Year 2

COUNTING, PROPERTIES OF NUMBERS AND NUMBER SEQUENCES

number
zero, one, two, three… to twenty and beyond
zero, ten, twenty… one hundred
zero, one hundred, two hundred… one thousand
none
how many…?
count, count (up) to
count on (from, to)
count back (from, to)
count in ones, twos, threes, fours, fives…
count in tens
more, less, many, few
tally
odd, even
every other
how many times?
multiple of
sequence
continue
predict
pattern, pair, rule

PLACE VALUE AND ORDERING

units, ones, tens, hundreds
digit
one-, two- or three-digit number
'teens' number
place, place value
stands for, represents
exchange
the same number as, as many as
equal to
Of two objects/amounts:
greater, more, larger, bigger
less, fewer, smaller
Of three or more objects/amounts:
greatest, most, biggest, largest
least, fewest, smallest
one more, ten more
one less, ten less
compare, order, size
first, second, third… tenth… twentieth
twenty-first, twenty-second…
last, last but one
before, after, next
between, half-way between
above, below

ESTIMATING

guess how many, estimate
nearly, roughly, close to
about the same as
just over, just under
exact, exactly
too many, too few, enough, not enough
round, nearest, round to the nearest ten

MAKING DECISIONS AND REASONING

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

ADDITION AND SUBTRACTION

+, add, addition, more, plus
make, sum, total
altogether
score
double, near double
one more, two more... ten more... one hundred more
how many more to make…?
how many more is… than…?
how much more is…?
- subtract, subtraction, take (away), minus
leave, how many are left/left over?
one less, two less… ten less… one hundred less
how many fewer is… than…?
how much less is…?
difference between
half, halve
= equals, sign, is the same as
tens boundary

MULTIPLICATION AND DIVISION

lots of, groups of
x, times, multiply, multiplied by
multiple of
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, divided by, divided into
left, left over

General

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

Exmouth Area
Learning Community

Year 2 Programme of Study

Number - number and place value

Pupils should be taught to:

- count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
- recognise the place value of each digit in a two-digit number (tens, ones)
- identify, represent and estimate numbers using different representations, including the number line
- compare and order numbers from 0 up to 100; use <, > and = signs
- read and write numbers to at least 100 in numerals and in words
- use place value and number facts to solve problems.

Number - addition and subtraction

Pupils should be taught to:

- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental and written methods
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and ones
  - a two-digit number and tens
  - two two-digit numbers
  - adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Number - multiplication and division

Pupils should be taught to:

- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Number - fractions

Pupils should be taught to:

- recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity
- write simple fractions for example, $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$.

Measurement

Pupils should be taught to:

- choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
- compare and order lengths, mass, volume/capacity and record the results using >, < and =
- recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value
- find different combinations of coins that equal the same amounts of money
- solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
- compare and sequence intervals of time
- tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times
- know the number of minutes in an hour and the number of hours in a day.

Geometry - properties of shapes

Pupils should be taught to:

- identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
- compare and sort common 2-D and 3-D shapes and everyday objects.

Geometry – position and direction

Pupils should be taught to:

- order and arrange combinations of mathematical objects in patterns and sequences
- use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).

Statistics

Pupils should be taught to:

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data.

In order to encourage children to work mentally, calculations should always be presented horizontally so children can make decisions about how to tackle them.

Addition to be taught alongside each other Subtraction

Children should use number lines that are marked out in jumps of one and ten and learn which would be most appropriate for a given calculation.

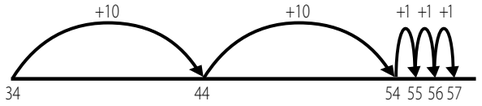
Children will begin to use 'empty number lines' themselves starting with the larger number and counting on, keeping the first number whole.

Numicon and Base Ten should be used to support this. It is important that the visual image of these resources is related to the number line. Encourage children to use the language of partitioning and bridging when explaining their strategies.

Counting on

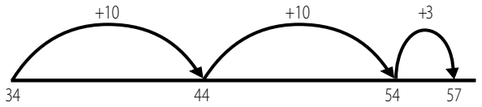
First counting on in tens and ones.' (jumping in 10's).

34 + 23 = 57



Then helping children to become more efficient by adding the ones in one jump (by using the known fact 4 + 3 = 7).

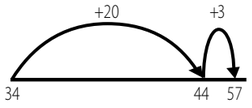
34 + 23 = 57

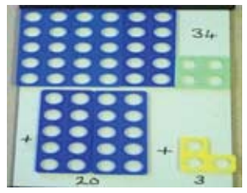


Followed by adding the tens in one jump and the ones in one jump.

34 + 23 = 57

Or 34 + ☐ = 57
57 = ☐ + 34

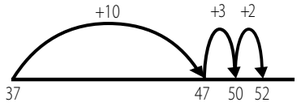


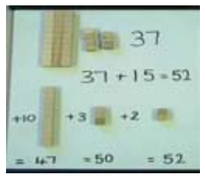


Bridging through ten can help children become more efficient. (target 10).

37 + 15 = 52

Or 52 = 37 + ☐
52 = ☐ + 37





Compensation

Children should be taught when adding 9, it is easier to add 10 then subtract 1, modelling on a bead bar over jumping 10.

