Sheringham
COMMUNITY PRIMARY SCHOOL & NURSERY

Calculation POLICY

Formally adopted by the Governing Body of Sheringham Community Primary & Nursery School	
On	1st September 2021
Chair of Governors	
Head Teacher	
Last updated	3rd January 2023
Review	January 2024

Be all that you can be…

Content

Introduction

It is our belief that the children at Sheringham Primary School will gain a deep, long term conceptual understanding of calculation in every concept that is secure and adaptable before moving onto the next. As stated in the main maths policy using the CARES Curriculum children are to have experiences that will equip them with skills to be able to calculate efficiently and confidently throughout their lives and fully understand each interlinked concept.

Intent

The main aims of this policy are in line with the new National curriculum 2014 and aim to ensure that all children:

- become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately

- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. (NC 2014)

Children will be able to:

- have a conceptual understanding of methods rather than a set of memorised procedures.

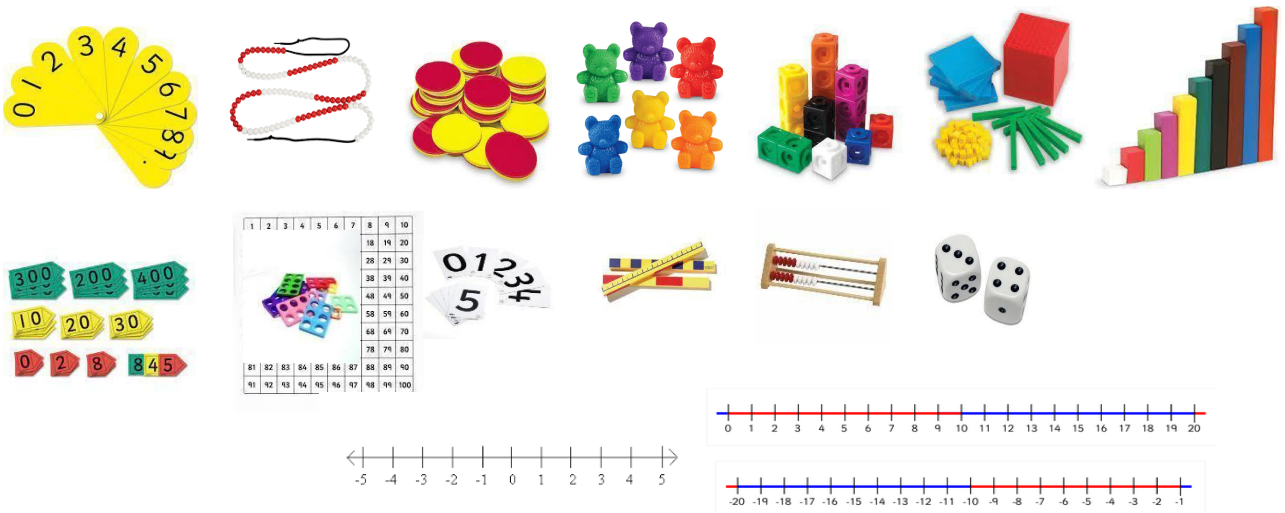
- use mathematical vocabulary correctly to communicate and share mathematical thinking.
- develop their relational understanding of new concepts, making connections through a CPA approach.
- demonstrate procedural and conceptual fluency in mental and written calculations from EYFS to KS2 and develop a depth of understanding using a mastery approach.
    - Confidently apply the appropriate method to any given context, be it familiar or unfamiliar, in maths lessons and across the curriculum

Representations

Pupils will have the opportunity to manipulate a wide variety of models and images and resources to choose the best representation for each calculation.

Representations are vitally important in developing conceptual understanding and supporting children's visualisation of the maths. Different concepts can be represented using the same resource/representation depending on the child's age and stage of mathematical development.

These will include Numicon, rekenreks, number lines, number fans, bead strings, counters, counting objects, cubes, Diennes, Cuisenaire rods, multilink, unifix, place value cards, 100 square, dice, arrow cards, digit cards, counting sticks, etc.



The Number Line

"Developing a number line is one of the strongest and most useful mental images in helping us to undertake mental calculations." Koshy 1999

In the children's mathematical development, the school will encourage the use of the number line as a model and image to support mathematical understanding.

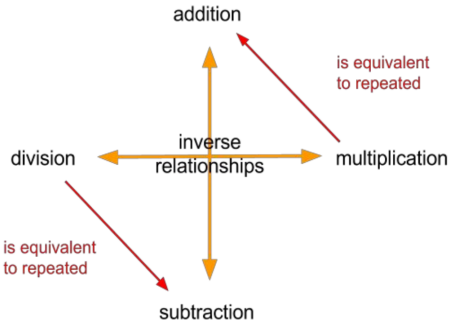
Mental images of number lines support place value and the development of efficient calculation methods, which consequently underpin the use of written calculation methods as stipulated by the NC documentation.

The number line is beneficial in its use as it will:

- Develops a child's mental imagery and spatial understanding of number
- Strongly develops sense/relationships of numbers
- Provides a progressive and consistent method of recording calculations
- Underpins children's acquisition of basic facts
- Allows a child to demonstrate a range of calculation strategies
- Enables more efficient methods to be developed

The Four Operations

All four calculations possess very strong links to each other. The basic ideas of addition and subtraction can be used to describe, estimate and calculate the more complex concepts of multiplication and division.



For these reasons it is vitally important that addition and subtraction and multiplication and division are taught alongside each other for the children to make links.

It is vital that all children have a conceptual and deep understanding of the mathematics and that no 'tricks' are taught as short cuts which can cause misconceptions to be embedded. For example, adding a zero when multiplying by ten does not support an understanding of place value.

