Primary School
Calculation policy
Stages C & D

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

Addition

Stage C (Y2/3)

Emphasis on mental calculation.

Combining sets to make a total.

Progression in use of informal recording including the number line.

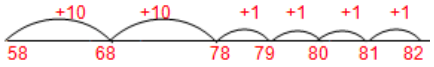
Answers to be recorded as part of a number sentence.

Reordering strategy.

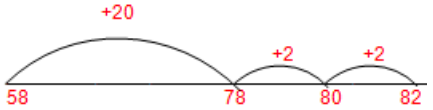
COUNTING ON AND BACK ITP
NUMBER LINE ITP

Adding:
TU + TU = TU
and when secure moving on to
TU + TU = HTU
HTU +TU = HTU

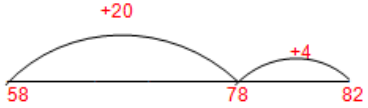
24 + 58



adding in 10s and 1s



add 20, bridge the 10



Subtraction

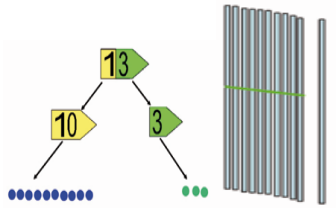
Stage C

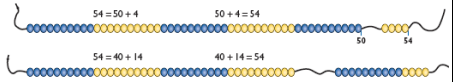
Place value, partitioning and recombining.

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
When it is a subtraction calculation, underline the second number – this is the only number that can be partitioned.

73 – 46 =

Multiplication

Stage C

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

Be able to partition a 2 digit number.

MULTIPLICATION BOARD ITP

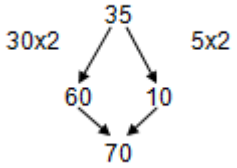
MULTIPLICATION TABLES ITP

Doubles are same as x2.

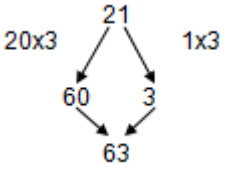
Vocabulary of double, multiply, groups of, sets of, lots of etc.

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

Stage C

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.

Primary School
Calculation policy
Stages C & D

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

add 20 and then 4

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

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

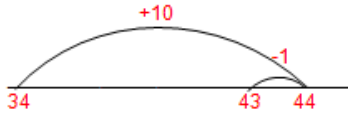
Introduce column addition without crossing the boundary

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

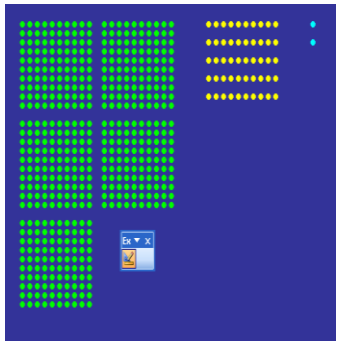
or

Double 13 = 26

26 + 1 = 27

EXCEL MISSING SIGNS AND NUMBERS

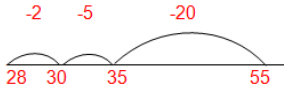
73 – 40 = 33
33 – 6 = 27



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.



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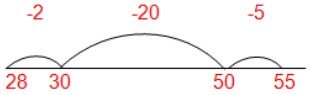
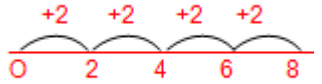


or

Grouping

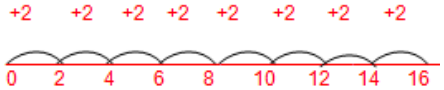


"How many groups of 2 are there in 8?"

The number of jumps tells you the number of groups.

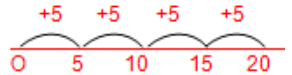
DOUBLING AND HALVING SPREADSHEET

16 ÷ 2 =
"How many groups of 2 are there in 16?"
"I know that dividing by 2 is the same as halving."

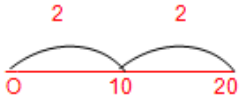


Jump size depends on knowledge and confidence of child. (See D)

20 ÷ 5 =



4 jumps
or moving away from + notation



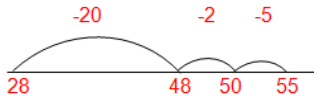
2 double jumps because 5x2 =10

Primary School
Calculation policy
Stages C & D

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

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

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

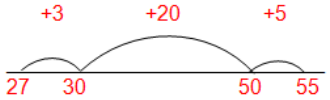


55 – 27 = 28

Find the difference (counting on to the right) Model with numbers that are close together.

55 – 27 = 28

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



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.

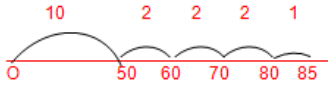
Use of apparatus (Diennes) to understand rearrangements, e.g. 55 as 40 and 15, not as part of calculations.

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

(Beadstick and other place value ITPS)

Decision making
Statements and word problems.

85 ÷ 5 =



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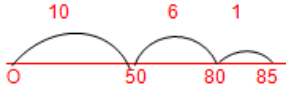


Decision making
Children investigate statements and solve word problems using appropriate methods such as mental/ jottings/ numberline.

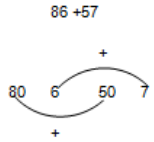
Primary School
Calculation policy
Stages C & D

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

Stage D (Y3/4)

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

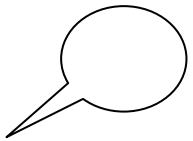
HTU + TU
Cross the 10s/100s boundary.



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"

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

Stage D

Counting backwards and forwards beyond zero, negative and positive numbers. (Y4)

-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.

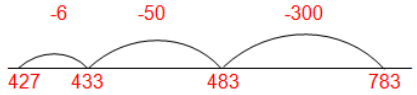
Least significant digit is always dealt with first to establish if the exchange is needed.

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

NUMBER BOARDS (all stages onwards) for range of numbers

Partitioning the second number strategy

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



783 – 356 = 427

Difference strategy

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

Stage D

Known table facts 2, 3,4,5,6, 8 and 10. Use doubling to connect the tables, eg the 4s are doubled to make the 8s.

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.

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

Stage D

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.

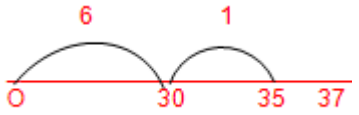
21 ÷ 5 = 4 r 1

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.

37 ÷ 5 =

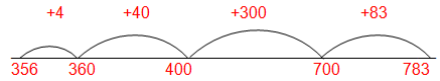


Primary School
Calculation policy
Stages C & D

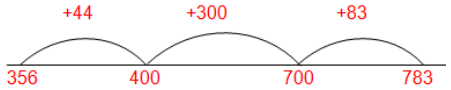
Policy reflects: concrete (do it!) abstract (see it!) visual (remember it!) communication (record it!)

Decision making.

783?"



leading to



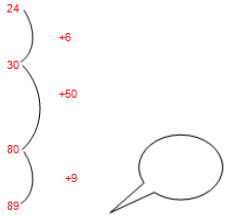
Both strategies need to record the answer in a number sentence.

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



"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."

multiplied by 3 equals 21. 60 add 21 equals 81."

Practical array models.

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

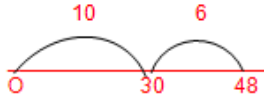
Use partitioning/re-arranging to find multiples of the divisor.

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

Primary School
Calculation policy
Stages C & D

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

	81 = 80 1 - 57 50 7 __ _____ = 24 81 = 70 11 - 57 50 7 __ _____ = 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**		