Mental Addition

Year 1

Using place value

Count in 1s

e.g. *45 + 1*

Count in 10s

e.g. *45 + 10 without counting on in 1s*

34	35	36
44		46
54	55	56

Add 10 to any given 2-digit number

Counting on

Count on in 1s

e.g. *8 + 3 as 8, 9, 10, 11*



Add, putting the larger number first

Count on in 10s

e.g. *45 + 20 as 45, 55, 65*

Year 2

Using place value

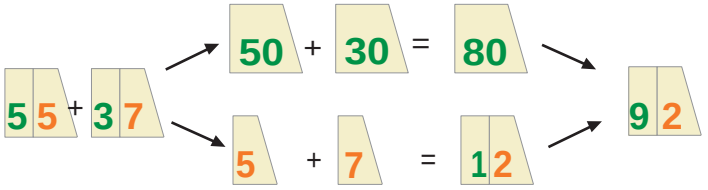
Know 1 more or 10 more than any number

e.g. *1 more than 67*

e.g. *10 more than 85*

Partitioning

e.g. *55 + 37 as 50 + 30 and 5 + 7, then finally combine the two totals: 80 + 12*



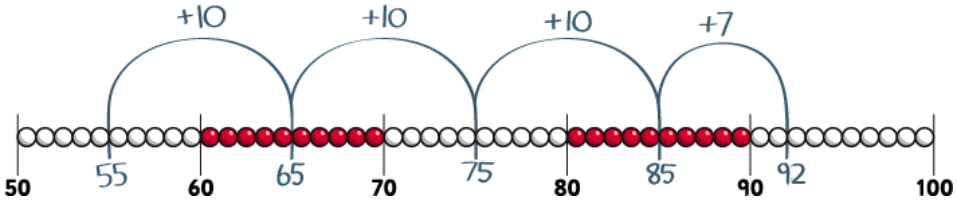
Counting on

Add 10 and multiples of 10 to a given 1- or 2-digit number

e.g. *76 + 20 as 76, 86, 96 or in one hop: 76 + 20 = 96*

Add two 2-digit numbers by counting on in 10s, then in 1s

e.g. *55 + 37 as 55 + 30 (85) + 7 = 92*



Add near multiples of 10

e.g. *46 + 19*

e.g. *63 + 21*

Mental Addition

Year 1

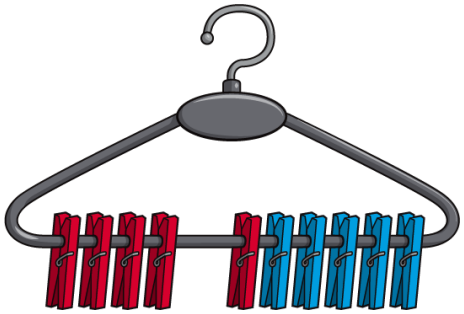
Using number facts

'Story' of 4, 5, 6, 7, 8 and 9

e.g. *7 = 7 + 0, 6 + 1, 5 + 2, 4 + 3*

Number bonds to 10

e.g. *5 + 5, 6 + 4, 7 + 3, 8 + 2, 9 + 1, 10 + 0*



4 + 6 = 10

Use patterns based on known facts when adding

e.g. *4 + 3 = 7 so we know 24 + 3, 44 + 3, 74 + 3*

Year 2

Using number facts

Know pairs of numbers which make the numbers up to and including 12

e.g. *8 = 4 + 4, 3 + 5, 2 + 6, 1 + 7, 0 + 8*

e.g. *10 = 5 + 5, 4 + 6, 3 + 7, 2 + 8, 1 + 9, 0 + 10*

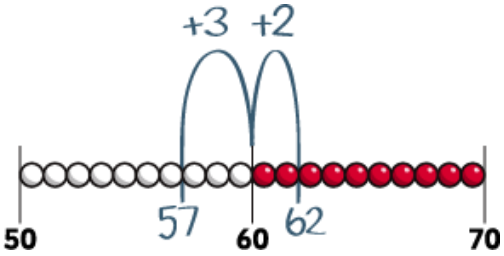
Use patterns based on known facts when adding

