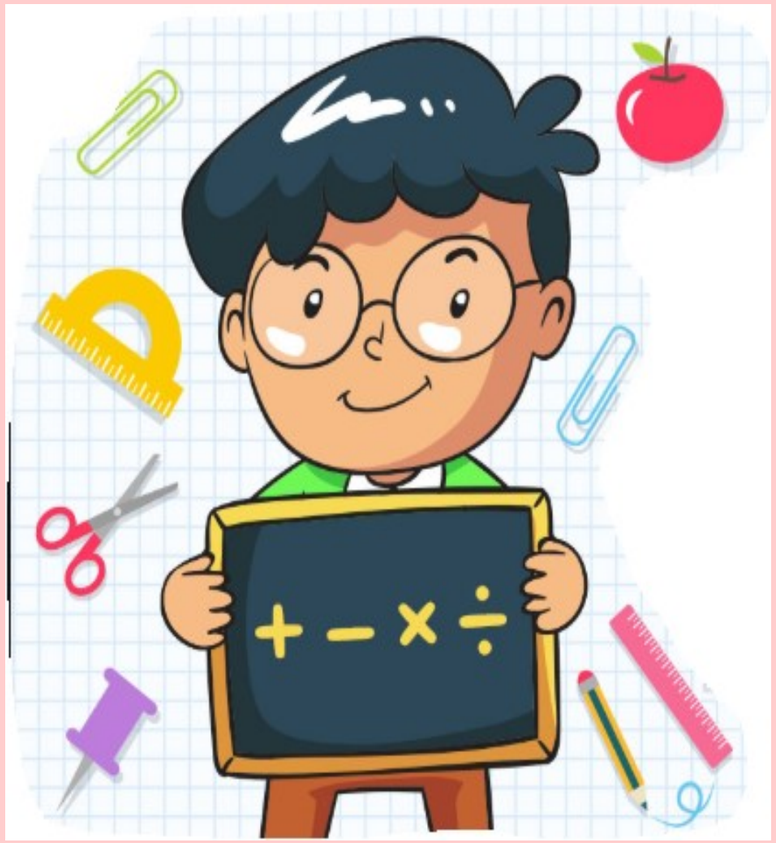
Mental Recall



Leighterton Primary School

Rapid Recall by the End of KS1

This includes all number bonds to 20, and doubles to 20.

The table below shows the basic addition facts that children should know as part of their Year 2 mental maths practice by the time they reach Year 3.

P.S *It is also worth noting that pupils should also be able to rapidly recall the related subtraction facts.*

+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	**3 + 3**	**3 + 4**	**3 + 5**	**3 + 6**	**3 + 7**	**3 + 8**	**3 + 9**	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

Adding 1 and 2 Bonds to 10 Adding 10 Doubles Adding 0 Near Double Compensating and Adjusting

Rapid Recall Year 3

This table shows the times table facts that children should be able to rapidly recall by the end of Year 3. You will see that in Year 3 mental maths knowledge continues to play an important role.

It is also important to note that, as well as the multiplication facts, children should be able to rapidly recall the related division facts as well. For example, for 4 x 6 = 24, children should know 24 ÷ 6 = 4 and 24 ÷ 4 = 6.

	1	2	3	4	5	6	7	8	9	10	11	12
1	1 x1	2x1	3x1	4x1	5x1	6x1	7x1	8x1	9x1	10x1		
2	1x2	2x2	3x2	4x2	5x2	6x2	7x2	8x2	9x2	10x2		
3	1x3	2x3	3x3	4x3	5x3	6x3	7x3	8x3	9x3	10x3		
4	1x4	2x4	3x4	4x4	5x4	6x4		8x4		10x4		
5	1x5	2x5	3x5	4x5	5x5	6x5	7x5	8x5	9x5	10x5		
6	1x6	2x6	3x6	4x6	5x6	6x6		8x6		10x6		
7	1x7	2x7	3x7	4x7	5x7	6x7		8x7		10x7		
8	1x8	2x8	3x8	4x8	5x8	6x8		8x8		10x8		
9	1x9	2x9	3x9	4x9	5x9	6x9		8x9		10x9		
10	1x10	2x10	3x10	4x10	5x10	6x10	7x10	8x10	9x10	10x10		
11	1x11	2x11	3x11	4x11	5x11	6x11		8x11		10x11		
12	1x12	2x12	3x12	4x12	5x12	6x12		8x12		10x12		

1 x facts | Doubles | Squares | New Facts | Known Facts

Rapid Recall Year 3

- Addition and subtraction of multiples of 10 where the answer is between 0 and 100 (e.g. 70 + 30 = 100, 20 + 40 = 60)

- Double and halves of multiples of 10 to 100 using known doubles to 20 (e.g. double 6 = 12 so double 60 = 120, double 7 = 14 so double 70 = 140)

- Multiplying two-digit number by 10 using their knowledge of place value (e.g. 24 x 10 = 240)

Rapid Recall Year 4

	1	2	3	4	5	6	7	8	9	10	11	12
1	1 x1	2x1	3x1	4x1	5x1	6x1	7x1	8x1	9x1	10x1	11x1	12x1
2	1x2	2x2	3x2	4x2	5x2	6x2	7x2	8x2	9x2	10x2	11x2	12x2
3	1x3	2x3	3x3	4x3	5x3	6x3	7x3	8x3	9x3	10x3	11x3	12x3
4	1x4	2x4	3x4	4x4	5x4	6x4	7x4	8x4	9x4	10x4	11x4	12x4
5	1x5	2x5	3x5	4x5	5x5	6x5	7x5	8x5	9x5	10x5	11x5	12x5
6	1x6	2x6	3x6	4x6	5x6	6x6	7x6	8x6	9x6	10x6	11x6	12x6
7	1x7	2x7	3x7	4x7	5x7	6x7	7x7	8x7	9x7	10x7	11x7	12x7
8	1x8	2x8	3x8	4x8	5x8	6x8	7x8	8x8	9x8	10x8	11x8	12x8
9	1x9	2x9	3x9	4x9	5x9	6x9	7x9	8x9	9x9	10x9	11x9	12x9
10	1x10	2x10	3x10	4x10	5x10	6x10	7x10	8x10	9x10	10x10	11x10	12x10
11	1x11	2x11	3x11	4x11	5x11	6x11	7x11	8x11	9x11	10x11	11x 11	12x11
12	1x12	2x12	3x12	4x12	5x12	6x12	7x12	8x12	9x12	10x12	11x12	12x 12

1 x facts Doubles Squares New Facts Known Facts

The 38 new multiplication (and division) facts that children need to know by the end of Year 4.