Vocabulary

Communication of mathematical thinking is a vital skill and the children at SCPS are encouraged to verbalise their thinking with correct vocabulary using reasoning skills and sentence stems. For example, the term 'sum' will only be used to refer to an addition calculation

Bar Model

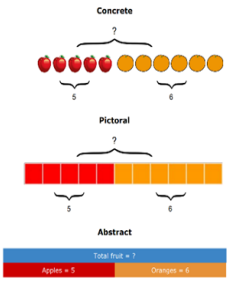
Bar Method – Problem Solving Approaches

The Bar method is a visual representation of a word problem. It allows the children to visualise the structure of the problem making it easier to see which parts of the problem are known and which are unknown. It is not a calculation tool. Once the problem is visualised then the appropriate number operations can be selected to solve it.

This also follows the Concrete – Pictorial – Abstract (CPA) model of conceptual understanding.

Part-whole model for addition and subtraction.

There are 5 apples and 6 oranges. How many pieces of fruit altogether?

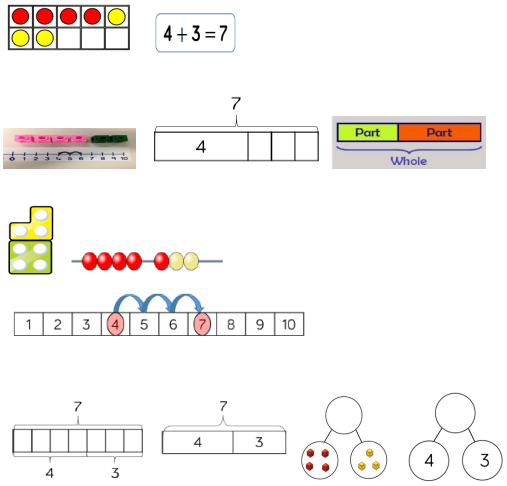
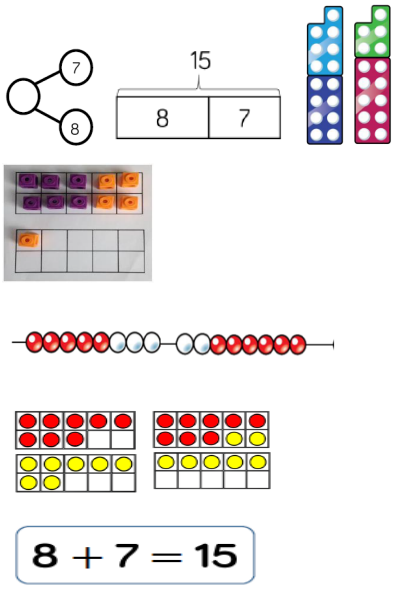


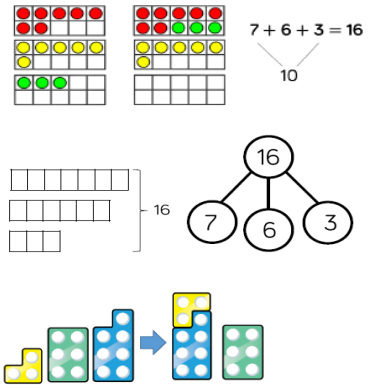
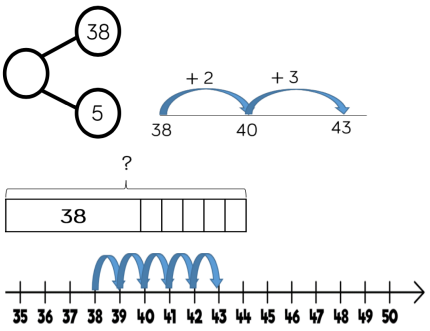
The bar method can also be used to help solve problems relating to multiplication, division, fractions, ratio and proportion. Through representing each part with bars, children can find the parts unknown and solve the problem. In each case, children should start with the

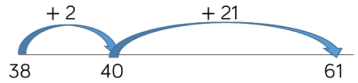
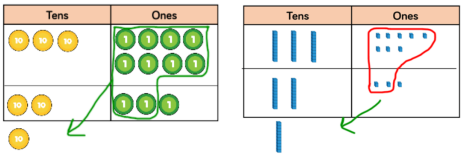
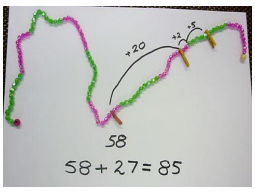
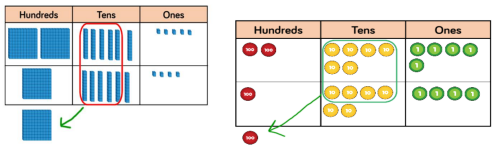
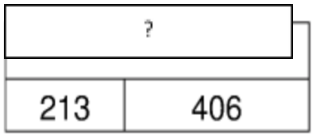
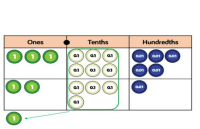
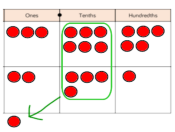
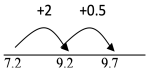
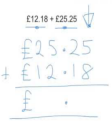
concrete model before moving onto a pictorial representation and then finally by using an abstract representation in the form of a bar, or bars.

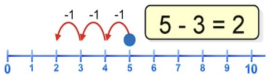
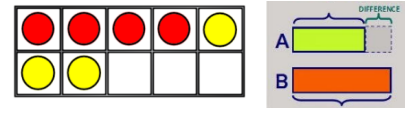
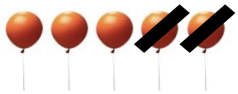
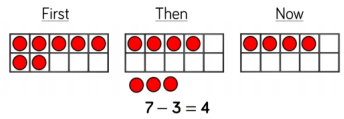
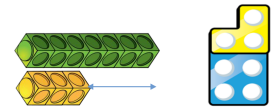
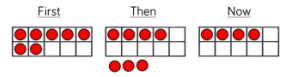
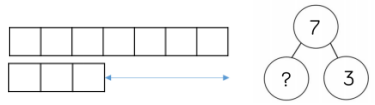
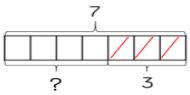
Progression of the calculations

