

Maths Calculation Policy

'Learning and growing, side by side in God's love.'



Maths in Early Years Foundation Stage (EYFS)

At Eastry C.E Primary School, we believe that Mathematics is an important part of learning for all children in the early years and receiving a good grounding in maths is an essential life skill. We are committed to delivering a rich and varied curriculum that not only focuses on number but also supports skills such as problem solving, understanding and using shapes as well as measure and developing skills in spatial awareness.

In EYFS by the end of the year, children should be able to:

Have a deep understanding of number to 10, including the composition of each number.

• Subitise (recognise quantities without counting) up to 5.

• Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally



Maths in Early Years Foundation Stage (EYFS)

Children in the EYFS learn by playing and exploring, being active and through creative and critical thinking which can take place both indoors and outside and link to life experiences.

Mathematical understanding can be developed through stories, songs, games, routine, questioning, imaginative play, real life scenarios, child initiated learning and structured teacher led activities.

I have one banana and three ▫◈◲छਫ਼ apples. How many pieces of fruit Ten Frames do I have altogether? فک افک $(\bullet \bullet)(\bullet \bullet)(\bullet \bullet)(\bullet \bullet)$ How many leaves I have six cakes and I eat 5 have I found? two. How many are left? 6

EYFS vocabulary: number, add, zero, take away, equal, forwards, backwards, many, altogether, left, more, less, double, share, same, half, digit, one(s) circle, square, triangle rectangle, oval, cube, cuboid, sphere, cylinder, side, corner, edge, round, pointy, bigger(est) smaller(est) taller(est) shorter(est) heavier(est) lighter(est) longer(est), full (er/est) empty(ier/est) on top, behind, next to, between, in front, on top, under, inside, time, today, yesterday, tomorrow, first, next, finally, afterwards, compare

Children are encouraged to record their understanding through mark making and informal jottings:

Visual and concrete resources are also used when counting, adding or subtracting 1 digit numbers, sharing into aroups or doubling:





Year 1 Addition key vocabulary: ones, tens, digit, fewest, largest, greatest, sum, missing number, total

| Objective & | Concrete | Pictorial | Abstract | • |
|--|--|---|--|---|
| Strategy | | | | V |
| Adding multiples of ten | 50 = 30 + 20 | 2 tons + 5 tons tons 30 + 50 = | 20 + 30 = 50 70 = 50 + 20 40 + 🗆 = 60 | |
| Use known number facts Part part whole | 20 Service A state of the stat | This can be represented using a bar model. | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| Using known facts | $\begin{array}{c} \Box \Box \Box + \Box \Box \Box = & \Box \Box \Box \Box \Box \\ \Box \Box \Box + & \Box \Box \Box = & \Box \Box \Box \Box \Box \Box \\ Three and three makes six. So three tens and three tens make six tens. \end{array}$ | $\begin{array}{cccc} & + & & & \vdots & \\ & & & & & \\ & & & & \\ & & & &$ | 3 + 4 = 7 leads to 30 + 40 = 70 leads to 300 + 400 = 700 | |
| Bar model | | 7 + 3 = 10 | 23 25 ? 23 + 25 = 48 | |

1Str

Year 2 Addition key vocabulary: exchange, hundred, order, compare, equivalent, sequence,



Year 2 Addition key vocabulary: exchange, hundred, order, compare, equivalent, sequence,





Year 3 Addition key vocabulary: one hundred more, thousand, column, commutative, complement





Year 4-6 Addition Key vocabulary: ten thousand, hundred thousand, million, inverse,, tenths, hundredths, thousandths, digit total, standard method, ascending, decimal



Year 1 Subtraction Key vocabulary: subtract, most, least, ones, tens, digit, fewest, largest, greatest, number sentence, missing number