e.g. *6 + 3 = 9, so we know 36 + 3 = 39, 66 + 3 = 69, 56 + 3 = 59*



Bridging 10

e.g. *57 + 5 = 57 + 3 (60) + 2 = 62*



Add three or more 1-digit numbers, spotting bonds to 10 or doubles

e.g. *3 + 5 + 3 = 6 + 5 = 11*

e.g. *8 + 2 + 4 = 10 + 4 = 14*

Mental Subtraction

Year 1

Using place value

Count back in 1s

e.g. *Know 53 – 1*

Count back in 10s

e.g. *Know 53 – 10 without counting back in 1s*

32	33	34
42	43	44
52	53	54

Taking away

Count back in 1s

e.g. *11 – 3 as 11, 10, 9, 8*

e.g. *14 – 3 as 14, 13, 12, 11*



Count back in 10s

e.g. *53 – 20 as 53, 43, 33*

Year 2

Using place value

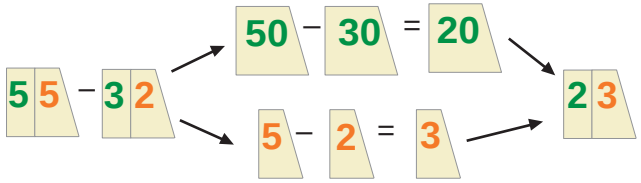
Know 1 less or 10 less than any number

e.g. *1 less than 74*

e.g. *10 less than 82*

Partitioning

e.g. *55 – 32 as 50 – 30 and 5 – 2 and combine the answers: 20 + 3*



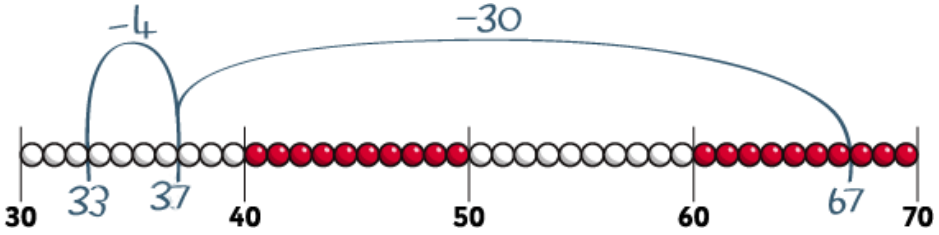
Taking away

Subtract 10 and multiples of 10

e.g. *76 – 20 as 76, 66, 56 or in one hop: 76 – 20 = 56*

Subtract two 2-digit numbers by counting back in 10s, then in 1s

e.g. *67 – 34 as 67 subtract 30 (37) then count back 4 (33)*



Subtract near multiples of 10

e.g. *74 – 21*

e.g. *57 – 19*

Overview of Strategies and Methods – Subtraction

