



Calculation Policy  
2020-2021  
Year 3

# Addition - Year 3

## End of Year Expectation:

Add numbers mentally, including a three-digit number and ones, a three digit number and ones, a three-digit number and tens, a three-digit number and hundreds.

Add numbers with up to three digits, using formal written methods. - begin to use compact column addition to add numbers with three digits.

Estimate the answer to an addition calculation, using inverse to check.

Solve addition problems, including missing number problems, using number facts, place value and more complex addition.

When do we know children are ready for this method?

Do they know addition and subtraction facts to 20?

Do they understand place value and can they partition numbers?

Can they explain their mental strategies orally and record them using informal jottings?

- ① Example calculation: ②
- a)  $121 + 6 = 127$
  - b)  $123 + 8 = 131$

Children count on using mental methods or a numberline /200 square

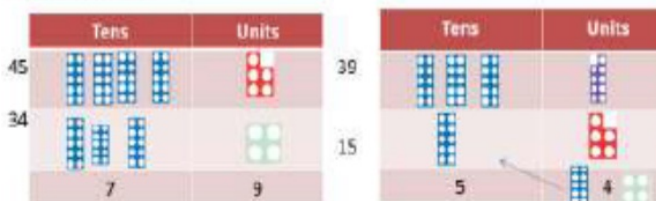
Example calculation:  
c)  $34+25$  (no crossover)

$$57+29 = 77$$

$$57 + 20 = 77$$

$$77 + 9 = 86$$

Mental partitioning to add tens and units. ④



Example calculation:  
e)  $121 + 12 = 133$  (no crossover)

f)  $123 + 18 = 141$  (bridging once)

g)  $79+86 = 165$  (multiple bridging)

Begin investigating benefits addition for calculation t

③  $176 + 147 = 323$

$$\begin{array}{r} 176 \\ + 147 \\ + 13 \\ + 110 \\ \hline 200 \\ \hline 323 \end{array}$$

(7 + 6)  
(70 + 40)  
(100 + 100)

**expanded method:**

Use this intermediate step only if children experience difficulty moving on from partitioning method

$$\begin{array}{r} 236 \\ + 73 \\ \hline 309 \\ \hline 1 \end{array}$$

**Compact column addition**

**Key vocabulary** add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact

Add the units first, carry numbers underneath the bottom line, remind pupils of actual value eg, 3 tens add 7 tens.

# Subtraction - Year 3

## End of Year Expectation:

Subtract numbers mentally including:

- > a three-digit number and ones
- > a three-digit number and tens
- > a three-digit number and hundreds

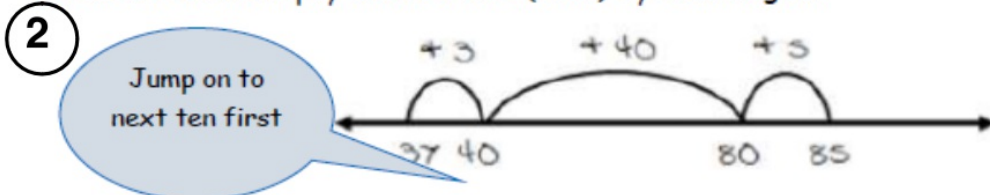
Subtract numbers up to three digits using formal written methods.

Estimate an answer to a calculation and use inverse operations to check answers.

NB Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

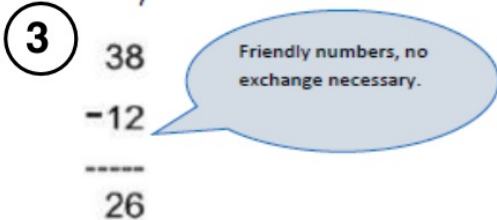
## Year 3 Subtract with 2 and 3-digit numbers

Subtract on an empty number line (ENL) by counting on



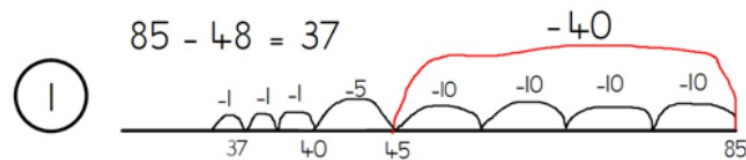
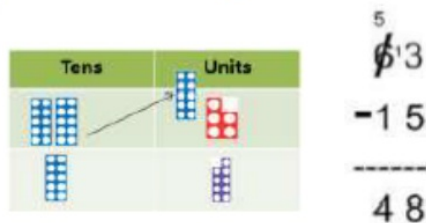
Children should understand when to count back where appropriate, using place value or number facts. This skill should be reinforced through mental work.

