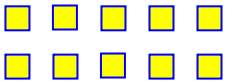
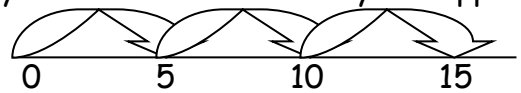
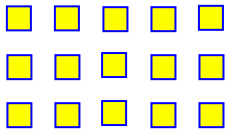
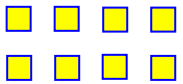
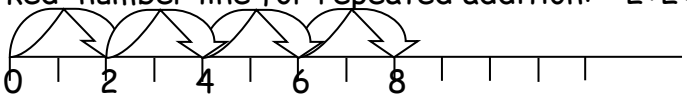
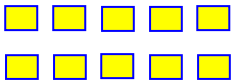
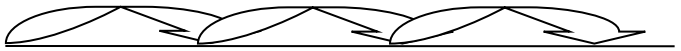
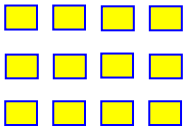
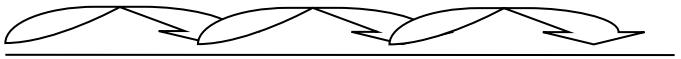
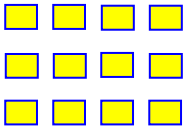
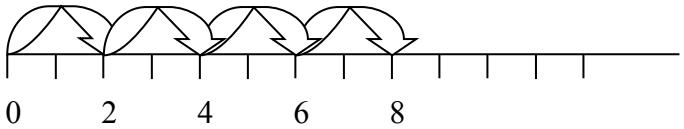
St Anne's Catholic Primary School Nantwich
Calculation Policy for Multiplication and Division

<table>
<tr><th colspan="2">Year 1 Approaches to written methods: MULTIPLICATION</th></tr>
<tr><td>AIMS</td><td>Understand multiplication as 'repeated addition.' i.e. :- 2 x 5 = 2+2+2+2+2
Understand multiplication as describing an array. 2 x 5 =
 
Understand multiplication as doubling a number or repeated addition.</td></tr>
<tr><td>Top</td><td>Using an empty number line or an array to support mental calculations :-
 


5 + 5 + 5 = 15 or 3 sets of 5 = 15</td></tr>
<tr><td>Upper Middle</td><td>Using an array to describe multiplication and a marked number line for repeated addition:- 2+2+2+2
 
 
</td></tr>
<tr><td>Lower Middle</td><td>Use real objects and pictorial representations to sort into equal sets, count in pairs.
  </td></tr>
</table>

Special Needs	Use real objects and pictorial representations to sort into equal sets, count in pairs. 

Year 2 Approaches to written methods: MULTIPLICATION	
AIMS	Understand multiplication as 'repeated addition.' Ie :- 2 x 5 = 2 + 2 + 2 + 2 + 2 Understand multiplication as describing an array. 2 x 5 =  Understand multiplication as doubling a number, and the relationship between doubling and halving. Begin to use the empty number line to record mental calculation strategies. When <u>recording</u> multiplication only record up to multiples of 10 x 10 – not multiples of 11 or 12
Top	Use of the empty number line to record simple multiplication problems and use of arrays to describe multiplication problems. 4 x 3 =   0 4 8 12 "4 multiplied by 3" or "4 times 3"
Upper Middle	Use of the empty number line to record simple multiplication problems and use of arrays to describe multiplication problems. 4 x 3 =   0 4 8 12 "4 multiplied by 3" or "4 times 3"

Lower Middle	Begin to use a marked number line to represent simple problems using repeated addition :- 2+2+2+2=8 
Special Needs	Use real objects and pictorial representations to sort into equal sets. Begin to record on marked number lines. 

Year 3 Approaches to written methods: MULTIPLICATION	
AIMS	• No formal method, but children should understand multiplication as **repeated addition** and as **describing an array**. • In order to provide the children with some of the pre-requisite skills for Y4 written approaches, the objective **'Use knowledge of number facts and place value to multiply and divide mentally'** (framework Section 5 p57) is useful. • Begin to develop informal ways of calculating and recording by partitioning and recombining e.g **17x5** 10 x 5 = 50 7 x 5 = 35 17 x 5 = 85
Top	**Children to know tables :- 2, 3, 4, 5, 9, 10** Using the partitioning and recombining method (see above) Children to multiply any 2 digit number by 2, 3, 4, 5, and 9 Extension:- multiply HTU by U

Upper Middle	**Children to know tables :- 2, 3, 4, 5, 10** Using the partitioning and recombining method (see above) Children to multiply any 2 digit number by 2, 3, 4 and 5
Lower Middle	**Children to know tables :- 2, 3, 5, 10 and begin to know 4** Using the partitioning and recombining method (see above) Children to multiply any 2 digit number up to 30 by 2, 3, 4 or 5
Special Needs	**Children to know tables :- 2, 5, 10 and begin to know 3 and 4** Using the partitioning and recombining method (see above) Children to multiply any 2 digit number up to 30 by 2 or 5

