Sense of Number

Expanded Visual Calculation Policy

Mental Strategies Policy

Hawkesley Church Primary Academy

July 2019

Graphic Design by Dave Godfrey

Compiled by the Sense of Number Maths Team

For sole use within Hawkesley Church Primary Academy.

'A picture is worth 1000 words!' www.senseofnumber.co.uk

Guide to using a Visual Calculation Policy

The Full Sense of Number Visual Calculation Policy Package provides a comprehensive visual representation of a school's Calculation Policy.

1: CPVCP Concrete and Pictorial VCP - The foundation of the policy, featuring key models and images to help children gain deep understanding of the abstract proceedures.

2: WSVCP Written Strategies progression from jottings to formal written methods from Y1 to Y6.

3: MSVCP Mental Strategies progression across KS1 and KS2 for all four operations.

4: ECPD Editable Calculation Policy Document - a comprehensive written explanation of a school's calculation policy, featuring thumbnails of the posters from the three documents above.

Typical uses:

Classoom: The posters are printed out (e.g. A4) and the appropriate slides are displayed for continual reference or on a working wall. Posters are used on the interactive whiteboard.

Reference: The summary overviews are printed out and inserted in the teacher's planning folder.

Parents: The posters are used to communicate to parents the methods being used within school.

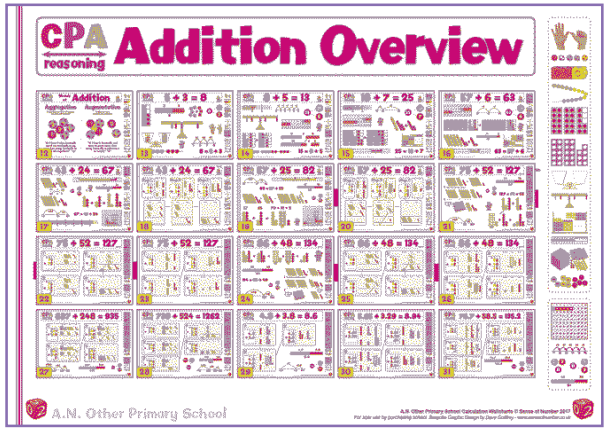
Website: Screen grabs of slides from the VCP are inserted on a schools' maths webpages.
(PLEASE NOTE: the VCP should not be placed on school website for copyright reasons.)
A secure PDF copy of the Editable Calculation Policy may be placed on the school webite.

Hawkesley Church Primary Academy

CPA reasoning Expanded Visual Calculation Policy

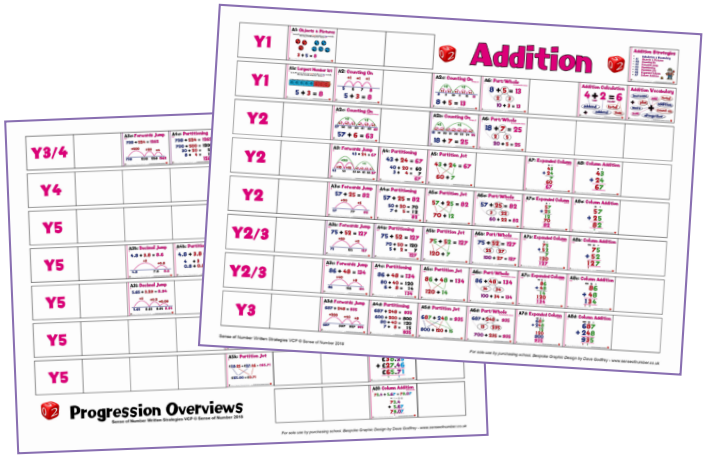
The Expanded Visual Calculation Policy helps children and teaching staff achieve mastery of all aspects of calculation. It contains the following three documents:

Concrete & Pictorial VCP



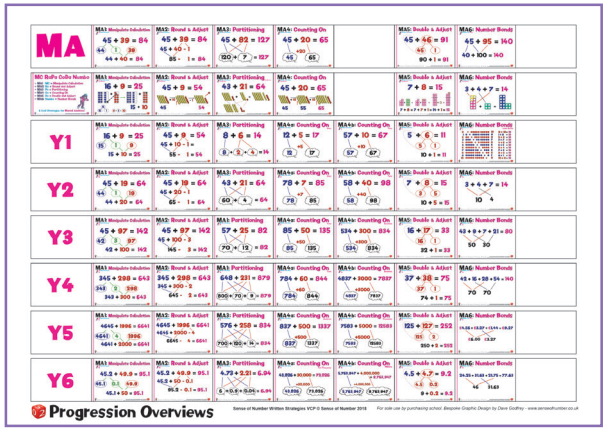
84 A3 wallcharts showing the range of models and images that help children to understand and master calculation strategies.

Written Strategies VCP



271 A4 posters showing the progression of written strategies (from Y1 to Y6) for all 4 operations in line with the National Curriculum.

Mental Strategies VCP



214 A4 posters showing the progression of mental strategies (from Y1 to Y6) for all 4 operations in line with the National Curriculum.

Poster Guide

Expanded Visual Calc. Policy

Code	Section	Concrete & Pictorial (84 A3 Wallcharts)		Written VCP (271 A4 Posters)		Mental VCP (215 A4 Posters)	
		Number of Wallcharts	Wallchart Numbers	No. of Posters	Poster Numbers	No. of Posters	Poster Numbers
	Policy Introduction Slides	4	1-4	4	1-4	4	1-4
	Introductory Posters	3	5-7	9	5-13		
	Operation Overviews	4	8-11	13	14-26	8	5-12
C	Counting Policy			15	27-41		
A	Addition	20	12-31	54	42-103		
MA	Mental Addtion					55	13-67
S	Subtraction	27	32-58	48	104-169		
MS	Mental Subtraction					63	68-130
M	Multiplication	11	59-69	39	170-209		
MM	Mental Multiplication					46	131-176
D	Division	15	70-84	55	210-264		
MD	Mental Division					38	177-215
	Multiplication Tables			11	265-275		
	Alternative layouts (Column & Number Lines)			29	276-306		

MC RaPa CoDa Numbo

14	MA1	MC = Manipulate Calculation
22	MA2	Ra = Round and Adjust
30	MA3	Pa = Partitioning
38	MA4	Co = Counting On
52	MA5	Da = Double and Adjust
60	MA6	Numbo = Number Bonds

6 Cool Strategies for Mental Addition!

Hawkesley Church Primary Academy

MA

MA1: Manipulate Calculation

45 + 39 = 84

44 1 39

44 + 40 = 84

MA2: Round & Adjust

45 + 39 = 84

45 + 40 - 1

85 - 1 = 84

MA3: Partitioning

45 + 82 = 127

120 + 7 = 127

MA4: Counting On

45 + 20 = 65

+20

45 65

MA5: Double & Adjust

45 + 46 = 91

45 1

90 + 1 = 91

MA6: Number Bonds

45 + 95 = 140

40 + 100 = 140

MC RaPa CoDa Numbo

- MA1 MC = Manipulate Calculation
- MA2 Ra = Round and Adjust
- MA3 Pa = Partitioning
- MA4 Co = Counting On
- MA5 Da = Double and Adjust
- MA6 Numbo = Number Bonds

6 Cool Strategies for Mental Addition!

MA1: Manipulate Calculation

16 + 9 = 25

16 15 1 9 10

15 + 10

MA2: Round & Adjust

45 + 9 = 54

+10 -1

45 54

MA3: Partitioning

43 + 21 = 64

MA4: Counting On

45 + 20 = 65

+10 +10

45 55 65

MA5: Double & Adjust

7 + 8 = 15

7 + 8 = 7 + 7 + 1 = 14 + 1 = 15

MA6: Number Bonds

3 + 4 + 7 = 14

Y1

MA1: Manipulate Calculation

16 + 9 = 25

15 1 9

15 + 10 = 25

MA2: Round & Adjust

45 + 9 = 54

45 + 10 - 1 =

55 - 1 = 54

MA3: Partitioning

8 + 6 = 14

8 + 2 + 4 = 14

MA4a: Counting On

Ones

12 + 5 = 17

+5

12 17

MA4b: Counting On

Tens

57 + 10 = 67

+10

57 67

MA5: Double & Adjust

5 + 6 = 11

5 1

10 + 1 = 11

MA6: Number Bonds

Learn Bonds

Y2

MA1: Manipulate Calculation

45 + 19 = 64

44 1 19

44 + 20 = 64

MA2: Round & Adjust

45 + 19 = 64

45 + 20 - 1

65 - 1 = 64

MA3: Partitioning

43 + 21 = 64

60 + 4 = 64

MA4a: Counting On

Ones

78 + 7 = 85

+7

78 85

MA4b: Counting On

Tens

58 + 40 = 98

+40

58 98

MA5: Double & Adjust

7 + 8 = 15

7 1

14 + 1 = 15

MA6: Number Bonds

3 + 4 + 7 = 14

10 4

Y3

MA1: Manipulate Calculation

45 + 97 = 142

42 3 97

42 + 100 = 142

MA2: Round & Adjust

45 + 97 = 142

45 + 100 - 3

145 - 3 = 142

MA1: Partitioning

57 + 25 = 82

70 + 12 = 82

MA4a: Counting On

Tens

85 + 50 = 135

+50

85 135

MA4b: Counting On

Hundreds

534 + 300 = 834

+300

534 834

MA5: Double & Adjust

16 + 17 = 33

16 1

32 + 1 = 33

MA6: Number Bonds

43 + 9 + 7 + 21 = 80

50 30

Y4

MA1: Manipulate Calculation

345 + 298 = 643

343 2 298

343 + 300 = 643

MA2: Round & Adjust

345 + 298 = 643

345 + 300 - 2

645 - 2 = 643

MA1: Partitioning

648 + 231 = 879

800 + 70 + 9 = 879

MA4a: Counting On

Tens

784 + 60 = 844

+60

784 844

MA4b: Counting On

Hundreds

4837 + 3000 = 7837

+3000

4837 7837

MA5: Double & Adjust

37 + 38 = 75

37 1

74 + 1 = 75

MA6: Number Bonds

42 + 16 + 28 + 54 = 140

70 70

Y5

MA1: Manipulate Calculation

4645 + 1996 = 6641

4641 4 1996

4641 + 2000 = 6641

MA2: Round & Adjust

4645 + 1996 = 6641

4645 + 2000 - 4

6645 - 4 = 6641

MA3: Partitioning

576 + 258 = 834

700 + 120 + 14 = 834

MA4a: Counting On

Hundreds

837 + 500 = 1337

+500

837 1337

MA4b: Counting On

Thousands

7583 + 5000 = 12583

+5000

7583 12583

MA5: Double & Adjust

125 + 127 = 252

125 2

250 + 2 = 252

MA6: Number Bonds

£4.56 + £3.27 + £1.44 = £9.27

£6.00 £3.27

Y6

MA1: Manipulate Calculation

45.2 + 49.9 = 95.1

45.1 0.1 49.9

45.1 + 50 = 95.1

MA2: Round & Adjust

45.2 + 49.9 = 95.1

45.2 + 50 - 0.1

95.2 - 0.1 = 95.1

MA3: Partitioning

4.73 + 2.21 = 6.94

6 + 0.9 + 0.04 = 6.94

MA4a: Counting On

Ten Thousands

43,826 + 30,000 = 73,826

+30,000

43,826 73,826

MA4b: Counting On

Millions

5,763,947 + 4,000,000 = 9,763,947

+4,000,000

5,763,947 9,763,947

MA5: Double & Adjust

4.5 + 4.7 = 9.2

4.5 0.2

9 + 0.2 = 9.2

MA6: Number Bonds

24.25 + 31.63 + 21.75 = 77.63

46 31.63

Progression Overviews

MC RaPa CoOCoB NumFa

6 Cool Strategies for Mental Subtraction!

Hawkesley Church Primary Academy

	MS1: Manipulate Calculation	MA2: Round & Adjust	MS3: Partitioning	MS4a: Counting On	MS4b: Counting On	MS5a: Counting Back	MS5b: Counting Back	MS6: Number Facts
MS	84 - 29 = 55 +1 +1 85 - 30 = 55	84 - 29 = 55 84 - 30 + 1 54 + 1 = 55	63 - 35 = 28 -33 -2 63 30 28	61 - 58 = 3 +3 58 61	40 - 28 = 12 +2 +10 28 30 40	68 - 20 = 48 48 68 -20	86 - 12 = 74 -10 -2 86 76 74	61 - 41 = 20 41 + 20 = 61
MC RaPa CoOCoB NumFa MS1 MC = Manipulate Calculation MS2 Ra = Round and Adjust MS3 Pa = Partitioning MS4 CoO = Counting On MS5 CoB = Counting Back MS6 NumFa = Number Facts 6 Cool Strategies for Mental Subtraction!	24 - 9 = 15 +15 +15 9 24 10 25 24 - 9 = 25 - 10 (24 + 1) - (9 + 1)	24 - 9 = 15 -10 +1 24 14 15	63 - 35 = 28 28 30 63 -2 -33	12 - 9 = 3 12 9 3	40 - 28 = 12 +2 +10 28 30 40	68 - 20 = 48 68 48 -20	86 - 12 = 74 74 76 86 -2 -10	61 - 41 = 20 41 + 20 = 61
Y1	24 - 9 = 15 +1 +1 25 - 10 = 15	24 - 9 = 15 24 - 10 + 1 14 + 1 = 15	23 - 8 = 15 -3 -5 23 20 15	12 - 9 = 3 +3 9 12		15 - 4 = 11 11 15 -4		19 - 9 = 10 9 + 10 = 19
Y2	84 - 29 = 55 +1 +1 85 - 30 = 55	84 - 29 = 55 84 - 30 + 1 54 + 1 = 55	63 - 35 = 28 -33 -2 63 30 28	61 - 58 = 3 +3 58 61	40 - 28 = 12 +2 +10 / +10 +2 28 30 40 / 28 38 40	68 - 20 = 48 48 68 -20	86 - 12 = 74 -10 -2 86 76 74	61 - 41 = 20 41 + 20 = 61
Y3	463 - 97 = 366 +3 +3 466 - 100 = 366	463 - 97 = 366 463 - 100 + 3 363 + 3 = 366	123 - 28 = 95 -23 -5 123 100 95	302 - 297 = 5 +5 297 302	61 - 37 = 24 +3 +21 / +20 +4 37 40 61 / 37 57 61	378 - 50 = 328 328 378 -50	89 - 34 = 55 -30 -4 89 59 55	123 - 83 = 40 83 + 40 = 123
Y4	876 - 298 = 578 +2 +2 878 - 300 = 578	876 - 298 = 578 876 - 300 + 2 576 + 2 = 578	132 - 58 = 74 -52 -6 132 80 74	1003 - 998 = 5 +5 998 1003	324 - 280 = 44 +20 +24 280 300 324	768 - 200 = 568 568 768 -200	578 - 45 = 533 -40 -5 578 538 533	847 - 447 = 400 447 + 400 = 847
Y5	5864 - 2996 = 2868 +4 +4 5868 - 3000 = 2868	5864 - 2996 = 2868 5864 - 3000 + 4 2864 + 4 = 2868	750 - 372 = 378 -350 -22 750 400 378	8.3 - 7.9 = 0.4 +0.4 7.9 8.3	1204 - 950 = 254 +50 +204 950 1000 1204	7291 - 2000 = 5291 5291 7291 -2000	8.6 - 4.1 = 4.5 -4 -0.1 8.6 4.6 4.5	1424 - 724 = 700 724 + 700 = 1424
Y6	46357 - 11999 = 34358 +1 +1 46358 - 12000 = 34358	46357 - 11999 = 34358 46357 - 12000 + 1 46357 + 1 = 34358	£64.30 - £24.50 = £39.80 -£24.30 -20p £64.30 £40 £39.80	£12.02 - £11.98 = 4p +4p £11.98 £12.02	12.4 - 9.8 = 2.6 +0.2 +2.4 9.8 10 12.4	86374 - 20000 = 66374 66374 86374 -20000	£65.87 - £30.24 = £35.63 -£30 -24p £65.87 £35.87 £35.63	13.2 - 9.2 = 4 9.2 + 4 = 13.2

