Primary School
Calculation policy
Year 4 and 5

Policy reflects: concrete (do it!) abstract (see it!) visual (remember it!) communication (record it!)

Addition	Subtraction	Multiplication	Division

Addition

Year 4

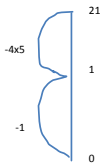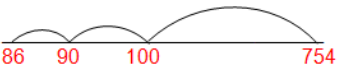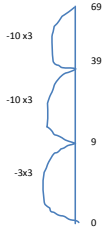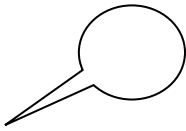**Continue with HTU + HTU, then extend to ThHTU + ThHTU.**

Approximate using the most significant digit, rounding skills.

Check using the inverse.

Refer to the carried digit as a ten or a hundred.

```
  587
+ 475
─────
 1062
  1 1
```

"*7 add 5 equals 12. That's 2 units and 1 ten to carry over.*
80 add 70 equals 150 and the one ten to carry makes 160. That's 6 tens and 100 to carry over. 500 add 400 equals 900 and the one hundred to carry makes 1000"

```
  7648
+ 1486
──────
    14
   120
  1000
 +8000
──────
  9134
```

```
  7648
+ 1486
──────
  9134
  1 1 1
```

Subtraction

Year 4

HTU – TU, then HTU – HTU.
(ThHTU – ThHTU)
(THHTU – HTU)

Extend to simple decimals with or without exchange from pence to pounds.

Ensure that all calculation is checked before started for any other possible 'tricky' bits.

Ensure that the setting out is accurate.

754 – 86 = 668

Take away (left)

```
     -6              -80
  ╭──────╮    ╭──────────────╮
 668   674                 754
```

or

```
    -2      -80        -4
  ╭───╮ ╭────────╮  ╭──────╮
 668  670         750    754
```

or

```
       -80            -6
  ╭──────────────╮ ╭──────╮
 668              748    754
```

Find the difference (right)

Multiplication

Year 4

Know table facts up to 12 x 12

Approximate first.

Partitioning / distributive law, e.g. 28x4 can be split up into 25x4 add 3x4 or 30x4 subtract 2x4.

Distributive Law   more …

The Distributive Law says that multiplying a number by a group of numbers added together is the same as doing each multiplication separately

Example: 3 × (2 + 4) = 3×2 + 3×4

So the "3" can be "distributed" across the "2+4" into 3 times 2 and 3 times 4.

3 x (2+4)   =   3x2 + 3x4

Pupils to explain the effect of multiplying by 10 and 100.

Addition to be done mentally.

HTU and TU x U.

Record using grid notation and expanded short multiplication.

346 x 9

x	300	40	6
9			

Division

Year 4

Know division facts corresponding to tables up to 12 x 12

Approximate first using multiplication facts.

Divide any integer up to 1000 by 10.

"*900 ÷ 10 = 90 because the digits move one place to the right*"

MOVING DIGITS ITP

Recap the finding of remainders on the number line first.

21 ÷ 5

"*What do I know? I know that 21 is not a multiple of 5, so there will be a remainder.*"

21 ÷ 5 = 4r1

```
                    21
        -4x5
                    1

        -1
                    0
```

Jump size depends   ...dg...
confidence of child. ...
This could also be s... ...ump... +5
along the number li... ...g in... ...nps
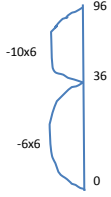and a remainder of 1.

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Primary School
Calculation policy
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Column 1:

```
 12·45
  7·36
+ 24·50
  0·11
  1·20
 13·00
 30·00
 44·31
```

NUMBER BOARDS

Column 2:

```
  +4   +10      +654
 86   90   100        754
```

Decomposition
(Continue with Diennes and/or money as appropriate)

```
754      700    50    4
- 86            80    6
              600    60    8  =668

754      600   140   14
- 86            80    6
              600    60    8  =668
```

*"It's tricky to take 6 from 4 and 80 from 50. I need to rearrange the number. I will exchange one ten from 50 which leaves 40 and makes 14 in the units. 40 to subtract 80 is tricky. I will **exchange** one hundred from 700 and make 140. 14 subtract 6 equals 8. 140 subtract 80 equals 60 and 600 subtract 0 equals 600."*

Decomposition

```
   £           £
 8·95      8 . 90   5
-4·38      4 · 30   8
           4 · 50   7  = 4.57

   £           £
 8·95      7 · 80   15
-4·38      4 · 30   8
           4 · 50   7  = 4.57
```

Column 3:

```
  346
x   9
   54 (9 x 6)
  360 (9 x 40)
 2700 (9 x 300)
 3114
```

Decision making
Children investigate statements and solve word problems using appropriate methods. Children are also given examples of x9 and encouraged to think about using methods such as x10 and subtracting x1.

Column 4:

Use problems in contexts that require the answer to be rounded up or down following the remainder.
Eg 35 children to sleep four to a tent. How many tents do we need?

Continue to use vertical chunking method.

$69 \div 3 =$

```
          69
-10 x3
          39
-10 x3
           9
 -3x3
           0
```

Fractions relate to division. ÷ 4 is the same as halve and halve again.

Recognise that division is non-commutative.

Know that a number cannot be divided by 0.

Begin to use chunking method for TU by U division (additive chunking/chunking up).

