# Morville Primary School
# Calculation policy
Reception and Year 1

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

Addition	Subtraction	Multiplication	Division
# Reception	# Reception	# Reception	# Reception

Addition — Reception

Counting objects, partitioning and recombining sets using practical apparatus.

Understand that the number gets bigger.

Addition is commutative.

Use number tracks to develop counting skills, forwards and backwards.

COUNTING ITP

Pictorial recording of practical experiences.

Teacher modelling of number sentences and addition as commutative.

$1 + 1 = 2$
double 1 is 2

$2 - 1 = 1$
half of 2 is 1

$2 + 2 = 4$
double 2 is 4

$4 - 2 = 2$
half of 4 is 2

Subtraction — Reception

Know that the number gets smaller because objects have been removed from the set.

Practical models of subtraction

Counting back on fingers, orally, number lines.

Find the difference, counting on.
MODELS AND IMAGES CHARTS

(To be used for lots of oral examples)

$5 + ? = 10$ $10 - 5 = ?$

$6 + ? = 10$ $? + 6 = 10$
$10 - 6 = ?$ $10 - 4 = 6$

$9 + ? = 10$ $? + 9 = 10$
$10 - 9 = ?$ $10 - ? = 9$

Multiplication — Reception

Jumping along number lines in jumps of 1, 2, 5 & 10.

Repeated addition, practical demonstrations. (*Models and Images charts*)

Doubles and grouping
Grouping is a random arrangement of a quantity into equal groups.

Arrays are a rectangular arrangement to show the equal groups.
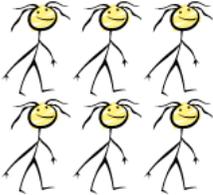
This is an array

Use of arrays to show that multiplication is commutative. Changing the order does not affect the answer. Peg boards are a useful model.

Use the language of 'lots of', 'groups of' and 'sets of' for 'x'.

Division — Reception

Counting on and back in steps of 1, 2 and 10.

Sharing equally and halving objects in practical contexts.

Pictorial recording.

Grouping, in practical contexts.

GROUPING ITP

Use cross curricular links (PE) and purposeful objects such as sock and shoes/ animals in the ark to get into groups.
Sharing models such sharing an apple or a Satsuma.

How many cars can you make if you have 8 wheels?

Addition	Subtraction	Multiplication	Division

Addition

$10 = 5 + 5$

$10 = 7 + 3$

$10 = 3 + 7$
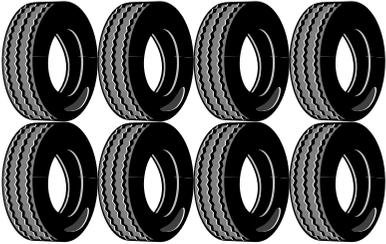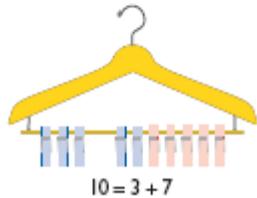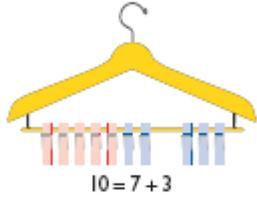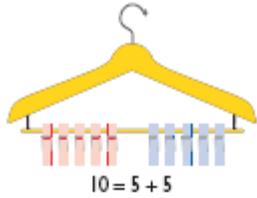
We have 10 pegs on the coathangers, how can we split them into 2 groups? Is there another way? How can you be sure you have got them all?

Once numbers can be written, number sentences can be recorded.

Modelling of commutative layout.

To have experience of '=' sign as last stage in calculation.
Use Numicon and balance scales for a balance image for concept of equality.
ADDITION AND SUBTRACTION EXCEL

Subtraction

$8 + ? = 10$

$7 + ? = 10$

$7 + 3 = 10$

$15 + 5 = 20$
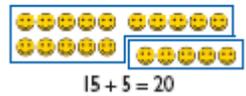
NUMBER FACTS ITP

Practical demonstrations of take away.

There were 9 balloons. Two popped. How many are left?

$9 - 2 = 7$

Find the difference where numbers are close together.