Progression Overviews

Mental Multiplication

10 Cool Strategies for Mental Multiplication

MM

MM1: Manipulate Calculation

16 x 3

(+2) (x2)

8 x 6 = 48

MM2: Factorising

16 x 3 = 48

(8 x 2 x 3)

8 x 6 = 48

MM3: Re-ordering

(9 x 2) x 5
18 x 5 = 90

(9 x 5) x 2
45 x 2 = 90

(2 x 5) x 9
10 x 9 = 90 *

MM4: Partitioning

15 x 5 = 75

50 (10 x 5) + 25 (5 x 5) = 75

MM5: Round & Adjust

49 x 3 = 147

(50 x 3) - (1 x 3)

150 - 3 = 147

MM6: Doubling

Double 17 = 34

20 + 14 = 34

MM7: Doubling Table Facts

8 x 6 = 48
(4 x 2)

4 x 6 = 24 → x 2

8 x 6 = 48

MM8: Doubling Up

17 x 4 = 68

Double 17 = 34 (17 x 2)
Double 34 = 68 (17 x 4)

Mental Multiplication

MM1 Manipulate Calculation
MM2 Factorising
MM3 Re-ordering
MM4 Partitioning
MM5 Round & Adjust
MM6 Doubling
MM7 Doubling Table Facts
MM8 Doubling Up
MM9 Multiply by ... then Halve
MM10 Jump

10 Cool Strategies for Mental Multiplication

MM1a: Manipulate Calculation

27 x 3

(+3) (x3)

9 x 9 = 81

MM2a: Factorising

27 x 3 = 81

(9 x 3 x 3)

9 x 9 = 81

MM3a: Re-ordering

(7 x 4) x 5
28 x 5 = 140

(7 x 5) x 4
35 x 4 = 140

(4 x 5) x 7
20 x 7 = 140 *

MM4a: Partitioning

37 x 4 = 148

120 (30 x 4) + 28 (7 x 4) = 148

MM5a: Round & Adjust

198 x 4 = 792

(200 x 4) - (2 x 4)

800 - 8 = 792

MM6a: Doubling

Double 37 = 74

60 + 14 = 74

MM7a: Doubling Table Facts

12 x 7 = 84
(6 x 2)

6 x 7 = 42 → x 2

12 x 7 = 84

MM8a: Doubling Up

36 x 8 = 288

Double 36 = 72 (36 x 2)
Double 72 = 144 (36 x 4)
Double 144 = 288 (36 x 8)

MM1b: Manipulate Calculation

45 x 14

(x2) (+2)

90 x 7 = 630

MM2b: Factorising

45 x 14 = 630

(45 x 2 x 7)

90 x 7 = 630

MM3b: Re-ordering

(9 x 8) x 6
72 x 6 = 432

(9 x 6) x 8
54 x 8 = 432 *

(8 x 6) x 9
48 x 9 = 432

MM4b: Partitioning

126 x 6 = 756

600 (100 x 6) + 120 (20 x 6) + 36 (6 x 6) = 756

MM5b: Round & Adjust

3.9 x 5 = 19.5

(4 x 5) - (0.1 x 5)

20 - 0.5 = 19.5

MM6b: Doubling

Double 78 = 156

140 + 16 = 156

MM7b: Doubling Table Facts

16 x 7 = 112
(8 x 2)

8 x 7 = 56 → x 2

16 x 7 = 112

MM8b: Doubling Up

125 x 16 = 2000

Double 125 = 250 (125 x 2)
Double 250 = 500 (125 x 4)
Double 500 = 1000 (125 x 8)
Double 1000 = 2000 (125 x 16)

MM1c: Manipulate Calculation

36 x 25

(+4) (x4)

9 x 100 = 900

MM2c: Factorising

36 x 25 = 900

(9 x 4 x 25)

9 x 100 = 900

MM4c: Partitioning

4.3 x 8 = 34.4

32 (4 x 8) + 2.4 (0.3 x 8) = 34.4

MM5c: Round & Adjust

£5.99 x 6 = £35.94

(£6 x 6) - (1p x 6)

£36 - 6p = £35.94

MM6c: Doubling

Double 340 = 680

600 + 80 = 680

MM7c: Doubling Table Facts

22 x 12 = 264
(11 x 2)

11 x 12 = 132 → x 2

22 x 12 = 264

MM1d: Manipulate Calculation

32 x 15

(x5) (+5)

160 x 3 = 480

MM2d: Factorising

32 x 15 = 480

(32 x 5 x 3)

160 x 3 = 480

MM4d: Partitioning

2.16 x 3 = 6.48

6 (2 x 3) + 0.3 (0.1 x 3) + 0.18 (0.06 x 3) = 6.48

MM6d: Doubling

Double 480 = 960

800 + 160 = 960

MM1e: Manipulate Calculation

26 x 32

(x4) (+4)

104 x 8 = 832

MM2e: Factorising

26 x 32 = 832

(26 x 4 x 8)

104 x 8 = 832

MM6e: Doubling

Double 278 = 556

400 + 140 + 16 = 556

MM1f: Manipulate Calculation

52 x 24

(x4) (+4)

208 x 6 = 1248

MM2f: Factorising

52 x 24 = 1248

(52 x 4 x 6)

208 x 6 = 1248

MM6f: Doubling

Double 768 = 1536

1400 + 120 + 16 = 1536

MM9: Mult by 10, 100, 1000 then Halve

86 x 5 = 430

86 x 10 = 860
860 ÷ 2 = 430

MM10: Jump!

1000	100	10	1
x100	3400		
x10		340	
			34

MM6g: Doubling

Double 3.7 = 7.4

6 + 1.4 = 7.4

MM9a: Mult by 10, 100, 1000 then Halve

56 x 25 = 1400

56 x 100 = 5600
5600 ÷ 2 = 2800
2800 ÷ 2 = 1400

MM10a: Jump!

x1000	63400			
x100		6340		
x10			634	
				63.4

Progression Overviews

Sense of Number Written Strategies VCP © Sense of Number 2018

Hawkesley Church Primary Academy

Mental Division

7 Cool Strategies for Mental Division!

MD

MD1: Manipulate Calculation

140 ÷ 20

(÷10) (÷10)

14 ÷ 2 = 7

MD2: Divide by 100 then Double

800 ÷ 50 = 16

800 ÷ 100 = 8

8 x 2 = 16

MD3: Halving

Half of 12 is equivalent to 12÷2

½ of 12 = 12÷2

MD4: Halve & Halve Again

84 ÷ 4 = 21

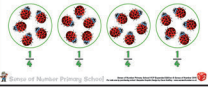
Half of 84 = 42 (84 ÷ 2)

Half of 42 = 21 (84 ÷ 4)

MD5: Division as a Fraction

Sharing Model

¼ of 20 = 20 ÷ 4 = 5



MD6: Find the Hunk!

72 ÷ 4 = 18

40 + 32 (÷ 4)

10 + 8 = 18

MD7: Jump (+10)

10 1

80

+10 8

Mental Division

MD1 Manipulate Calculation

MD2 Divide by 100 then Double

MD3 Halving

MD4 Halve and Halve Again

MD5 Division as a Fraction

MD6 Find the Hunk

MD7 Jump

7 Cool Strategies for Mental Division!

MD1a: Manipulate Calculation

84 ÷ 12

(÷2) (÷2)

42 ÷ 6 = 7

(÷2) (÷2)

21 ÷ 3 = 7

MD2a: Divide by 100 then Double twice

800 ÷ 25 = 32

800 ÷ 100 = 8

8 x 2 = 16

16 x 2 = 32

MD3a: Halving

Half of (20) 26

10 + 3 = 13

MD4a: Halve & Halve Again

128 ÷ 4 = 32

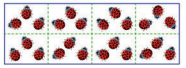
Half of 128 = 64 (128 ÷ 2)

Half of 64 = 32 (128 ÷ 4)

MD5a: Division as a Fraction

Sharing Model

⅛ of 24 = 24 ÷ 8 = 3



MD6a: Find the Hunk!

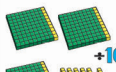
65 ÷ 4 = 16r1

40 + 25 (÷ 4)

10 + 6r1 = 16r1

MD7a: Jump (+10)

3 (Pictorial)



100 10 1

360

+10 36

MD1b: Manipulate Calculation

1200 ÷ 400

(÷100) (÷100)

12 ÷ 4 = 3

MD3b: Halving

Half of (50) 58

25 + 4 = 29

MD4b: Halve, Halve, Halve

(finding an eighth)

360 ÷ 8 = 45

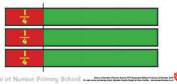
Half of 360 = 180 (360 ÷ 2)

Half of 180 = 90 (360 ÷ 4)

Half of 90 = 45 (360 ÷ 8)

MD5b: Division as a Fraction

¼ of 3 = 3 ÷ 4 = ¾



MD6b: Find the Hunk!

136 ÷ 4 = 34

120 + 16 (÷ 4)

30 + 4 = 34

MD7a: Jump (+10)

100 10 1

360

+10 36

MD1c: Manipulate Calculation

162 ÷ 18

(÷2) (÷2)

81 ÷ 9 = 9

MD3c: Halving

Half of (80 + 12) 92

40 + 6 = 46

Half of 92

45 + 1 = 46

MD4c: Halve, Halve, Halve

5000 ÷ 8 = 625

Half of 5000 = 2500 (5000 ÷ 2)

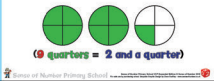
Half of 2500 = 1250 (5000 ÷ 4)

Half of 1250 = 625 (5000 ÷ 8)

MD5c: Division as a Fraction

Mixed Number Model

¼ of 9 = 9 ÷ 4 = 9/4 = 2 ¼



(9 quarters = 2 and a quarter)

MD6c: Find the Hunk!

394 ÷ 6 = 65r4

360 + 34 (÷ 6)

60 + 5r4 = 65r4

MD7b: Jump (+10/100)

1000 100 10 1

6300

+10 630

+100 63

MD1d: Manipulate Calculation

18 ÷ 1.5

(x2) (x2)

36 ÷ 3 = 12

MD3d: Halving

(25 tens)

Half of 326

160 + 3 = 163

Half of 326

150 + 10 + 3 = 163

MD5d: Division as a Fraction

Mixed Number Model

⅕ of 17 = 17 ÷ 5 = 17/5 = 3 2/5 (3.4)

(17 fifths = 3 wholes and 2 fifths)

MD6d: Find the Hunk!

536 ÷ 4 = 134

400 + 120 + 16 (÷ 4)

100 + 30 + 4 = 134

MD7c: Jump (+10/100/1000)

100 10 1 = 1/10 1/100 1/1000

634

+10 63.4

+100 6.34

+1000 0.634

MD1e: Manipulate Calculation

9.3 ÷ 0.3

(x10) (x10)

93 ÷ 3 = 31

MD3b: Halving

Half of 5.84

2.5 + 0.4 + 0.02

= 2.92

MD5e: Division as a Fraction

Mixed Number Model

⅛ of 19 = 19 ÷ 8 = 19/8 = 2 3/8 (2.375)

(19 eighths = 2 and 3 eighths)

MD6e: Find the Hunk!

18 ÷ 1.5 = 12

15 + 3 (÷ 1.5)

10 + 2 = 12

MD1f: Manipulate Calculation

6.25 ÷ 0.25

(x4) (x4)

25 ÷ 1 = 25

MD3f: Halving

Half of 34.72 = 17.36

15 + 2 + 0.35 + 0.01

(1 ten + 5 ones + 7 tenths + 2 hundredths)

Half of 34.72

10 + 7 + 0.3 + 0.6

MD5f: Division as a Fraction

Mixed Number Model

1/12 of 9 = 9 ÷ 12 = 9/12 = ¾ (0.75)

(9 twelfths = 3 quarters)