By the end of Year 4, children need to be able to rapidly recall all multiplication and related division facts for all times tables up to 12 x 12 in order to prepare them for the Year 4 multiplication check.

However, as you can see , there are only 38 new facts for them to learn during Year 4.

Rapid Recall Year 4

In addition to the facts above, and their basic addition facts, Year 4 children should be able to answer the following mental maths questions:

- Addition and subtraction of multiples of 10 using knowledge of number bonds to 10 and place value (e.g. 70 + 30 = 100, 50 + 60 = 110, 20 + 40 = 60);
- Addition and subtraction of multiples of 100 where the answer is 1,000 or less (e.g. 300 + 400 = 700, 400 + 600 = 1,000);
- Double and halves of multiples of 10 to 100 (e.g. double 60 = 120, half 50 = 25);
- Halves of any even number to 100 (e.g. half of 22 = 11);
- And multiplying any **two and three-digit number** by 10 and 100 using their knowledge of place value (e.g. 24 x 100 = 2,400)

Rapid Recall Year 5

Together with the 1-12 x multiplication and division facts, and their basic addition facts, children should be able to answer the following Year 5 mental maths questions:

- Addition and subtraction of multiples of 10 (e.g. 70 + 30 = 100, 50 + 60 = 110, 20 + 40 = 60);
- Addition and subtraction of multiples of 100 (e.g. 300 + 400 = 700, 400 + 600 = 1,000, 800 + 500 = 1,300);
- Addition and subtraction of multiples of 1000 (e.g. 3000 + 4000 = 7000);
- Double and halves of multiples of 10 to 100 (e.g. double 60 = 120, half 50 = 25);
- Halves of any number to 100 (e.g. half of 22 = 11, half of 51 = 25.5);
- Multiplying and **dividing** any number by 10 and 100 including decimals (e.g. 24 x 100 = 2,400, 45 ÷ 100 = 0.45, 3.4 x 10 = 34);
- Squares of all numbers up to 12;
- And cubes of 2,3,4 and 5

Rapid Recall Year 6

By Year 6, children should have a solid grasp of all the rapid recall facts from previous year groups and be able to apply them to a range of questions and problem solving situations. The final step is to practise the skill below:

. Multiplication and division of multiples of 10 and 100 based on known facts and their knowledge of place value (e.g. 40 x 40 = 1,600, 1320 ÷ 11 = 120)

Mental Calculation Strategies

Addition and Subtraction

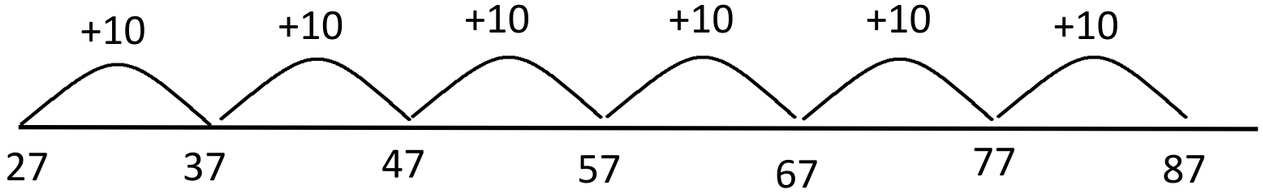
Mental Calculation Strategies

Counting Forwards and Backwards for Addition and Subtraction

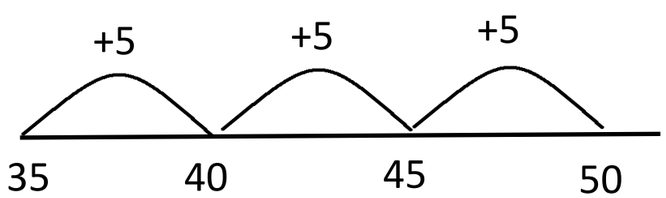
Counting forwards and backwards is first encountered in KS1, beginning at one and counting on in ones.

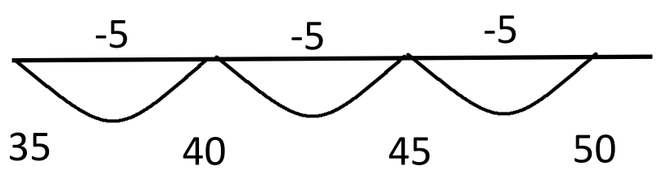
Pupils' sense of number is extended by beginning at different numbers and counting forwards and backwards in steps, not only of ones, but also of twos, fives, tens, hundreds, tenths and so on. This can be done **mentally** or using objects (in KS1) or a **numberline** to support, including drawing empty numberlines (see example below):

Counting on or back in tens from any number– e.g. working out 27 + 60= ? by counting on in tens from 27



Counting on or back in fives from any multiple of 5– e.g. 35+15=? by counting on in steps of 5 from 35.





