in previous years. Concrete methods are used to develop conceptual understanding before moving onto the methods below. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children use a pictorial method to aid conceptual understanding of subtraction of whole numbers with more than four digits. Examples are carefully constructed to begin with those that do not require exchange. When modelling this method, children's place value knowledge is reinforced. E.g. one unit take away 6 units, we can not do this and therefore we need to exchange from the tens column.  Once children have a secure conceptual understanding of subtracting whole numbers, they move onto the formal written method. As with previous methods, children's place value knowledge is reinforced through the modelling of this method. 
Subtract numbers with 3 decimal places using the formal written method of subtraction Children continue to building up subtraction of decimals taught in Year 4. Concrete methods are used to develop conceptual understanding before moving onto the methods taught below. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children use visual maths to subtract numbers with up to three decimal places. They use place holders where necessary. Examples are carefully structured beginning with questions that do not require exchange. When modelling this method, children's place value knowledge is reinforced. E.g. 0 thousandths take away 2 thousandths  Once children have a secure conceptual understanding of subtraction of decimals, they move onto a formal written method. As with previous methods, children's place value knowledge is reinforced through the modelling of this method. 

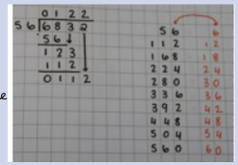
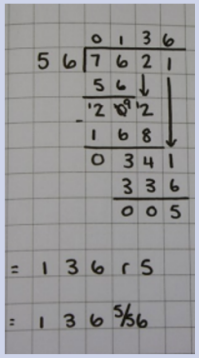
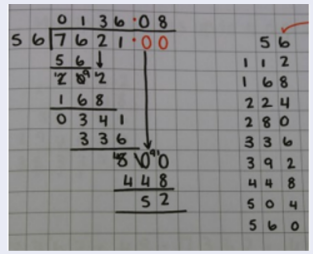
NC statement and guidance	CPA
Multiply a four-digit number by a one digit number using the formal written method of multiplication It is important when multiplying by a one-digit number that children are secure in their place value knowledge and can apply this to the method. If necessary, and to support conceptual understanding, refer to the concrete methods modelled for multiplying by a one-digit number in Year 4. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children extend upon their understanding of multiplying by a one-digit number taught in previous years. In this example, four groups of 7436 have been drawn. Children then use their addition skills to find the total.  Children move onto a less formal abstract method to help bridge the gap between a pictorial method and the formal written method.  Children move onto a formal written version of this however the same place value based conversations are still had when discussing and modelling. 
Use long multiplication to multiply two two-digit numbers Children are first introduced to multiplying by a two-digit number. Children base their understanding on a secure place value understanding of multiplying by a one-digit number. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children begin to understand multiplying by a 2-digit number as 2 calculations which are merged. They are multiplying by the number of ones, multiplying by the number of tens and the adding these values together. This can be seen in the example (right). 46 is multiplied by 30 (by multiplying by 3 and then multiplying by 10) 46 is then multiplied by 2. These values are then added together. Careful attention is made to the effect of multiplying by ten and why each time a whole number is multiplied by 10 there is a 0 in the ones column.  Children move onto the formal written method by understanding that they first multiplying their 2-digit number by the number of ones. Following their discussions from the previous method, a 0 is placed in the units column before continuing multiplying by the tens. These two calculations are then added together to reach the final answer. 