Year 1 Subtraction Key vocabulary: number, zero, subtract, equal, forwards, backwards, most, least, many, left, ones, tens, digit, fewest, largest, greatest, sum, missing number



| Objective & Strategy | Concrete | Pictorial | Abstract | | |
|--|--|--|--|--|--|
| Exchange a ten into ten ones. | Use Dienes to show how to change a ten into ten ones, use the term, 'take and make.' | ≊≊ <i>≇≋≇</i> 20−4 = | 20—4 = 16 'The difference between twenty and four is sixteen.' | | |
| Subtract 1 and 2 digit numbers to 100 without an exchange. | 34-13 = 21 | Children draw representations of Dienes and cross off. $ \begin{array}{c} $ | 43-21 = 22 'Three ones minus one equals two ones. Four tens minus two tens equals two tens. Forty three minus twenty one is twenty two.' Column 43 subtraction may be used -21 without an exchange. 22 | | |
| Make ten strategy Progression should be crossing one ten, crossing more than one ten, cross- ing the hundreds. | 34-28 Use a bead bar or bead strings to model counting to next ten and the rest. | 76 80 90 93 'counting on' to find 'difference' Use a number line to count on to next ten and then the rest. | 93—76 = 17 | | |
| | | | | | |

Year 2 Subtraction key vocabulary: numeral, teen, exchange, hundred, thousand, order, compare, equivalent, sequence, difference, tens



| Objective & | Concrete | Pictorial | Abstract | ٧J |
|--|--|---|--|-------|
| Strategy Column subtraction without an exchange (up to 3 digits). | HundredsTensOnes10010101100101011001011100111 </td <td>HundredsTensOnesImage: Constraint of the second second</td> <td>358 – 132 = 226 358 <u>- 132</u> 226</td> <td>1 J</td> | HundredsTensOnesImage: Constraint of the second | 358 – 132 = 226 358 <u>- 132</u> 226 | 1 J |
| Column subtraction with an exchange (up to 3 digits). | Tens Ones Image: Construction of the second seco | Tens Ones O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O Children may draw base ten or PV counters and cross off. O </td <td>5,1 65 -28 37 Then move to formal method.</td> <td>BTRAC</td> | 5,1 65 -28 37 Then move to formal method. | BTRAC |
| | 273 | A35 ? | ³ 435 - 273 262 | |

Year 3 Subtraction key vocabulary: one hundred less, hundreds, inverse





Year 4-6 Subtraction key vocabulary: descending, standard method, thousandths, hundredths, ten thousand, hundred thousand, million, decimal, tenths



Year 1 Multiplication key vocabulary ones, tens, digit, multiplication, multiply, lots of, array, equal groups



| Objective & | Concrete | Pictorial | Abstract | V |
|---------------------------|---|---|--|---|
| Repeated addition | Use different objects to add equal groups | Use pictorial including number lines to solve prob There are 3 sweets in one bag. How many sweets are in 5 bags altogether? | Write addition sentences to describe objects and pictures.Image: sentences to describe objects | |
| Understanding ar- rays | Use objects laid out in arrays to find the an- swers to 2 lots 5, 3 lots of 2 etc. | Draw representations of arrays to show understanding. | $3 \times 2 = 6$ $2 \times 5 = 10$ 3 + 3 = 6 2 + 2 + 2 + 2 + 2 = 10 | |

Year 1 Multiplication key vocabulary: ones, tens, digit, multiplication, multiply, lots of, array





Year 2 Multiplication key vocabulary: numeral, teen, hundred, thousand, order, equivalent, sequence, row, column, multiplication fact, times, repeated addition,



| Objective & | Concrete | Pictorial | Abstract |
|---|--|---|---|
| Strategy | | | |
| Multiplication is commutative | Create arrays using counters and cubes and Numicon. | Use representations of arrays to show different calculations and explore commutativity. | $12 = 3 \times 4$ $12 = 4 \times 3$ Use an array to write multiplication sentences and reinforce repeated addition. $0 = 0 = 0$ $5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$ |
| Using the Inverse This should be taught alongside division, so pupils learn how they work alongside each other. | | 4 x 3 = 12 4 x 3 = 12 12 ÷ 3 = 4 3 x 4 = 12 12 ÷ 4 = 3 | 2 x 4 = 8 4 x 2 = 8 8 ÷ 2 = 4 8 ÷ 4 = 2 8 = 2 x 4 8 = 4 x 2 2 = 8 ÷ 4 4 = 8÷ 2 Show all 8 related fact family sentences. |