"How many more do I add to 7 to get to 9?"
DIFFERENCE ITP

$9 - 7 = 2$

0 1 2 3 4 5 6 7 8 9 10
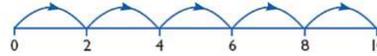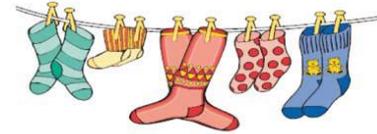
Multiplication

$2 + 2 + 2 + 2 + 2 = 10$
$2 \times 5 = 10$
2 multiplied by 5
5 pairs
5 hops of 2

GROUPING ITP
Pictures to show 2 lots of 3 or 3 lots of 2.

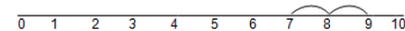| Addition	Subtraction	Multiplication	Division
	Vertical number line to show the difference. Number ladders. 9 – 7 = 2 9 8 7		

Year 1

Key skills of knowing number bonds to 10 and within 20.

Develop knowledge of fact families, e.g. 2, 5, 7.
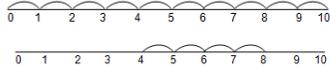
ooooo oo   7 = 5 + 2   2 + 5 = 7
            7 – 2 = 5   7 – 5 = 2

EXCEL ADDITION AND SUBTRACTION TRIOS

Counting forwards and recording on a number line.

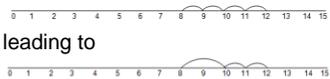**All answers to be recorded in a number sentence following any informal recording.**

0 1 2 3 4 5 6 7 8 9 10

0 1 2 3 4 5 6 7 8 9 10

COUNTING ON AND BACK ITP
NUMBER LINE ITP

4 + 8 =

Reordering – biggest number first.

8 + 4 =

Recording in number sentences and communication along number lines or with informal written methods.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

leading to

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Year 1

Subtraction sentences and jumps (backwards for take away – left and forwards for difference – right) along number lines.

EXCEL ADDITION AND SUBTRACTION TRIOS

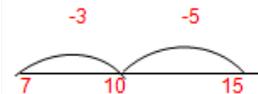**Check with the inverse.**

Know that 6 can be thought of as 5 and 1.

6 is 5 and 1 more

Know that 8 is 5 and 3, therefore subtract 5 then 3.

15 – 8 = 7

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

leading to

-3   -5

7   10   15

Children to show notation

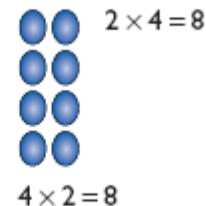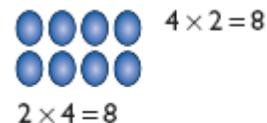**Find the difference by counting on along a number line.**

15 – 8 =

Reinforce the role of the number sentence.

Year 1

Pictorial repeated addition.
Grouping is a random arrangement of a quantity into equal groups.

Arrays are a rectangular arrangement to show the equal groups.

oooo   4 × 2 = 8
oooo
2 × 4 = 8

oo   2 × 4 = 8
oo
oo
oo
4 × 2 = 8

Counting in 2s, 5s and 10s and begin counting in 3s.

Introduce the x symbol once repeated addition is understood.

Year 1

With practical equipment:

Counting on and back in 2s, 5s and 10s and begin counting in 3s.

Grouping as repeated addition along the number line.

Introduce the ÷ symbol once repeated addition (grouping) is understood.

GROUPING ITP

If I have got 4, how many groups of 2 have I got?

+2   +2

0 1 2 3 4 5 6 7 8 9 10
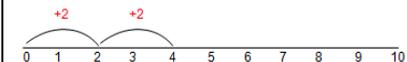
Grouping and sharing practically.
(NB If the answer is in the same units as the dividend, it is sharing. If the answer is in different units, it is grouping.)

Record sharing by using pictorial notation

There are 6 cakes and 2 children. How many cakes will they each get?
One for you and one for you.

Addition	Subtraction	Multiplication	Division
leading to			

Addition

leading to

Children to show notation

Addition is the inverse of subtraction. Fact family.

15 = 12 + 3	3 + 12 = 5
15 – 3 = 12	15 – 12 = 3

Using shapes to represent a missing number.