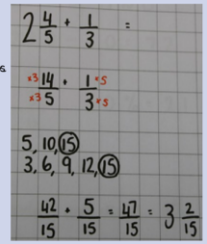
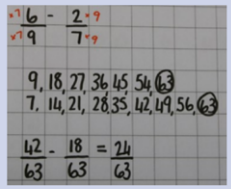
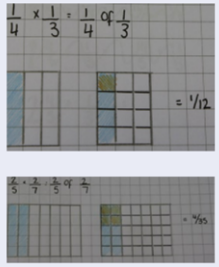
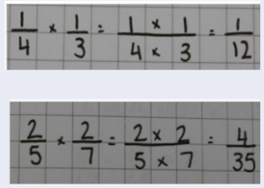
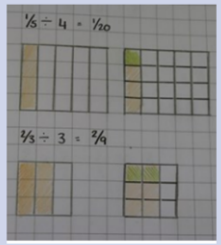
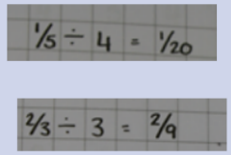
NC statement and guidance	CPA
Divide numbers with up to four digits by a one digit number and interpret remainders It is important that children are secure with their place value understanding of this method. Prior to modelling the formal method an abstract/pictorial method should be demonstrated. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Once children are secure with their conceptual understanding of this method a less formal abstract method is introduced and modelled alongside. As shown in the two examples (right), informal jottings are used for each process of the calculation.  Children move into writing remainders and remainders as fractions. In this case there were 3 remainders out of a group of 7.  Finally, children move on to a formal written method with out the use of jottings.  They can effectively discuss and explain the method with their use of place value knowledge.
Convert between mixed numbers and improper fractions	Fraction bars are first used to develop conceptual understanding. 3 and 1/4 represents 3 whole bars and 1/4 of a bar which is altogether 13/4.  When converting improper fractions to mixed numbers, children recognise that it is an improper fraction and therefore larger than one. They begin drawing fifths and shading eight in. One whole bar is shaded and 3/5 of another bar is shaded  Once conceptual understanding is developed, children move on to a more abstract approach. They understand that the whole number represents the whole number of bars that are shaded. Using the improper fractions they know how many equal pieces each bar is split into and therefore how many equal pieces are shaded in put the improper fraction.  When converting from improper to mixed numbers. Children know how they are trying to find how many whole bars are shaded in and what is left over. In the example (right), they are trying to make groups of 5. One whole group of 5 can be made from 8/5 and 3 left over which equals 1 whole and 3/5s.

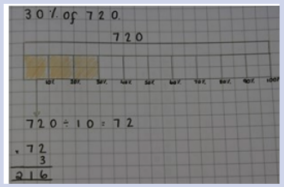
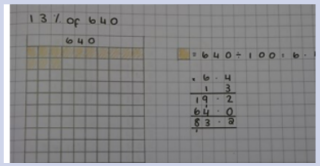
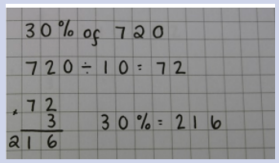
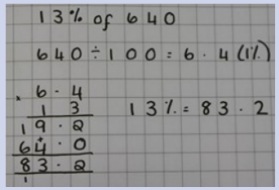
NC statement and guidance	CPA
Add and subtract fractions with denominators which are multiplies Children need to be secure in their addition and subtraction of fractions with the same denominator and why it is important that the denominator is the same before adding or subtracting.	Children recognise that in the two examples that are shown the calculation can not be completed yet because the denominators are not the same and therefore they are adding different sized pieces. Using fraction bars, they recognise that the fraction with the smallest denominator can be written as an equivalent fraction with the same denominator. Children draw fractions bars to represent and understand this process.   Children recognise that in the two examples that are shown the calculation can not be completed yet because the denominators are not the same and therefore they are adding different sized pieces. Looking at the fraction with the smallest denominator, using their multiplication knowledge, they see that they can multiply this fraction so that the denominator is the same as the same. Remembering that whatever is done to the denominator is also done to the numerator both are multiplied so that now both fractions have the same denominator. This can be seen in the orange on the examples. Once the denominators are the same, children can subtract.  
Multiply proper fractions and mixed numbers by a whole number	Children begin to understand multiplying proper and mixed number fractions by first using fraction bars. In the first example, 3 bards are drawn each representing 2/7. There are 6/7 shaded altogether. In the second example, mixed numbers are investigated. Three bars are drawn to represent 1 1/4. There are 15/5 shaded altogether.   When children conceptually understand this process, they move on to a more abstract method. They understand that the size of the pieces never changes and therefore the denominator doesn't change. The number of equal pieces increases by the value they are multiplying by. Therefore, the numerator is multiplied. When multiplying mixed numbers, this is first converted to an improper fraction and then the same method is applied.  