Progression Overviews

Sense of Number Written Strategies VCP © Sense of Number 2018

Hawkesley Church Primary Academy

MC RaPa CoDa Numbo

14 **MA1** MC = Manipulate Calculation

22 **MA2** Ra = Round and Adjust

30 **MA3** Pa = Partitioning

38 **MA4** Co = Counting On

52 **MA5** Da = Double and Adjust

60 **MA6** Numbo = Number Bonds

6 Cool Strategies for Mental Addition!

MA1: Manipulate Calculation

MC RaPa CoDa Numbo

$$45 + 39 = 84$$

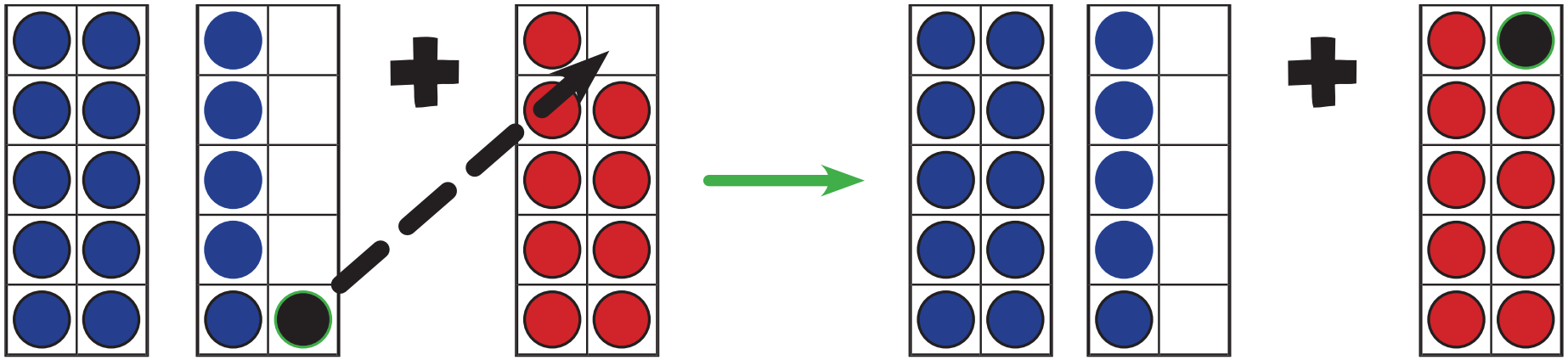
44 1

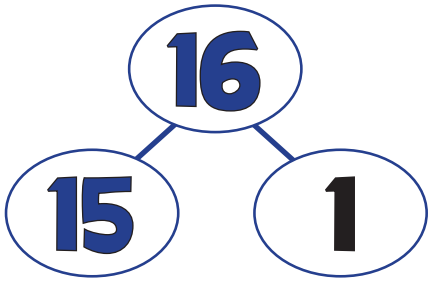
$$44 + 40 = 84$$

MA1: Manipulate Calculation

MC RaPa CoDa Numbo
Visualisation

16 + 9 = 25





9 + 1 = 10

15 + 10

MA1: Manipulate Calculation

MC RaPa CoDa Numbo

1

$$16 + 9 = 25$$

15

1

$$15 + 10 = 25$$

MA1: Manipulate Calculation

MC RaPa CoDa Numbo

2

$$45 + 19 = 64$$

44

1

$$44 + 20 = 64$$

MA1: Manipulate Calculation

MC RaPa CoDa Numbo

3

$$45 + 97 = 142$$

42

3

$$42 + 100 = 142$$

MA1: Manipulate Calculation

MC RaPa CoDa Numbo

4

$$345 + 298 = 643$$

343

2

$$343 + 300 = 643$$

MA1: Manipulate Calculation

Mc RaPa CoDa Numbo

5

$$4645 + 1996 = 6641$$

4641

4

$$4641 + 2000 = 6641$$

MA1: Manipulate Calculation

MC RaPa CoDa Numbo

6

$$45.2 + 49.9 = 95.1$$

45.1

0.1

$$45.1 + 50 = 95.1$$

MA2: Round & Adjust

MC RaPa CoDa Numbo

$$45 + 39 = 84$$

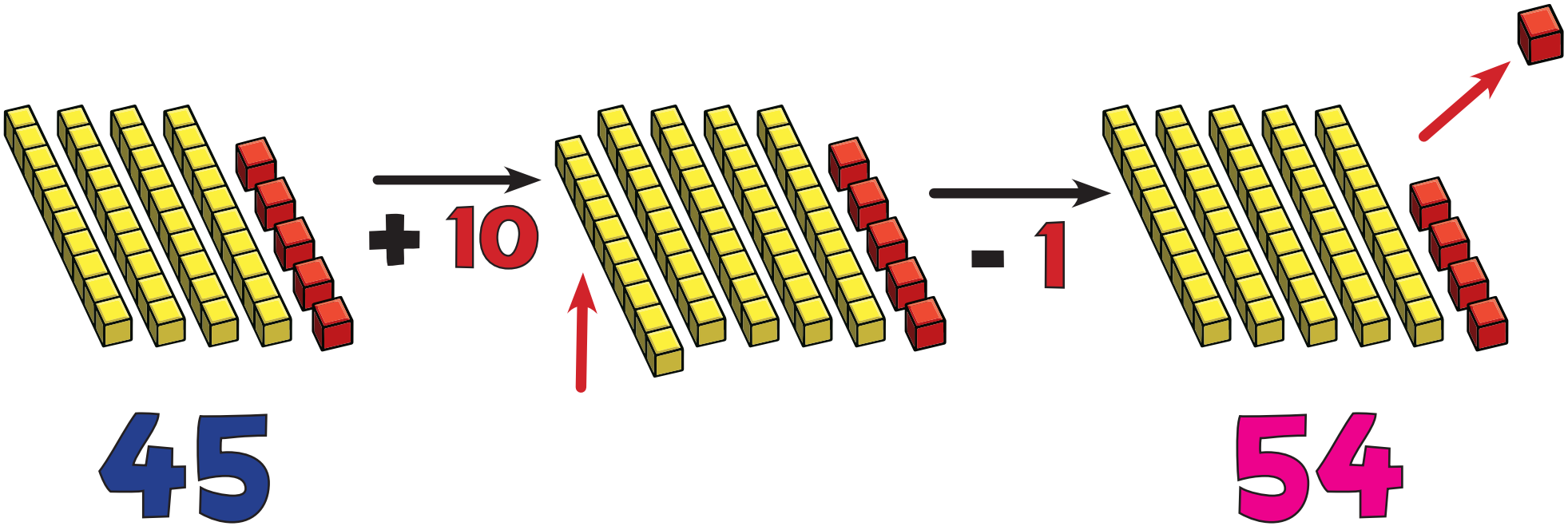
$$45 + 40 - 1$$

$$85 - 1 = 84$$

MA2: Round & Adjust

MC RaPa CoDa Numbo
Visualisation

45 + 9 = 54



MA2: Round & Adjust

MC RaPa CoDa Numbo 1

$$45 + 9 = 54$$

$$45 + 10 - 1 =$$

$$55 - 1 = 54$$

MA2: Round & Adjust

MC RaPa CoDa Numbo 2

$$45 + 19 = 64$$

$$45 + 20 - 1$$

$$65 - 1 = 64$$

MA2: Round & Adjust

MC RaPa CoDa Numbo 3

$$45 + 97 = 142$$

$$45 + 100 - 3$$

$$145 - 3 = 142$$

MA2: Round & Adjust

MC RaPa CoDa Numbo 4

$$345 + 298 = 643$$

$$345 + 300 - 2$$

$$645 - 2 = 643$$

MA2: Round & Adjust

MC RaPa CoDa Numbo 5

4645 + 1996 = 6641

4645 + 2000 - 4

6645 - 4 = 6641

MA2: Round & Adjust

MC RaPa CoDa Numbo 6

$$45.2 + 49.9 = 95.1$$

$$45.2 + 50 - 0.1$$

$$95.2 - 0.1 = 95.1$$

MA3: Partitioning

MC RaPa CoDa Numbo

45 + 82 = 127

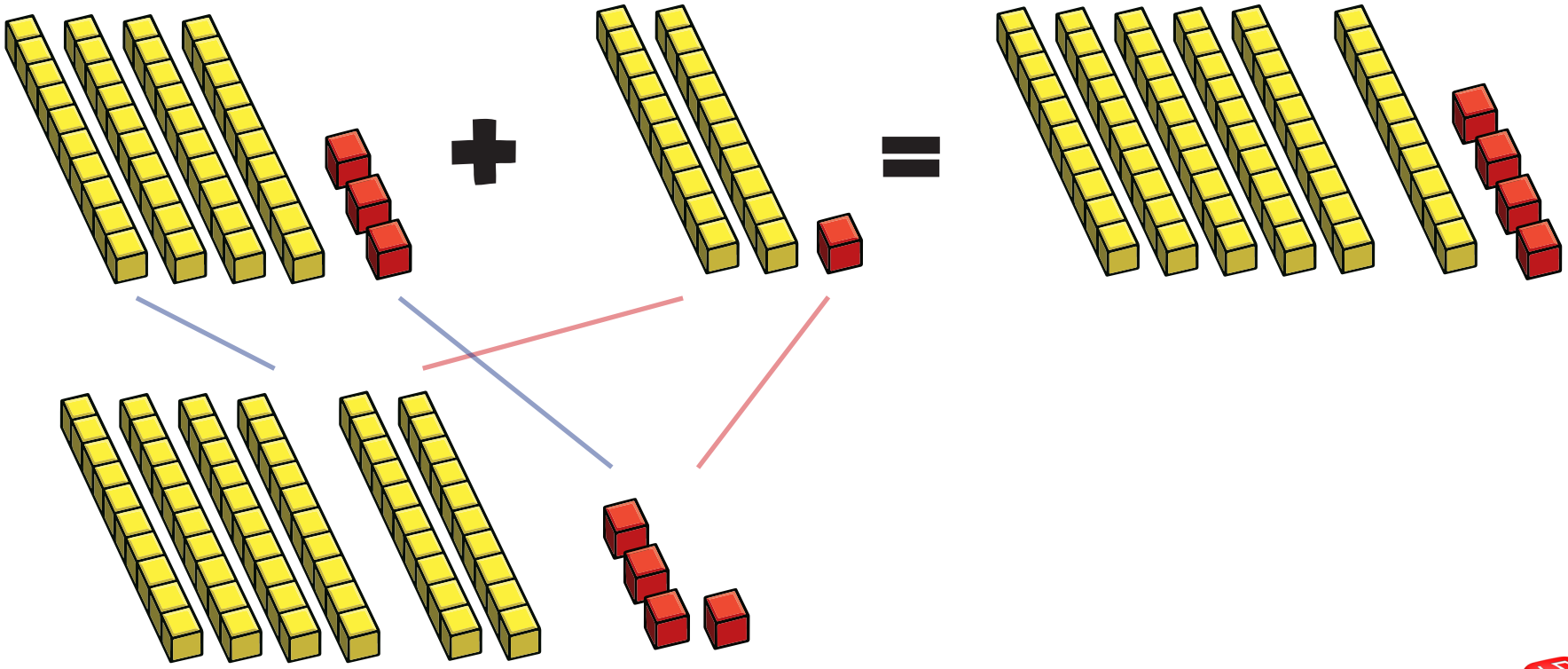
120 + 7 = 127