Year 4 Approaches to written methods: MULTIPLICATION

AIMS	**By the end of Year 5 all children will know by heart multiplication facts up to 10 x 10**
Top	**Children to know all tables facts up to 10 x 10**
Top	Begin to record the least significant digit first in order to prepare the children for compact standard method :-
Upper Middle	Children to know tables :- 2, 3, 4, 5, 6, 9 and 10. Begin to know: 7, 8
	Teach grid method (see above) for HTU x U and TU x U
Upper Middle	Use grid method for TU x U, HTU x U and TU x TU Children to know tables :- 2, 3, 4, 5, 9 and 10. Begin to know: 6, 7, 8
Lower Middle	Begin to record the least significant digit first in order to prepare the children for compact standard method :-
Special Needs	Children to know tables :- 2, 3, 4, 5, and 10. Begin to know: 6, 7, 8, 9
Lower	Teach grid method (see above) for TU x U
Middle	Use grid method for short (HTU x U) and long multiplication (TU x TU)
Special Needs	Use grid method for HTU x U

Year 5 Approaches to written methods: MULTIPLICATION

AIMS By the end of Year 5 all children will know by heart multiplication facts up to 10 x 10

Teach grid method A with a range of numbers e.g. 23 x 7 = (20 + 3) x 7 = 140 + 21 = 161

n.b. grid multiplication ITP from www.standards.dfes.gov.uk/numeracy

Where appropriate children will use the grid method for long multiplication.

More able children will use the compact standard method for short multiplication, others will use the grid method.

Grid method as above with HTU x U and TU x U

Children to know all tables facts up to 10 x 10

n.b. grid multiplication ITP from www.standards.dfes.gov.uk/numeracy

Begin to record the least significant digit first in order to prepare the children for compact standard method :-

23	
x 7	
21	(3 x 7)
140	(20 x 7)
161	

Using multiplication TU x TU as the grid method.

Children for compact standard method :-

i.e.

23		23	
x 7	→	x 7	
21		161	
140		2	
161			

Children to know tables :- 2, 3, 4, 5, 6, 9 and 10. Begin to know: 7, 8

Teach grid method (see above) for HTU x U and TU x U

Use grid method for TU x U, HTU x U and TU x TU
Children to know tables :- 2, 3, 4, 5, 9 and 10. Begin to know: 6, 7, 8

Begin to record the least significant digit first in order to prepare the children for compact standard method :-

23	
x 7	
21	(3 x 7)
140	(20 x 7)
161	

Children to know tables :- 2, 3, 4, 5, and 10. Begin to know: 6, 7, 8, 9

Teach grid method (see above) for TU x U

Use grid method for short (HTU x U) and long multiplication (TU x TU)

Use grid method for HTU x U

Year 6 Approaches to written methods: MULTIPLICATION

AIMS

All children will use the grid method for long multiplication.

n.b. grid multiplication ITP from www.standards.dfes.gov.uk/numeracy

27 x 36

	20	7	
30	600	210	810
6	120	42	+ 162
			972

The more able will be shown the compact method

Short multiplication – both grid and compact methods depending on ability.

Top

Short multiplication – standard compact method :

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  47
 x 9
423
  6
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Long multiplication – grid method, with the more able using the standard compact method

[Framework P67 year 6 example]

Upper Middle

Short multiplication – standard compact method

Long multiplication – grid method

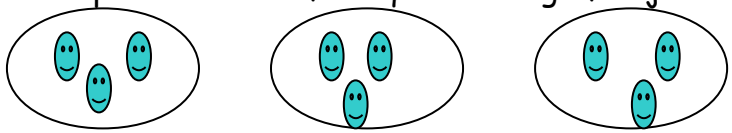
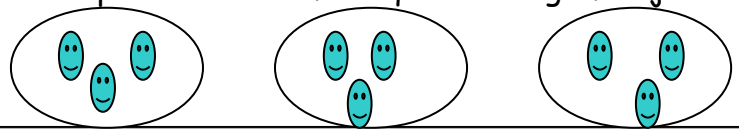
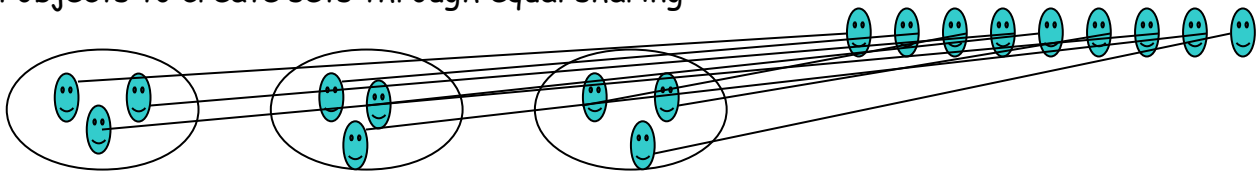
Lower Middle