Mental Subtraction

Year 1

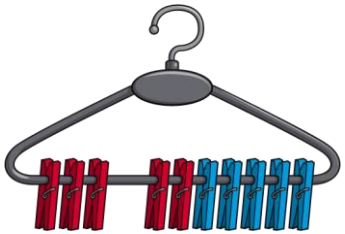
Using number facts

'Story' of 4, 5, 6, 7, 8 and 9

e.g. 'Story' of 7 is *7 – 1 = 6, 7 – 2 = 5, 7 – 3 = 4*

Number bonds to 10

e.g. *10 – 1 = 9, 10 – 2 = 8, 10 – 3 = 7*



10 – 7 = 3

Subtract using patterns of known facts

e.g. *7 – 3 = 4 so we know 27 – 3 = 24, 47 – 3 = 44, 77 – 3 = 74*

Year 2

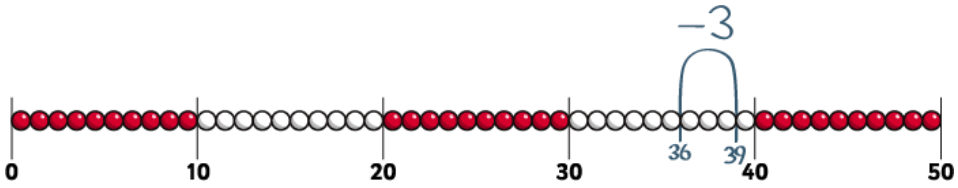
Using number facts

Know pairs of numbers which make the numbers up to and including 12 and derive related subtraction facts

e.g. *10 – 6 = 4, 8 – 3 = 5, 5 – 2 = 3*

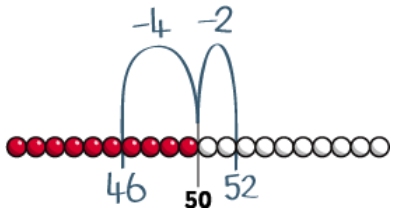
Subtract using patterns of known facts

e.g. *9 – 3 = 6, so we know 39 – 3 = 36, 69 – 3 = 66, 89 – 3 = 86*



Bridging 10

e.g. *52 – 6 as 52 – 2 (50) – 4 = 46*



Counting up

Find a difference between two numbers on a line where the numbers are close together

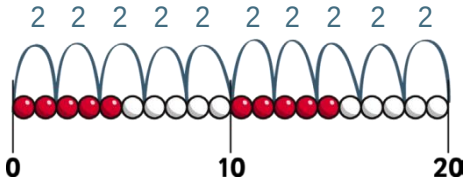
e.g. *51 – 47*

Mental Multiplication

Year 1

Counting in steps ('clever' counting)

Count in 2s



Count in 10s

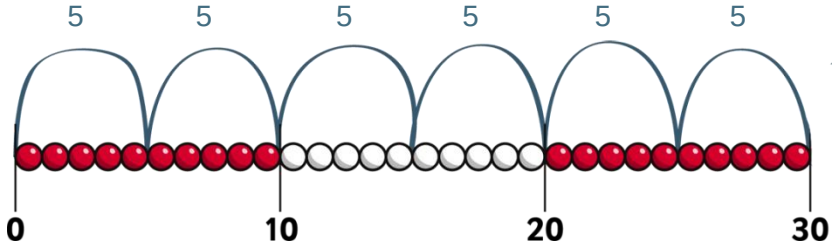
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Year 2

Counting in steps ('clever' counting)