$\square + \bigcirc = \triangle$ $\square + \square = \triangle$
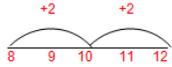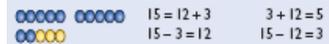$5 + 4 = 9$ $6 + 6 = 12$

Adding more than two numbers

Strategy to include looking for facts or bonds that are useful e.g. bonds up to and including 10, doubles or adding 10 to a given number.
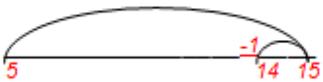
$6 + 3 + 4 = 13$
10

$6 + 3 + 4 + 7 + 2 = 22$
10   10

Children to show notation

Compensation strategy
   $5 + 9 =$
   $5 + 10 – 1$

Children to show notation

Doubles then near doubles
   $5 + 6 =$
   $5 + 5 + 1 = 11$

   $7 + 8 =$
   $8 + 8 - 1 = 15$

Decision making

Using statements such as

Ben did $14 + 9 = 23$

Subtraction
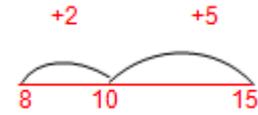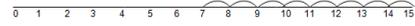
Children to show notation

Use patterns to find answers to subtractions

$10 + 4 =$
$10 – 4 =$
$20 + 4 =$
$20 – 4 =$

EXCEL PATTERNS OF CALCULATION

Decision making

$17 - \square = 12$

Sam works out

$17 – 5 = 12.$

 How could he have done this?

Multiplication
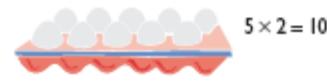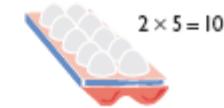
$5 + 5 + 5 + 5 + 5 + 5 = 30$
$5 \times 6 = 30$
5 multiplied by 6
6 groups of 5
6 hops of 5
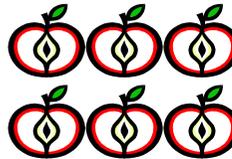
1 group of 3 = 3

2 groups of 3 = 6

Doubles and grouping recorded on number lines

$2 + 2 =$
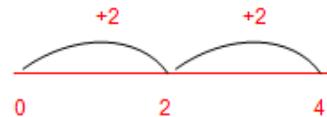
Children to show notation

$2 + 2 + 2 =$
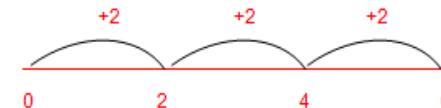
Division
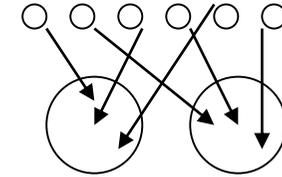
5 hops in 15. How big is each hop?

15 shared between 5
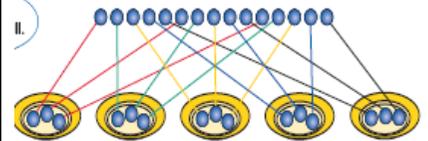
There are 7 cakes and 2 children. How many cakes will they each get?
'Leftovers' introduced.
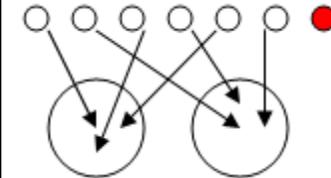
There are 20 sweets in a bag. How many children can have 5 each?
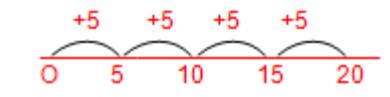
Addition	Subtraction	Multiplication	Division
How could he have done it? **To know that the = sign means 'the same as' and can appear in a different place within a calculation; 14 = 8 + 6, 7+6=8+5**		 3 x 2 =6 3 multiplied by 2 equals 6. 3 times 2 equals 6 click row or column markers to build up a number line as each row or column is coloured In the example above with 5 rows and 9 columns, when you select to count along the columns the given calculation is: 5 x 9 = 45 [the 5 is multiplied by 9]. Selecting to count along rows gives: 9 x 5 = 45 [the 9 is multiplied by 5].	20 ÷ 5 = 4 "How many groups of 5 are there in 20?"
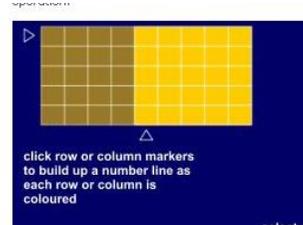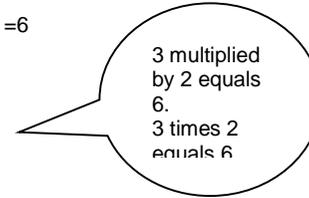
Morville Primary School
Calculation policy
Year 2 and Year 3
Policy reflects: concrete (do it!) abstract (see it!) visual (remember it!) communication (record it!)

