

Year 2

Addition and Subtraction

- Recall and use addition and subtraction facts up to 20 fluently, and derive and use related facts up to 100.
- Add and subtract with concrete objects, representations and mentally
 $10 + 0 =$ $10 + \text{tens} =$ $10 + 10 =$ $0 + 0 + 0 =$
- 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 use this to check calculations and solve missing number problems.

Developing Mental Fluency - Strategies

Teachers and/or pupils may demonstrate these strategies on a numbered number line supported by a variety of materials.

Re order numbers when adding.

$$14 + 27 = \quad \quad \quad \text{or } 3 + 8 + 7 = \quad (\text{using knowledge of number bonds to } 10)$$

Bridging through ten and multiples of 10 when adding and subtracting

$$36 + 18 = \quad \quad \quad 73 - 16 =$$

Partition, add and recombine

$$42 + 36 = 40 + 30 \quad 2 + 6 = \quad 70 + 8 = 78$$

Count on / back in tens then ones to find total or difference

$$36 + 22 = \quad \quad \quad \text{Counting on } 23 - 17 = \quad \quad \quad \text{Counting back } 45 - 20 =$$

Adding / subtracting a near multiple of ten and adjusting

$$23 + 19 = \quad \quad \quad 65 - 21 =$$

Doubles and near doubles

$$15 + 16$$

Deriving new facts

$$3 + 7 = 10 \text{ therefore } 30 + 70 = 100 \quad \quad \quad 100 - 30 = 70 \quad \quad \quad 30 = 100 - 70 \quad \quad \quad 70 = 100 - \square$$

Year 2 Addition

$T0 + 0 =$

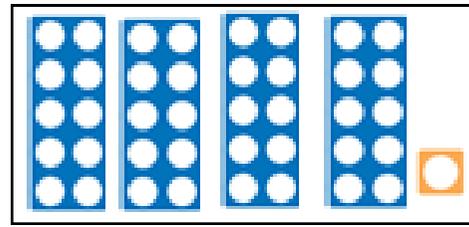
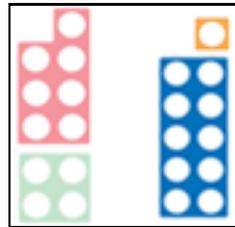
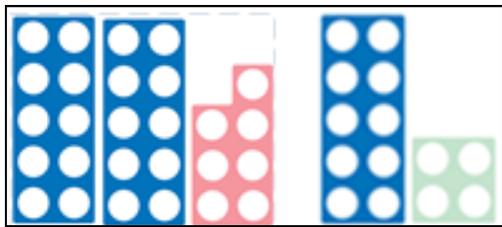
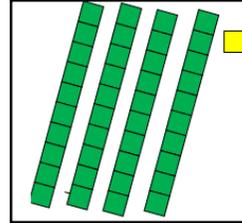
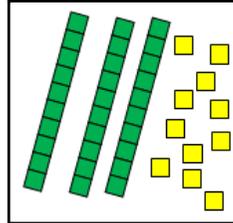
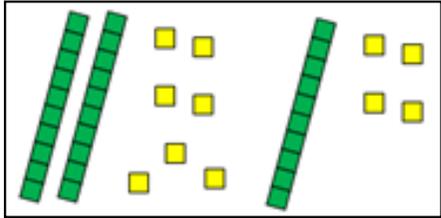
$T0 + \text{tens} =$

$T0 + T0 =$

$0 + 0 + 0 =$

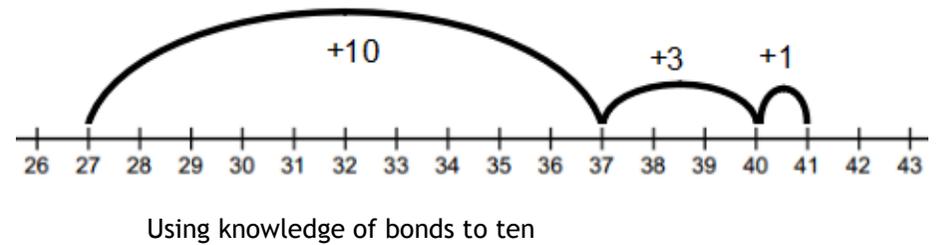
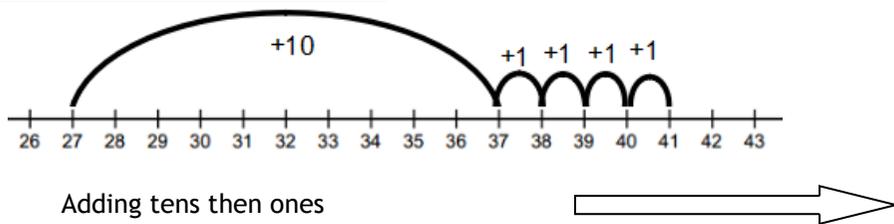
Models and representations