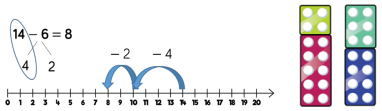
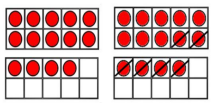
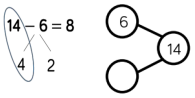
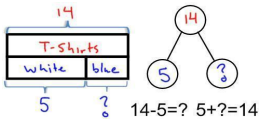
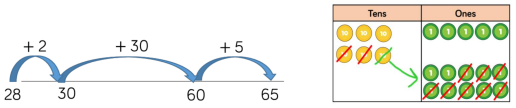
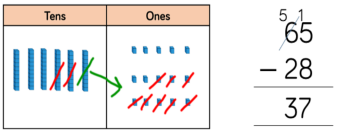
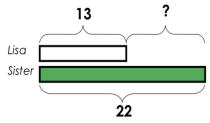
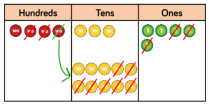
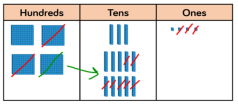
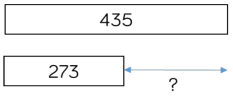
The progression of the calculations in this policy builds up in small steps. They are not year group dependent but dependent on the stage of learning of the individual or group of learners.

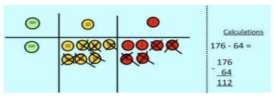
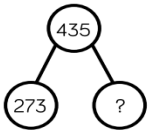
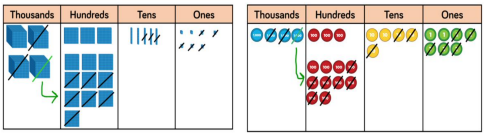
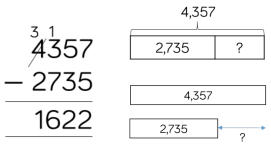
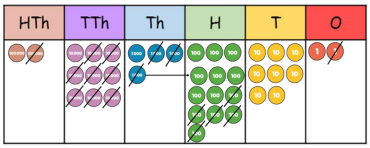
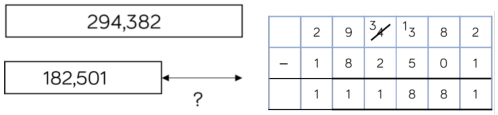
Addition & Subtraction		
Skills	**Representations showing Concrete/Pictorial/Abstract approaches**	**Explanation and Language**
Add two 1-digit numbers to 10		• **Aggregation –** combining two or more quantities to find a total • **Augmentation –** increasing by another quantity, i.e. counting on to find a total • Children can explore **Aggregation** with the use part/part/whole illustrations, cubes, numicon, bar model and ten frames. These will support the children's understanding of addition providing a conceptual understanding • Children can explore **Augmentation** with the use of bead-string, number line, bar model and number track. • It is important for children to be able to use a variety of different representations to enable them to develop a conceptual understanding. • **Addend –** a number to be added to another number **<u>Vocabulary for the children to learn</u>** • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole**
Add 1- and 2-digit numbers to 20		• It is important for children to have a clear understanding that when crossing 10, they should be clear that they group 10 ones to make ten, known as **unitising (the ability to see a group of objects as a single unit in its own right. For example, one ten being made up of ten ones).** • They will need to have a clear understanding of when adding 1 and 2-digit numbers that in crossing ten, they need to be fluent in grouping ten ones to make ten before counting on to 20 **<u>Vocabulary for the children to learn</u>** • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole** • **Partition**

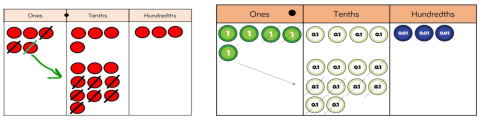
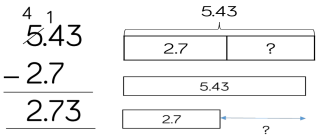
Add 3 1-digit numbers		• When adding three 1-digit numbers, children should be encouraged to 'make 10' for efficiency. • **Commutativity** *(change the order of numbers when adding and subtracting and the sum will not change)* should be explored to teach the children this particular law in mathematics to be explored further later on • The tens frame is effective in illustrating this point for children to be able to group numbers together to make ten – **unitising.** • Children will begin to bridge through 10 and later 20 **<u>Vocabulary for the children to learn</u>** • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole** • **Commutativity** • **Partition**
Add 1-digit and 2-digit numbers to hundred		• Children should be encouraged to count on from the smaller number utilising their knowledge of bonds to ten. • The use of bead strings and hundred squares will help children find bonds to ten. • It's important that children get lots of opportunities to use manipulatives to explore place value to scaffold the learning when attempting to bridge multiples of 10 and so on. **<u>Vocabulary for the children to learn</u>** • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole** • **Partition** • **Commutativity**