Year 2 Multiplication key vocabulary: numeral, teen, hundred, thousand, order, equivalent, sequence, row, column, multiplication fact, times, repeated addition,



Year 3 Multiplication key vocabulary: product, digit total, commutative







| Objective & | Concrete | Pictorial | Abstract | VC |
|--|----------|-----------|---|-----------|
| Strategy | | | | TO |
| Multiplying decimals up to 2 decimal plac- es by a single digit. | | | Remind children that the single digit belongs in the ones column and to line up the decimal points in the question and answer. | <u> </u> |
| | | | 3 · 1 9 × 8 2 5 · 5 2 | |
| | | | 'Eight groups of nine hundredths is seventy two hundredths, which is the same as seven tenths and two hundredths. Eight groups of one tenths makes eight tenths; add the seven tenths to give a total of fifteen tenths, which is the same as one whole and five tenths. Eight groups of three makes twenty four; add on the extra one whole one, to make twenty five ones' | PLICATION |
| | | | | |



Year 1 Division key vocabulary: ones, tens, digit, division, divide,



Year 2 Division key vocabulary: hundred, division fact, equal groups, share equally, left over,





Year 3 Division key vocabulary: remainder,







| Objective & Strategy | Concrete | Pictorial | Abstract | Y5.6 |
|--|---|--|--|--------|
| Divide at least 3 digit numbers by 1 digit. | Hundreds Tens Ones | | 2 1 4 | - 10-0 |
| Short Division | | | 4 8 5 ¹ 6 | |
| | Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number. | Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also | 856 ÷ 4 = 214 | Ζ |
| | | draw their own counters and group them through a more pictorial method. | | |
| | | | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| | | | 8,532 ÷ 2 = 4,266 | |

Year 5-6 Division key vocabulary: tenths, hundredths, thousandths, inverse, factorise, prime factor,



| Objective & | Concrete | | Concrete Pictorial | | | | | VC | |
|--|----------------------------|---------------------|--------------------|-----|---------------------|----------------------|----------------------|---|----|
| Divide multi digits by 2 digits. | | Į | | | | | | | 10 |
| Short Division | 0 3 12 4 ⁴ 3 | 6 ⁷ 2 | | 432 | ÷ 12 | = 3 | 6 | | |
| | 7,335 ÷ 15 = 48 | 9 | 15 | 0 | 4 7 ₃ | 8 13 ₃ | 9 ¹³ 5 | When children begin to divide up to 4- digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. | S |
| | 15 30 45 60 | 75 | 90 | 105 | 120 | 135 | 150 | Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate. | Ž |



Long Division

 $132 \pm 12 - 36$

Introduce children to long division as a method of dividing by a 2 digit number.

1. Children should begin by starting with this expanded method (see opposite) which supports them with understanding how multiples can help with division. It can also support children to see division as repeated subtraction; therefore linking their understanding of grouping.

| | | - • 4 | . . – | Multiples of 12: | |
|---|---|-------|--------------|------------------|-----------|
| | | 0 | 3 | 6 | |
| 1 | 2 | 4 | 3 | 2 | |
| | _ | 3 | 6 | 0 | (12 x 30) |
| | | | 7 | 2 | |
| | - | | 7 | 2 | (12 x 6) |
| | | | | 0 | |

2. Children can then progress to the formal compact method for long division (without the calculations in the brackets) when appropriate.

516 ÷ 12 = 43 1 2 5 1 $-\frac{4 8}{3}$ -3

3. When secure, children will be expected to use either long division method and interpret remainders as whole numbers, decimals, fractions or rounding as required.

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