37 + 9 = ?? 37 + 10 = 47 47 -1 = 46

Complementary addition

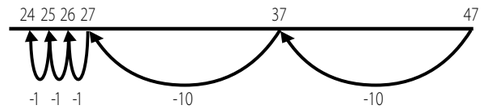
Children should understand solving word problems, such as 'You need 10 marbles, but you only have 6, how many more do you need?' Model on bead bar and number line… 'How to find the missing number' e.g. 10 = 6 + __

Children will use bead strings and numbered number lines to support.

calculations. They should begin to use empty number lines. When subtracting, children should be taught to only partition the second number.

Counting back

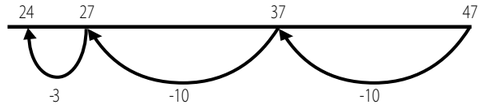
First counting back in tens and ones. 47 - 23 = 24

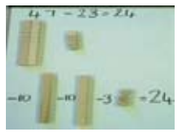


Then helping children to become more efficient by subtracting the units in one jump (by using the known fact 7 – 3 = 4).

47 - 23 = 24

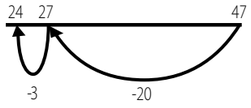
Or 47 - ☐ = 24
24 = 47 - ☐





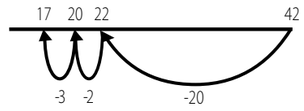
Followed by subtracting the tens in one jump and the units in one jump.

47 - 23 = 24



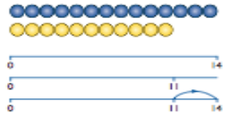
Bridging through ten can help children become more efficient.

42 - 25 = 17



Counting on

It is important that children experience finding the difference between 2 numbers by counting on. The difference ITP is a good visual image.



The difference between 11 and 14 is 3.

14 - 11 = 3
11 + ☐ = 14

It is important that this is modelled using two bead strings, or two Numicon plates as shown in the picture above. Children should experience finding the difference in a range of contexts including height e.g. growth of two seedlings.

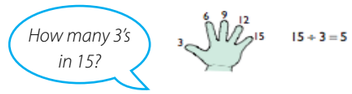
Compensation

When subtracting 9, it is easier to subtract 10 then add 1, (model on a bead bar).

37 - 9 = ?? → 37 - 10 = 27 → 27 + 1 = 28

Multiplication to be taught alongside each other Division

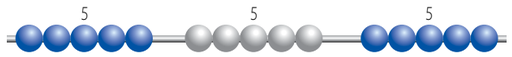
Children will develop their understanding of multiplication and use jottings to support calculation:



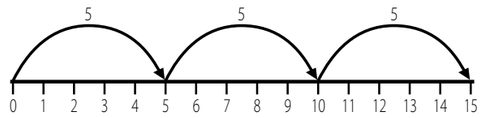
Repeated addition

5 times 3 = 5 x3 = 5 three times = Three groups of 5 = 5 + 5 + 5 = 15

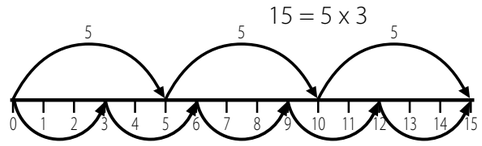
On a bead bar: 5 x 3 = 5 + 5 + 5



And on a number line: 5 x 3 = 5 + 5 + 5



Children should know that 3 x 5 has the same answer as 5 x 3. This can also be shown on the number line.



Arrays

Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method. Children will need to be taught the language of 'rows' and 'columns'.

5 x 3 = 15

3 x 5 = 15

5 x 2 = 10

2 x 5 = 10

The multiplication ITP is a good visual image. They should explore arrays in the environment.

It is important to connect the array model to repeated addition using resources such as counters and show the link between more complex fractions of objects, numbers and quantities.

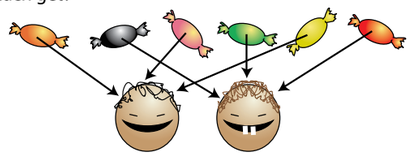
Scaling

Exploring concepts such as:

'This is twice as long as/
half as long as/
3 times as tall as'

Children will develop their understanding of division and use jottings to support calculation. They should make the link between counting in equal steps and grouping.

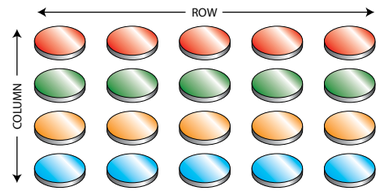
Sharing '6 sweets shared between 2 people, how many do they each get?'



Relate fractions to the sharing aspect of division through arrays and model the recording.

E.g. 8 ÷ 2 = half of 8.

1. 5 x 4
2. 4 x 5
3. 20 ÷ 5
4. 20 ÷ 4
5. 1/5 of 20
6. 1/4 of 20



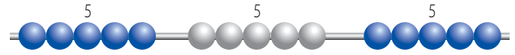
Grouping 'There are 6 sweets, how many people can have 2 sweets each?'

'Crisps come in packs of 5, I have 20 children and each needs a packet. How many packs do I need to buy?' 20 ÷ 5 = 4

Repeated Subtraction

15 ÷ 5 = 15 – 5 – 5 – 5 =

(3 groups of 5)



Children should be encouraged to use their known multiplication facts to work out division calculations.

The **bead bar** will help children with interpreting calculations like 12 ÷ 3 = as 'How many 3's equal 12?

Solve calculations using symbols to stand for unknown numbers and complete equations using inverse operations.

■ ÷ 2 = 4 20 ÷ ▲ = 4 ■ ÷ ▲ = 4

Scaling

Sam ran 6km on Saturday.
On Sunday he ran half as far.
How far did he run on Sunday?

Exmouth Area Learning Community