50—15 =

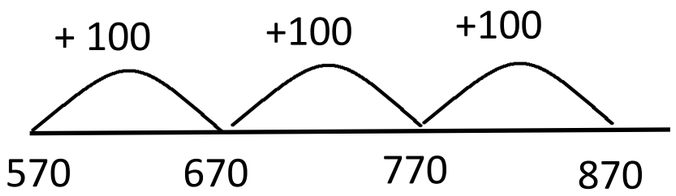
Using the same method

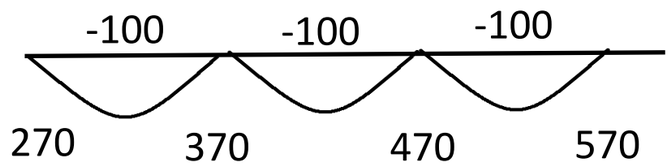
Progression

Mental Calculation Strategies

Counting Forwards and Backwards for Addition and Subtraction

Counting on or back in hundreds from any number e.g. 570 + 300= ? by counting on in hundreds from 570.

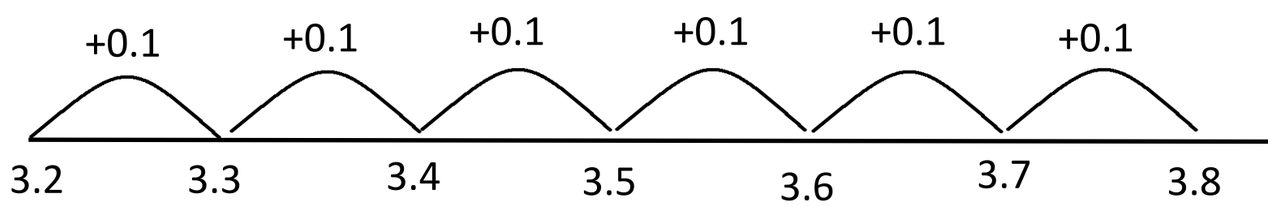




570—300 =

Using the same method

Counting on or back in tenths and/or hundredths- e.g. 3.2 + 0.6 = ? by counting on in tenths.



Mental Calculation Strategies

Partitioning

Partitioning strategies teach children how to break up large numbers into smaller ones.

It is important that children are aware that numbers can be partitioned- both along the place value boundaries and in other ways e.g. 1489 = 1000 + 400+ 80 + 9 or 1489 = 1300+ 100 + 50 + 30 + 9

They can then use their partitioning to help them calculate addition and subtraction calculations. This can be extended as children progress through KS2.

Calculations with whole numbers which do not involve crossing place value boundaries- *e.g.*

23 + 45= ?

20 + 40 = 60

3 + 5 = 8

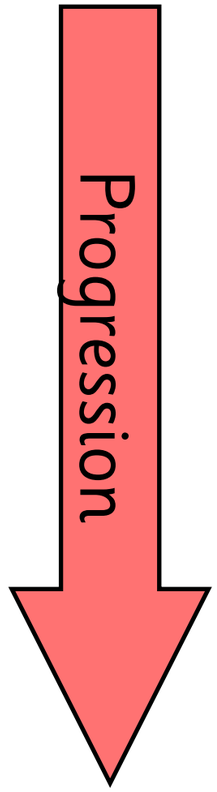
60 + 8 = 68

68—32 = ?

60—30 = 30

8—2 = 6

30 + 6 = 36



Mental Calculation Strategies

Partitioning

Calculations with whole numbers which involve crossing place value boundaries- *e.g.*

In order to use this strategy, children must have a solid knowledge of number bonds that make 10 and be able to partition a number in different ways e.g. 17 = 10 + 3 + 4

57 + 14 =

57 + 3 = 60

60 + 11 = 70

Essential knowledge for this question:

7 + 3 = 10

14 = 3 + 11

574 + 17 =

574 + 6 = 580

580 + 11 = 591

Essential knowledge for this question:

4 + 6 = 10

17 = 6 + 11

43 – 17 =

43 - 3 = 40

40 - 4 = 36

36 - 10 = 26

Essential knowledge for this question:

3-3 = 0

17 = 3 + 4 + 10

432 - 45 =

432 - 2 = 430

430 - 3 = 427

427 - 40 = 387

Essential knowledge for this question:

2-2 = 0

45 = 2 + 3 + 40

Progression

Mental Calculation Strategies

Partitioning

Calculations with decimal numbers which do not involve crossing place value boundaries- *e.g.*

5.6 + 3.2 =

5 + 3 = 8

0.6 + 0.2 = 0.8

8 + 0.8 = 8.8

25.81 + 12.14 =

25 + 12 = 37

0.8 + 0.1 = 0.9

0.01 + 0.04 = 0.05

37 + 0.9 + 0.05 = 37.95

4.3 - 2.1=

4 - 2 = 2

0.3 - 0.1 = 0.2

2 + 0.2 = 2.2

25.74 - 21.31 =

25 - 21 = 4

0.7 - 0.3 = 0.4

0.04 - 0.01 = 0.03

4 + 0.4 + 0.03 = 4.43

Progression

Mental Calculation Strategies

Partitioning

Calculations with decimal numbers which involve crossing place value boundaries- e.g.

1.4 + 1.6 =

1.4 + 0.6 = 2

2 + 1 = 3

Essential knowledge for this question:

4 + 6 = 10

So 0.4 + 0.6 = 1

1.4 - 0.6 =

1.4 - 0.4 = 1

1 - 0.2 = 0.8

Or

14 - 6 = 8 ÷ 10 = 0.8

Essential knowledge for this question:

4-4 = 0

0.6 = 0.4 + 0.2

Or 14 - 6 = 8

Progression

0.8 + 0.35 =

0.8 + 0.2 = 1

1 + 0.15 = 1.15

Essential knowledge for this question:

8 + 2 = 10

So 0.8 + 0.2 = 1

2.6 - 1.7 =

2.6 - 0.6 = 2

2 - 0.1 = 1.9

1.9 - 1 = 0.9

Or 26 - 17 = 9÷10 = 0.9

Essential knowledge for this question:

6 - 6 = 0

1.7 - 0.6 + 0.1 + 1

Or 26 - 17 = 9

Mental Calculation Strategies

Compensating and Adjusting

Compensation involves adding more than you need and then subtracting the extra off that you have added.