MA3: Partitioning

MC RaPa CoDa Numbo
Visualisation

Visualisation

43 + 21 = 64



MA3: Partitioning

MC RaPa CoDa Numbo 1

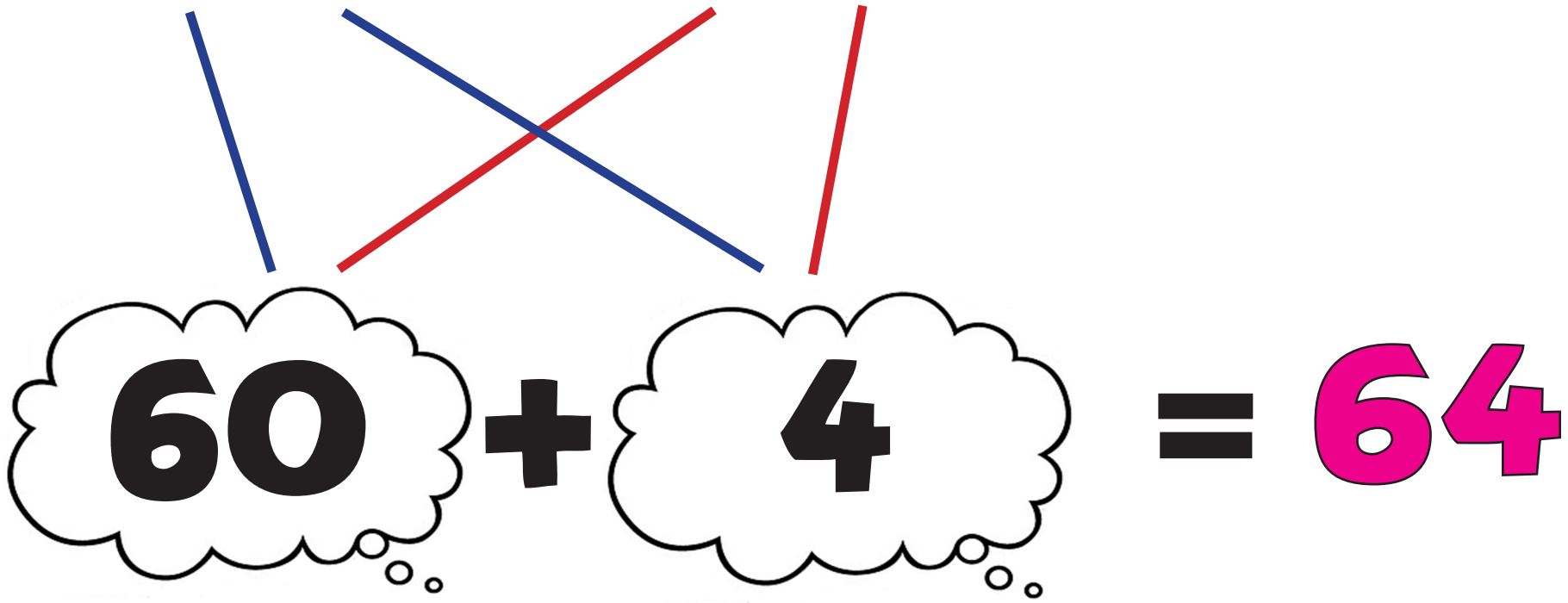
$$8 + 6 = 14$$

$$8 + 2 + 4 = 14$$

MA3: Partitioning

MC RaPa CoDa Numbo 2

43 + 21 = 64



MA3: Partitioning

MC RaPa CoDa Numbo 3

$$57 + 25 = 82$$

$$70 + 12 = 82$$

MA3: Partitioning

MC RaPa CoDa Numbo 4

648 + 231 = 879

800 + 70 + 9 = 879

MA3: Partitioning

MC RaPa CoDa Numbo 5

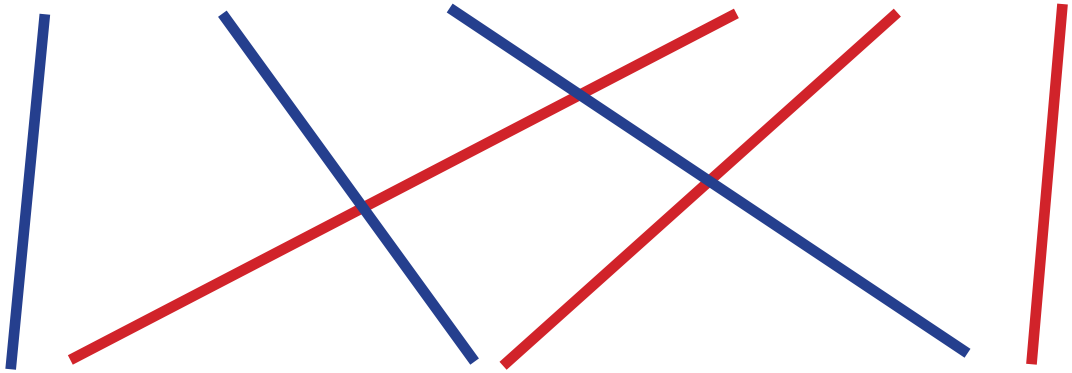
576 + 258 = 834

700 + 120 + 14 = 834

MA3: Partitioning

MC RaPa CoDa Numbo 6

4.73 + 2.21 = 6.94



6 + 0.9 + 0.04 = 6.94

MA4: Counting On

MC RaPa CoDa Numbo

$$45 + 20 = 65$$

+20

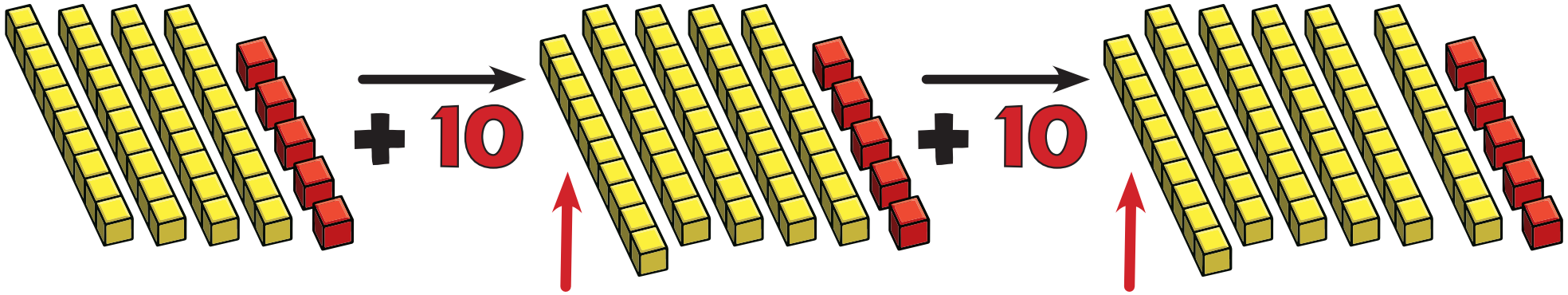
45

65

MA4: Counting On

MC RaPa CoDa Numbo
Visualisation

45 + 20 = 65



45 55 65

MA4a: Counting On

MC RaPa CoDa Numbo 1

Ones

$$12 + 5 = 17$$

+5

12

17

MA4b: Counting On

MC RaPa CoDa Numbo 1

Tens

$$57 + 10 = 67$$

+10

57

67

MA4a: Counting On

MC RaPa CoDa Numbo 2

Ones

$$78 + 7 = 85$$

+7

78

85

MA4b: Counting On

MC RaPa CoDa Numbo 2

Tens

$$58 + 40 = 98$$

+40

MA4a: Counting On

MC RaPa CoDa Numbo 3

Tens

85 + 50 = 135

+50

85

135

MA4b: Counting On

MC RaPa CoDa Numbo 3

Hundreds

$$534 + 300 = 834$$

+300

534

834

MA4a: Counting On

MC RaPa CoDa Numbo 4

Tens

784 + 60 = 844

+60

784

844

MA4b: Counting On

MC RaPa CoDa Numbo 4

Hundreds

$$4837 + 3000 = 7837$$

+3000

4837

7837

MA4a: Counting On

MC RaPa CoDa Numbo 5

Hundreds

$$837 + 500 = 1337$$

+500

837

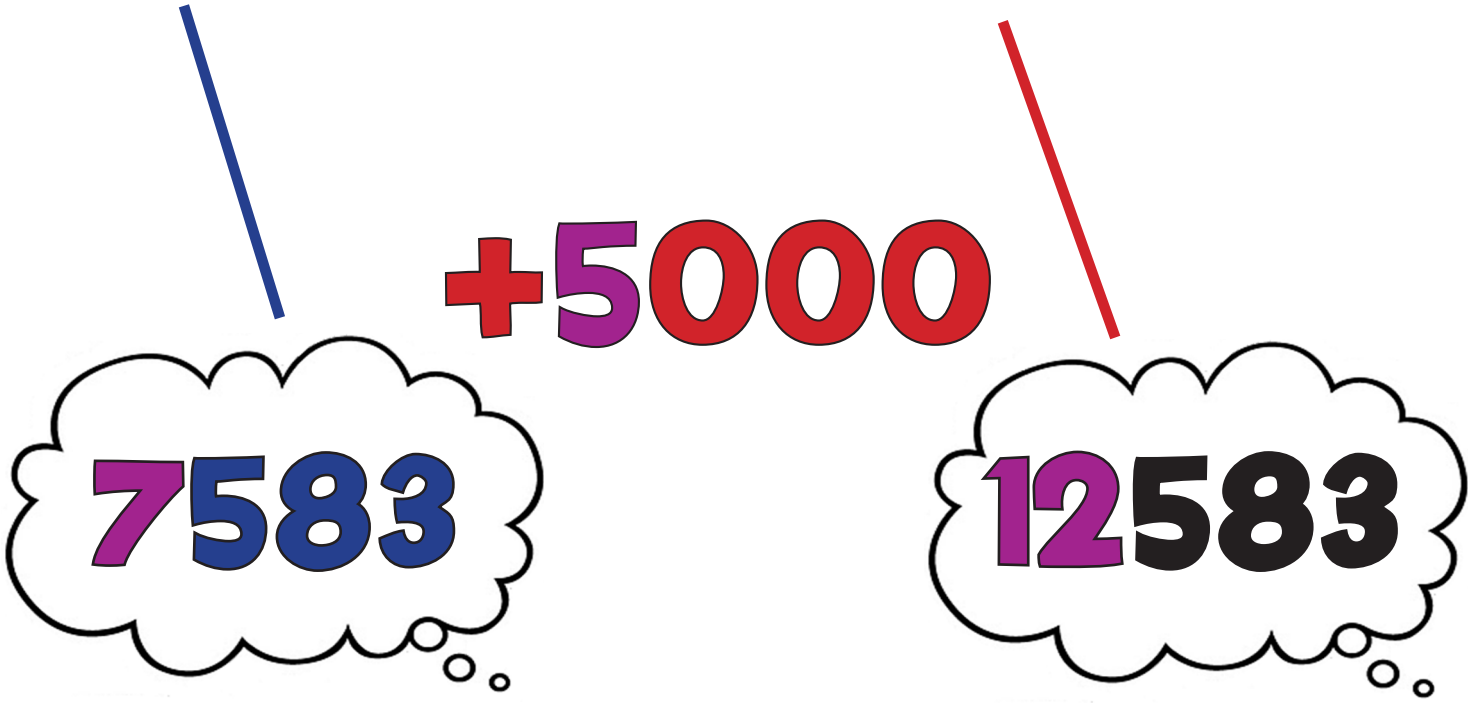
1337

MA4b: Counting On

MC RaPa CoDa Numbo 5

Thousands

$$7583 + 5000 = 12583$$



MA4a: Counting On

MC RaPa CoDa Numbo 6

Ten Thousands

43,826 + 30,000 = 73,826

+30,000

MA4b: Counting On

MC RaPa CoDa Numbo 6

Millions

5,763,947 + 4,000,000 = 9,763,947

+4,000,000

MA5: Double & Adjust

MC RaPa CoDa Numbo

45 + 46 = 91

45

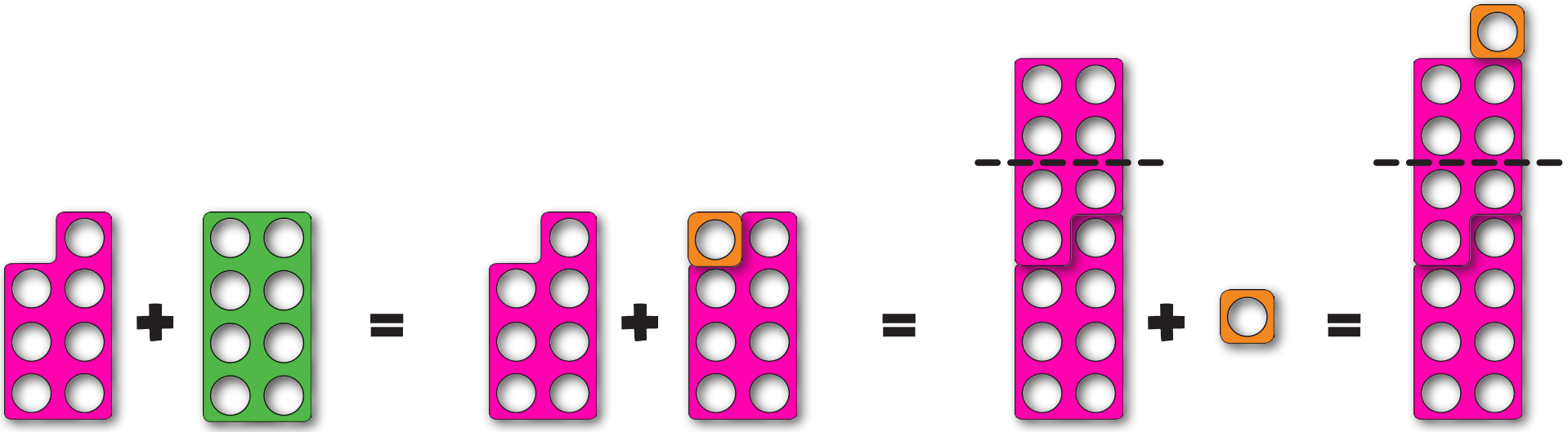
1

90 + 1 = 91

MA5: Double & Adjust

MC RaPa CoDa Numbo
Visualisation

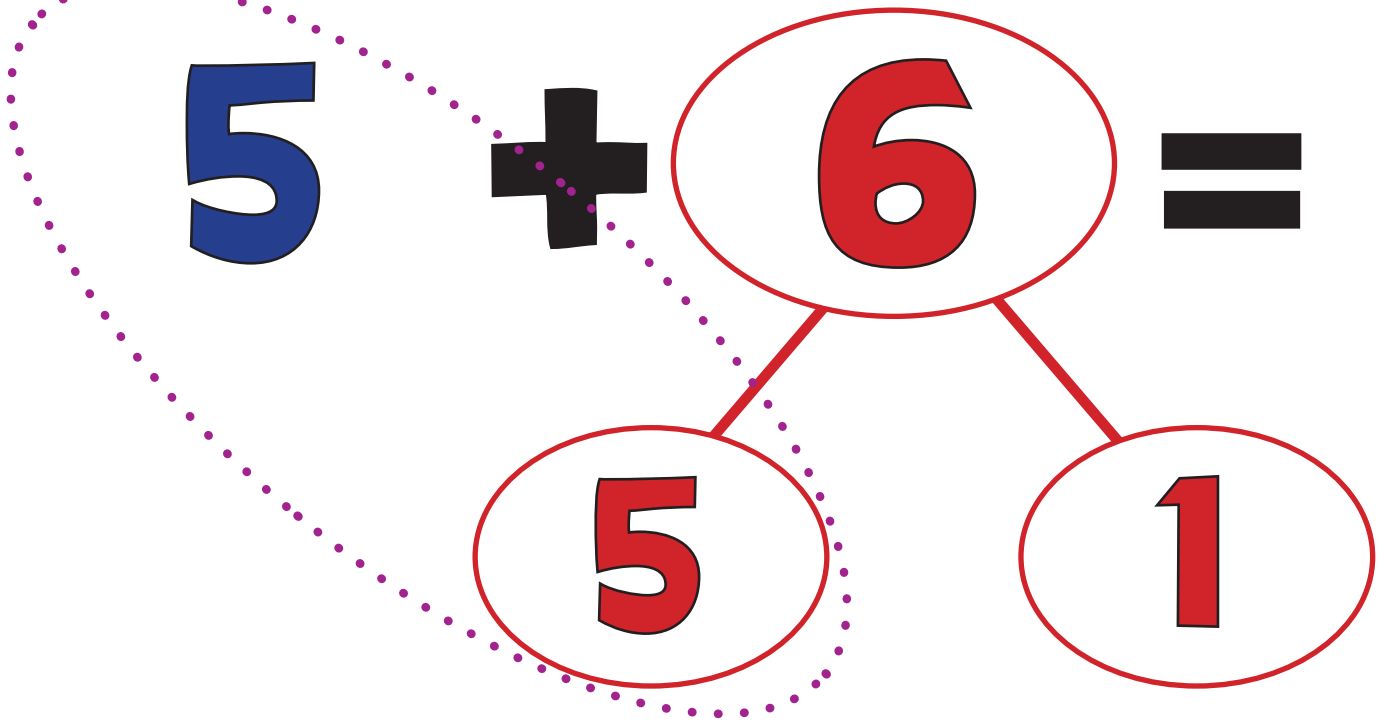
7 + 8 = 15



7 + 8 = 7 + 7 + 1 = 14 + 1 = 15

MA5: Double & Adjust

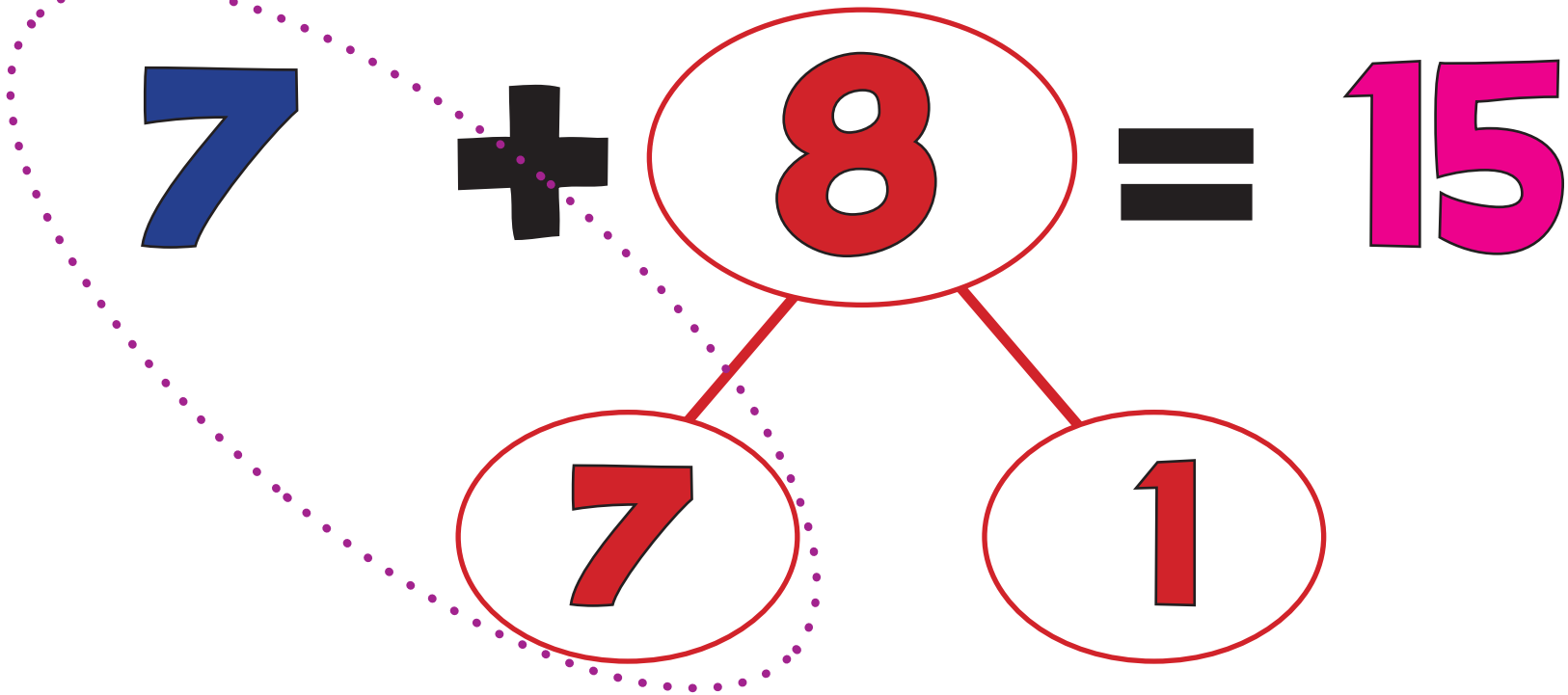
MC RaPa CoDa Numbo 1