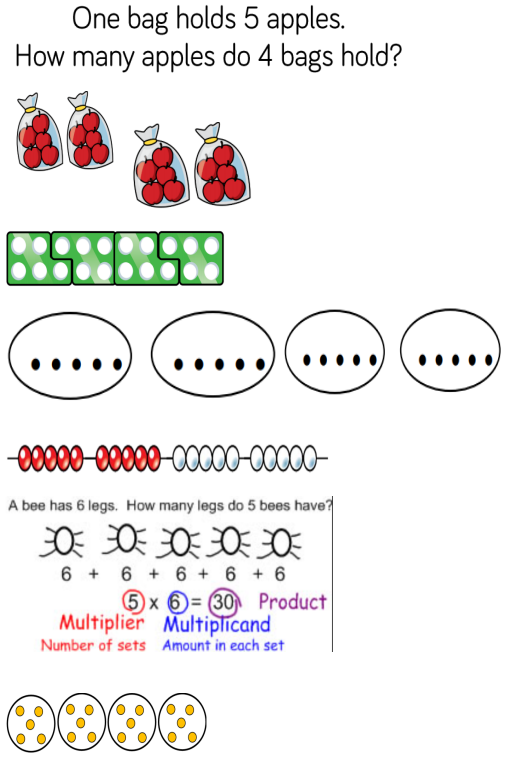
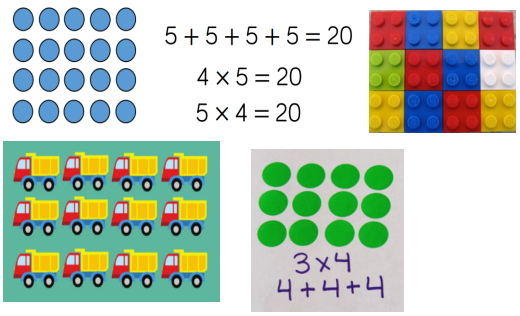
Add two 2-digit numbers to 100	  38 + 23 61 1 	• The use of the number line helps the children to become more efficient in their approach by finding the bond to ten and **partitioning** the numbers along the line more efficiently. • Children should be encouraged to use concrete resources such as place value counters. This way, children will begin to understand exchanging within the calculation. • Once secure with their understanding of exchanging and with a deep conceptual understanding of place value, children can begin to use a more formal method, alongside a pictorial representation. **<u>Vocabulary for the children to learn</u>** • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole** • **Commutativity** • **Exchange** • **Partition**
Add two 3-digit numbers	  265 + 164 429 1	• As children move forward, it is important that they have the written methods alongside pictorial representations to help them progress their understanding. This will be backed up with their conceptual understanding of place value with exchanging and bridging. • The bar model helps children to visualise the problem before any formal calculation takes place. **<u>Vocabulary for the children to learn</u>** • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole** • **Commutativity** • **Exchange** • **Partition**
Adding decimals	  3.65 + 2.41 6.06 1  	• Children can then be extended to adding numbers with decimals (with the same number of decimal places) and encouraged to use a place value holder to support their understanding of place value in relation to decimals • Children need to have a very secure understanding of decimals and their relationship with 1. • The use of the number line builds on the children's understanding of **partitioning**. The children should count on efficiently with whole numbers and then the decimals parts. • It is important that children have context when adding numbers with decimal places such as money and other measures.

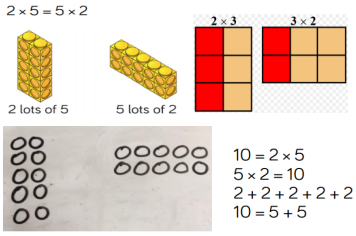
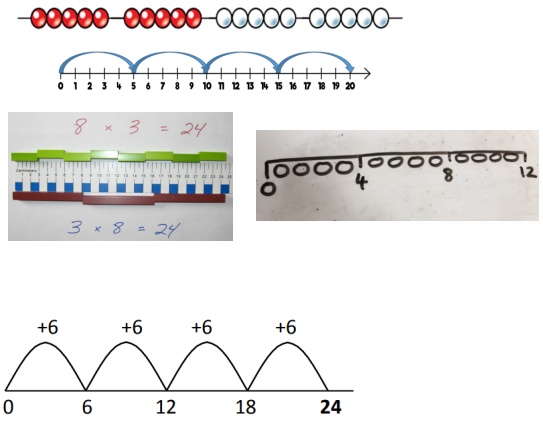
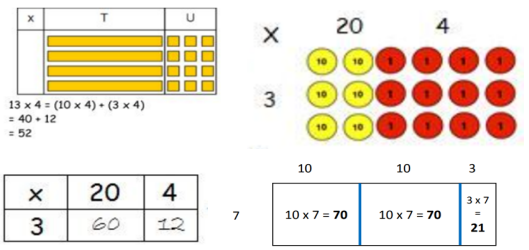
		Vocabulary for the children to learn • **Addend** • **Plus** • **Altogether** • **Total** • **Sum** • **Calculation** • **Equals** • **Part/whole** • **Commutativity** • **Exchange** • **Partition**
	Subtraction	
Skills	**Representations showing Concrete/Pictorial/Abstract approaches**	• **Explanation and Language**
Take away and finding the difference	   	• Children are taught **take away** as a means of subtraction, counting back from the right-hand side as the larger number would appear to the right of a number line. • **Finding the difference** is clearly represented using Numicon and the bar model as well as cubes. • Children should be given a context in which to begin to understand what **finding the difference** means so that they are able to begin to understand the mathematical concept. • Using the phrases, first, then, now helps the children to contextualise the calculation with a number story. **Vocabulary for the children to learn** • **Take away** • **Less than** • **Find the difference** • **Subtract**
Subtracting 1-digit numbers within 10	   	• The **minuend** (the number from which an amount is subtracted) can be represented using numicon and linking cubes so that children can physically manipulate the **subtrahend** (the number to be subtracted from the minuend) • Again, the bar model helps contextualise the problem for children. • The continued use of numicon helps reinforce children's knowledge of bonds which will aid fluency. **Vocabulary for the children to learn** • **Take away** • **Less than** • **Find the difference** • **Subtract** • **Minuend** • **Subtrahend**

