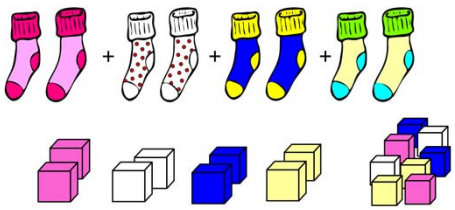
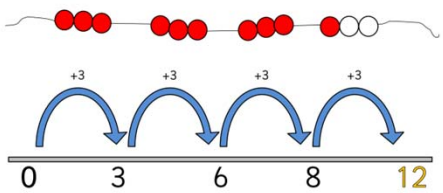
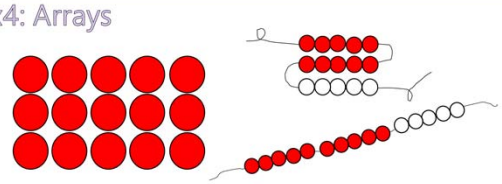
Providenciales Primary School

# Calculation Policy
# *Multiplication*

*This policy accounts for only one path of progression through multiplication. Children will move through these calculation methods and experiences at different rates. Consequently, the stages do not relate to an age range or year group – rather, they should be seen as a continuum that all children will progress along. They may incorporate other approaches in their work and this should be encouraged so long as they are developing sound understanding. The concepts outlined here will enable the school to deliver a set of skills that allow for continuity and progression.*

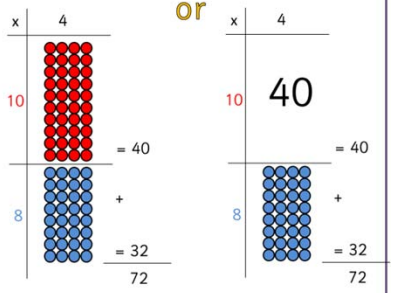
| *Stage* | ***Examples*** | ***At each stage children develop and refine different skills. Children secure their understanding by…*** |
|---|---|---|
| x1: Early Experiences | x1: Early experiences<br>  | ✓ Recognising 1-to-1 relationship.<br>✓ Counting on from a number using physical resources.<br>✓ Arranging objects into sets containing the same amount.<br>✓ Comparing the size of groups.<br>***Use key language in context:***<br>Groups of, sets of, lots of, pairs. |
| x2: Objects | x2: Repeated addition<br>  <br>4 x 2 = 2 + 2 + 2 + 2 = 8<br>Practical experience of repeated addition using a range of apparatus | ✓ Using mental addition strategies for adding in 2s, 3s, 5s.<br>✓ Exploring and beginning to recognise numbers in the 2, 3, 5 and 10 times tables.<br>✓ Using knowledge of odd and even numbers to recognise multiples of 2.<br>***Use key language in context:***<br>Repeated addition, sequence, times, equals. |
| x3: Number-line | x3: Number-line repeated addition<br>  <br>4 x 3 = 12<br>Repeated addition recorded using number-lines | ✓ Beginning to recognise multiplication facts for 2, 5 and 10 times tables.<br>✓ Extending a sequence by identifying the pattern and continuing in equal steps.<br>✓ Talking about patterns in the 2, 5 and 10 times tables and use this to extend beyond x10.<br>✓ Recording legibly with increasing accuracy.<br>***Use key language in context:***<br>Repeated addition, equal jumps, equal groups of. |
| x4: Arrays | x4: Arrays<br>  <br>5 x 3 = 15<br>3 x 5 = 15<br>Physical resources are arranged into rows, providing visual models for exploring multiplication and division | ✓ Recalling multiplication facts for the 2, 3, 4, 5 and 10 times tables and begin to recognise related division facts.<br>✓ Understanding that a multiplication can be broken down into easier chunks using an array<br>e.g. 4x8 = (4x5) + (4x3) = 20 + 12 = 32.<br>✓ Recording legibly with increasing accuracy.<br>***Use key language in context:***<br>Array, partition, multiply, multiples, times |

## x5: Arrays in grids

### x5: Arrays in grids

18 x 4 = 72

10 + 8




Partition larger numbers and arrange in grid. Arrays support the developing knowledge of multiplication facts.

- ✓ Partitioning 2-digit numbers into 10s and 1s.
- ✓ Extending multiplication knowledge into the quick recall of the 6 and 8 times tables.
- ✓ Recognising how times tables knowledge can be applied to solve larger problems
  *x6: 6, 12, 18, 24, 30*
  *x60: 60, 120, 180, 240, 300.*
- ✓ Applying addition strategies for adding in columns.
- ✓ Recording legibly to arrange arrays into the grid.

***Use key language in context:***
Partition, tens, units, times, groups of, product.

## x6: Grid Method

### x6: Grid method

32 x 6 = 192

30 + 2

| x | 6 |
|---|---|
| 30 | 180 |
| 2 | + 12 |
| | 192 |

258 x 17 = 4386

200 + 50 + 8 | 10 + 7

| x | 10 | 7 |
|---|---|---|
| 200 | 2000 | 1400 |
| 50 | 500 | 350 |
| 8 | 80 | + 56 |

2580 + 1806 = 4386

Partition numbers using place value and multiply each value. Arrange answers into columns for addition.

- ✓ Demonstrating quick recall of all multiplication facts to 10x10 and begin to recall related division facts.
- ✓ Recognising place value in TH, H, T, U and partition numbers accurately.
- ✓ Understanding zero as a 'place holder' in 3- and 4-digit numbers.
- ✓ Multiplying and divide numbers mentally by 10 and 100
- ✓ Applying addition strategies for adding in columns.
- ✓ Using rounding, estimating and number sense to check for accuracy in work.

***Use key language in context:***
Place value, partition, 'true value', multiply & divide.

## x7: Expanded Column

### x7: Expanded column

279 x 36 = 10,044

279
x 36

279
x 36
54 (6 x 9)
420 (6 x 70)
1200 (6 x 200)
270 (30 x 9)
2100 (30 x 70)
+ 6000 (30 x 200)
10,044

Each value is multiplied and the true value recorded in columns. All values are added to find the total.

- ✓ Recording the 'true value' of numbers in solving a calculation.
- ✓ Demonstrating a secure understanding of place value in TTH, TH, H, T, U numbers and to 1 and 2 decimal places.
- ✓ Showing secure understanding of multiplying and dividing by 10 and 100.
- ✓ Recording legibly to arrange calculations in columns.
- ✓ Using rounding, estimating and number sense to check for accuracy in work.

***Use key language in context:***
Place value, partition, 'true value'

## x8: Column

### x8: Column multiplication

348 x 29 = 10,092

348
x 29
3132
+ 6960
10,092

137 x 8.4 = 1150.8

137.0
x 8.4
54.8
+1096.0
1150.8

Each digit is multiplied with addition taking place throughout the calculation. 'True values' are discussed but not recorded.

- ✓ Recognising place value in numbers to Millions.
- ✓ Recognising place value in numbers to 2 and 3 decimal places in the context of measure.
- ✓ Demonstrating greater accuracy and efficiency in using multiplication knowledge to derive other useful facts:
  *x20, x30, x40 and x200, x300, x400 etc*
  *and x0.2, x0.3, x0.4 and x0.02, x0.03, x0.04 etc*
- ✓ Using rounding, estimating and number sense to check for accuracy in work.

***Use key language in context:***
Place value, addition, decimal, tenth, hundredth, etc.