Addition	Subtraction	Multiplication	Division
Year 2	**Year 2**	**Year 2**	**Year 2**

Addition — Year 2

Emphasis on mental calculation.

Combining sets to make a total.

Progression in use of informal recording including the number line.

Answers to be recorded as part of a number sentence.

Reordering strategy.

COUNTING ON AND BACK ITP
NUMBER LINE ITP
Adding:
TU + TU = TU
and when secure moving on to
TU + TU = HTU
HTU +TU = HTU

24 + 58

adding in 10s and 1s
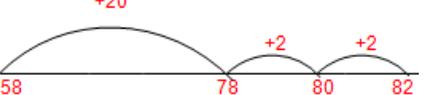
add 20, bridge the 10

add 20 and then 4

Record partitioned steps in number sentences underneath each other and add mentally.

Subtraction — Year 2

Place value, partitioning and recombining.

Rearranging of numbers so that 36 can be seen as 30 and 6 or as 20 and 16.

Partitioning of numbers into T and U then HTU. Know what each digit represents.

TU – TU
HTU – TU
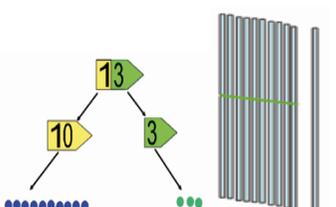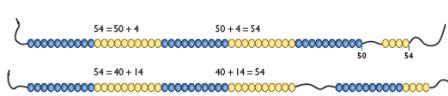
PLACE VALUE ITP

Partitioning the second number strategy
76 – 43 =
76 – 40 = 36
36 – 3 = 33

73 – 46 =
73 – 40 = 33
33 – 6 = 27

Multiplication — Year 2

Using tables facts 2s, 10s and 5s and 3s and 4s.

Be able to partition a 2 digit number.

MULTIPLICATION BOARD ITP

MULTIPLICATION TABLES ITP

Doubles are same as x2.

Vocabulary of double, multiply, groups of, sets of, lots of etc.

Partitioning strategy for doubling.

Double 35

A lolly costs 21p. How much do 3 cost?
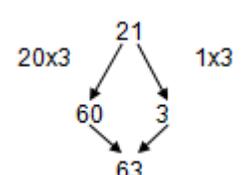
Decision making
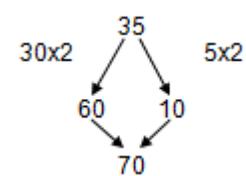**Children investigate statements and solve word problems using appropriate methods such as mental/ jottings/ numberline.**

Division — Year 2

Understand division as repeated addition, grouping.

Table facts (see multiplication).

Division facts corresponding to the 2, 10, 5, 3 and 4 times tables.

Use x and ÷ signs.

MULTIPLICATION AND DIVISION TRIOS SPREADSHEET

Count a handful of beads by grouping them in fives. How many groups of 5 are there? How many are left? Can you write a division sentence to describe this?

How many lengths of 6 m can you cut from 48m of rope? Write the number fact that represents this. How did you work it out?

(OVERCOMING BARRIERS L2-L3 knowing and using number facts)

Record using the correct division symbol.

Use of number lines to record repeated addition.

Practical apparatus to support concept. Introduce the vocabulary of remainder.

Practical contexts to be used so that the calculation is not in the abstract.

Addition	Subtraction	Multiplication	Division

Addition

24+58=
20+50=70
 4+ 8=12
70+12=82

Introduce column addition without crossing the boundary

  24 (20+4)
+53 (50+3)
 77 (70 + 7)

Check answers by repeating addition in different order or by an equivalent calculation.