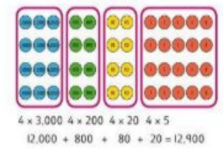
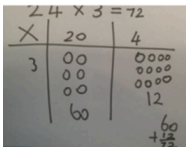
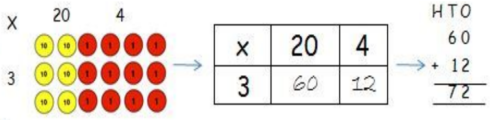
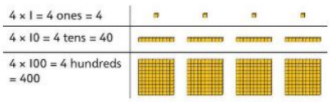
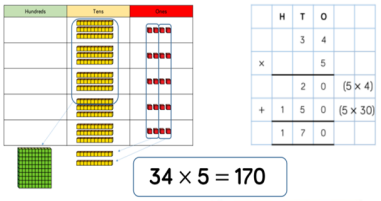
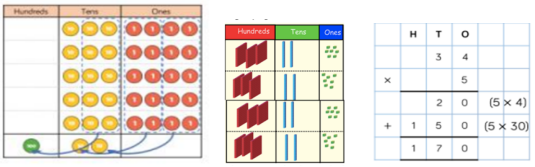
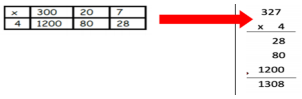
Subtract 1 and 2 digit numbers within 20	 14 – 6 = 8    14-5=? 5+?=14	• Children should be taught when crossing 10 the importance of **partitioning** so that they can use their bonds to 10 knowledge to efficiently subtract. • Tens frames and the number line clearly represent taking away and meeting bonds to ten. Children should count back to the 10 bond which promotes efficiency. • The part-part-whole and bar model help children to understand the **inverse** of calculations when adding and subtracting as well as helping them to understand the nature of subtraction itself. **Vocabulary for the children to learn** • **Take away** • **Less than** • **Find the difference** • **Subtract** • **Minuend** • **Subtrahend** • **Partition** • **Inverse**
Subtract 2- digits within 100	  *Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them.* 	• Children should use a blank number line to enable them to make efficient jumps in multiples of 10 when counting on to find the difference. • Children should first subtract without exchanging to see the positioning of digits and their value within the calculation. • The use of place value counters and base ten help the children to have a deeper understanding of exchanging where necessary. • Formal written methods should be modeled alongside pictorial representations to consolidate understanding. **Vocabulary for the children to learn** • **Take away** • **Less than** • **Find the difference** • **Subtract** • **Minuend** • **Subtrahend** • **Partition** • **Inverse** • **Exchange**
Subtracting numbers with up to 3-digits	  	• Children need to continue to explore the language of subtraction – **finding the difference** and **take away** with various representations to illustrate this. • The Bar model clearly illustrates finding the difference and the use of base ten and place value counters help the children to understand the concept of exchanging. • Formal written methods should be modeled alongside pictorial representations to scaffold their understanding **Vocabulary for the children to learn** • **Take away** • **Less than** • **Find the difference**

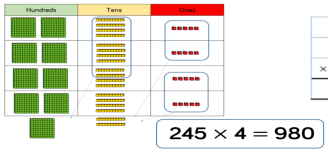
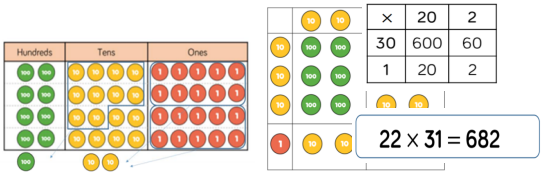
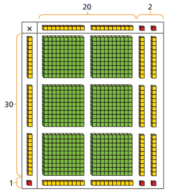
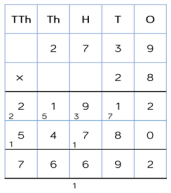
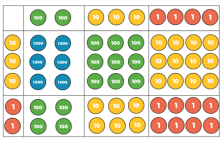
	  	• **Subtract** • **Minuend** • **Subtrahend** • **Partition** • **Inverse** • **Exchange**
Subtracting numbers with up to 4-digits	  	• Place value counters or blank counters on a place value grid support the children's understanding of place value within a subtraction calculation and helps support their presentation of four digit subtractions as a result. • Children should utilise their knowledge of place value firstly to subtract without exchange, moving onto exchanging as before. Key manipulatives to represent this are place value counters and base ten as illustrated. • The Bar model again illustrates the principle of finding the difference. **<u>Vocabulary for the children to learn</u>** • **Take away** • **Less than** • **Find the difference** • **Subtract** • **Minuend** • **Subtrahend** • **Partition** • **Inverse** • **Exchange**
Subtracting numbers with more than 4-digits	  	• Children should draw on their knowledge and understanding of place value and exchanging across the values to work with written methods alongside a clear pictorial representation such as place value charts to secure a deep conceptual understanding. • The use of number lines when subtracting four-digit numbers is not an efficient method here as it becomes cumbersome to manipulate. **<u>Vocabulary for the children to learn</u>** • **Take away** • **Less than** • **Find the difference** • **Subtract** • **Minuend** • **Subtrahend** • **Partition** • **Inverse** • **Exchange**

Subtracting numbers with decimal places	  	• Here children should have a deep conceptual understanding of place value. They need to have experience of subtracting decimals with a variety of decimal places and are encouraged to use place value holders so that they can recognise the position of digits within the calculation. • It is important that children have context when subtracting numbers with decimal places such as money and other measures. **<u>Vocabulary for the children to learn</u>** • **Take away** • **Less than** • **Find the difference** • **Subtract** • **Minuend** • **Subtrahend** • **Partition** • **Inverse** • **Exchange** • **Decimal place**

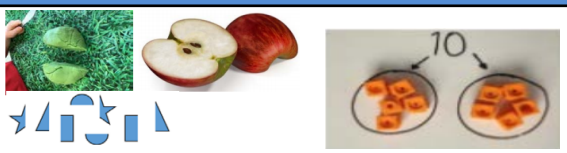
Multiplication		
Skills	**Representations showing Concrete/Pictorial/Abstract approaches**	**Explanation and Language**
Repeated addition/ repeated grouping of multiple objects		• Children should experience regular counting on and back from different numbers to support division and multiplication. • Use a wide range of resources to encourage a deep understanding of the concept of multiplication. • The children learn about grouping in practical contexts and through pictorial representations. • Through pictorial representations children show counting in groups and multiples. Dots, marks or tallies may be used for the representation and children should be encouraged to count in groups too. • Children show multiplication as repeated addition. As they understand multiplication they will learn to unitise and move from additive to multiplicative reasoning. • **Unitising** – is seeing the group as a unit rather than as individual ones • Introduce multiplication symbol for recording where children are ready • **Multiplier** – the number doing the multiplying, how many groups or lots of • **Multiplicand** – how many in the group being multiplied by • **Product** - the result of multiplying numbers together. • Please be aware that the image shows the multiplier x groups/lots of (multiplicand) **<u>Vocabulary for the children to learn</u>** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product**
Representation of the multiplication through an array		• Using an array will give a representation image of the multiplication that will helps the children to develop an understanding that the multiplication is commutative: • 2x3 and 3x2 will give the same product. • Introduce multiplication symbol for recording where children are ready • **Multiplier** – the number doing the multiplying, how many groups or lots of • **Multiplicand** – how many in the group being multiplied by • **Product** - the result of multiplying numbers together. • Please be aware that the image shows the multiplier x groups/lots of (multiplicand) **<u>Vocabulary for the children to learn</u>** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product**