10 + 1 = 11

MA5: Double & Adjust

MC RaPa CoDa Numbo 2



14 + 1 = 15

MA5: Double & Adjust

MC RaPa CoDa Numbo 3

16 + 17 = 33

16

1

32 + 1 = 33

MA5: Double & Adjust

MC RaPa CoDa Numbo 4

$$37 + 38 = 75$$

37 | 1

$$74 + 1 = 75$$

MA5: Double & Adjust

MC RaPa CoDa Numbo 5

125 + 127 = 252

125

2

250 + 2 = 252

MA5: Double & Adjust

MC RaPa CoDa Numbo 6

$4.5 + 4.7 = 9.2$

4.7 → 4.5 and 0.2

$9 + 0.2 = 9.2$

MA6: Number Bonds

MC RaPa CoDa Numbo

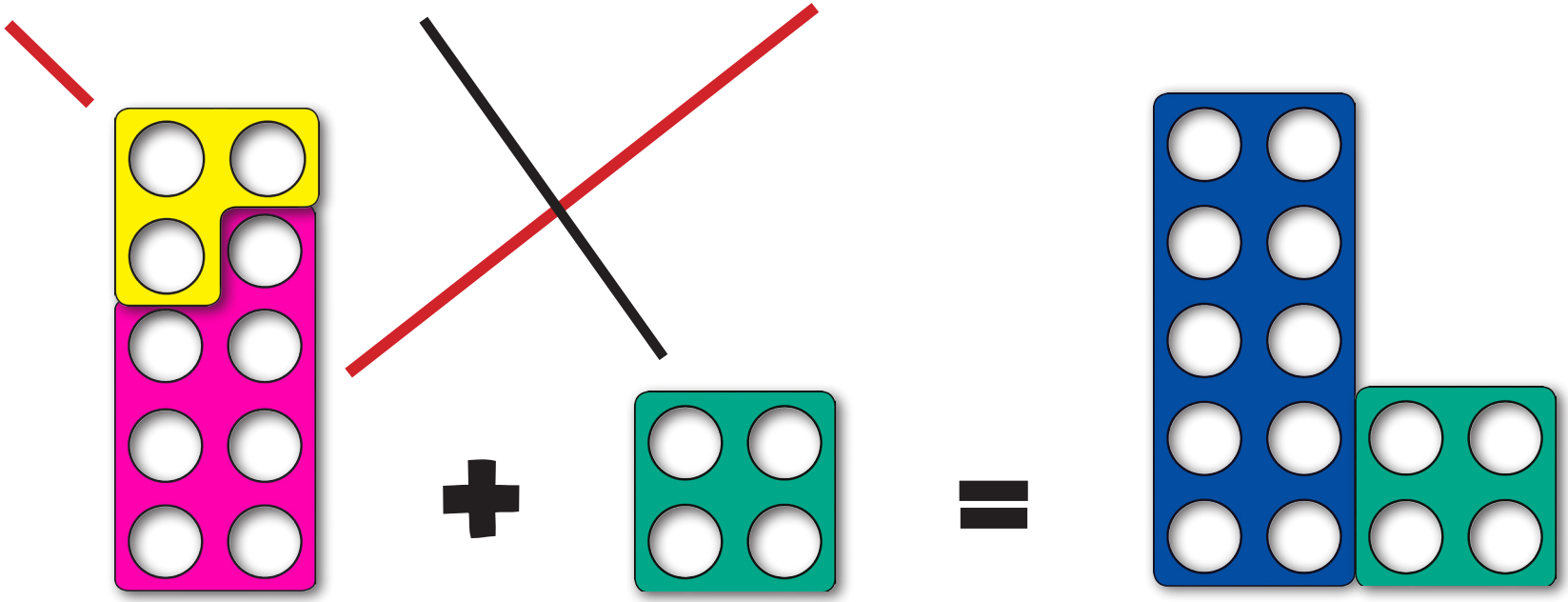
$$45 + 95 = 140$$

$$40 + 100 = 140$$

MA6: Number Bonds

MC RaPa CoDa Numbo
Visualisation

3 + 4 + 7 = 14



MA6: Number Bonds

MC RaPa CoDa Numbo 1

Learn Bonds

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

MA6: Number Bonds

MC RaPa CoDa Numbo 2

$$3 + 4 + 7 = 14$$

10 4

MA6: Number Bonds

MC RaPa CoDa Numbo 3

$$43 + 9 + 7 + 21 = 80$$

50 30

MA6: Number Bonds

MC RaPa CoDa Numbo 4

$$42 + 16 + 28 + 54 = 140$$

70 70

MA6: Number Bonds

MC RaPa CoDa Numbo 5

£4.56 + £3.27 + £1.44 = £9.27

£6.00 £3.27

MA6: Number Bonds

MC RaPa CoDa Numbo 6

$$24.25 + 31.63 + 21.75 = 77.63$$

46

31.63

MC RaPa CoOCoB NumFa

6 Cool Strategies for Mental Subtraction!

Hawkesley Church Primary Academy

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa

$$84 - 29 = 55$$

+1 +1

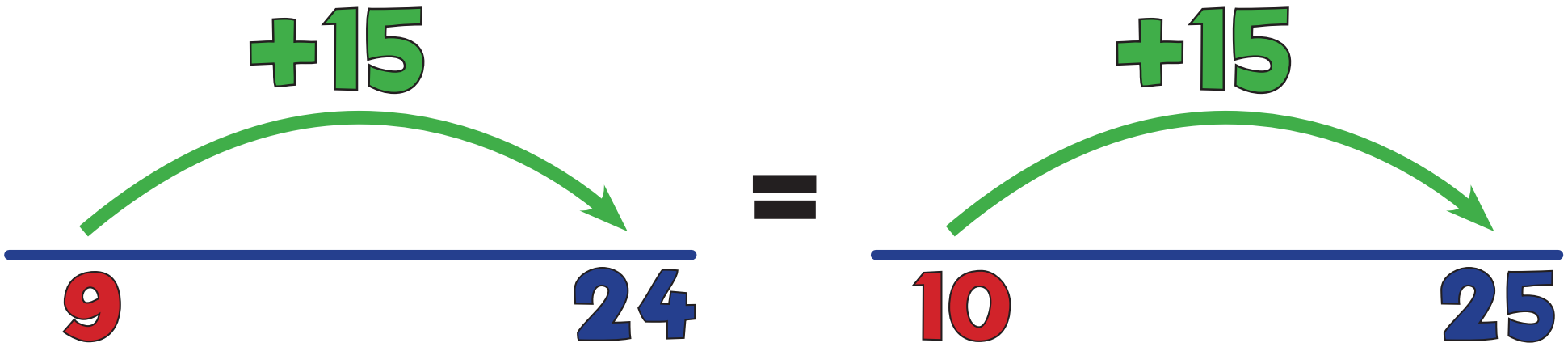
$$85 - 30 = 55$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa
Visualisation

Same Difference!

$$24 - 9 = 15$$



$$24 - 9 = 25 - 10$$

$$(24 + 1) - (9 + 1)$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa 1

Same Difference!

$$24 - 9 = 15$$

+1 +1

$$25 - 10 = 15$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa 2

Same Difference!

$$84 - 29 = 55$$

+1 +1

$$85 - 30 = 55$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa 3

Same Difference!

$$463 - 97 = 366$$

+3 +3

$$466 - 100 = 366$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa 4

Same Difference!

$$876 - 298 = 578$$

+2 +2

$$878 - 300 = 578$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa 5

Same Difference!

$$5864 - 2996 = 2868$$

+4 +4

$$5868 - 3000 = 2868$$

MS1: Manipulate Calculation

MC RaPa CoOCoB NumFa 6

Same Difference!