This strategy is useful for adding numbers that are close to a multiple of 10, such as numbers that end in 1 or 2, or 8 or 9.

The number to be added is rounded to a multiple of 10 plus or minus a small number.

For example, adding 9 is carried out by adding 10, then subtracting 1. A similar strategy works for adding decimals that are close to whole numbers.

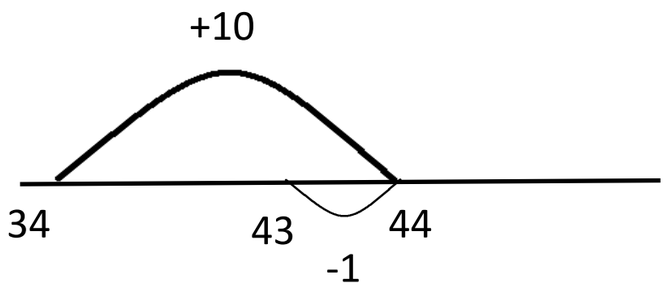
Compensating and adjusting to 10 e.g.

Can be modelled on a numberline first or using counters to reinforce.

34 + 9 =

34 + 10 = 44

44 - 1 = 43



Progression

Mental Calculation Strategies

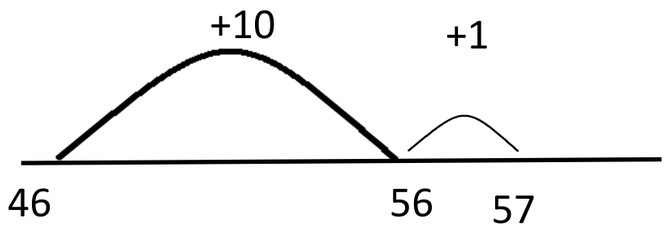
Compensating and Adjusting

Compensating and adjusting to 10 e.g.

46 + 11 =

46 +10 = 56

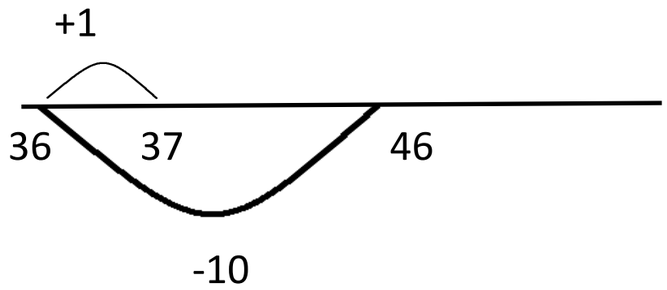
56 + 1 = 57



46 - 9 =

46 - 10 = 36

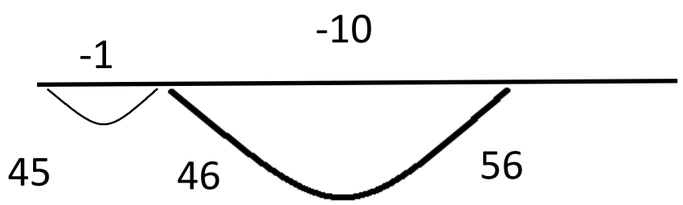
36 + 1 = 37



56 - 11 =

56 - 10 = 46

46 - 1 = 45



Progression

Mental Calculation Strategies

Compensating and Adjusting

Compensating and adjusting to a multiple of 10 e.g.

38 + 18 =

38 + 20 = 58

58 - 2 = 56

65 + 68 =

65 + 70 = 135

135 - 2 = 133

146 - 39 =

146 - 40 = 106

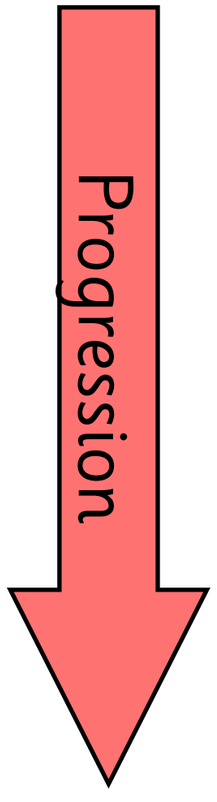
106 + 1 = 107

258 - 59 =

258 - 60 = 198

198 + 1 = 199

Children will need to be explicitly taught that they have taken away too many so they need to add back on and shown this on a numberline.



Mental Calculation Strategies

Compensating and Adjusting

Compensating and adjusting to a multiple of 10 or 100 e.g.

138 + 69 =

138 + 70 = 208

208 - 1 = 207

324 + 299 =

324 + 300 = 624

624 - 1 = 623

146 - 99 =

146 - 100 = 46

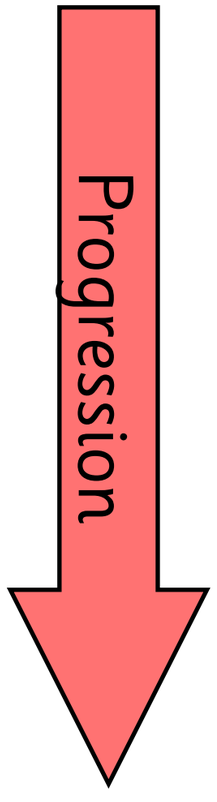
46 + 1 = 47

258 - 201 =

258 - 200 = 58

58 - 1 = 57

Children will need to be explicitly taught that they have taken away too many so they need to add back on and shown this on a numberline.