Compensation strategy

34 + 9 =
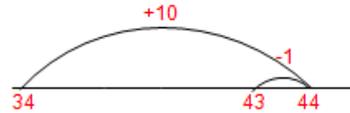
Near doubles

13 + 14 = ☐

Double 14 = 28

28 – 1 = 27

or

Double 13 = 26

26 + 1 = 27

Adding zero leaves a number unchanged/ adding ten to a number keeps units digit constant.

Decision making (mental, jottings, numberline)
Statements and word problems.

Subtraction
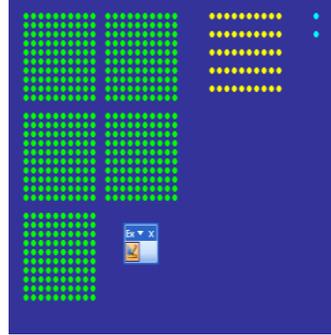
PLACE VALUE DOTS EXCEL SPREADSHEET

Counting back (left) from the larger number in partitioned steps of the smaller number to reach the unknown.

55 – 27
Rearranging strategy
Partitioning the 27 into 20, 5 and 2.

or
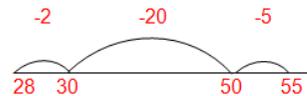
or
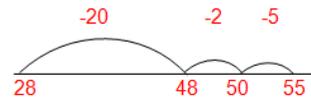
55 – 27 = 28

Find the difference (counting on to the right)

55 – 27 = 28

"How many more do I need to add to 27 to get to 55?"

Multiplication

Division

Grouping
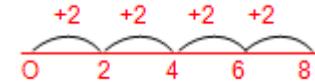
"How many groups of 2 are there in 8?"

The number of jumps tells you the number of groups.

DOUBLING AND HALVING SPREADSHEET

16 ÷ 2 =
"How many groups of 2 are there in 16?"
"I know that dividing by 2 is the same as halving."
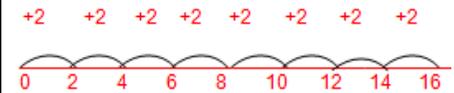
Jump size depends on knowledge and confidence of child. (See D)

20 ÷ 5 =

4 jumps
or moving away from + notation
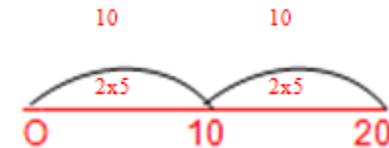
2 double jumps because 5x2 =10
85 ÷ 5 =

Addition	Subtraction	Multiplication	Division

Subtraction section:

Subtract mentally pairs of multiples of 10 and 100, using known facts

60 – 20 = 40 because 6 – 2 = 4

700 – 300 = 400

Continue to use the vertical number line.

Use of apparatus (Diennes) to understand rearrangements, e.g. 55 as 40 and 15, not as part of calculations.

BEADSTICKS ITP to be used with Diennes to develop concept of exchange.

(Beadstick and other place value ITPS)

**Decision making
Statements and word problems.**
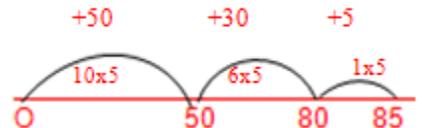
Division section:

Or

**Decision making
Children investigate statements and solve word problems using appropriate methods such as mental/ jottings/ numberline.**

Year 3 (Addition)

Counting on in multiples of 100s, 10s or units using a number line.

**HTU + TU
Cross the 10s/100s boundary.**

86 +57

80   6   50   7
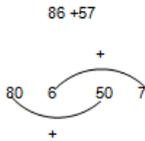
NUMBER BOARDS (all stages onwards) for range of numbers
Start with least significant digit

  67
+ 24
  11 (7+4)
+ 80 (60+20)
  91

"7 add 4 equals 11 and 60 add 20 equals 80. 1+ 0 = 1 and 1 ten + 8 tens = 9 tens"

Year 3 (Subtraction)

Counting backwards and forwards beyond zero, negative and positive numbers.

-5 is negative 5 and minus 5

TU – TU, HTU – TU, HTU – HTU.

Lead on to decomposition method in expanded format.

Ensure understanding of number partitioning and exchange.

Least significant digit is always dealt with first to establish if the exchange is needed.