46357 - 11999 = 34358

+1 +1

46358 - 12000 = 34358

MS2: Round & Adjust

MC RaPa CoOCoB NumFa

$$84 - 29 = 55$$

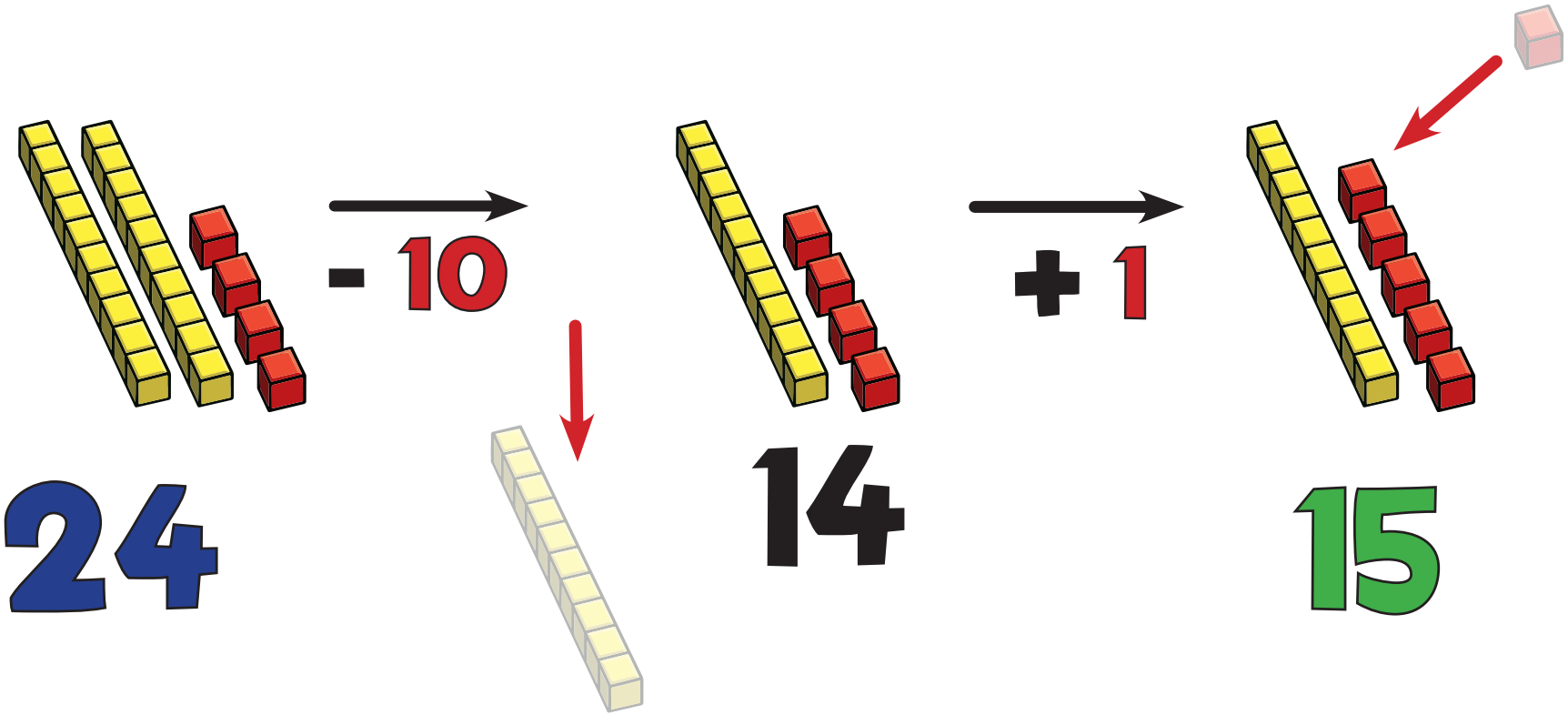
$$84 - 30 + 1$$

$$54 + 1 = 55$$

MS2: Round & Adjust

MC RaPa CoOCoB NumFa
Visualisation

24 - 9 = 15



MS2: Round & Adjust

MC RaPa CoOCoB NumFa 1

$$24 - 9 = 15$$

$$24 - 10 + 1$$

$$14 + 1 = 15$$

MS2: Round & Adjust

MC RaPa CoOCoB NumFa 2

$$84 - 29 = 55$$

$$84 - 30 + 1$$

$$54 + 1 = 55$$

MS2: Round & Adjust

MC RaPa CoOCoB NumFa
3

463 - 97 = 366

463 - 100 + 3

363 + 3 = 366

MA2: Round & Adjust

MC RaPa CoOCoB NumFa
4

876 - 298 = 578

876 - 300 + 2

576 + 2 = 578

MA2: Round & Adjust

MC RaPa CoOCoB NumFa 5

5864 - 2996 = 2868

5864 - 3000 + 4

2864 + 4 = 2868

MS2: Round & Adjust

MC RaPa CoOCoB NumFa 6

46357 - 11999 = 34358

46357 - 12000 + 1

46357 + 1 = 34358

MS3: Partitioning

MC RaPa CoOCoB NumFa

$$63 - 35 = 28$$

$$-\ 33 \quad -\ 2$$

63 → 30 → 28

MS3: Partitioning

MC RaPa CoOCoB NumFa
Visualisation

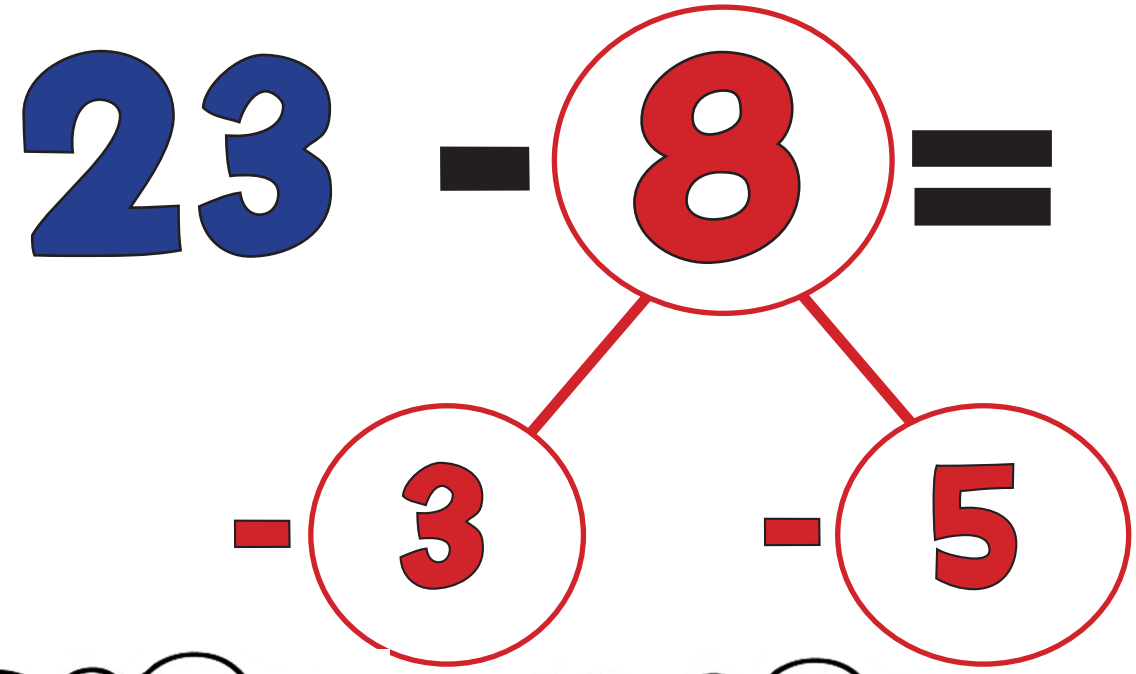
63 - 35 = 28

28 30 63

-2 -33

MS3: Partitioning

MC RaPa CoOCoB NumFa 1



MS3: Partitioning

MC RaPa CoOCoB NumFa 2

$$63 - 35 = 28$$

$$-33 \quad -2$$

63 → 30 → 28