Mental Calculation Strategies

Compensating and Adjusting

Compensating and adjusting with decimals e.g.

5.7 + 3.9 =

5.7 + 4 = 9.7

9.7 - 0.1 = 9.6

16.4 + 4.8 =

16.4 + 5 = 21.4

21.4 - 0.2 = 21.2

18.7 - 0.9 =

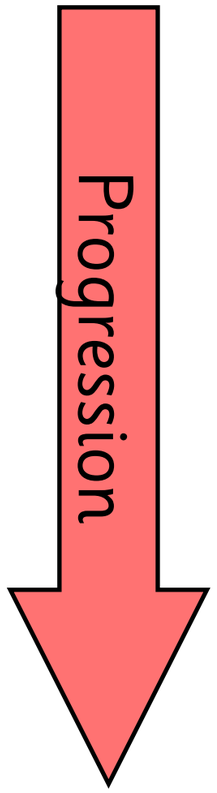
18.7 - 1 = 17.7

17.7 + 0.1 = 17.8

145.89 - 102 =

145.89 - 100 = 45.89

45.89 - 2 = 43.89



Mental Calculation Strategies

Using Near Doubles

Once children have learnt their doubles facts, these are the ways you can help the children to progress with near doubles:

Near Doubles under 20 e.g.

Again, children will be shown this using counters and/or a numberline first to visualise the process.

18 + 16 =

Double 18 = 36

36 - 2 = 34

Or

Double 16 = 32

32 + 2 = 34

14 + 17 =

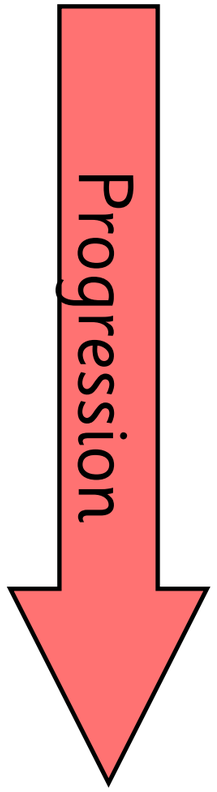
Double 14 = 28

28 + 3 = 31

Or

Double 17 = 34

34 - 3 = 31



Mental Calculation Strategies

Using Near Doubles

Once children have learnt their doubles facts, these are the ways you can help the children to progress with near doubles:

Near Doubles to multiples of 10 e.g.

Again, children will be shown this using counters and/or a numberline first to visualise the process.

60 + 70 =

Double 60 = 120

120 + 10 = 130

Or

Double 70 = 140

140 - 10 = 130

75 + 76 =

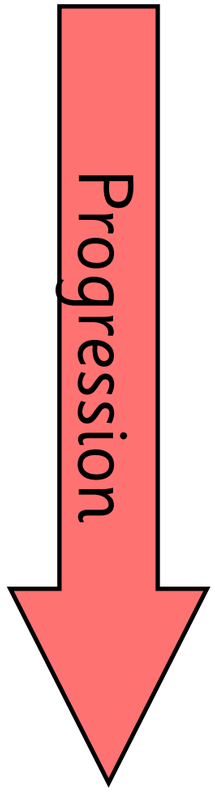
Double 75 = 150

150 + 1 = 151

Or

Double 76 = 152

152 - 1 = 151



Mental Calculation Strategies

Using Near Doubles

Once children have learnt their doubles facts, these are the ways you can help the children to progress with near doubles:

Decimal near doubles to whole numbers e.g.

Again, children will be shown this using counters and/or a numberline first to visualise the process.

0.7 + 0.8 =

Double 0.7 = 1.4

1.4 + 0.1 = 1.5

Or Double 0.8 = 1.6

1.6 - 0.1 = 1.5

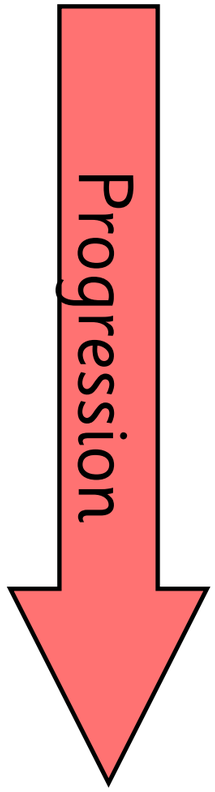
2.5 + 2.6 =

Double 2.5 = 5

5 + 0.1 = 5.1

Or Double 2.6 = 5.2

5.2 - 0.1 = 5.1



Mental Calculation Strategies

Multiplication and Division

Mental Calculation Strategies

Multiply using place value

Children should be able to build upon their rapid recall of 1-12 x multiplication and division facts, and multiplication and division facts for multiples of 10 and 100 to calculate an increasing range of multiplication questions mentally.

Multiply a number by a multiple of 10 using their knowledge of place value e.g.

6 x 80 =

6 x 8 = 48

48 x 10 = 480

60 x 80 =

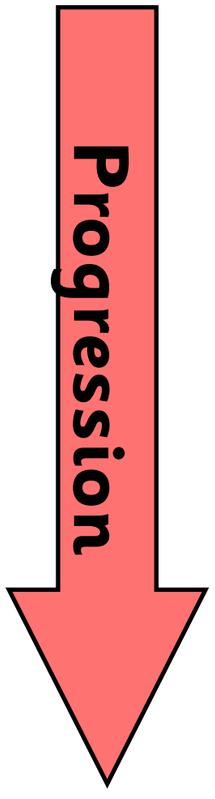
6 x 8 = 48

48 x 100 = 4800

60 x 800 =

6 x 8 = 48

48 x 1000 = 48,000



Mental Calculation Strategies

Multiply using partitioning

Children should be able to build upon their rapid recall of 1-12 x multiplication and division facts, and multiplication and division facts for multiples of 10 and 100 to calculate an increasing range of multiplication questions mentally.