Check for mental approach first before written method. "Can I do this in my head?"

NUMBER BOARDS (all stages onwards) for range of numbers

Reduction strategy

Year 3 (Multiplication)

Known table facts 2, 3,4,5,6, 8 and 10.

NUMBER DIALS ITP

Refer to multiplication tables ITPs above.

Refer to Page 60 Overcoming barriers L2-L3 for further guidance.

Multiply by 10 / 100, understanding the shift in the digits.

Know what each digit represents, partition a three digit number.

Commutative law (the principle that the order of two numbers in a multiplication calculation makes no difference, e.g. 5x7=7x5).

MOVING DIGITS

Consolidate arrays and repeated addition. Recalling facts.
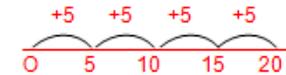**4 x 5 = 20, 5 x 4 = 20.**

Year 3 (Division)

Understand division as repeated addition.

Know all corresponding tables facts for 2, 3,4,5,6, 8 and 10.

Know what each digit represents in a HTU number.

Use numbers that will generate remainders. r notation for the remainder.

21 ÷ 5 = 4 r 1

Record using a number line,
30 ÷ 5 = 6

"What do I know about the number I am dividing by?"
" I know that 5 x 6 = 30"

Repeated addition along a number line with jumps representing number of groups.

Addition	Subtraction	Multiplication	Division

Addition

```
   625
 + 48
   13 (5+8)
   60 (20 + 40)
 + 600 (600 + 0)
   673
```

All language in the context of the place value and the mental addition of the totals to be done in any order.

```
 625
+ 48
 673
```

Decision making.

Subtraction

783 – 356
Partitioning the 356 into 300, 50 and 6.

```
    -6      -50        -300
 427  433      483         783
```
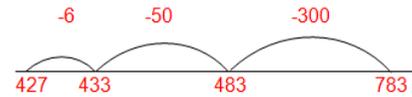
783 – 356 = 427

Difference strategy

"How many more do I need to get from 356 to 783?"

```
  +4      +40      +300      +83
356   360     400      700     783
```
leading to
```
   +44        +300       +83
356        400        700      783
```
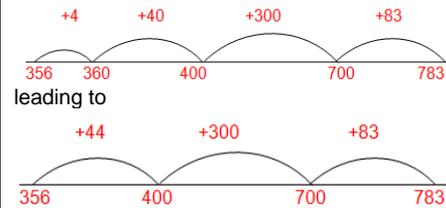
Both strategies need to record the answer in a number sentence.

783 -356 = 427
"783 subtract 356 equals 427"

```
    89  =  80      9
  - 24  =  20      4
            60         5 = 65
```

"9 subtract 4 equals 5 and 80 subtract 20 equals 60. 60 and 5 make 65"

Vertical number line

```
24
        +6
30
        +50
80
        +9
89
```
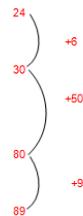
Multiplication

Informal recording of partitioned numbers
15 x 5 = 75

10 x 5 = 50
 5 x 5 = 25

27 x 3 = 81

 20x3 = 60
 7x3 = 21

"20 **multiplied by** 3 equals 60 and 7 **multiplied by** 3 equals 21. 60 add 21 equals 81."
Use unifix bricks to show array

e.g. 14 x 3

10x3=30
 4x3-12

x	10	4
3		

23 x 8 =
20 x 8 =160
3 x 8 = 24
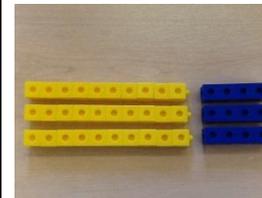
x	20	3
8		

```
  23
x  8
  24 (8 x3)
 160 (8 x20)
 184
```

Decision making

Division
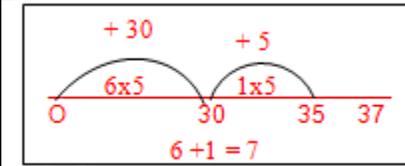
37 ÷ 5 =

Use partitioning/re-arranging to find multiples of the divisor.