MS3: Partitioning

MC RaPa CoOCoB NumFa 3

123 - 28 = 95

- 23
- 5

123

100

95

MS3: Partitioning

MC RaPa CoOCoB NumFa 4

132 - 58 = 74

- 52
- 6

132

80

74

MS3: Partitioning

MC RaPa CoOCoB NumFa 5

750 - 372 = 378

- 350 - 22

750 400 378

MS3: Partitioning

MC RaPa CoOCoB NumFa

6

£64.30 - £24.50 = £39.80

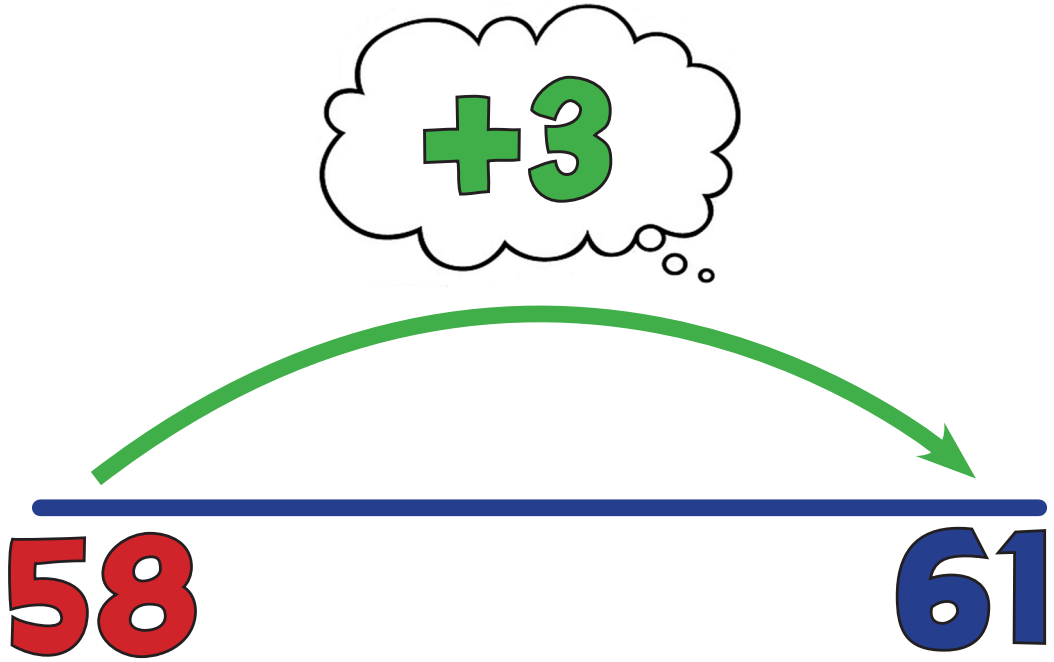
- £24.30 - 20p

MS4a: Counting On

MC RaPa CoOCoB NumFa

Small Difference

61 - 58 = 3

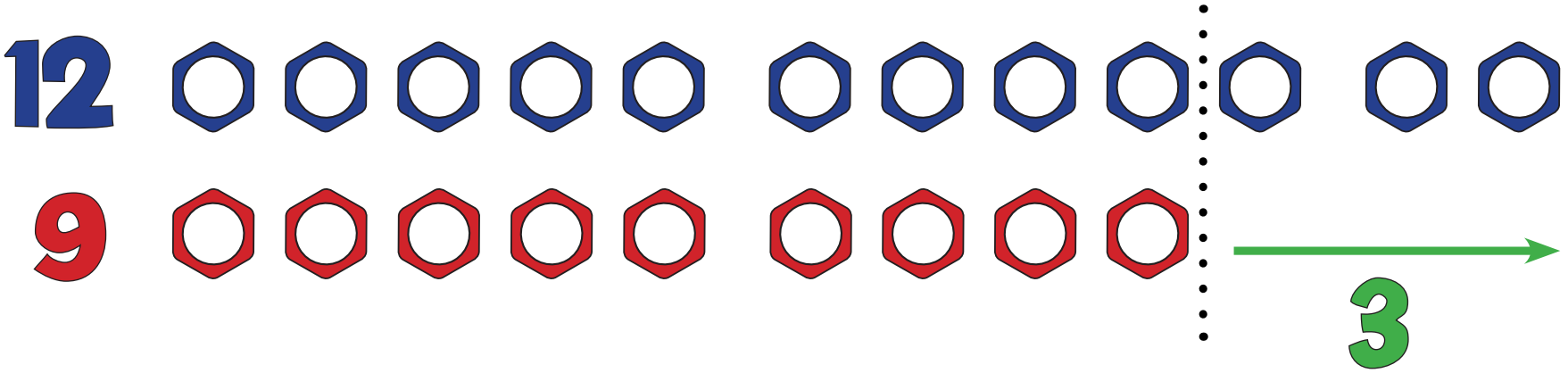


MS4a: Counting On

MC RaPa CoOCoB NumFa
Visualisation

Small Difference

12 - 9 = 3

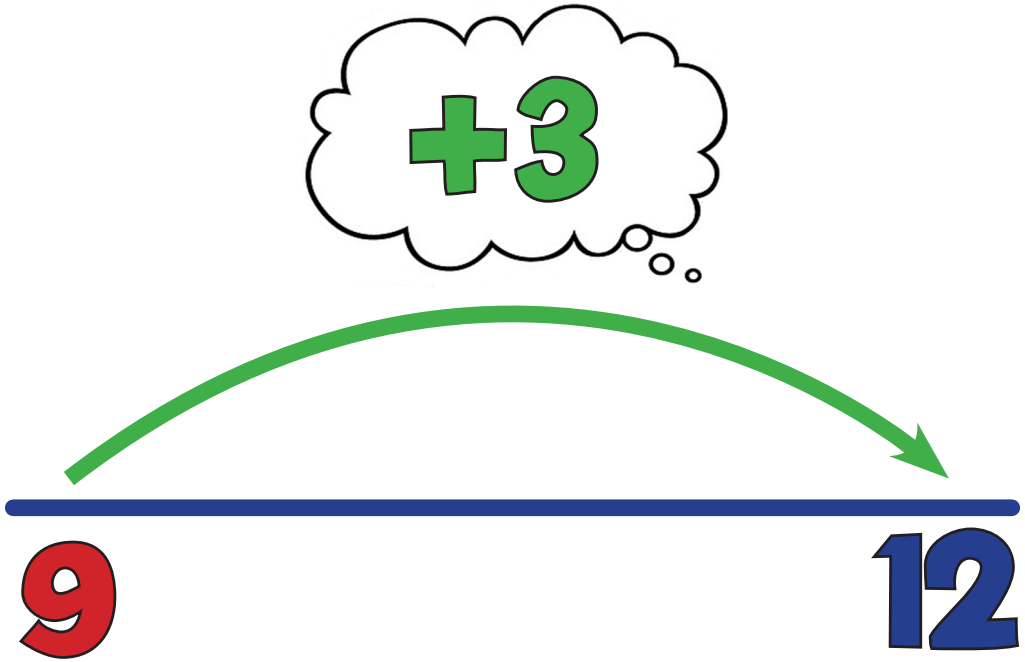


MS4a: Counting On

MC RaPa CoOCoB NumFa 1

Small Difference

$$12 - 9 = 3$$

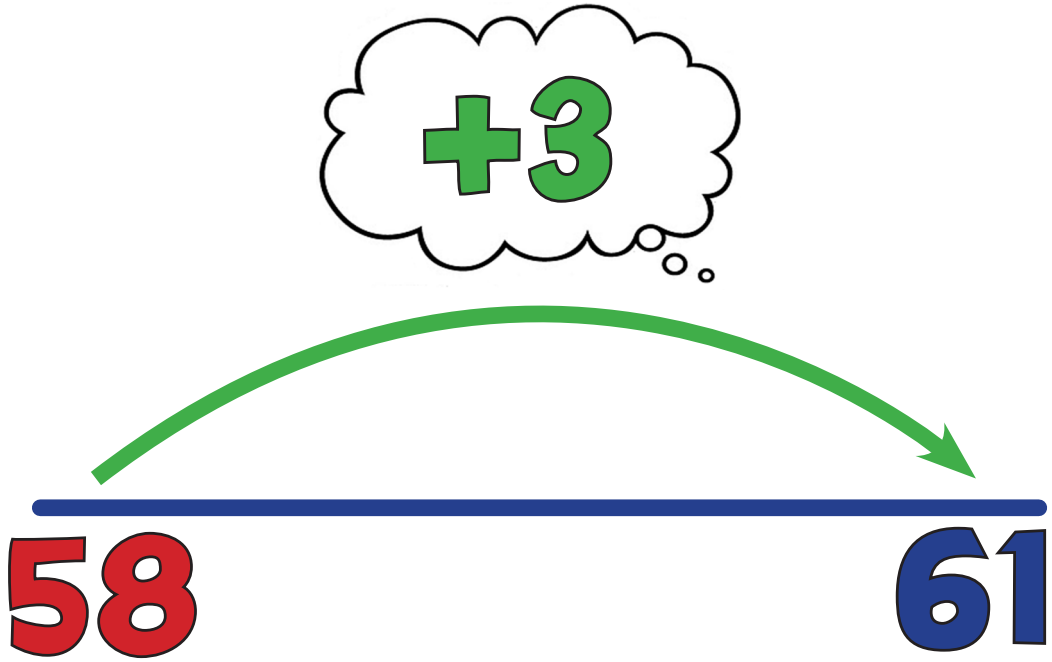


MS4a: Counting On

MC RaPa CoOCoB NumFa 2

Small Difference

61 - 58 = 3

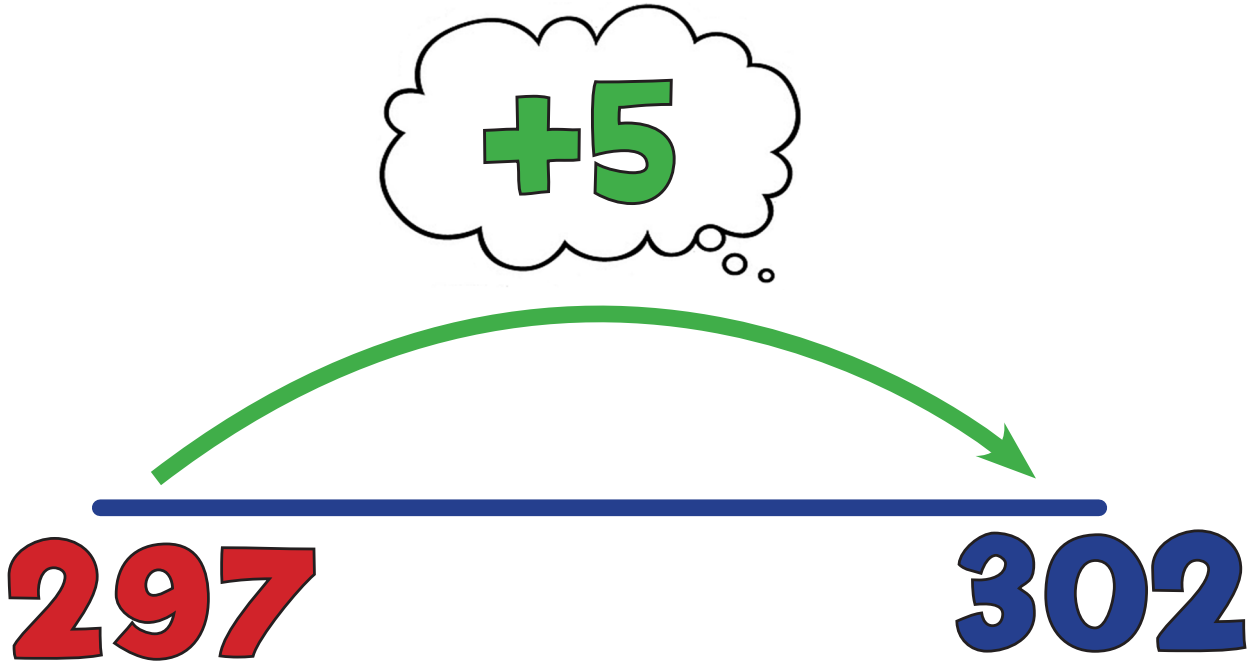


MS4a: Counting On

MC RaPa CoOCoB NumFa 3

Small Difference

302 - 297 = 5

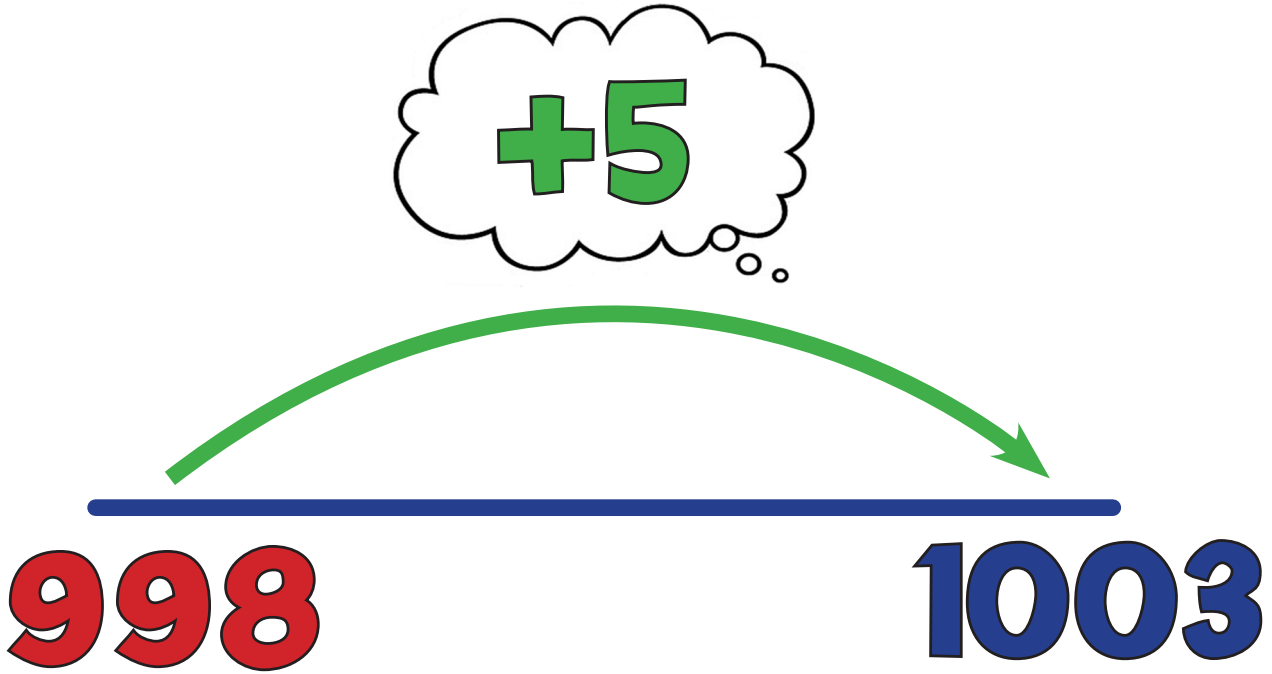


MS4a: Counting On

MC RaPa CoOCoB NumFa 4

Small Difference

$$1003 - 998 = 5$$

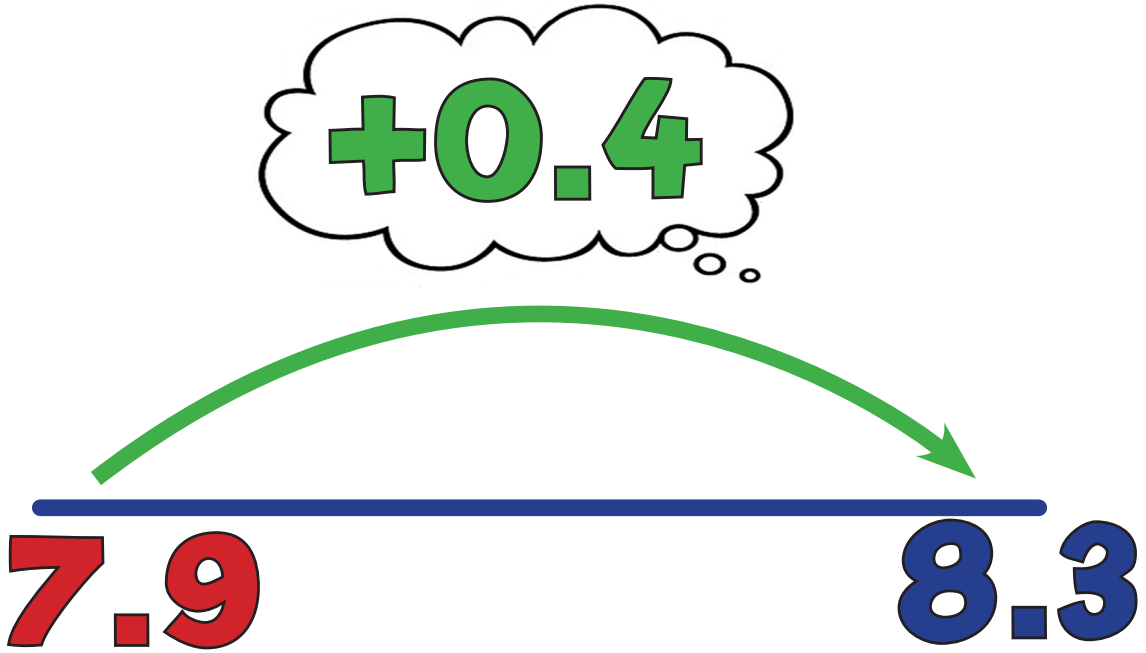


MS4a: Counting On

MC RaPa CoOCoB NumFa 5

Small Difference

8.3 - 7.9 = 0.4



MS4a: Counting On

MC RaPa CoOCoB NumFa 6