$27 + 14 = 41$



$7 + 4 = 11$

Numbered number lines (leading to ENL)



Jottings

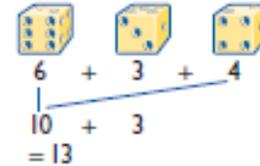
$27 + 14 = 27 + 10 = 37$
 $37 + 4 = 41$

When teaching the stages in progression start with models and make connections with the number line at the same time.. Children should be able to explain what is happening when they exchange ones for a ten and remaining ones.

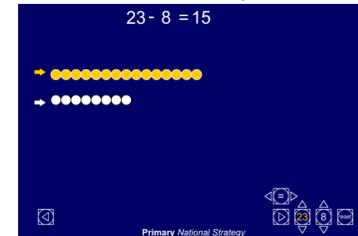
Place emphasis on the ability to explain and reason about the mathematics behind the method. E.g. Ask 'What's the same and what's different?'

Other manipulatives

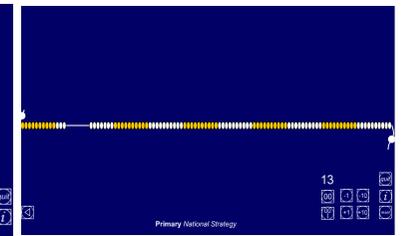
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Hundred square



Difference ITP



Bead String ITP

Year 2 Subtraction

T0 - 0 =

T0 - tens =

T0 - T0 =

Models 45 - 27 =



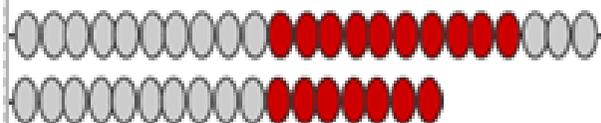
Other manipulatives

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

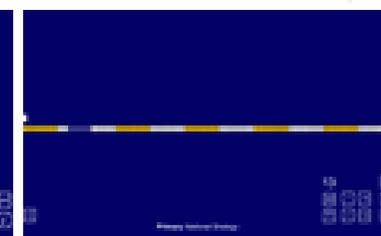
Hundred square



Bead string to show difference 23 - 17 =



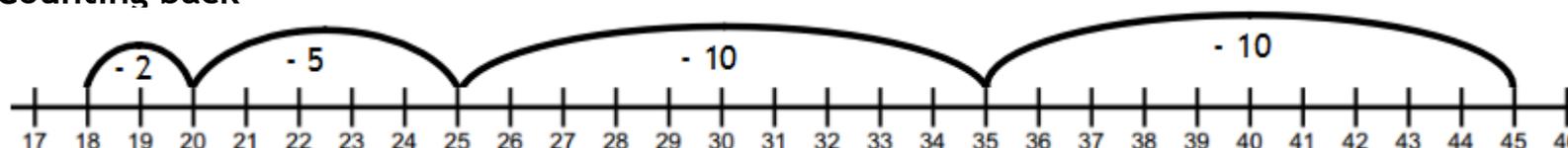
Difference ITP



Bead String ITP

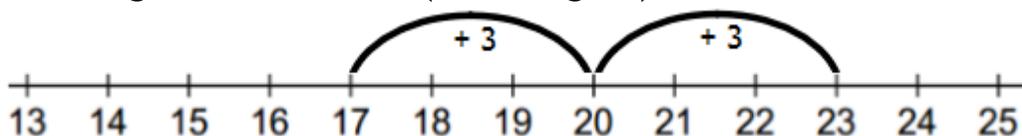
Numbered number lines (leading to ENL)

Counting back



Smaller jumps leading to more efficient jumps.

Finding the difference (counting on)



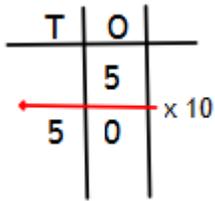
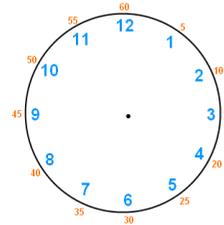
When teaching the stages in progression start with models and make connections with the number line. Place emphasis on the ability to explain and reason about the mathematics behind the method. E.g. Ask 'What's the same and what's different about these three approaches to the same calculation?'