Partitioning method
 48 ÷ 3 =
'What do I know about 3 x tables?'
"I know 3 x 10 = 30."

```
 30    18
  ↓     ↓
 10     6
```

 48 ÷ 3 = 16

10 x 3 = 30   6 x 3 = 18
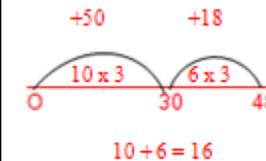
Decision making

Addition	Subtraction	Multiplication	Division
	"Add 6 to 24 to make 30. Add 50 to 30 to make 80. Add 9 to 80 to make 89. So 6 add 50 add 9 equals 65." 81 = 80 1 - <u>57</u> <u>50</u> <u>7</u> <u> </u> <u> </u>= 24 81 = 70 11 - <u>57</u> <u>50</u> <u>7</u> <u> </u> <u> </u>= 24 "1 to subtract 7 is tricky so I will rearrange 81 into 70 and 11. 11 subtract 7 equals 4 and 70 subtract 50 equals 20. 20 and 4 make 24." **BEADSTICKS ITP** **Decision making**		

Morville Primary School
Calculation policy
Year 4 and Year 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 11
```

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

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
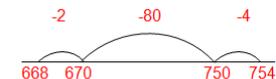
```
  -2      -80       -4
 ___   _____   ___
668 670        750 754
```

or
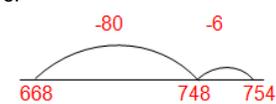
```
     -80          -6
  _____   ____
 668       748    754
```

Find the difference **(right)**

```
  +4   +10        +654
 ___  ____   _____
86  90    100              754
```

Decomposition

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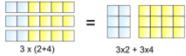
Pupils to explain the effect of multiplying by 10 and 100.

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			

```
  346
x   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

```
        +20          +1  r1
     _____      ___
    O     4x5      20  21
```
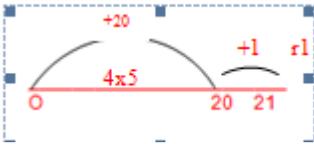
Jump size depends on knowledge and confidence of child. (See D)
This could also be shown as jumps of +5 along the number line resulting in 4 jumps and a remainder of 1.
Use problems in contexts that require the answer to be rounded up or down following the remainder.

Addition	Subtraction	Multiplication	Division
NUMBER BOARDS	**(Continue with Diennes and/or money as appropriate)**	54 (9 x 6) 360 (9 x 40) 2700 (9 x 300) 3114	**Eg 35 children to sleep four to a tent. How many tents do we need?**

Subtraction

```
  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
```

```
  6 14 1
  7 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.

Multiplication

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.

Division

Continue to use partitioning/re-arranging method.

$69 \div 3 =$

'What do I know about 3 x tables?'
"I know 3 x 10 = 30."

```
30    30    9
↓     ↓     ↓
10    10    3
```

$69 \div 3 = 23$
 or

$30 \div 3 = 10$
$30 \div 3 = 10$
$9 \div 3 = 3$
$69 \div 3 = 23$

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"

```
60    36
↓     ↓
10    6
```

$96 \div 6 = 16$

```
      +60        +30       +6
    10x6        3x6       1x6
  0             60     90    96