Grid method for short and long multiplication

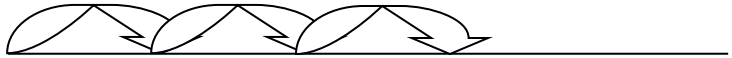
Special Needs

Grid method for short and long multiplication

Year 1 Approaches to written methods: DIVISION

AIMS	Understand the operation of division as 'sharing equally', and begin to understand division as grouping of objects
Top	Using pictorial representations for equal sharing of objects :-  Begin to understand the operation of grouping as 8 ÷ 2 as 
Upper Middle	Using pictorial representations for equal sharing of objects :- 
Lower Middle	Use practical objects to create sets through equal sharing 
Special Needs	Use practical objects to create sets through equal sharing 

Year 2 Approaches to written methods: DIVISION

AIMS	Understand the operation of sharing equality and as grouping of objects. **n.b.** grouping ITP from www.standards.dfes.gov.uk/numeracy
Top	To continue to use grouping as a strategy to solve simple division problems and begin to use empty or marked number lines to record calculations.  0 5 10 15 15 ÷ 5 = 3 Count forward on number lines using repeated addition.
Upper Middle	Use grouping as a strategy for solving division problems and begin to record on a marked number line :-  0 2 4 6 8 8 ÷ 2 =4
Lower Middle	Using practical equipment to begin to group objects and record using pictorial representations.
Special Needs	To use practical equipment to continue to develop the skill of equal sharing and record with pictorial representations.

Year 3 Approaches to written methods: DIVISION	
AIMS	No formal written method. The pre-requisite skills that must be developed are:- Concept of division as grouping (repeated subtraction) Framework Section 5 P.49 Being able to subtract multiples of 10 from any number eg. 117 – 20/30/40 etc. **n.b.** grouping ITP from www.standards.dfes.gov.uk/numeracy
Top	Children to use 2,3,4,5,9 and 10 x tables facts to understand division as grouping. Children to be able to subtract multiples of 10 from any 2 or 3 digit number.
Upper Middle	Children to use 2,3,4,5 and 10 x tables facts to understand division as grouping. Children to be able to subtract multiples of 10 from any 2 or 3 digit number.
Lower Middle	Children to use 2,3,4,5 and 10 x tables facts to understand division as grouping Children to be able to subtract multiples of 10 from any 2 or 3 digit number.

Special Needs	Children to use 2, 5 and 10 x tables facts to understand division as grouping. Children to use 100 square to assist their understanding of subtracting multiples of 10 from any number.

Year 4 Approaches to written methods: DIVISION	
AIMS	Most children will use the 'chunking' method by subtracting chunks of 10x the divisor and are able to divide TU ÷ U. To be recorded as follows:- (Expanded short division) 16 r. 1 6 97 - 60 (10 X 6) 37 - 36 (6 X 6) 1
Top	To use the above method to be able to calculate HTU ÷ U
Upper Middle	To use the above method to be able to calculate TU ÷ U
Lower Middle	To use the above method to be able to calculate TU ÷ U

Special Needs	To understand division as grouping (repeated subtraction) and to reinforce the links between x/÷ **n.b.** grouping ITP from www.standards.dfes.gov.uk/numeracy

Year 5 Approaches to written methods: DIVISION	
AIMS	Most children will be able to use this method to be able to divide HTU ÷ U and will be progressing to subtracting 'chunks' of 10 x, 20X or 30x etc... of the divisor. 10 r 3 17 173 - 170 (17 x 10) 3
Top	To be able to calculate HTU ÷ TU by 'chunking'
Upper Middle	To be able to calculate HTU ÷ U by 'chunking'.

Lower Middle	To be able to calculate HTU ÷ U by 'chunking'.
Special Needs	To be able to calculate TU ÷ U by 'chunking'.

Year 6 Approaches to written methods: DIVISION	
AIMS	All children to be able to use 'chunking' to be able to calculate HTU ÷ U and most will be able to use this method to calculate HTU ÷ TU. 32 r.4 6 196 - 180 (30 x 6) 16 - 12 (2 x 6) 4 Some more able children will be able to use an appropriate compact method for short division.
Top	To be able to complete short and long division using the 'chunking' method (extending to decimals with 2 decimal places. Framework P.69 Section 6) 3 2 r.4 Some children may be able to use the compact method for short division eg. 6 1 9[1]6

Upper Middle	To be able to complete short and long division using the 'chunking' method
Lower Middle	To be able to complete short and long division using the 'chunking' method
Special Needs	To be able to complete short division using the 'chunking' method