Multiplication and Division objectives

- Recall and use multiplication and division facts for 2, 5 and 10 multiplication tables.
- Know doubles of numbers to at least 15, doubles of multiples of 5 up to 50
- Recognise odd and even numbers
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using \times , \div and $=$
- 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.

Developing Mental Fluency— Strategies

Teachers and/or pupils may demonstrate these strategies on an empty number line (ENL) supported by a variety of materials.

Connect x 10 table to place value.**Connect x 5 table to divisions on the clock face****Partition, double ones, double tens and recombine**

$$16 \times 2 =$$

$$\text{Double } 10 = 20 \quad \text{Double } 6 = 12 \quad 20 + 12 = 32$$

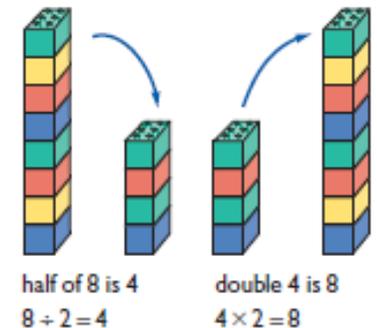
Use knowledge that halving is the inverse of doubling and that doubling is equivalent to multiplying by 2

Children begin to relate divisions to fractions and measures

$$40 \div 2 = 20, \text{ half of } 40 \text{ is } 20, 20 \text{ is half of } 40$$

Children use commutativity and inverse relations to develop multiplicative reasoning

$$4 \times 5 = 20 \quad 20 \div 5 = 4 \text{ and } 20 \div 4 = 5$$



Year 2 Multiplication

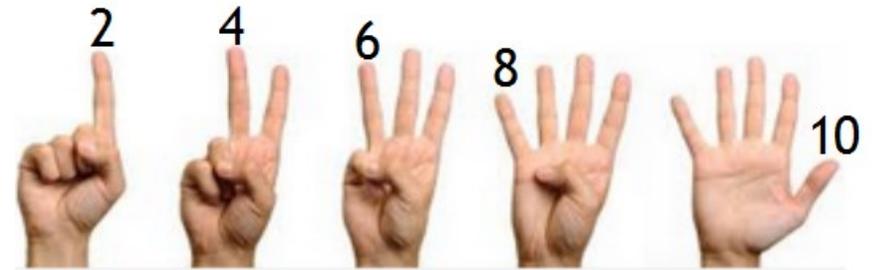
Within 2, x5 and x10 multiplication tables including missing numbers

Models

Arrays

$4 \times 2 = 8$ $2 \times 4 = 8$

Consider turning the array (rather than making two) in order for children to see the equivalence between the two calculations.