  10+5+1=16
```

Addition	Subtraction	Multiplication	Division

			96 ÷ 6
			"What do I know?
			Set up partial multiple table:
			
			1 → 6
			2 → 12
			4 → 24
			10 → 60
			5 → 30
			
			leads to
			
			  60 (10)
			+ 30 (5)
			  90
			+ 6 (1)
			  96
			
			96 ÷ 6 = 16

# Year 5 	
 	
.
Add with increasingly large numbers using the compact method.
 	
Extend methods to include decimals to two decimal places.
	# Year 5
	
	Subtract with increasingly large numbers using the compact method.
	
	Extend methods to include decimals to two decimal places.
		# Year 5
		
		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
			# Year 5
			
			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".

Addition	Subtraction	Multiplication	Division
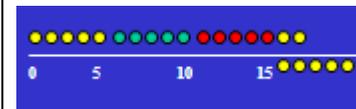
Multiplication column:

x	200	70	3
3			

Followed by appropriate addition calculation.
273p x 3 = 819p
= £8.19

x	4000	300	40	6
8				

4346 x 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 halving again to find x 25.
or using doubling and halving,

Division column:

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

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

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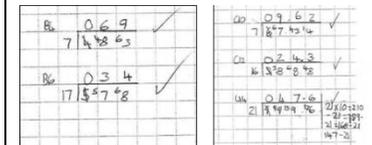
"483 divided by 7. 4 hundreds cannot be shared equally between 7, so exchange the 100s for 40 tens. I now have 48 tens which shared equally between 7 is 6 with a remainder of 6 tens. Exchange the 6 tens for 60 units, we now have 63 units.
63 divided equally between 7 equals 9. The answer is 69."

Use Diennes or place value equipment to model.

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

Addition	Subtraction	Multiplication	Division
		24 x25=12x50 **=6 x100**	tickets. The rest paid £7.50 each. How much money was collected from selling tickets? Money and measures, e.g. Which is longer: $^3/_4$ of an hour or 2500 seconds? **Partitioning method for HTU.** $847 \div 7$ "What do I know? I know 7x12 = 84 so 7 x120 = 840" $\begin{array}{cc} & 847 \\ 840 & 7 \\ \downarrow & \downarrow \\ 120 & 1 \end{array}$ $847 \div 7 = 121$ (OVERCOMING BARRIERS Level 4 to Level 5 typical questions) Work out $575 \div 25$, 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 $768 \div 12$ 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: $943 \div 41 = 2\square$ Work out whether or not 29 is a factor of 811.

Morville Primary School
Calculation policy
Year 6
Policy reflects: concrete (do it!) abstract (see it!) visual (remember it!) communication (record it!)

Addition	Subtraction	Multiplication	Division

Year 6

Promote decision making so that pupils choose an appropriate method/strategy.

Continue the use of informal methods and number lines.

Ensure understanding of standard written method.

Continue ThHTU + ThHTU then calculations with any number of digits.

Approximate using the most significant digits and a feel for the 'whole' number.

Appropriate teaching/use of the calculator including interpreting the display, e.g. money or measures.

Calculator display 0.37 is then interpreted as 37p in the context of money. Remind 4p = 0.04
Calculator display £1.4 is interpreted as £1.40

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

Decimal points are fixed on the line with digits in the squares.

Decimals, fill 'empty columns' with zeros.

124·9 + 7·25

```
   124·90
+    7·25
   132·15
     1 1
```

Year 6

ThHTU – ThHTU then any number of digits.

Appropriate use of a calculator including interpretation of displays.

Money, measures and real life contexts.

6467 – 2684

```
   5 13 1
   6467
-  2684
   3783
```

324·9 – 7·25

```
   1 1  8 1
   324·90
-    7·25
   317·65
```

13·6 – 2·8 =

+0·2   +10·6

2·8   3   13·6

13·6 – 2·8 = 10·8

leading to

14·6 – 2·76

+0·04   +0·2   +11·6

2·76   2·80   3   14·6

Year 6

Know all multiplication facts and corresponding division facts to 12 x 12 and beyond and be able to apply them.

Explain the effect of dividing by1000.

Extend methods to include Th HTU by TU.

Continue to use the short division method when the two digit divisor is up to 12 or is a easily recognisable multiple eg 20, 25 or 50.

Use a calculator appropriately, approximating first.

Use of calculator for interpreting the quotient by entering a fraction to find the decimal equivalent.

Mathsonline.org-long division

Use long division only with pupils who are secure with number sense and place value.

384 ÷ 16
"What do I know about the divisor?"
Record partial tables.

Long division   (thinking not generally recorded)

```
      24
16 ) 38 6 4      (38÷16=2 r 6;
                  2x16=32)
```

Addition	Subtraction	Multiplication	Division
			− 32 ↓ *(bring the 4 down)* *64 (16 into 64=4; 4x16=64)* *− 64* *0 (no remainder)* **Continue to make use of partitioning and the number line for repeated addition where appropriate.** 944 ÷ 22 = What do I know about the divisor? Express the remainder as a fraction or decimal. Overcoming Barriers L4/5 Division giving a decimal answer, e.g. Divide 9 by 5 giving your answer as a decimal. Missing number calculations, e.g. ☐ ÷ 8 = 0.04; 0.6 × ☐ = 4.2