$96 \div 6$

"What do I know? 6 x 10 = 60"

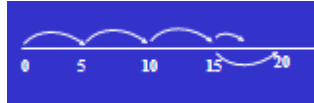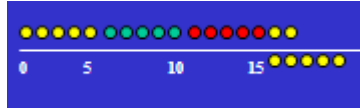|			

	6 14 1
	$\cancel{7}\cancel{5}4$
	- 2 8 6
	4 6 8
	
	Emphasis on language of place value, i.e. 14 units subtract 6 units, 14 tens subtract 8 tens, and 6 hundreds subtract 2 hundreds.
			60 36
			↓ ↓
			10 6
			96 ÷ 6 = 16
			
			96
			-10x6
			36
			-6x6
			0
			
			96 ÷ 6
			"What do I kno
			Set up partial
			
			Introduce bus stop method
			
			87 ÷ 7 is approximately 10 x 7 = 70
			
			   12 r3
			7) 87
			 - 70 (10 x 7)
			  17
			 -14. (2 x 7)
			   3
			
			87 ÷ 7 = 12 r3 12 3/7

Primary School
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Year 5	Year 5	Year 5	Year 5

.
 	
 Add with increasingly large numbers using the compact method.
 	
 Extend methods to include decimals to two decimal places.
	Subtract with increasingly large numbers using the compact method.
	
	 Extend methods to include decimals to two decimal places.
		Th HTU , HTU , TU x TU and U
		
		 28 x 27
		
		 Addition to be done mentally or across followed by column addition
		
		   28
		 x 27
		    56 (7x8)
		  140 (7 x20)
		  160 (20x8)
		  400 (20x20)
		  756
		
		 28 X 27 = 756
		
		 Multiply in different contexts
		
		 £2.73 x 3
		 £2.73 x 3 = 273p x 3
		
		 Followed by appropriate addition calculation.
		 273p x 3 = 819p
		        = £8.19
			Know division facts corresponding to tables up to 12 x 12 and be able to apply them.
			
			 Use the relationship between multiplication and division.
			
			 Extend chunking method to include ThHTU by U, with an integer remainder.
			
			 Dividing up to 10,000 by 10/100.
			
			 Check with inverse operation. Use of calculator.
			
			 Use the number line to find remainders and express the quotient as a fraction or decimal.
			
			 DIVISION WITH REMAINDERS PPT (example given below)
			 17 ÷ 5
			 "What do I know? 17 is not a multiple of 5".

2/4/14

x	4000	300	40	6
8				

$4346 \times 8 = 34768$

```
  32000
   2400
    320
+    48
  34768
```

```
   4346
x     8
     48 (8x6)
    320 (8x40)
   2400 (8 x300)
  32000 (8x4000)
  34768
```

Decision making
Children investigate statements and solve word problems using appropriate methods.
Children investigate alternative methods such as compensation strategies and doubling and halving and discuss when these might be most appropriate and efficient.

Examples:

24x99 could be done using the grid method, but could also be calculated by x100 and subtracting 24x1.

24 x25 could be done using the grid method, but could also be calculated by 24x100, halving to find x50 and

$$3\frac{2}{5}$$

$3\ \frac{2}{5} = 3.4$

From knowledge of decimal/fraction equivalents or by converting $\frac{2}{5}$ into $\frac{4}{10}$.

Short division with 'bus stop' notation

"483 divided by 7. 4 hundreds cannot be shared equally between 7, so exchange the 100s for 40 tens. I now have 48 tens which shared equally between 7 is 6 with a remainder of 6 tens. Exchange the 6 tens for 60 units, we now have 63 units. 63 divided equally between 7 equals 9. The answer is 69."

Use Diennes or place value equipment to model.

		halving again to find x 25.
		 or using doubling and halving,
		24 x25=12x50
		            =6 x100
		
		ThHTU x TU and HTU x TU and including decimals.
		
		TU x TU
		
		   78
		x 42
		   16 (2 x 8)
		 140 (2 x 70)
		 320 (40 x 8)
		+2800 (40 x 70)
		  3276
		
		Compact (long)
		
		   78
		x42
		 156
		        ₁
		+3120
		 3276
		
		Involve decimals, money and measures through approximation and appropriate use of the calculator.
		
		Addition either mentally or by column addition.
			Decision making
			
			([OVERCOMING BARRIERS](#) Level 4 to Level 5 – Questions.)
			 Word problems, e.g. 200 people attended a concert. $\frac{1}{5}$ of the people had complimentary tickets. The rest paid £7.50 each. How much money was collected from selling tickets?
			
			Money and measures, e.g. Which is longer: $\frac{3}{4}$ of an hour or 2500 seconds?
			
			Consolidating bus stop method for larger numbers, remainders and decimals extending to 2 digit divisors
			
			([OVERCOMING BARRIERS](#) Level 4 to Level 5 typical questions)
			
			Work out 575 ÷ 25, explaining your method.
			
			Peter says that, if you want to divide a number by 12, you can divide it by 4 then by 3. Is he right? Explain how you know. Work out 768 ÷ 12 using Peter's method and using another method. Do you get the same answer?
			
			How many 35p packets of stickers can I buy with £5? Explain how you know.
			
			Coaches have 56 seats for passengers. How many coaches are needed to take 275 people on a trip?
			
			Complete this calculation: 943 ÷ 41 = 2☐

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			Work out whether or not 29 is a factor of 811.