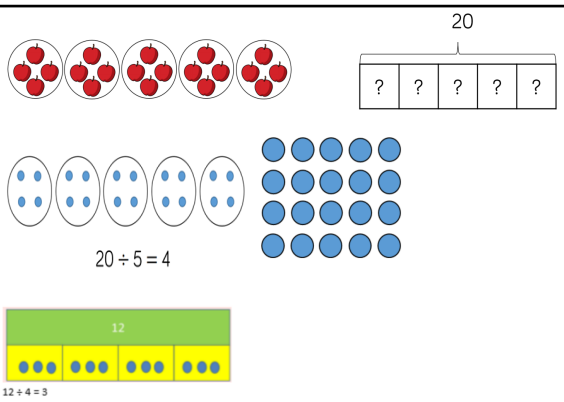
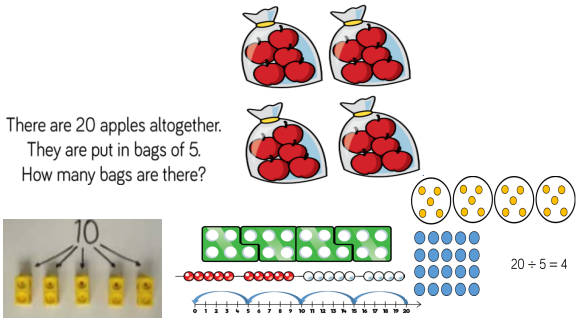
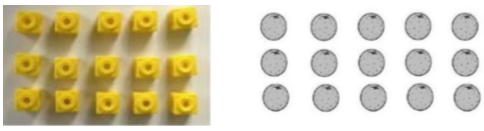
		• **Array** • **commutativity**
Arrays to illustrate commutativity		• Counters, other objects, and pictorial representations can be used to support the understanding of commutativity. • **Commutativity** – you can change the order of the numbers when multiplying and the product will not change. **Vocabulary for the children to learn** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **commutativity**
Number lines for repeated addition and multiplication.		• The use of an empty or blank number line will support the understanding of repeated addition. • Children will use an empty number line to show multiplication as repeated addition. • Bead strings and Rekenreks may be used to support conceptual understanding. • Introduce multiplication symbol for recording where children are ready • **Multiplier** – the number doing the multiplying, how many groups or lots of • **Multiplicand** – how many in the group being multiplied by • **Product** - the result of multiplying numbers together. **Vocabulary for the children to learn** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **Commutativity**
Grid method (Using CPA)		• Children may need to use concrete representations of the partitioning process to support their conceptual understanding. • The partitioning of numbers into tens and ones and efficient non-canonical partitioning will need to be taught as a skill through the teaching of the grid. **Vocabulary for the children to learn** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **Commutativity**

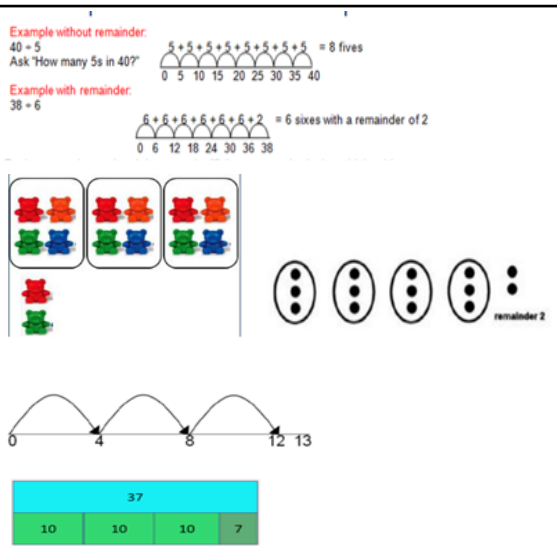
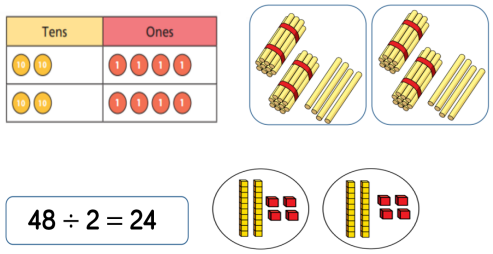
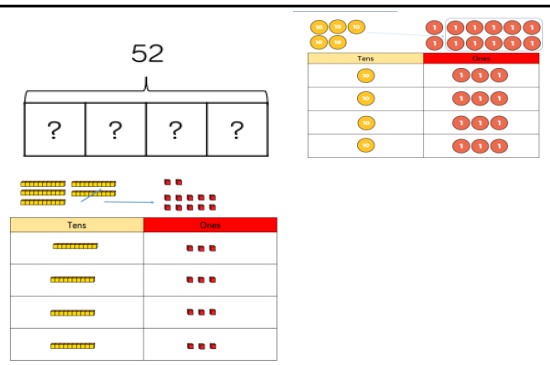
		• **Non-canonical Partitioning**
Grid method as a progression towards formal multiplication	   Use place value equipment to multiply by 10, 100 and 1,000 by unitising.  **Grid method** X 30 6 4 120 24 Leading to expanded method 36 x 4 24 (6 x 4) 120 (30 x 4) 144 36 x 4 144 2	• Link the grid to arrays with representations to support the conceptual understanding. • Children need to be taught that arrays/grids should be proportional to represent the size of the amount within the section. • Linking the arrays with the dienes, place value counters and the abstract calculations supports the children's understanding of the conceptual understanding • Unitising – is seeing the group as a unit rather than as individual ones • Multiply one digit number by one digit number to solve problems • Array with concrete resources will progress to the grid method then to the expanded column method showing each stage allowing for conceptual understanding. • Known facts should be used to multiply. **Vocabulary for the children to learn** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **Commutativity** • **Non-canonical Partitioning**
Column Multiplication	  	• Children will need to be supported by place value counters, dienes and pictorial representations at this stage of multiplication for conceptual understanding. • Manipulatives should only be removed once children have a very secure understanding of place value and fluency in multiplication using the expanded method. **Vocabulary for the children to learn** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **Commutativity** • **Non-canonical Partitioning**