Counting on fingers



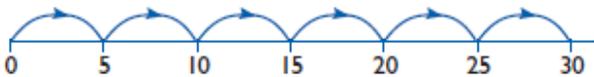
$5 + 5 + 5 + 5 + 5 + 5 = 30$

$5 \times 6 = 30$

5 multiplied by 6

6 groups of 5

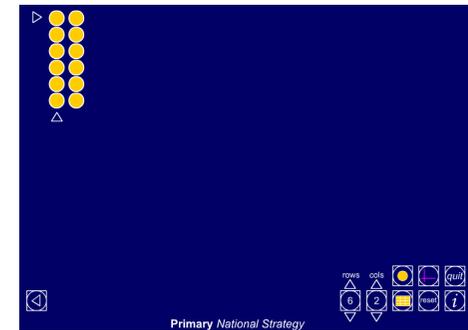
6 hops of 5



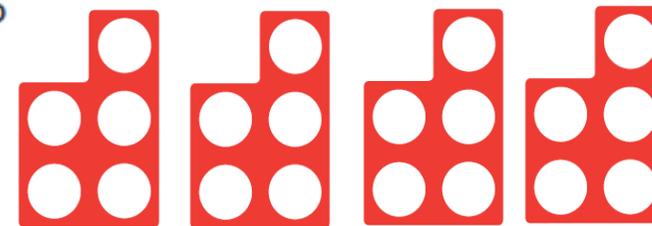
$10p + 10p + 10p + 10p + 10p = 50p$

$10p \times 5 = 50p$

5 hops of 10



Multiplication facts ITP

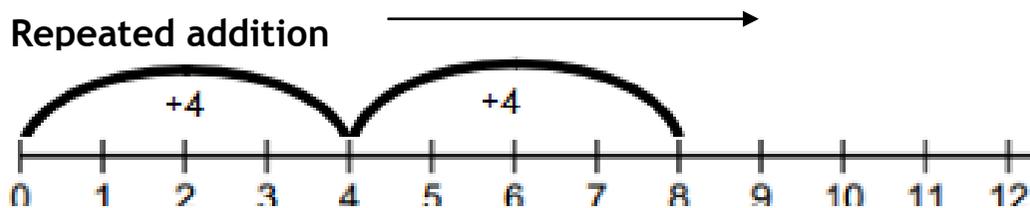


$5 \times 4 =$

4 groups of 5

Numbered number lines (leading to ENL)

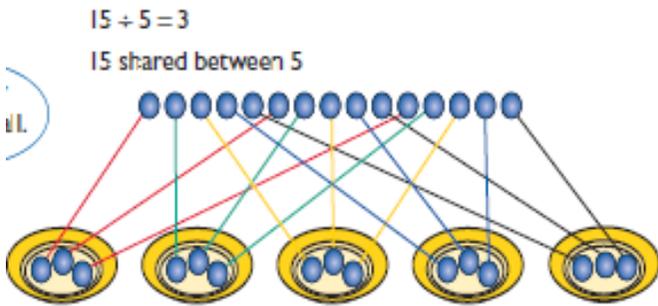
Repeated addition



When teaching the stages in progression start with models and make connections with the number line. Place emphasis on the ability to explain and reason about the mathematics behind the method. E.g. Ask 'What's the same and what's different about these three approaches to the same calculation?'

Models

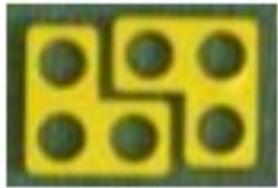
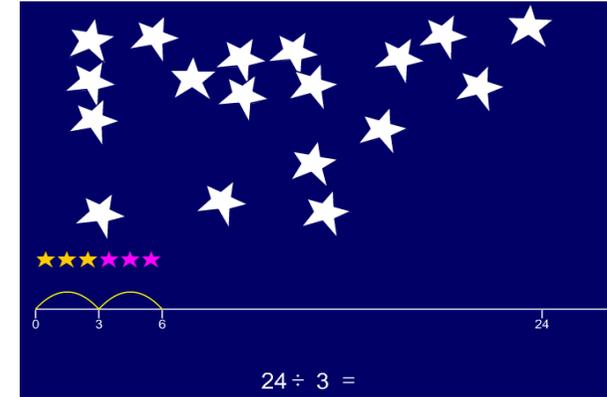
Sharing



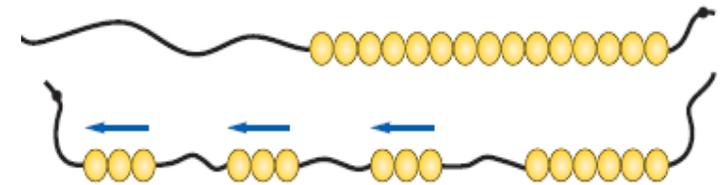
At this stage children still need experience of both grouping and sharing. Grouping will become the basis of short and long division.

As they become more confident with their multiplication tables, children should be able to identify ten and then five groups of some divisors.

Grouping

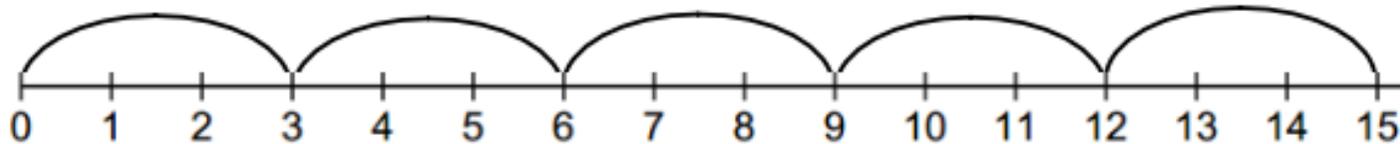


Grouping ITP



Expanded

$15 \div 3 =$ Repeated subtraction on a numbered number line.



When teaching the stages in progression start with models and make connections with the expanded and formal methods at the same time. Use counters and/or Dienes alongside the expanded as an explanation for the formal method. Place emphasis on the ability to explain and reason about the mathematics behind the method. E.g. Ask 'What's the same and what's different about these three approaches to the same calculation? Children should become fluent in using the formal method.