Begin to use formal column subtraction method, first using 'friendly numbers'.



Teach the children to consider the most appropriate method

4 Move to formal subtraction using 'take and make'.



Key vocabulary equal to, take, take-away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least count back, how many left, how much less is..., difference, count on, strategy, partition, tens units, **take and make, exchange, digit, value, hundreds**



# Multiplication - Year 3

## End of Year Expectation:

Recall and use multiplication facts for the 3's, 4's and 8's

Write and calculate mathematical statements for multiplication tables (2,3,4,5,8,10's times tables) including for two-digit numbers

times one-digit numbers using mental methods and formal written methods.

Solve problems including missing number problems involving multiplication with correspondance problems in which n objects are connected to m objects.

## Year 3 multiply 2-digit numbers by a single digit number

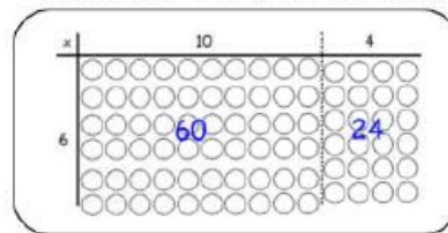
Introduce the grid method for multiplying 2 digits by 1 digit

Eg.  $23 \times 8 = 184$

X	20	3
8	160	24

$$160 + 24 = 184$$

Link the layout of the grid to an array initially:



Demonstrate how the array links to the grid calculation

Children **MUST** be able to do the following before moving onto grid method:

- Partition numbers into tens and units
- Multiply multiples of ten by a single digit (Smile multiplication) using their knowledge of multiplication facts and times tables.
- Recall and work out multiplication facts in the 2,3,4,5,8 and 10 times tables

Smile Multiplication 😊  
 $30 \times 80 = 2400$   
24  
Do the tables bit.  
Then make it 10, 100 or 1000 times bigger!

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value

# Division - Year 3

## End of Year Expectation:

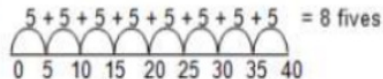
Recall and use division facts for the 3s, 4s and 8s.  
Write and calculate mathematical statements for division (2,3,4,5,8,10) including 2 digit numbers divided by a 1 digit number using mental methods.  
Solve problems including missing number problems involving division.

## Year 3 Divide 2-digit numbers by a single digit

Example without remainder:

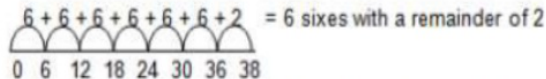
$40 \div 5$

Ask "How many 5s in 40?"



Example with remainder:

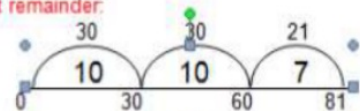
$38 \div 6$



For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.

Example without remainder:

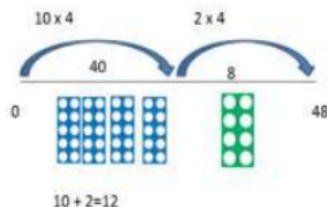
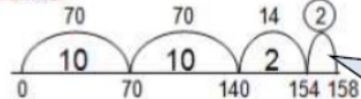
$81 \div 3$



This could either be done by working out the numbers of threes in each jump as you go along (10 threes are 30, another 10 threes makes 60, and another 7 threes makes 81. That's 27 threes altogether) or by counting in jumps of known multiples of 3 to reach 81 (30 + 30 + 21) then working out the number of threes in each jump.

Example with remainder:

$158 \div 7$



Grouping on a number line first without, then with remainders

Model first using Dienes, then using bead bar to show link to ENL

Develop fluency in mathematical talk or patter e.g.

" My question is 32 divided by 8.

I know that the inverse will be  $? \times 8 = 32$

so how may 8's make 32? 8, 16, 24, 32 = 4

$4 \times 8 = 32$  so 32 divided by 8 is 4"

Using facts that I already know eg:

$120 \div 4 =$

I know that  $10 \times 4 = 40$

so  $20 \times 4 = 80$

$30 \times 4 = 120$

repeated addition  $40 + 40 + 40 = 120$

Use the formal written layout for division using multiplication tables that they know:

$$\begin{array}{r} 4 \\ 8 \overline{) 32} \end{array}$$

'How many eights are there in thirty two?'

Continue using the formal written layout, introducing remainders:

$$\begin{array}{r} 8 \text{ r } 1 \\ 3 \overline{) 25} \end{array}$$