Year 4

PROPERTIES OF NUMBERS AND NUMBER SEQUENCES

number, count, how many…?
odd, even
every other
how many times?
multiple of
digit
next, consecutive
sequence
continue
predict
pattern, pair, rule
relationship
sort, classify, property

PLACE VALUE, ORDERING AND ROUNDING

units, ones, tens, hundreds, thousands, ten thousand, hundred thousand, million
digit, one-, two-, three- or four-digit number, numeral
'teens' number
place, place value
stands for, represents
exchange
the same number as, as many as
equal to
Of two objects/amounts:
>, greater than, more than, larger than, bigger than
<, less than, fewer than, smaller than
Of three or more objects/amounts:
greatest, most, largest, biggest
least, fewest, smallest
one, ten, one hundred, one thousand
more/less
compare, order, size
first… tenth… twentieth
last, last but one
before, after, next
between, half-way between
guess how many, estimate
nearly, roughly, close to, about the same as, approximate, approximately
just over, just under, exact, exactly
too many, too few, enough, not enough
round (up or down), nearest
round to the nearest ten
round to the nearest hundred
integer, positive, negative
above/below zero, minus

MAKING DECISIONS AND REASONING

pattern, puzzle
calculate, calculation
mental calculation
method
jotting
answer
right, correct, wrong
what could we try next?
how did you work it out?
number sentence
sign, operation, symbol, equation

ADDITION AND SUBTRACTION

add, addition, more, plus, increase
sum, total, altogether
score
double, near double
how many more to make…?
subtract, subtraction, take (away), minus, decrease
leave, how many are left/left over?
difference between
half, halve
how many more/fewer is… than…?
how much more/less is…?
equals, sign, is the same as
tens boundary, hundreds boundary
inverse

MULTIPLICATION AND DIVISION

lots of, groups of
times, multiply, multiplication, multiplied by
multiple of, product
once, twice, three times… ten times…
times as (big, long, wide… and so on)
repeated addition
array
row, column
double, halve
share, share equally
one each, two each, three each…
group in pairs, threes… tens
equal groups of
divide, division, divided by, divided into
remainder
factor, quotient, divisible by
inverse

General

same, different
missing number/s
number facts, number pairs, number bonds
greatest value, least value
number line, number track
number square, hundred square
number cards, number grid
abacus
counters, cubes, blocks, rods
die, dice
dominoes
pegs, peg board, pin board
geo-strips
same way, different way
best way, another way
in order, in a different order
not
all, every, each

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Year 4 Programme of Study

Number - number and place value

Pupils should be taught to:

- count in multiples of 6, 7, 9, 25 and 1000
- find 1000 more or less than a given number
- count backwards through zero to include negative numbers
- recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)
- order and compare numbers beyond 1000
- identify, represent and estimate numbers using different representations
- round any number to the nearest 10, 100 or 1000
- solve number and practical problems that involve all of the above and with increasingly large positive numbers
- read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.

Number - addition and subtraction

Pupils should be taught to:

- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Number - multiplication and division

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Number - fractions (including decimals)

Pupils should be taught to:

- recognise and show, using diagrams, families of common equivalent fractions
- count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.
- solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number
- add and subtract fractions with the same denominator
- recognise and write decimal equivalents of any number of tenths or hundredths
- recognise and write decimal equivalents to 1/4, 1/2, 3/4
- find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths
- round decimals with one decimal place to the nearest whole number
- compare numbers with the same number of decimal places up to two decimal places
- solve simple measure and money problems involving fractions and decimals to two decimal places.

Measurement

Pupils should be taught to:

- convert between different units of measure [for example, kilometre to metre; hour to minute]
- measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres
- find the area of rectilinear shapes by counting squares
- estimate, compare and calculate different measures, including money in pounds and pence

Geometry - properties of shapes

Pupils should be taught to:

- compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- identify acute and obtuse angles and compare and order angles up to two right angles by size
- identify lines of symmetry in 2-D shapes presented in different orientations
- complete a simple symmetric figure with respect to a specific line of symmetry.

Geometry – position and direction

Pupils should be taught to:

- describe positions on a 2-D grid as coordinates in the first quadrant
- describe movements between positions as translations of a given unit to the left/right and up/down
- plot specified points and draw sides to complete a given polygon.

Statistics

Pupils should be taught to:

- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

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In order to encourage children to work mentally, calculations should always be presented horizontally so children can make decisions about how to tackle them. Encourage children to choose to use the most efficient method for the numbers and the context. Teach operations together to emphasise the importance of inverse.

Addition to be taught alongside each other Subtraction

Model expanded horizontal partitioning with Base 10 leading to compact vertical method working from left to right, then from right to left.

Expanded horizontal method

2000 +300 +20 +7
1000 +500 +40 +2
3000 +800 +60 +9 = 3869

2387	2387
+2942	+2942
4000	9
1200	120
120	1200
9	4000
5329	5329

Model how solving an addition on an empty number line increasingly becomes less efficient as the complexity and size of numbers increases.

Moving into compact method

£3.59	867	473
+ £0.78	+ 524	+ 258
£4.37	1391	731

Compensation

Continue to teach compensation method where children round and adjust to the nearest 10 / 100, especially in the context of money.