Calculation Policy Year 6

NC statement and guidance	CPA
Multiply numbers up to four digits by a two-digit number use long multiplication Children base their conceptual understanding on previous years. This can be reinforced prior to beginning teaching. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children begin to understand multiplying by a 2-digit number as 2 calculations which are merged. There are multiplying by the number of ones, multiplying by the number of tens and then adding these value together. This can be seen in the example (right). 7362 is multiplied by 40 (by multiplying by 10 and then multiplying by 4). 7362 is multiplied by 8. These values are then added together. Careful attention is made to the effect of multiplying by ten and why each time a whole number is multiplied by 10 there is a 0 in the ones column.  Children move onto the formal written method by understanding that they first multiply their 4-digit number by the number of ones. Following their discussions from the previous method, a 0 is placed in the ones column before continuing multiplying by the tens. These two calculations are then added together to reach the final answer. 
Multiply a one-digit number with 2 decimal places by a one-digit number When introducing multiplying decimals that children are secure in their place value knowledge. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	When introducing multiplying a decimal number by a one-digit number, a pictorial method is first introduced. In the example (right) 3 groups of 2.74 have been drawn in. It is then established that there are 12 hundredths which make 1 tenth and 2 hundredths and therefore 1 tenth is carried over. There are now 22 tenths which make 2 ones and 2 tenths and so 2 tenths are carried over. This gives 8.22 as an answer.  Children move onto a formal written version of this however the same place value based conversations are still have. E.g. 3 lots of 4 hundredths equals 12 hundredths - place 2 in the hundredths column and carry the 1 tenth over and so on. 

NC statement and guidance	CPA
Divide numbers up to four-digit by a two-digit number using long division writing remainders as whole numbers, fractions or rounding Time is spent to discuss the method used. Children understand the place value implications of the method being taught. Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	As a pre-curser to teaching long division children are taught a range of methods to find the first ten multiples of a two-digit number. Children look at the relationship between how the first ten multiples in the ones column end the same as the first ten multiples of the two-digit number. Children are encouraged as much as possible to find these first ten multiples mentally. However, where this is not possible informal jottings are used. When dividing by a two digit number, children first look in the thousands column. How many groups of 56 can you get out of 6? The answer is 0 so 0 groups written at the top. Children then move along - how many groups of 56 can I get out of 68? The answer is 1 so 1 group is written and the top and then taken away underneath leaving 12. Children can not take any groups of 56 from 12 and therefore the 3 from the tens column is bought down. How many groups of 56 can we get from 123? The answer is 2. Two groups are written at the top and then taken away underneath leaving 11. We can not get any groups of 56 from 11 so we bring down the 2. How many groups of 56 can we get from 112? The answer is 2. 2 groups are written at the tip and take away underneath leaving no remainders.  Using the long division taught children then interpret the remainder to fit the context that they have. When interpreting the remainder as a fraction, children look at how many are left out of the group they were trying to make. In this example there were 5 left out of a group of 56. 
Use written division in cases where the answer has up to decimal places Note - as part of calculation, children are taught to estimate and use rounding to check answers to calculations and determine, the context of a problem levels of accuracy	Children begin writing the first ten multiplies. Although children are encouraged to do this mentally as possible jottings can be used to support this. Children then follow the same division rules as previously demonstrated. In order to write the remainder as a decimal children place a decimal point as a 0 as a place holder in the tenths column. This 0 can be then bought down to form part of the calculation - no groups of 56 can be taken away from 50 so another 0 is placed as a place holder in the hundredths column. This 0 can then be bought down. Eight groups of 56 can be taken away from 500. Groups written at the top and taken away at the bottom. Children complete this process up to two decimal places. 