Count in 2s, 5s and 10s



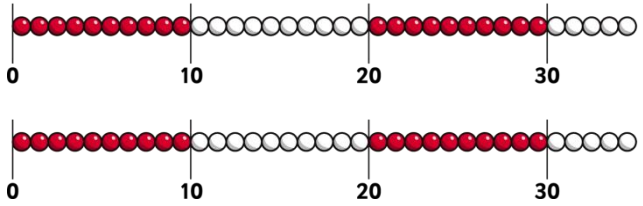


Begin to count in 3s

Doubling and halving

Begin to know doubles of multiples of 5 to 100

e.g. *double 35 is 70*



Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5

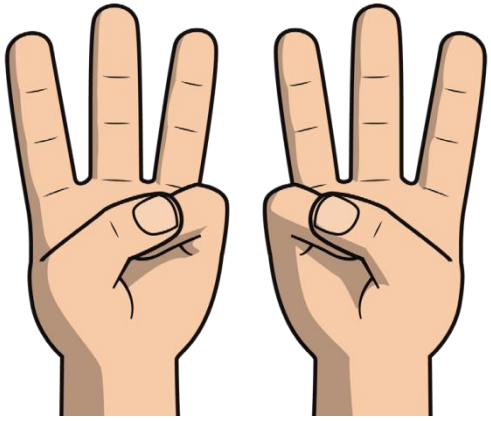
Mental Multiplication

Year 1

Doubling and halving

Find doubles to double 5 using fingers

e.g. *double 3*



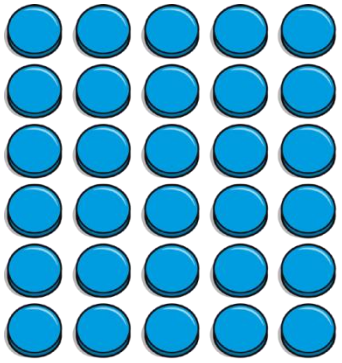
Year 2

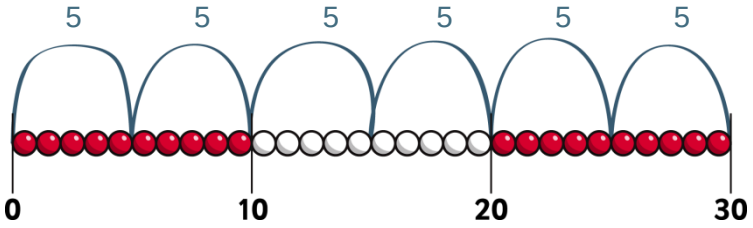
Grouping

Use arrays to find answers to multiplication and relate to 'clever' counting

e.g. *3 × 4 as three lots of four things*

e.g. *6 × 5 as six steps in the 5s count as well as six lots of five*





Understand that 5 × 3 can be worked out as three 5s or five 3s

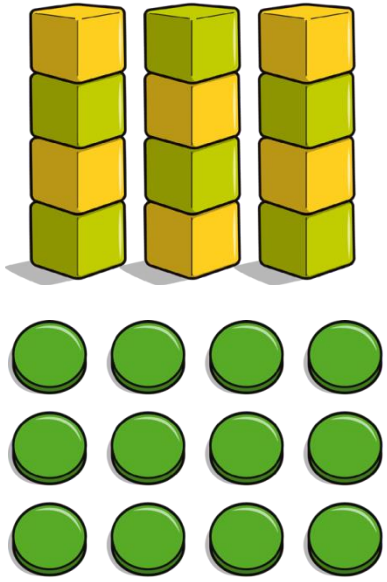
Mental Multiplication

Year 1

Grouping

Begin to use visual and concrete arrays and sets of objects to find the answers to 'three lots of four' or 'two lots of five'

e.g. *three lots of four*

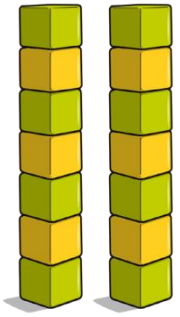


Year 2

Using number facts

Know doubles to double 20

e.g. *double 7 is 14*



Start learning ×2, ×5, ×10 tables, relating these to 'clever' counting in 2s, 5s, and 10s

e.g. *5 × 10 = 50, and five steps in the 10s count = 10, 20, 30, 40, 50*

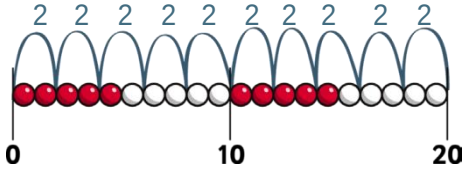


Mental Division

Year 1

Counting in steps ('clever' counting)