Multiply a 2-digit number by a single digit by partitioning and using their knowledge of place value e.g.

26 x 3 =

20 x 3 = 60

6 x 3 = 18

60 + 18 = 78

57 x 4 =

50 x 4 = 200

7 x 4 = 28

200 + 28 = 228

Progression

Mental Calculation Strategies

Multiply using partitioning

Children should be able to build upon their rapid recall of 1-12 x multiplication and division facts, and multiplication and division facts for multiples of 10 and 100 to calculate an increasing range of multiplication questions mentally.

Multiply a decimal number with up to 2 decimal places by a single digit by partitioning e.g.

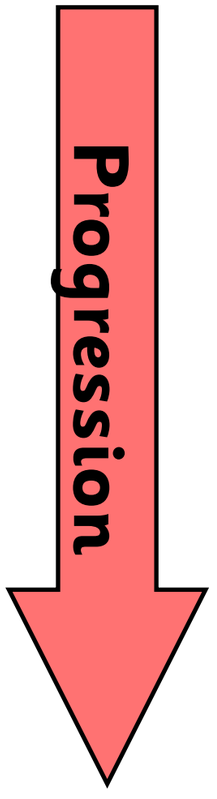
3.42 x 4 =

3 x 4 = 12

0.4 x 4 = 1.6

0.02 x 4 = 0.08

12 + 1.6 + 0.08 = 13.68



Mental Calculation Strategies

Divide using partitioning

Children should be able to build upon their rapid recall of 1-12 x multiplication and division facts, and multiplication and division facts for multiples of 10 and 100 to calculate an increasing range of division questions mentally.

Divide up to three digit numbers by a single digit by partitioning

91 ÷ 7 =

(partition initially into 10x divisor and remainder)

70 ÷ 7 = 10

21 ÷ 7 = 3

10 + 3 = 13

Then…

378 ÷ 9 =

(partition the number into known multiples of the divisor)

360 ÷ 9 = 40

18 ÷ 9 = 2

40 + 2 = 42

Progression

Mental Calculation Strategies

Divide using partitioning

Divide decimal numbers by single digits by partitioning using known facts

8.4 ÷ 6 =

6 ÷ 6 = 1

2.4 ÷ 6 = 0.4

1 + 0.4 = 1.4

Or use place value

7.6 ÷ 4 =

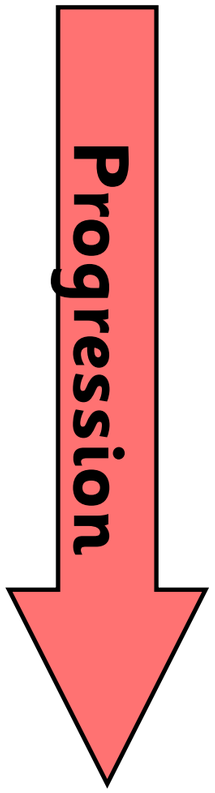
76 ÷ 4 =

40 ÷ 4 = 10

36 ÷ 4 = 9

10 + 9 = 19

19 ÷ 10 = 1.9



Mental Calculation Strategies

Doubling and Halving

Children should be able to recognise halving as the inverse of doubling and be able to rapidly calculate doubles and halves of numbers.

Some double and half facts are rapid recall rather than ones that children should need to calculate each time, and these are covered in the lists at the beginning of the document.

Find the doubles and halves of any two-digit number and any multiple of 10 or 100 by partitioning and using place value e.g

Double 73

Double 70 = 140

Double 3 = 6

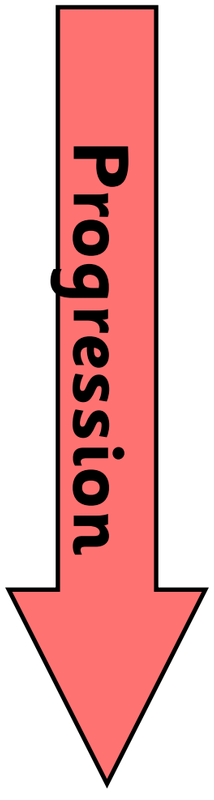
`40 + 6 = 146

Half of 680

Half of 600 = 300

Half of 80 = 40

300 + 40 = 340



Mental Calculation Strategies

Doubling and Halving

Multiply and divide by 4 by doubling/halving twice and 8 by doubling/halving again:

34 x 4 =

34 x 2 = 68

68 x 2 = 136 (calculated by partitioning)

45 x 8 =

45 x 2 = 90

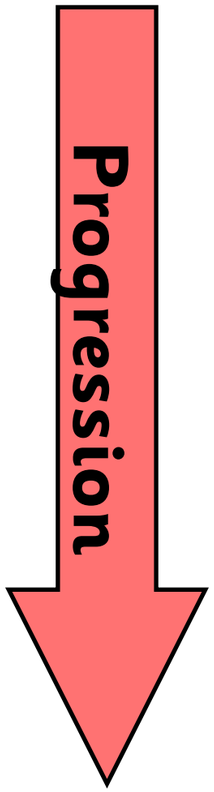
90 x 2 = 180

180 x 2 = 360

96 ÷ 4 =

96 ÷ 2 = 48

48 ÷ 2 = 24



Mental Calculation Strategies

Doubling and Halving

Find the doubles and halves of any number up to 100,000 by partitioning:

32 202 ÷ 2 = (expect the children to do this without jottings)

