Rickleton Primary School

Calculation Guidance and Progression

Calculation at Rickleton Primary School

To ensure children can calculate both accurately and efficiently, a thorough and progressive approach to learning and applying calculation skills throughout school is required.

Our younger children, up to Year 3, will record calculations in a variety of ways that include jottings and diagrams. Initially, it is important that the children understand the number system through counting and place value. We explore this within school through sequencing, looking at patterns of numbers and how we are able to partition numbers. Written calculations are the ultimate aim: the aim is for children to do calculations mentally and, if the numbers are too large, to use a way of writing them down that helps their thinking. As children develop their mathematical understanding through Years 3, 4, 5 and 6, they will be asked if they can complete a calculation mentally. Sometimes this will need to be supported by resources, drawings, diagrams or notes. If they can't calculate it mentally they will then look for the most suitable written method.

Multiplication tables are the key to many areas of mathematics and if children are able to recall their tables and related division facts quickly this will help them to grasp other concept. To support children in learning and then being able to recall their times tables fluently, we have split the different multiplication tables over the following year groups:

- Year 2 – Counting in 2's, 5's and 10's.
- Year 3 – 2, 5, 4 and 8 times tables, including division facts.
- Year 4 – 3, 6, 7, 9, 11 and 12 times tables, including division facts.

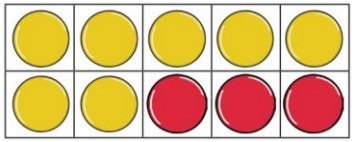
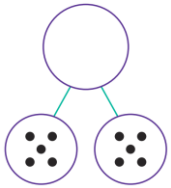
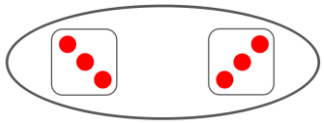
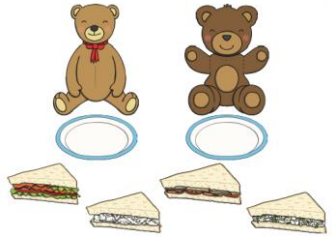
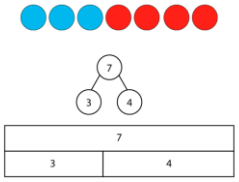
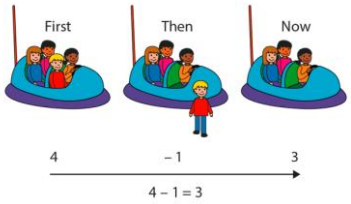
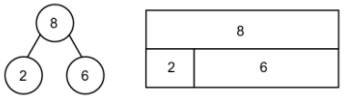
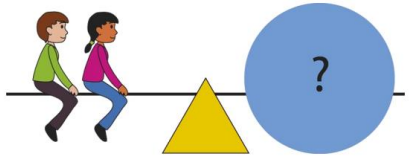
The aim of this guidance is to outline some of the ideas relating to number development used at Rickleton Primary School. These range from the early counting skills and drawings in the Early Years and Key Stage 1 to more formal calculations used by the end of/or in Key Stage 2.

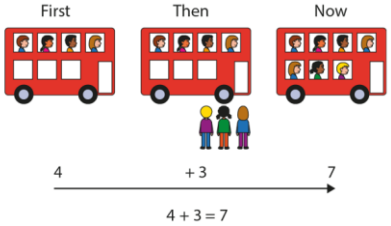
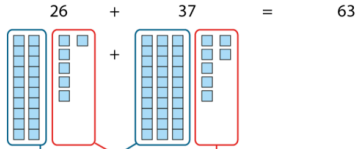
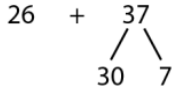
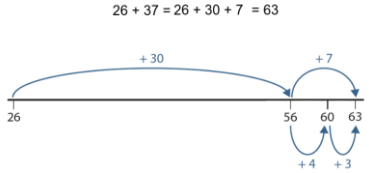
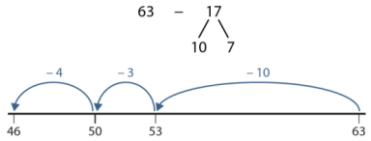
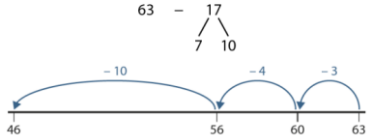
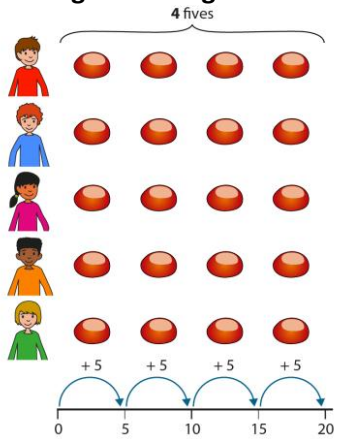
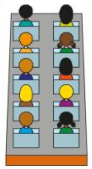
We hope that it will allow staff and parents to support their children with their homework by using the same strategies that they are familiar with in school.