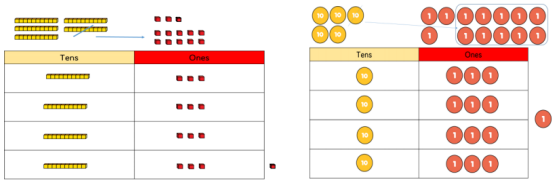
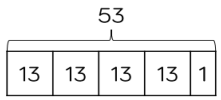
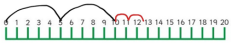
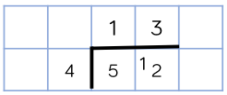
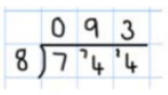
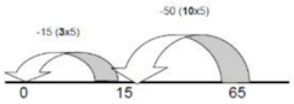
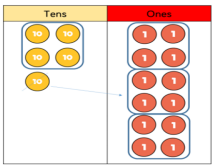
Column multiplication (continuing onto 2-digit numbers by 2 digit numbers)	  	• Base ten/dienes and place value counters will continue to support the understanding of the written. • Children will need to continue using the expanded calculation to support their understanding of the visual representation when moving into formal. • Manipulatives should only be removed once children have a very secure understanding of place value and fluency in multiplication using the expanded method. **Vocabulary for the children to learn** • **Groups ˙/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **Commutativity** • **Non-canonical Partitioning**
Multiplying beyond into multi digit multiplication.	 2,739 × 28 = 76,692 234 × 32 = 7,488 × 200 30 4 30 6,000 900 120 2 400 60 8  Th H T O 2 3 4 × 3 2 4 6 8 1 0 2 0 7 4 8 8	• When multiplying a multi-digit digit number by 2-digits use the area model to help children to understand the size of the numbers they are using. This will link to finding the area of a rectangle by finding the size of the shape covered. • The grid method matches the area model as an initial method. • Reinforce language of place value when multiplying by multiples of 10. • Extend to 3 or 4-digit numbers multiplied by a 2-digit number. **Vocabulary for the children to learn** • **Groups of/lots of** • **Repeated addition** • **Multiply** • **Product** • **Array** • **Commutativity** • **Non-canonical Partitioning**

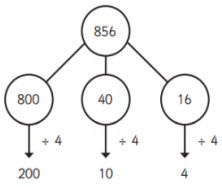
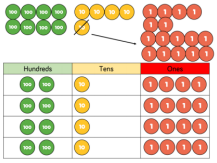
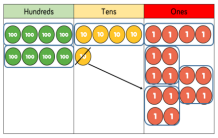
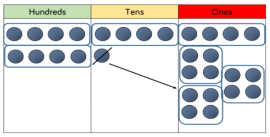
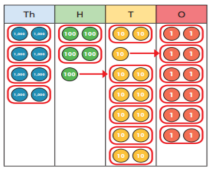
Division

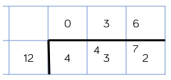
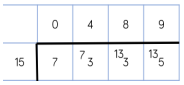
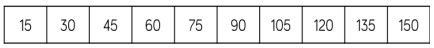
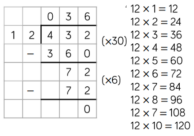
Skills	Representations showing Concrete/Pictorial/Abstract approaches	Explanation and Language
Division by sharing		• Children should experience regular counting on and back from different numbers to support division and multiplication. • They should begin to recognise the number of groups counted to support understanding of the relationship between multiplication and division. • Children to solve problems by sharing amounts of a wide range of objects into equal groups. • Children use concrete, pictorial representations. Once they are secure, they can be introduced to the division symbol but not before. • When sharing pictorial images, use circles rather than dots to aid counting.

		• Children should also be introduced to halving into equal groups to make links to fractions. • **Sharing** - sharing the total (dividend) number by the divisor • **Divisor** – Amount being shared by • **Quotient** – amount in each group. **Vocabulary for the children to learn** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient**
Division by grouping		• Children solve problems by grouping. • Grouping encourages children to count in multiples and make the links with counting backwards and repeated subtraction. This will link to the use of a number line. • Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. • **Grouping** – Finding how many groups of the divisor in the total number **Vocabulary for the children to learn** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient**
Division with arrays		• Make links to multiplication by making arrays and creating number sentences. • Progress to using the grid method for division. **Vocabulary for the children to learn** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays**

Sharing with remainders		• Divide objects between groups and see how much is left over. • Objects can be drawn in circles to aid dividing pictorially remainders will be seen by not fitting into a whole group. • Use number line and bar model to illustrate pictorial representation. **Vocabulary for the children to learn** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder**
Division of 2 digit by one digit (with no exchange		• When dividing children can use manipulatives that allow them to partition. Straws, base Ten, place values counters can be used to share numbers into equal groups. **Vocabulary for the children to learn** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder**
Dividing 2 digit by 1 digit with exchanging		• Children should be encouraged to use manipulatives to physically exchange tens for ones. Appropriate resources are place value counters, base ten. • Use of these manipulatives firstly outside the place value grid supports the understanding of exchanging. • The bar model can be used to provide a clear understanding of the problem being asked to give a clearer picture alongside the manipulatives to provide a clearer understanding. **Vocabulary for the children to learn** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient**