32 000 ÷ 2 = 16000

200 ÷ 2 = 100

2 ÷ 2 = 1

16000 + 100 + 1 = 16 101

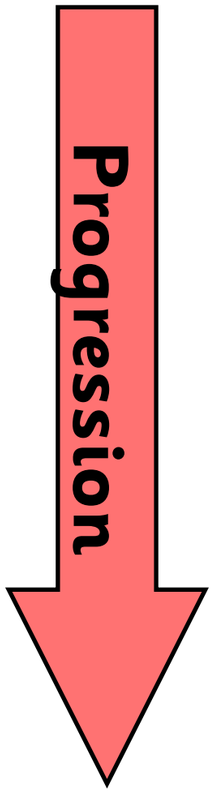
45 502 x 2 =

45 000 x 2 = 90 000

500 x 2 = 1000

2 x 2 = 4

90 000 + 1000 + 4 = 91 004



Mental Calculation Strategies

Doubling and Halving

Multiply by 50 by multiplying by 100 and halving

80 x 50 =

80 x 100 = 800

800 ÷ 2 = 400

660 x 50 =

660 x 100 = 66000

66000 ÷ 2 = 33 000

Progression

Mental Calculation Strategies

Doubling and Halving

Divide a multiple of 50 by 50 by dividing by 100 then doubling-

450 ÷ 50 =

450 ÷ 100 = 4.5

4.5 x 2 = 9

1550 ÷ 50 =

1550 ÷ 100 = 155

15.5 x 2 = 31

Progression

Mental Calculation Strategies

Doubling and Halving

Divide a multiple of 25 by 25 by dividing by 100 then multiplying by 4 (by doubling and doubling again)

350 ÷ 25 =

350 ÷ 100 = 3.5

3.5 x 2 = 7

7 x 2 = 14

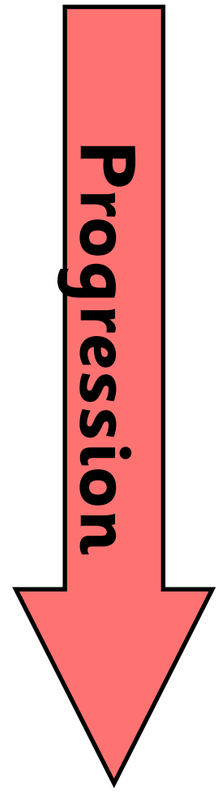
Multiply by 25 by multiplying by x 100 then dividing by 4 (by halving and halving again)

350 x 25 =

350 x 100 = 35000

35000 ÷ 2 = 17500

17500 ÷ 2 = 8750 (by partitioning)



Mental Calculation Strategies

Doubling and Halving

Double and half decimal number with up to one decimal place by portioning –

3.8 x 2 =

3 x 2 = 6

0.8 x 2 = 1.6

6 + 1.6 = 7.6 (or double 38 then divide by 10)

8.4 ÷ 2 =

8 ÷ 2 = 4

0.4 ÷ 2 = 0.2

4 + 0.2 = 4.2

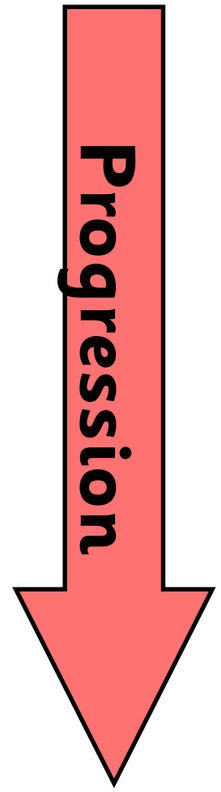
184.6 ÷ 2 =

180 ÷ 2 = 90

4 ÷ 2 = 2

0.6 ÷ 2 = 0.3

90 + 2 + 0.3 = 92.3



Mental Calculation Strategies

Fractions, decimals and percentages

Children should be able to develop their understanding of fractions, decimals and percentages and how they are related to division.

They should therefore be able to use their rapid recall multiplication and division facts to calculate some questions involving fractions, decimals and percentages mentally.

Mentally find fractions of numbers using known multiplication and division facts–

3/5 of 45 =

45 ÷ 5 = 9

9 x 3 = 27

2/8 x 32 =

32 ÷ 8 = 4

4 x 2 = 8

1 1/2 x 16 =

1 x 16 = 16

16 ÷ 2 = 8

16 + 8 = 32

Progression

Mental Calculation Strategies

Fractions, decimals and percentages

Find 10% or multiples of 10% of whole numbers

30% of 50

50 ÷ 10 = 5

5 x 3 = 15

Find 5% of whole numbers by finding 10% then halving

5% x 750 =

75 ÷ 10 = 75

75 ÷ 2 = 37.5

Use these methods combined to find any multiple of 5% of a whole number e.g 35% x 125

Progression

Mental Calculation Strategies

Fractions, decimals and percentages

Find 1% of any whole number by dividing by 100

1% x 345 =

345 ÷ 100 = 34.5

Mentally find 50% by halving and 25% by dividing by 4 of whole numbers

25% of 150

150 ÷ 2 = 75

75 ÷ 2 = 37.5

Use all the previous strategies combined to find any percentage of a whole number e.g.

44% x 130 =

130 ÷ 10 = 13

13 x 4 = 52

130 ÷ 100 = 1.3

1.3 x 4 = 5.2

52 + 5.2 = 57.2

Progression

Mental Calculation Strategies

Fractions, decimals and percentages

Use the nifty trick:

x% of y = y% of x

So…

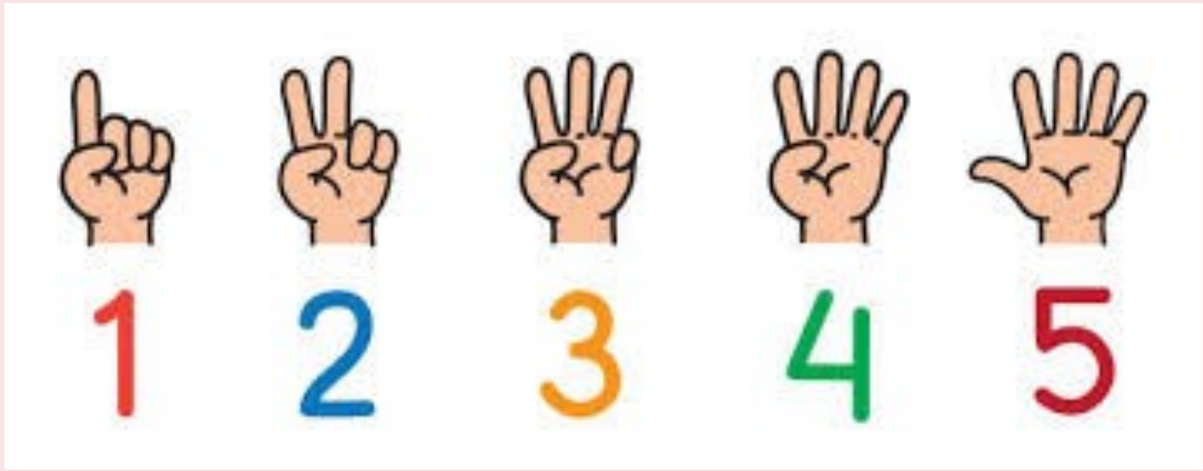
4% x 75 = 75% x 4 = (link to 3/4)

4 ÷ 4 = 1 (to find 25%)

1 x 3 = 3

Progression

Counting



Leighterton Primary School

Year Group	Counting skills (Progressive going downwards)	
	Rote Counting	**Counting Objects**
R	Count forwards from 0 to 5 Count backwards from 5 to 0 Count forwards from 0 to 10 Count backwards from 10 to 0 Count forwards from 0 to 20 Count backwards from 20 to 0 Count forwards from any given number within 0 -5 Count backwards from any given number within 0-5 Count forwards from any given number within 10 Count backwards from any given number within 10 Count forwards from any given number within 20 Count forwards from any given number within 20 Count forwards within 20 starting and stopping at different numbers Count backwards within 20 starting and stopping at different numbers Count forwards a given number of steps e.g. Start on 6 and count on 3 (within 10) Count backwards a given number of steps (within 10)	Count up to 20 objects following the principles below: 1) **Stable order principle** - that the counting sequence stays consistent and in order 2) **Cardinality principle** - that the last number you say when counting is the number of objects in the group 3) **Movement is magnitude principle** -understanding that as you move up the counting sequence, the quantity increases and vice versa 4) **One-to - one correspondence** - understanding that each object must be given one count in the counting sequence and only one count 5) **Order Irrelevance principle** - understanding that you can begin counting with any object in the group as long as you only count each object once 6) **Conservation principle**- that they number of objects stays the same even if you spread out or cover some of the objects 7) **Abstraction principle** - understanding that five large things is the same quantity as five small things Count up to 5 objects when in a linear arrangement Count up to 5 objects in a random arrangement Count up to 5 objects from a larger group Recognise up to 5 objects by subitising (like the pattern on a dice) Count up to 5 things they can't see or touch e.g. claps, stamps, jumps Repeat the above with numbers to 10 Repeat the above with numbers to 20
1	Count to and across 100 from 0 Count from 100 backwards to 0 Count to and across 100 forwards from any number Count backwards from any given number crossing 100 Count in multiples of two from 0 to 24 Count in multiples of 5 from 0 to 60 Count in multiples of 10 from 0 to 120	

2	Count in multiples of 2 from 0 to 24 Count in multiples of 5 from 0 to 60 Count in multiples of 3 from 0 to 36 Count in multiples of 10 from any number within 100 Count backwards in multiples of 10 from any number within 100 Count in odd numbers from 1 to 20 Count forwards in halves up to 10 Count forwards in quarters up to 10 Count forwards in thirds up to 10
3	Count forwards in multiples of 4 from 0 up to 48 Count forwards in multiples of 8 from 0 up to 96 Count forwards in multiples of 50 from 0 to 1000 Count backwards in multiples of 4 from 48 to 0 Count backwards in multiples of 8 from 96 to 0 Count backwards in multiples of 50 from 1000 to 0 Count in multiples of 100 from 0 to 1000 Count in multiples of 100 from any number up to 1000 Count backwards in multiples of 100 from any number less than 1000 Count forwards in tenths (as fraction and decimal) from any number within 50 Count backwards in tenths (as fraction and decimal) from any number within 50 Count backwards in halves from 10 Count backwards in quarters from 10 Count backwards in thirds from 10

4	Count forwards in multiples of 6 from 0 to 72 Count forwards in multiples of 9 from 0 to 108 Count forwards in multiples of 7 from 0 to 84 Count backwards in multiples of 6 from 72 to 0 Count backwards in multiples of 9 from 108 to 0 Count backwards in multiples of 7 from 84 to 0 Count forwards in multiples of 1000 from 0 to 10 000 from any number Count backwards in multiples of 1000 from any number within 10 000 Count forwards in steps of 25 to 1000 Count backwards in steps of 25 from 1000 Count backwards through zero to include negative numbers Count forwards in hundredths Count backwards in hundredths Count forwards in steps of any fraction with the same denominator e.g. sixths Count backwards in steps of any fraction with the same denominator
5	Count forwards in powers of 10 from any given number up to one million (whole numbers) Count backwards in powers of 10 from any given number from one million (whole numbers) Count forwards through zero Count backwards through zero Count forwards in steps of known multiples as decimals e.g. 0.2, 0.9 1.1 , 2.5 Count forwards in square numbers from 0 to 100 Count backwards in square numbers from 100 to 0 Count forwards in prime numbers to 20 Count backwards in prime numbers from 19 Count forwards and backwards in steps of simple fractions including bridging 0
6	Consolidate all counting from previous year groups including bridging 0 e.g. -25s forwards and backwards