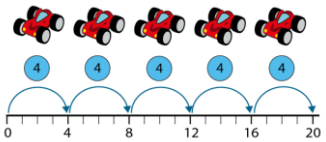
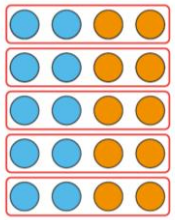
Guidance on calculations used in each year group.

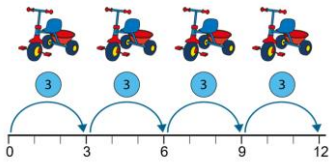
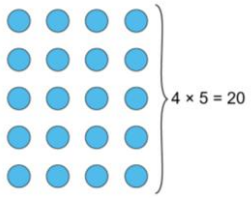
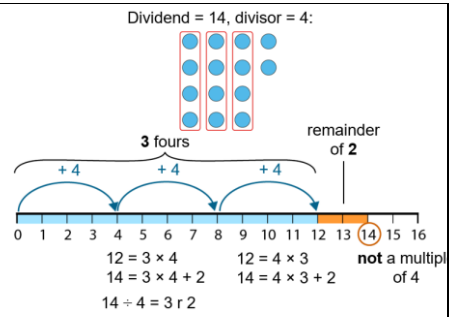
	Addition	Subtraction	Multiplication	Division
EYFS	• Number bonds to 10 • One more • Combining two parts to make a whole. • Starting at the bigger number and counting on. • Adding on a ten frame/five frame.	• Counting back • Taking away ones. • One less	• Doubling	• Sharing objects into groups.
Year 1	• Aggregation – combining two or more parts through the use of objects, part whole models and bar models. • Augmentation – increasing a value by counting on.	• Reduction – decreasing a value by counting back. • Partitioning – separating parts through the use of objects, part whole models and bar models.	• Doubling • Counting in groups 2, 5 and 10.	• Halving
Year 2	• Addition on a number line. • Addition by partitioning • Initial introduction to column method (up to 2 digits)	• Subtraction on a number line including bridging through ten. • Subtraction through the use of partitioning	• Doubling • Counting in groups of 2, 5 and 10. • Repeated addition	• Division as grouping and sharing.
Year 3	• Column method (up to 3 digits)	• Column method (up to 3 digits)	• 2, 5, 4 and 8 times tables • Repeated addition	• 2, 5, 3 and 6 division facts
Year 4	• Column method (up to 4 digits)	• Column method (up to 4 digits)	• 3, 6, 9, 11 and 12 times tables. • Repeated addition	• 4, 8, 9, 11 and 12 division facts. • Division using a number line.
Year 5	• Column method (more than 4 digits). • Column method with decimals.	• Column method (more than 4 digits). • Column method with decimals.	• Column multiplication	• Short division
Year 6	• Column method (more than 4 digits). • Column method with decimals.	• Column method (more than 4 digits). • Column method with decimals.	• Column multiplication	• Long division