		• **Arrays** • **Remainder** • **Exchange**
Dividing 2 digit by 1 digit (sharing with remainders)	  53 ÷ 4 = 13 r1 12 ÷ 5 = 2 r 2 	• Children should be encouraged to use place value counters and base ten. If they manipulate these outside the place value grid in the first instance, they will be able to see the remainders that are left behind once the equal groups have been made. • Modeling the bar model alongside the place value grids will help children to see the relationship between equal groups and remainders. • Illustrating a division calculation along a number line helps children to visualise the number line and the equal groups (divisor)in the calculation as well as any remainders outside the equal groups. **<u>Vocabulary for the children to learn</u>** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange**
Dividing 2 digit by 1 digit by grouping	 52 ÷ 4 = 13 Continue to use blank number lines as appropriate, using multiples of the divisor. 65 ÷ 5 = 13   	• When using grouping in short division, children should start with the largest place value and grouping by the divisor. • Language is key here! Children are to ask "How many groups of 4 ten can we make?" and then "How many groups of 4 ones can we make?" Any remainders will be clearly shown as left behind and ungrouped. • Children should be made aware that a zero is used to represent a number that is not divisible. **<u>Vocabulary for the children to learn</u>** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange**

Dividing 3 digit by 1 digit by sharing	 **844 ÷ 4 = 122**  **856 ÷ 4 =**	• Part/Part/Whole models with flexible partitioning enable children to use their knowledge of partitioning and multiples of the divisor to efficiently find the quotient. • Children are to continue using place value counters outside the place value grid initially to help with exchanging before grouping into equal groups (divisor) and highlighting any remainders. • Blank number lines are less efficient here as the dividend will be too great to manipulate with single digit divisors. **<u>Vocabulary for the children to learn</u>** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange** • **Partition**
Dividing 3 digit by 1 digit with grouping	  **856 ÷ 4 = 214** 2 1 4 4 8 5 16	• Children continue to use place value counters and grouping and later by drawing to support this understanding. • Once children have a deep conceptual understanding of dividing with grouping, model the written method alongside to reinforce this concept. **<u>Vocabulary for the children to learn</u>** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange** • **Partition**
Dividing 4 digit numbers by 1 (grouping)	 **8,532 ÷ 2 = 4,266** 4 2 6 6 2 8 5 13 12	• Place value counters can be moved on a place value grid to support grouping and exchanging. Drawing counters moves children towards a more pictorial representation. • Be mindful that multiple exchanges can become confusing when children are drawing and manipulating counters here and so, when children have a conceptual understanding of exchange, a written method should be modeled alongside to consolidate the understanding. **<u>Vocabulary for the children to learn</u>**

		• **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange** • **Partition**
Dividing multi digits by 2 digits	$432 \div 12 = 36$  $7{,}335 \div 15 = 489$   15 30 45 60 75 90 105 120 135 150	• As children move on to dividing multi digits by 2 digits, the use of manipulatives can become confusing. Therefore, children should only move on once they have a secure deep conceptual understanding of division and exchanging. • When children are using written methods, they should write out multiples alongside the calculations to support finding the number of groups within the calculation. **<u>Vocabulary for the children to learn</u>** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange** • **Partition**
Dividing multi digits by 2 digits (long division)	 $12 \times 1 = 12$ $12 \times 2 = 24$ $12 \times 3 = 36$ $12 \times 4 = 48$ $12 \times 5 = 60$ $12 \times 6 = 72$ $12 \times 7 = 84$ $12 \times 8 = 96$ $12 \times 7 = 108$ $12 \times 10 = 120$ $432 \div 12 = 36$	• Only when children have a **DEEP CONCEPTUAL UNDERSTANDING OF DIVISION AND EXCHANGING** should they move onto long division. Again, writing multiples alongside the calculation helps to find the number of groups. **<u>Vocabulary for the children to learn</u>** • **Share** • **Divide** • **Equal groups** • **Repeated subtraction** • **Divisor** • **Quotient** • **Arrays** • **Remainder** • **Exchange** • **Partition**

<u>CARES Curriculum</u>

CARES (**C**ommunity, **A**spiration, **R**esilience, Emotional Well-Being)**:**

In addition to the coverage of the national curriculum, Sheringham Community Primary School & Nursery have prioritised four extra elements, based on extensive consultation with stakeholders, designed specifically to meet the needs of the children growing up in our context.
They are Community, Aspiration, Resilience and Emotional Well-Being.

Community

We aim to provide carefully sequenced cumulative work which allows learners to make connections between different mathematical concepts and contexts building on prior learning and understanding how the mathematics fits into all aspects of life.

Aspiration

It is our aim that all pupils can achieve success in mathematics, through mastering the numbers system, developing mathematical thinking and vocabulary, exploring mathematical concepts and explain processes by proving their mathematical ideas.

Resilience

We aim to provide a mathematics curriculum which will allow all pupils to become resilient, confident, and independent mathematical learners who build on immediate feedback and intervention and by retrieving, using and applying concepts regularly, develop fluency as well as conceptual understanding.

Emotional

We aim to develop a growth mindset 'can do' attitude towards mathematics giving children opportunities to fully explore mathematical concepts, using a range of manipulatives and models which enable pupils to represent ideas, make connections and experience the joy of mathematics.

Skills and Knowledge

Mathematical understanding is not about memorising facts and procedures: it is about enquiry to develop an understanding in and manipulation of numbers to problem solve. We aim to encourage pupils to find multiple routes to solve problems, reason about mathematics and through carefully scaffolded question provoke pupils to think beyond the surface.

Inclusion

All children have equal access to the curriculum regardless of background, prior attainment or SEND. We aim to incorporate mathematics into a range of experiences enabling all pupils to achieve success and reach as high a standard as possible.
Further information can be found in our statement of equality information and objectives, and in our SEN policy and information report.

Links to Policies:

This policy should be read in conjunction with the:

- EYFS Policy
- Feedback Policy
- Assessment, Recording & Reporting Policy
- Homework Policy
- SEN Information Report
- Calculation Policy

This policy reflects the requirements of the National Curriculum programmes of study, which all maintained schools in England must teach.

In addition, this policy acknowledges the requirements for promoting the learning and development of children set out in the Early Years Foundation Stage (EYFS) statutory framework

Monitoring and review

We are aware of the need to review and update the school mathematics policy regularly to take into account of new initiatives, changes in the curriculum and assessment. We will review this policy in September 2022.

Policy Signed by:

_____	**Head Teacher**	**Date:**	_____
_____	**Chair of Governors**	**Date:**	_____

Next review date: September 2022