Count in 2s

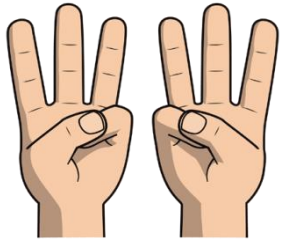


Count in 10s

1	2	3	4	5	6	7	8	9	
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

Doubling and halving

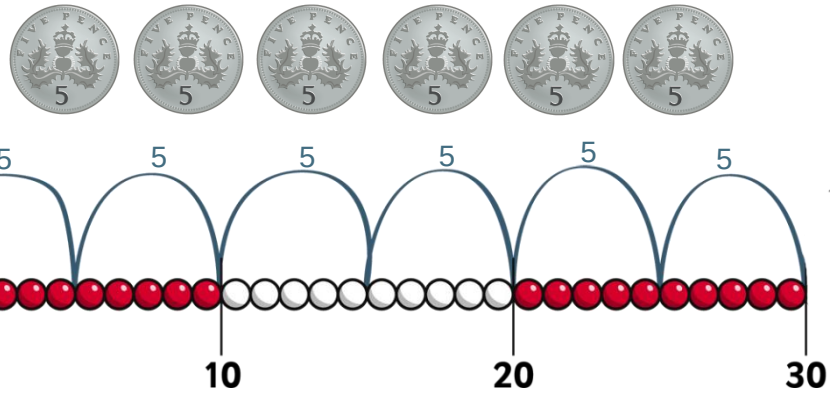
Find half of even numbers up to 12, including realising that it is hard to halve an odd number



Year 2

Counting in steps ('clever' counting)

Count in 2s, 5s and 10s

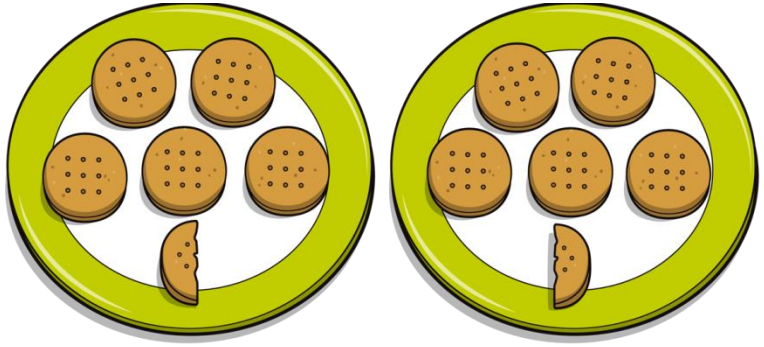


Begin to count in 3s

Doubling and halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a $\frac{1}{2}$

e.g. *$\frac{1}{2}$ of 11 = 5 $\frac{1}{2}$*



Begin to know half of multiples of 10 to 100

e.g. *half of 70 is 35*

Mental Division

Year 1

Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to questions such as *'How many towers of three can I make with twelve cubes?'*

Sharing

Begin to find half of a quantity using sharing

e.g. *find half of 16 cubes by giving one each repeatedly to two children*

Year 2

Grouping

Relate division to multiplication by using arrays or towers of cubes to find answers to division

e.g. *'How many towers of five cubes can I make from twenty cubes?' as _ × 5 = 20 and also as 20 ÷ 5 = _*



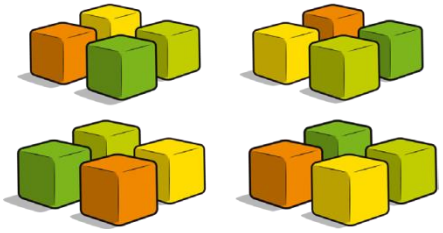
Relate division to 'clever' counting and hence to multiplication

e.g. *'How many fives do I count to get to twenty?'*

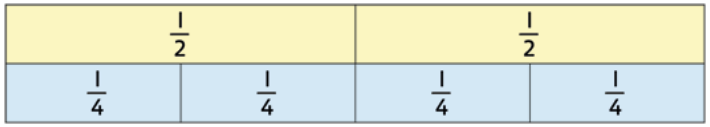
Sharing

Begin to find half or a quarter of a quantity using sharing

e.g. *find a quarter of 16 cubes by sorting the cubes into four piles*



Find 1/4, 1/2, 3/4 of small quantities



Using number facts

Know half of even numbers to 24

Know ×2, ×5 and ×10 division facts

Begin to know ×3 division facts