NC statement and guidance	CPA
Add and subtract fractions (including mixed numbers) with different denominators When adding and subtracting fractions pictorial methods from previous year may be used to support conceptual understanding.	When calculating with mixed numbers, these are converted into improper fractions first. Children will recognise that they can not add the fractions straight away as the denominators are not the same nor are the denominators multiples of each other. Children find the lowest common multiple. If confident, children do not need to write this step to find the lowest common multiple. Using this children convert so that the denominators are the same and then use this to add.  Children will recognise that they can not subtract the fractions straight away as the denominators are not the same nor are the denominators multiples of each other. Children find the lowest common multiple. If confident, children do not need to write this step to find the lowest common multiple. Using this children convert so that the denominators are the same and then use this to subtract. 
Multiply pairs of proper fractions	Children understand the multiplication as finding a fraction of another fraction. As seen in the example 1/4 of 1/3 (1/4 x 1/3). Children begin drawing a fraction bar of their starting fraction. In this case 1/3, as they are finding 1/4 **of** 1/3. They then share each third in quarters and shade in 1 as they want 1/4. Resulting in 1/12. This example is extended (right) where children are now finding 2/5 of each of the 2/7 that they have been shaded.  Children move on to an abstract approach. Using the understanding gained from the pictorial method, children multiply to the numerators and denominator to answer the multiplication. 
Divide proper fractions by a whole number	Children use fraction bars to represent division of fractions. They draw the fraction they are starting with as shown in orange. They then split each equal piece into the divisor. We would receive one of each of the new pieces. In the first example we would receive 1 out of now 20 equal pieces. In the second example, we would receive 1 piece from each of the thirds we started with. This would give out 2 out of now 9 equal pieces.  Children move on to not using a pictorial method and understand that when dividing the numerator stays the same as we will still receive the same number of equal pieces. We multiply the denominator as the size of those pieces gets smaller. 

NC statement and guidance	CPA
Solve problems involving the calculation of percentages	Children begin by using a bar to understand that there is 100% in a whole. Using this they find 10% and use this to find percentages of other multiples of ten.  When finding and using 1% children begin to understand this by using a hundreds square. With each square representing 1%. Children begin finding 1% and then move onto using 1% to find other percentages.  Children move on to not using the percentage bar or the percentages square as a representation.  

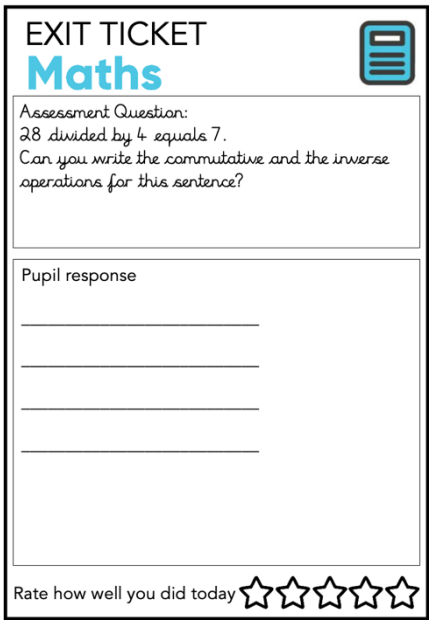
Impact

Assessment is the BRIDGE between teaching and learning

Formative assessment strategies

Assessment allows teachers to have a lens into a child's learning. We balance assessment carefully, to ensure that pupils feel supported but not overwhelmed by its use. Our principles around assessment are that it's purposeful and moves learning forward.

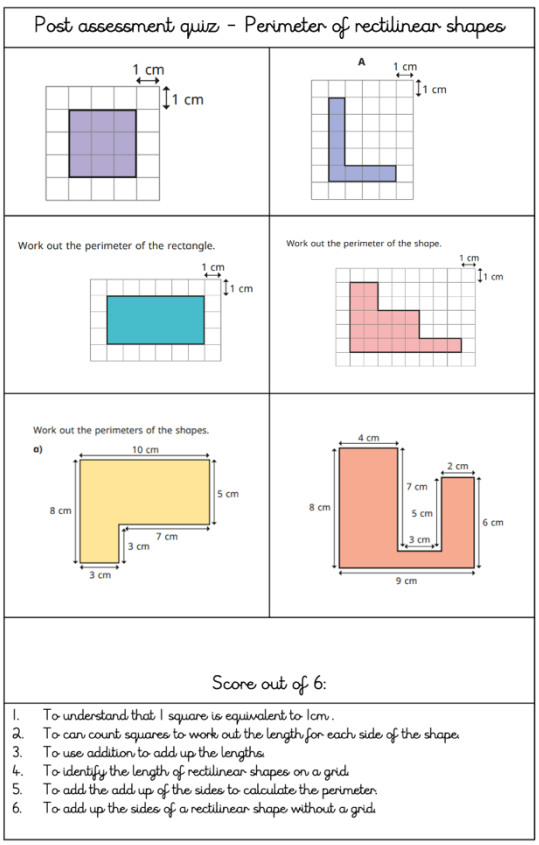
Exit tickets – assessment of learning between lessons


