KS1 and KS2 Calculation Policy
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Audience
Teachers, Parents/Carers, Governors

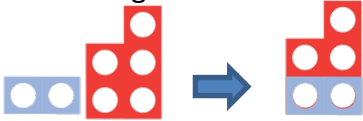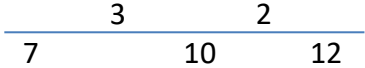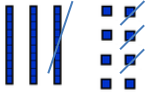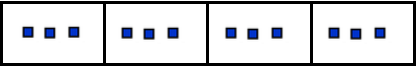**Rationale**
This policy contains the calculation methods that will be taught at Holymead Primary School.   It is intended to support every child develop the key skills of mental calculation and written calculation.   Workshops will be held regularly to demonstrate methods and to advice parents and carers on how to support their child in mathematics.

UNICEF CRC Article 29: Education must develop every child's personality, talents and abilities to the full.

KS1 (Year 1 and Year 2)

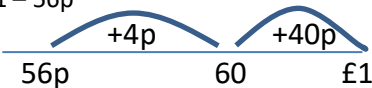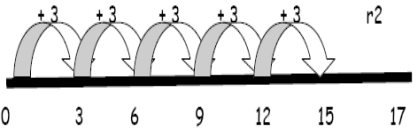| Addition	Subtraction	Multiplication	Division
Recall number bonds to 10 and 20, and for other numbers up to 20 e.g. 8 = 5+3 Using a part part whole picture: 10 5 Recognise effect of adding and subtracting zero **Counting on using known facts / number line** TU + U, e.g. 23 + 3 – recall 3+3=6, therefore 23+3=26 **Use of hundred square** TU + multiple of 10 (e.g. 56 + 20) **Partitioning method – with drawings of tens and ones** TU + TU e.g. 23+16 = 39 3+6=9 20+10=30 30+9=39 U+U+U (3+7+2) – look for pairs that make 10 or a double (5+5+2), reorder to start with the biggest number	Recall addition and subtraction facts to 20 (fact families e.g. 3+4=7, 4+3=7, 7–4=3, 7–3=4) Solving 8 – 5 by recalling addition facts that 8 is made up of 5 and 3. Subtract one and two digit numbers (TU-U) by counting back or using known facts e.g. 35 – 3 (5-3=2, so answer is 32) Understand the word difference by visually comparing Numicon pieces e.g. 5 – 2 = 3 Subtracting by counting on / back on a number line to bridge a ten e.g. 12 – 5 is the same as 12 – 2 – 3 as represented on a number line: 3 2 7 10 12 Counting back using tens and ones (before column subtraction in Y3) 38 – 13 	Showing multiplication using Numicon e.g. 3 x 2 (three lots of two) e.g. 2 x 3 (two lots of three) To know the 2x 5x 10x table written "as lots of" 1x2=2, 2x2=4, 3x2=6 To know that multiplication is commutative e.g. 5 x 7 is the same as 7 x 5 To recall that 0 x a number = 0 e.g. 0x10=0 Inverse facts between multiplication and division using Numicon e.g. 3 x 5 = 15 so 15 ÷ 5 = 3 To recall doubles of all numbers to 10, e.g. double 9 = 18 (and therefore half of 18 = 9)	Recalling of all even numbers to 20 e.g. Half of 12 = 6 Halving two digit even numbers using Numicon e.g. Half of 42 = 21 Linking division to sharing using objects (Year 1) e.g. bricks 6 bricks shared between 3 people Division by counting in groups (Year 2) e.g. 6 ÷ 2 = 3 "How many groups of 2 are there in 6?" e.g. 15 ÷ 5 = 3 Arrow to show how many lots of 5 in 15. Find simple fractions of objects or numbers using sharing ¼ of 12 = 3, therefore ¾ of 12 = 9

KS2 (Year 3 to Year 6)

Addition	Subtraction	Multiplication	Division
Instant recall of all single digit number facts, includes doubles, bridging ten 7+5 (7+3+2 or 2+5+5), near doubles e.g. 6+7 (6+6+1)	**Instant recall of all single digit subtraction facts e.g. 8 – 5 = 3 (see KS1 strategy)**	**Recall of times tables up to 12x12 by the end of Year 4**	**Recall of division facts based on times tables** e.g. $21 \div 3 = 7$. This is progressing onto to a **number line**:
Partitioning Method 34 + 15 30+10=40 4+5=9 =49	**Counting back / recall subtraction fact mentally** e.g. 15 – 3 (count back from 15 to 12, or recall 5-3=2, therefore 15-3=12).	**Partitioning Method** 16 x 3 10 x 3=30 6 x 3=18 **30+18=48**	How many groups of 3 in 17? e.g. $17 \div 3 = 5\ r\ 2$
Developing into only partitioning one number 34 + 15 34+10+5	**Bridging (crossing) a ten mentally** e.g. 15-9 = 6 (count up from 9 up to 15 or find difference by counting back 15-5-1). **Counting up on a number line** to find complements to multiples of 10 or 100 e.g. £1 – 56p 	**Compact Column Method** $$\begin{array}{r} 7\ \ 2 \\ \times\ \ \ \ \ 3 \\ \hline 2\ \ 1\ \ 6 \\ \hline \end{array}$$	**Use a bar model to show division or fraction**: $60 \div 3$ or $\frac{1}{3}$ of 60
(Once proficient, this becomes a mental calculation strategy)	**By partitioning a number** e.g. 13 – 5 Either: a) 13 – 3 – 2 (partitioned the 5) b) (10 – 5) + 3 (partitioned 13 into 10 and 3, subtract 5 from 10)	**Compact Column method for TU.t x U** $$\begin{array}{r} 21.8 \\ \times\ \ 3 \\ \hline 65.4 \\ \hline 2 \\ \end{array}$$	**Long division** In year 4, pupils use place value counters with the long division method to divide by single digits. In years 5 and 6 pupils then progress to using the "Divide, Multiply, Subtract, Bring Down" strategy with arrows. Pupils support their calculation by jotting down multiples of the divisor (as seen on the right)
Column addition without carrying **Column addition with carrying (using equipment in year 3 & 4)** $$\begin{array}{r} 36 \\ +47 \\ \hline 83 \\ 1 \end{array}$$ Saying that the carried number is 1 ten	**Column Subtraction without exchanging** Pupils **must** subtract the ones first **Column subtraction** with exchanging in any column – e.g. exchanging hundreds and tens and ones. Using apparatus in year 3 & 4. 	**Long multiplication** TU x TU $$\begin{array}{r} 32 \\ \times\ 15 \\ \hline 1{,}60 \\ 320 \\ \hline 480 \\ \end{array}$$	
Progressing to column addition of money, decimals and larger numbers.	Using a number line to calculate differences: time, differences between positive and negative numbers.	**Derive times tables to support division** e.g. 16 times tables by using doubles, halves, x10, x5 etc. **Double / halving method** 16 x 5 is the same as 8 x 10 (Half of 16, but double 5) **Recall factor pairs of two digit numbers** e.g. 24 1 and 24, 2 and 12, 3 and 8, 4 and 6	**Once fluent with the long division method, pupils can then use the 'compact' method to divide by one digit.** $$\begin{array}{r} 1\ \ 4 \\ 3\ \overline{\smash{)}\ 4\ \ {}^1 2} \\ \end{array}$$ Write the remainder as a fraction or decimal.