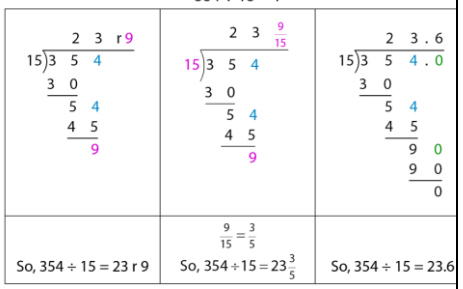
Progression in Calculations

	Addition	Subtraction	Multiplication	Division
EYFS	**Five frames/Ten frames**  7 yellow counters and 3 red counters makes 10 counters altogether. **Parts and Whole**  5 and 5 makes 10.	**Taking away**  There are 7 ducks at the pond. 2 ducks fly away and there are 5 ducks left. Use of jottings	**Doubles**  6 is made of 3 and 3 3 and 3 make 6	**Sharing**  4 sandwiches shared between 2 bears means that each bear gets 2 sandwiches each.
Year 1	**Aggregation**  3 + 4 = 7	**Reduction**  **Partitioning**  8 – 2 = 6	**Counting in Groups**  One group of two, two groups of two…. Two, four, six …  One group of five, two groups of five…. Five, ten, fifteen …  One group of ten, two groups of ten….	**Halving** There are four children on the seesaw. Two children are on one side. How many children are on the other side?  2 + ☐ = 4 4 – 2 = ☐

	Augmentation 		Ten, twenty, thirty …	
Year 2	**All strategies would not bridge a 10 initially and then once strategy is secure to include calculations that bridge the ten.** **Partitioning using Dienes/Counters**  **Partitioning Abstractly**  26 + 30 = 56 56 + 7 **Addition on a Number Line** 	**All strategies would not bridge a 10 initially and then once strategy is secure to include calculations that bridge the ten.** **Subtraction on a Number Line** Bridging a multiple of ten – subtracting the tens first:  Bridging a multiple of ten – subtracting the ones first:  63 – 17 = 46	**Repeated Addition**  **5 + 5 + 5** **3 × 5** **5 + 5 + 5 = 3 × 5** Children to state ‘3 lots of 5.’	**Dividing as Sharing**  5 shared by 1 is 1 each. 20 ÷ 5 = 4 20 divided between 5 is equal to 4 each. **Dividing as Grouping** *‘A carriage on a fairground ride holds ten people.’*  *‘If there are thirty people, how many carriages are needed?’* There are 3 groups of ten in 30 so 30 divided into groups of 10 is 3. 3 x 10 = 30

	Some children would +30 and then one more until secure with partitioning. **Introduction to column addition, to only up to two digit numbers.**			so 30 ÷ 10 = 3
Year 3	**Column Addition** 3 5 + 1 2 4 7 With regrouping 1 7 2 2 3 4 + 5 4 4 6 0 1 1	**Column Subtraction** 10s 1s 6 5 − 2 3 4 2 With regrouping 100s 10s 1s ~~4~~3 ~~1~~0 9 14 − 2 5 7 1 4 7	**2, 4, 5 and 8 Times Tables.** **Repeated Addition**  There are 20 wheels. 5 × 4 = 20 4 × 5 = 20 **Array**  5 groups of 4 5 × 4 = 20 five 4s are 20	**2, 4, 5 and 8 Division Facts** e.g. 'If the ones digit of a number is even, the number can be divided by 2.' 'If a number is divisible by 4, halving it twice gives a whole number.'
Year 4	**Column Addition with Regrouping** 4 1 6 2 2 3 + 1 8 4 8 2 3 1 1	**Column Subtraction with Regrouping** 100s 10s 1s ~~4~~3 ~~1~~0 9 14 − 2 5 7 1 4 7	**3, 6, 9, 11 and 12 Times Tables** **Repeated Addition**	**3, 6, 9, 11 and 12 Division Facts** e.g. 'For a number to be divisible by 3, the sum of the digits of the number must be divisible by 3.' **Grouping and use of Number Line to Divide**

			 There are 12 wheels. 4 × 3 = 12 3 × 4 = 12 **Array** 	
Year 5	**Column Addition with Decimals** 14 . 5 + 23 . 9 _____ _____	**Column Subtraction with Decimals** 4 . 3 − 1 . 7 _____ _____	**Column Multiplication** 3 6 7 × 4 _____ 1 4 6 8 _____ 2 2	**Short Division** 1 5 3 4) 6 ²1 ¹2
Year 6	No new methods taught	No new methods taught	**Column Multiplication** ~~1~~ ~~5~~ 5 7 × 3 5 3 0 3 57 × 5 1 6 2 0 57 × 30 1 9 2 3	**Long Division with Remainders, Fraction Remainders and Decimal Remainders**

				354 ÷ 15 = ?  So, 354 ÷ 15 = 23 r 9 $\frac{9}{15} = \frac{3}{5}$ So, 354 ÷ 15 = $23\frac{3}{5}$ So, 354 ÷ 15 = 23.6