EXIT TICKET
Maths
Assessment Question:
28 divided by 4 equals 7.
Can you write the commutative and the inverse operations for this sentence?
Pupil response
Rate how well you did today

The exit ticket provides an assessment question to unpick how well a child has accessed the intended learning for that lesson. **The exit ticket should tangibly link to the objective or skill that the teacher has delivered.**

From this, teachers may deduce how successfully the child has understood the skill from an independent application task. This helps teachers to ensure that learning is building securely and cumulatively on prior knowledge.

When assessment demonstrates key gaps and issues, it provides teachers with an opportunity to rethink the objectives and sequence of learning the child is receiving.


Post assessment quiz – Perimeter of rectilinear shapes
Work out the perimeter of the rectangle.
Work out the perimeter of the shape.
Work out the perimeters of the shapes.
Score out of 6:
1. To understand that 1 square is equivalent to 1cm.
2. To can count squares to work out the length for each side of the shape.
3. To use addition to add up the lengths.
4. To identify the length of rectilinear shapes on a grid.
5. To add the add up of the sides to calculate the perimeter.
6. To add up the sides of a rectilinear shape without a grid.

Enhanced Learning Outcomes
Our commitment to utilising various assessment methods, including low-stakes quizzes, Next Steps for Learning (NSLs), and exit passes, has had a profound impact on student learning. These ongoing assessments allow teachers to identify individual strengths and areas that require improvement, leading to targeted support. As a result, our students consistently demonstrate improved performance and understanding of mathematical concepts, reflecting in their overall academic growth.

Personalised Learning
The implementation of pre and post-assessments for units of study ensures that our teaching is tailored to the specific needs of each student. These assessments enable us to gauge their baseline knowledge and measure their progress. Teachers use the insights gained from pre-assessments to precisely sequence the learning, ensuring that content is introduced in a way that builds on prior knowledge and challenges students at the right level. By personalising instruction based on these assessments, we empower every child to reach their full mathematical potential, promoting a sense of achievement and self-efficacy.

Gap Analysis and Intervention
Our use of PIXL termly tests has been instrumental in identifying gaps in knowledge among our students. The assessments bear resemblance to the end of key stage tests that pupils will face and are heavily weighted to the curriculum content taught in the term. Teachers can conduct in-depth gap analysis, allowing them to design targeted interventions and support strategies. This approach ensures that no child is left behind, as we address their individual learning needs promptly and effectively.

Success in Statutory Assessments
Through our rigorous mathematics curriculum and continuous assessment practices, our students feel supported and confident during the statutory assessments. These assessments are an accurate reflection of their mathematical proficiency and preparedness for the next academic level. Our focus on teaching not only to the test but to a deeper understanding of mathematical concepts equips our students to perform confidently in these assessments.

In summary, our comprehensive approach to mathematics assessment, encompassing both formative and summative methods, empowers our students to achieve their full mathematical potential. By combining personalised learning, targeted interventions, and success in statutory assessments, we ensure that each child at St Mary's not only meets but exceeds their mathematical goals.

Statutory assessments play a crucial role in tracking student progress within the Partnership. These assessments include the Early Years Foundation Stage (EYFS) baseline assessment, Year 4 Multiplication Tables Check (MTC), and Year 6 SATs. They provide valuable insights into students' development, ensuring they meet age-appropriate milestones and excel academically.