£4.99 + £6.99 = £5.00 – 1p + £7.00 – 1p = £12.00 – 2p = £11.98

Using similar methods, children will:

- ✓ *add several numbers with different numbers of digits;*
- ✓ *begin to add two or more three-digit sums of money, with or without adjustment from the pence to the pounds;*
- ✓ *know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. £3.59 + 78p.*

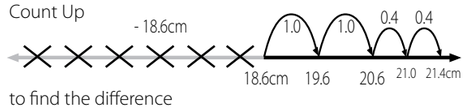
Number lines and Difference

'Find the difference by counting on'

Including measures e.g. 754ml - 690ml or 1275g - 786g

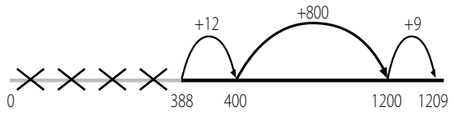
£3.00 - £2.68 E.g. 21.4cm – 18.6cm = 18.6cm + = 21.4cm

Count Up



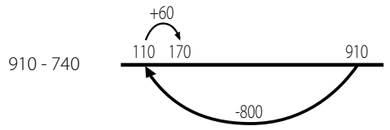
to find the difference
21.4cm - 18.6cm = 2.8cm

Where the numbers involved in the calculation are close together or near to multiples of 10, 100 etc counting on using a number line should be used. e.g. 1209 – 388 = 821



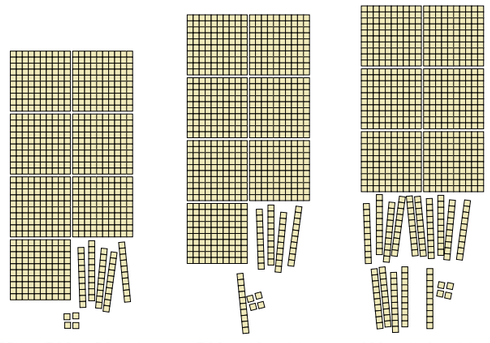
Counting back and Compensation

Using number lines, bridging through 10, 100 and 1000 and rounding and adjusting (compensating)
e.g. 42p – 5p *or* 193 litres – 18 litres *or* £823 – £32 *or* 706mins – 28mins *or* 307cm – 111cm *or* 1006km - 9km



Expanded horizontal (including 4 digit numbers) using base 10

Step 1 754 = 700 + 50 + 4
- 286 - 200 + 80 + 6
Step 2 700 + 40 + 14 (adjust from T to O)
- 200 + 80 + 6
Step 3 600 + 140 + 14 (adjust from H to T)
- 200 + 80 + 6
400 + 60 + 8 = 468



754 = 700 + 50 + 4 = 700 + 40 + 14 = 600 + 140 + 14
- 200 80 6
400 + 60 + 8

Leading to vertical compact method

6 14 1
~~7~~ ~~8~~ 4
- 286
= 468

Children should:

- ✓ *be able to subtract numbers with different numbers of digits;*
- ✓ *begin to find the difference between sums of money, with or without 'adjustment' from the pence to the pounds.*

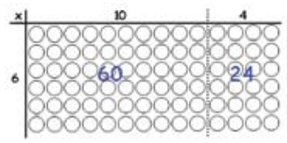
Multiplication to be taught alongside each other Division

2 and 3 digit x 1 digit numbers. Include X 0 and X 1

Partitioning using place value and the distributive law

38 x 5 = (30 x 5) + (8 x 5)
= 150 + 40
= 190

Children will continue to use **arrays** where appropriate leading into the grid method of multiplication.



(10 x 6) + (4 + 6)
60 + 24
= **84**

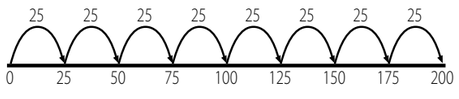
Grid method

(Short multiplication – multiplication by a single digit)

Children can approximate first

23 x 8 is approximately 25 x 8 = 200

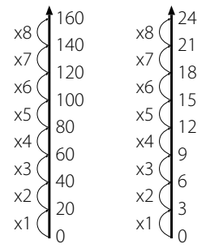
25 x 8



20 x 8 = 160 + 3 x 8 = 24 = 184

x 20 3
8 160 24

160
+ 24
184



23
x 8
24 (3 x 8)
+ 160 (20 x 8)
184

Expanded Method leading to Compact Method

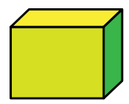
23
x 8
= 184

Recognise and use factor pairs

14 x 8 = 7 x 2 x 8 = 112

Multiply 3 single digits together

e.g. 3 x 4 x 5



Division

2 and 3 digit ÷ 1 digit numbers. Include ÷ 0 and ÷ 1

Number lines and known multiplication facts to solve division

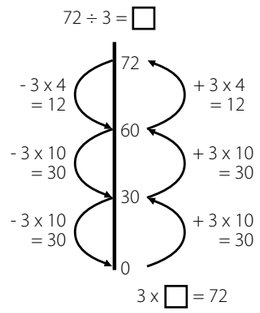
Children will continue to develop their use of number lines and known multiplication facts to solve division (using known multiples of the divisor).

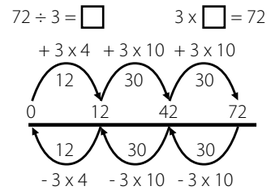
Short division

(2 digit ÷ 1 digit numbers)

Illustrate using horizontal and vertical bead bar and number line to make link between vertical column method.
Expanded written method with common multiple, leading to division of other multiples.

72 ÷ 3

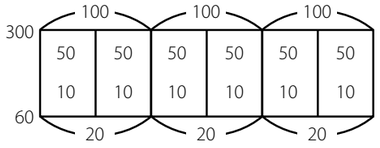




Using knowledge of place value, known facts and fractions.

360 ÷ 6 = 60 6 x 10 x 6 *or* 6 x 6 x 10 *or* 6 x 60 = 360

360 ÷ 6 = 1/6 of 360



1/3 of 360 = 120
1/6 of 360 = 60
2/6 of 360 = 120

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