Small Difference

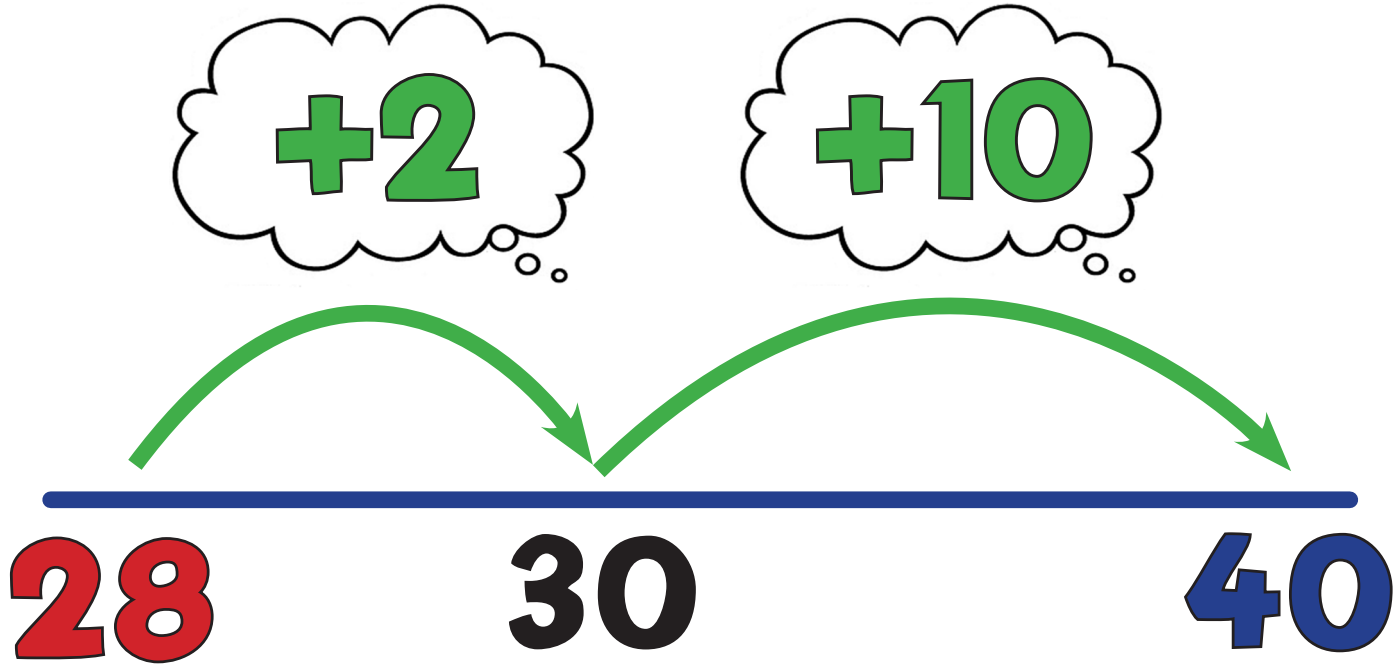
£12.02 - £11.98 = 4p

MS4b: Counting On

MC RaPa CoOCoB NumFa

Jumps

40 - 28 = 12

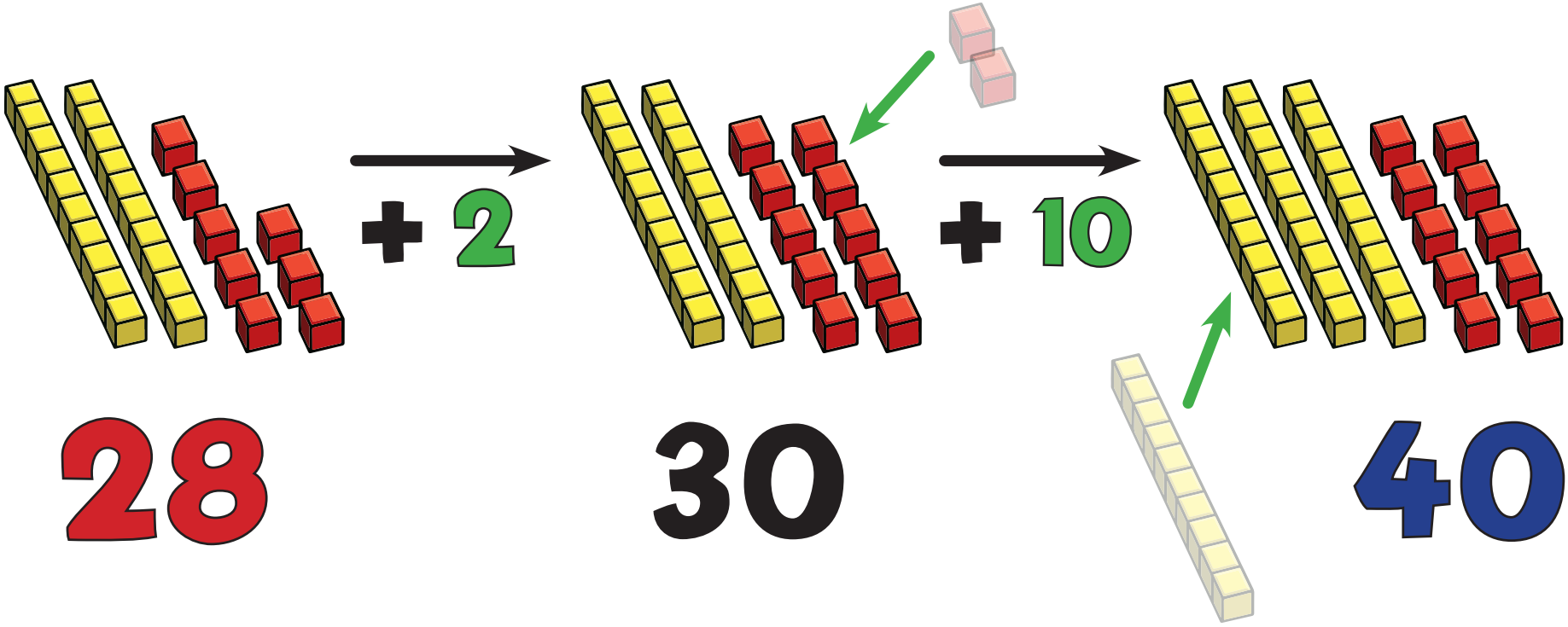


MS4b: Counting On

MC RaPa CoOCoB NumFa
Visualisation

Jumps

40 - 28 = 12

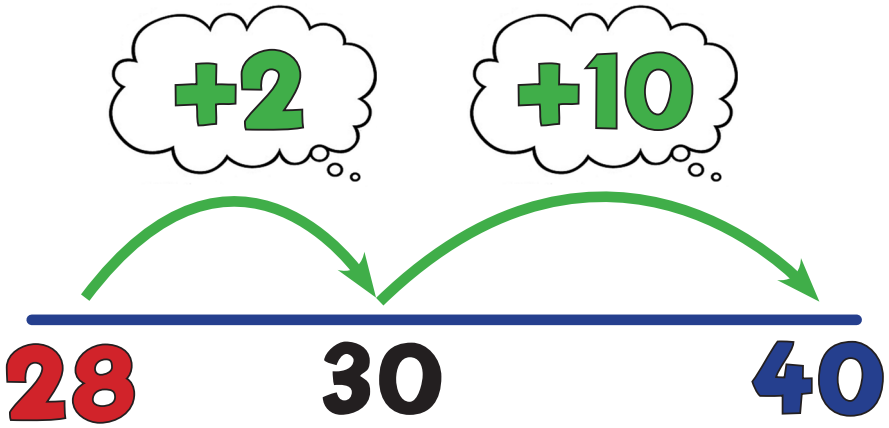


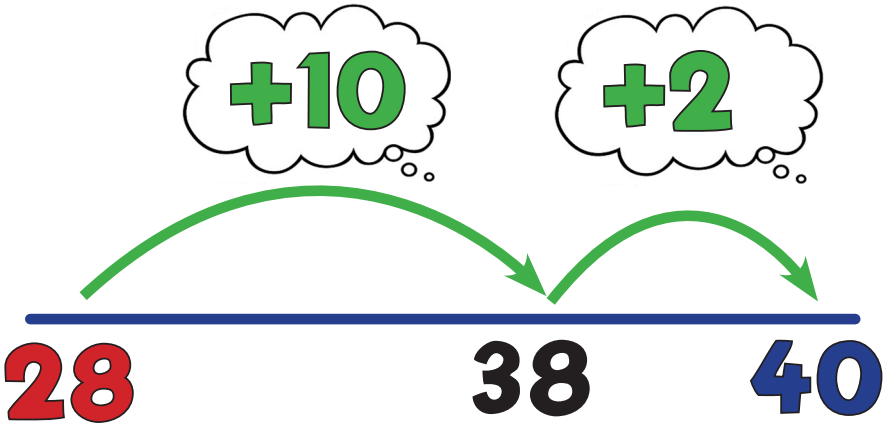
MS4b: Counting On

MC RaPa CoOCoB NumFa 2

Jumps

40 - 28 = 12



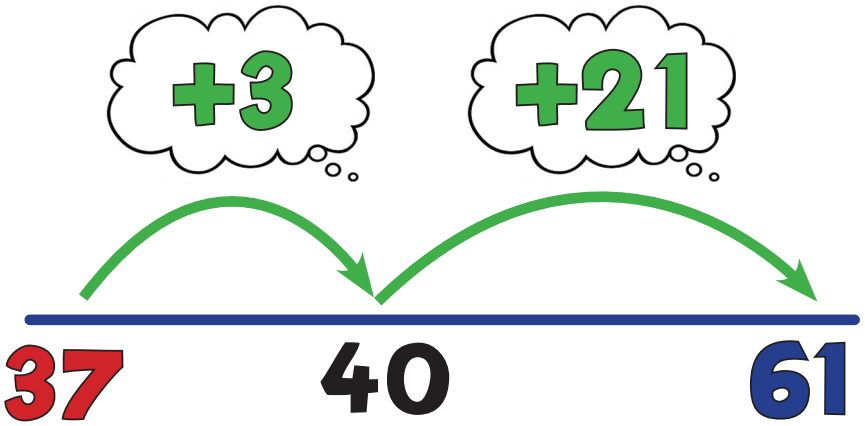


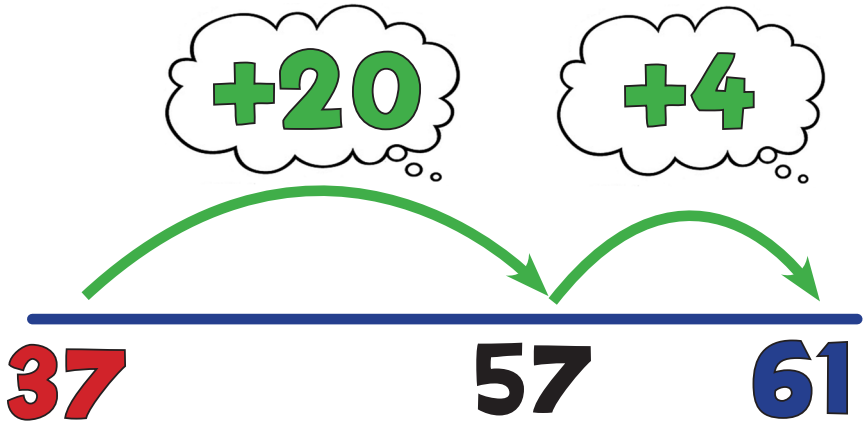
MS4b: Counting On

MC RaPa CoOCoB NumFa 3

Jumps

61 - 37 = 24



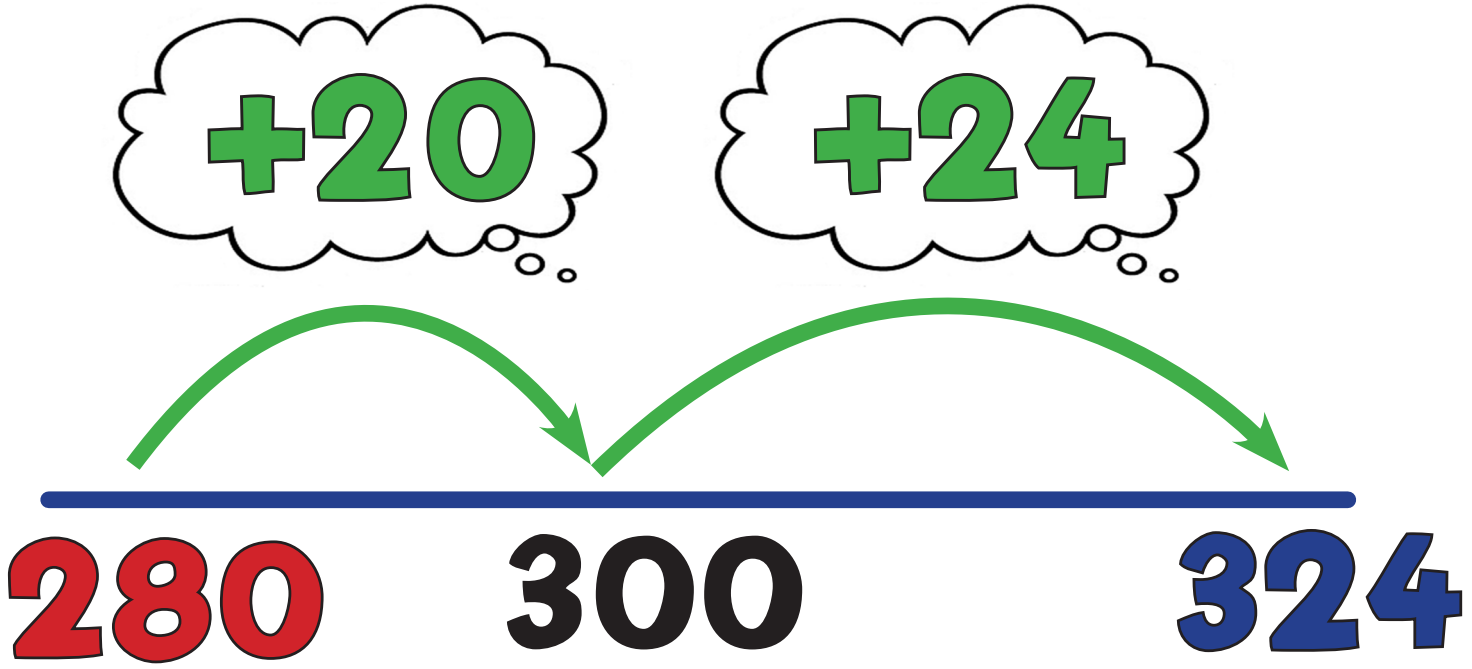


MS4b: Counting On

MC RaPa CoOCoB NumFa 4

Jumps

324 - 280 = 44

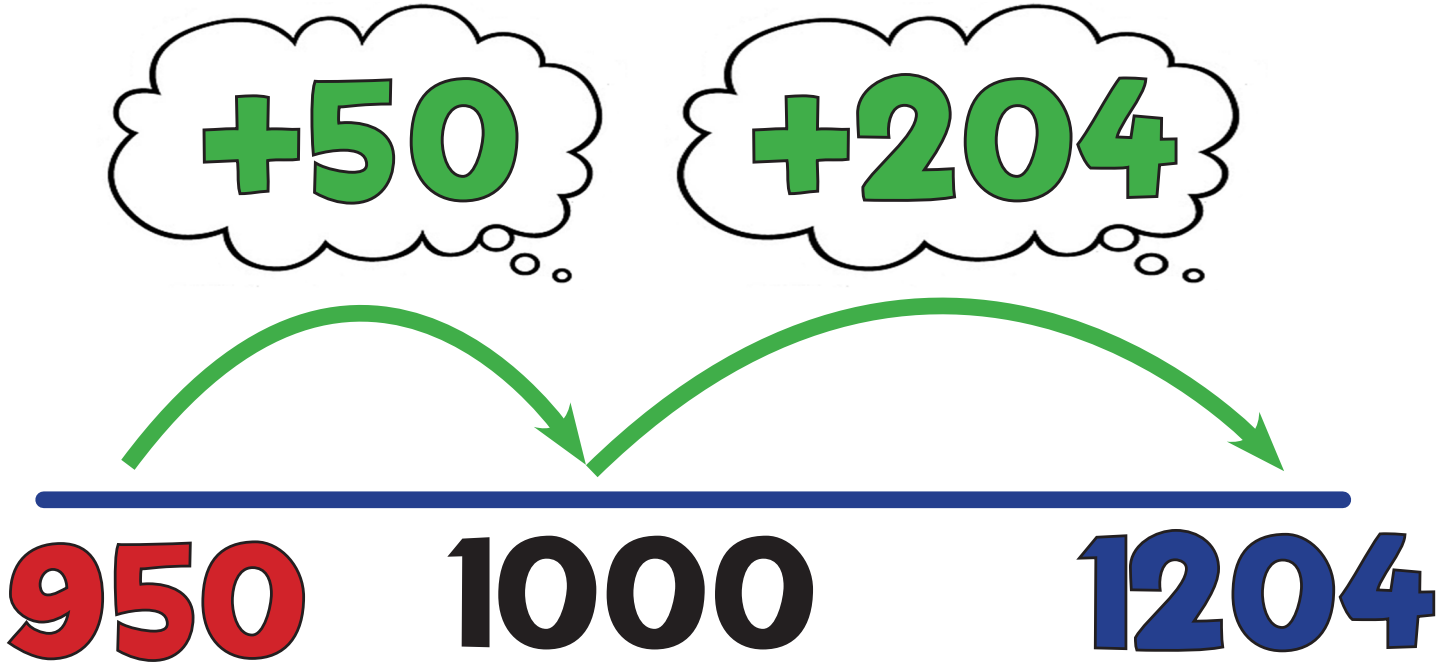


MS4b: Counting On

MC RaPa CoOCoB NumFa 5

Jumps

1204 - 950 = 254

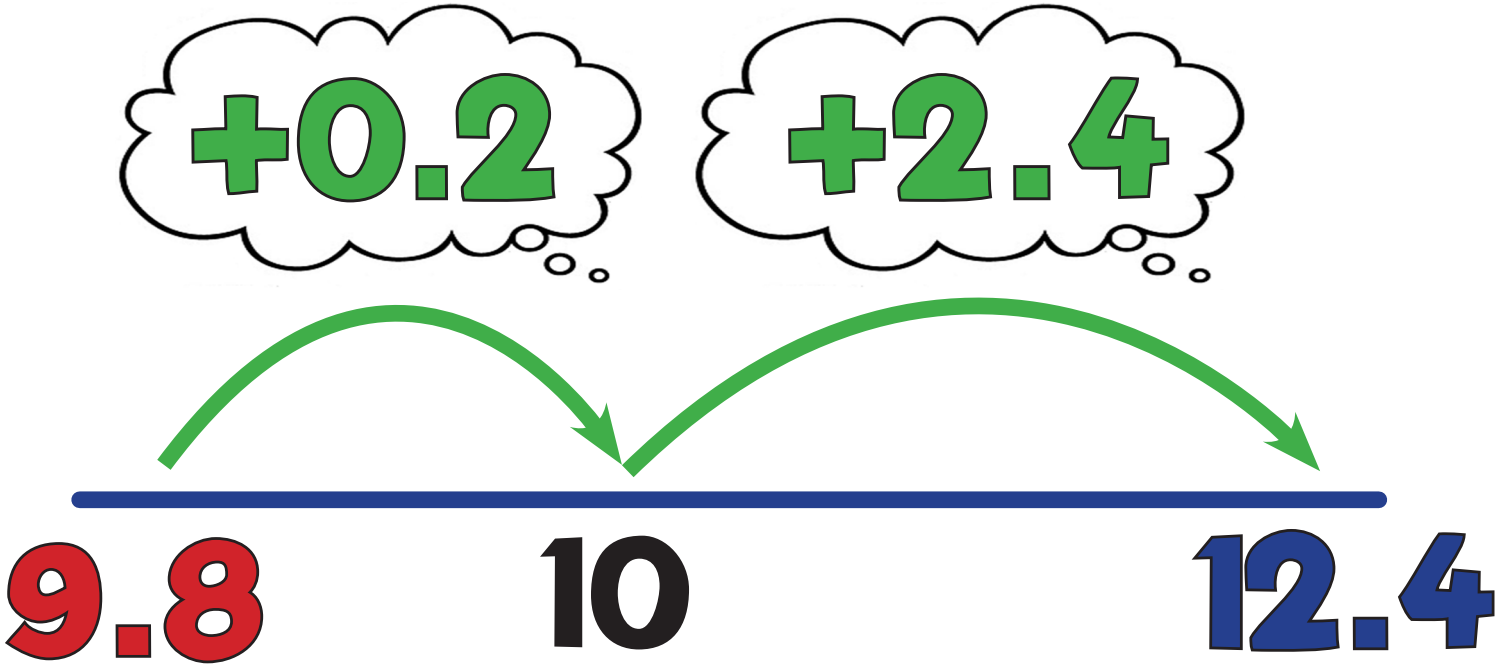


MS4b: Counting On

MC RaPa CoOCoB NumFa 6

Jumps

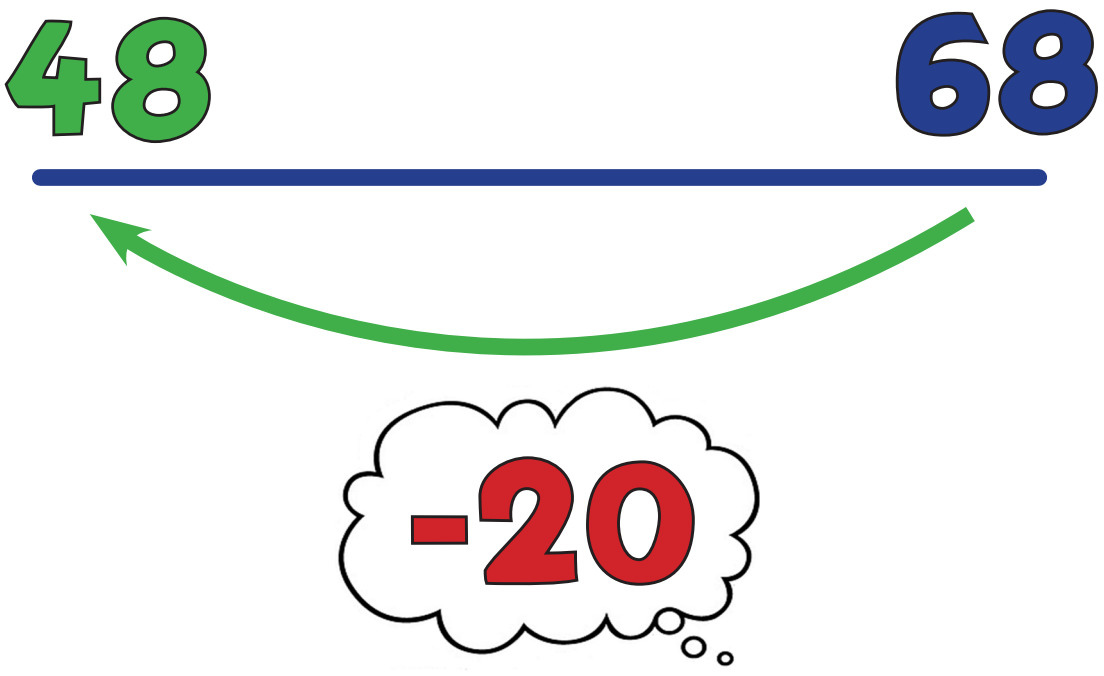
12.4 - 9.8 = 2.6



MS5a: Counting Back

MC RaPa CoOCoB NumFa

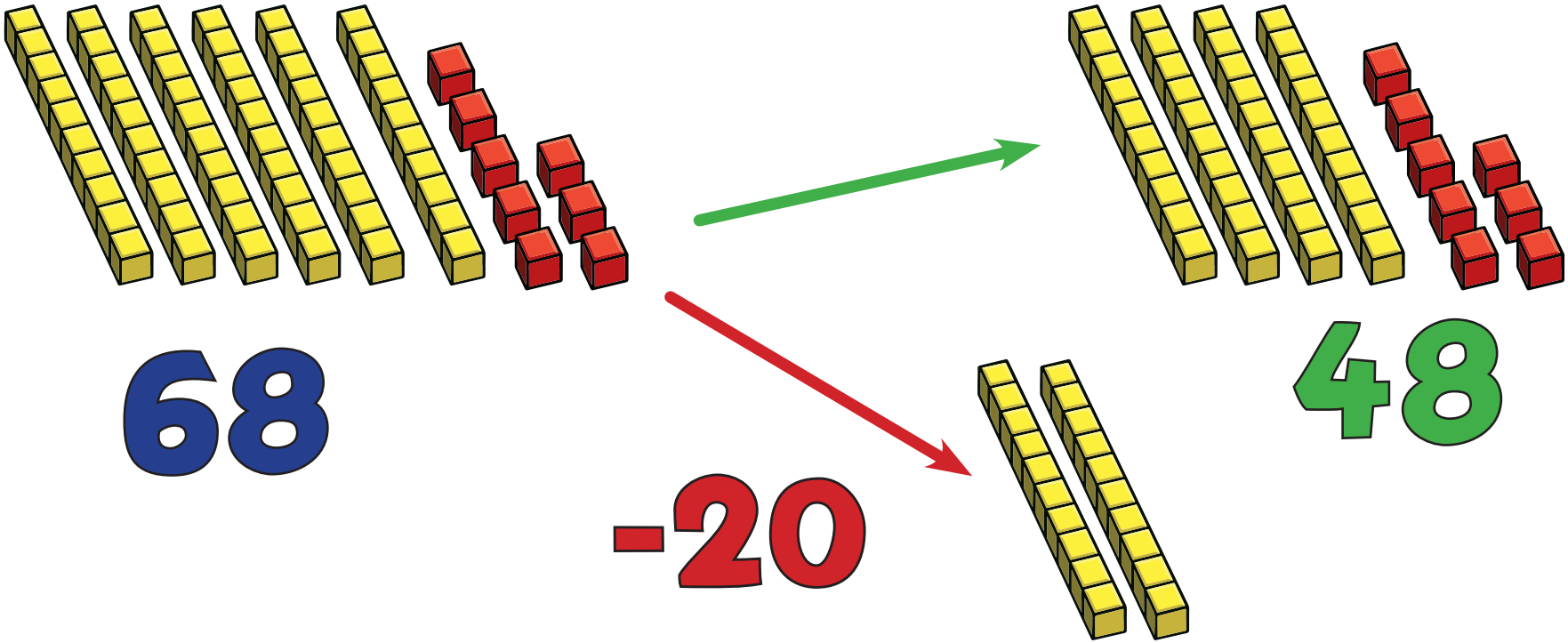
68 - 20 = 48



MS5a: Counting Back

MC RaPa CoOCoB NumFa
Visualisation

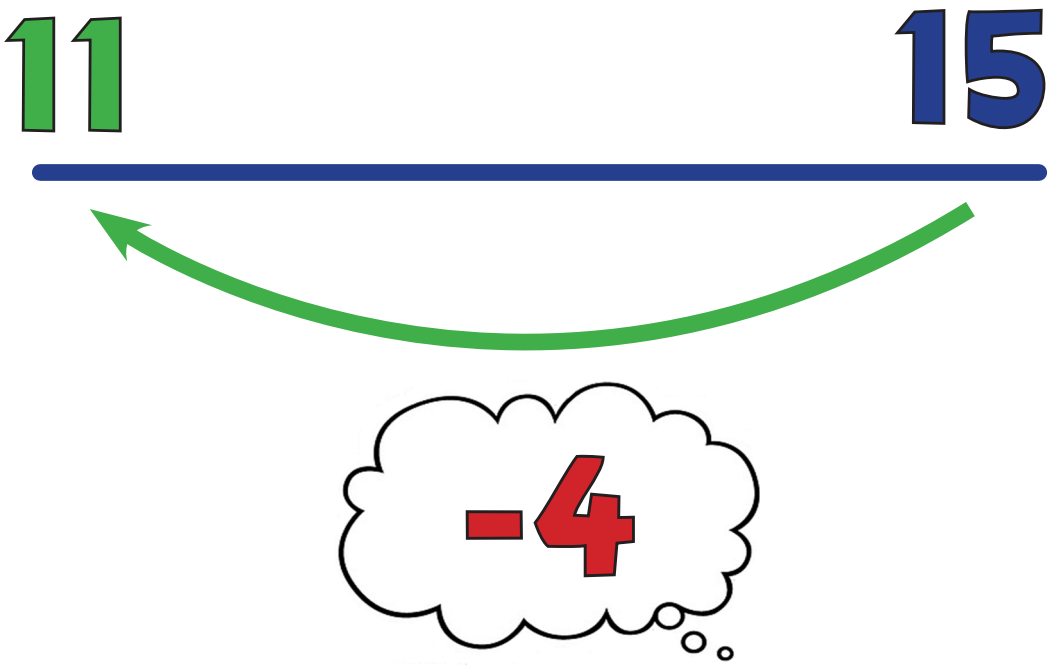
68 - 20 = 48



MS5a: Counting Back

MC RaPa CoOCoB NumFa 1

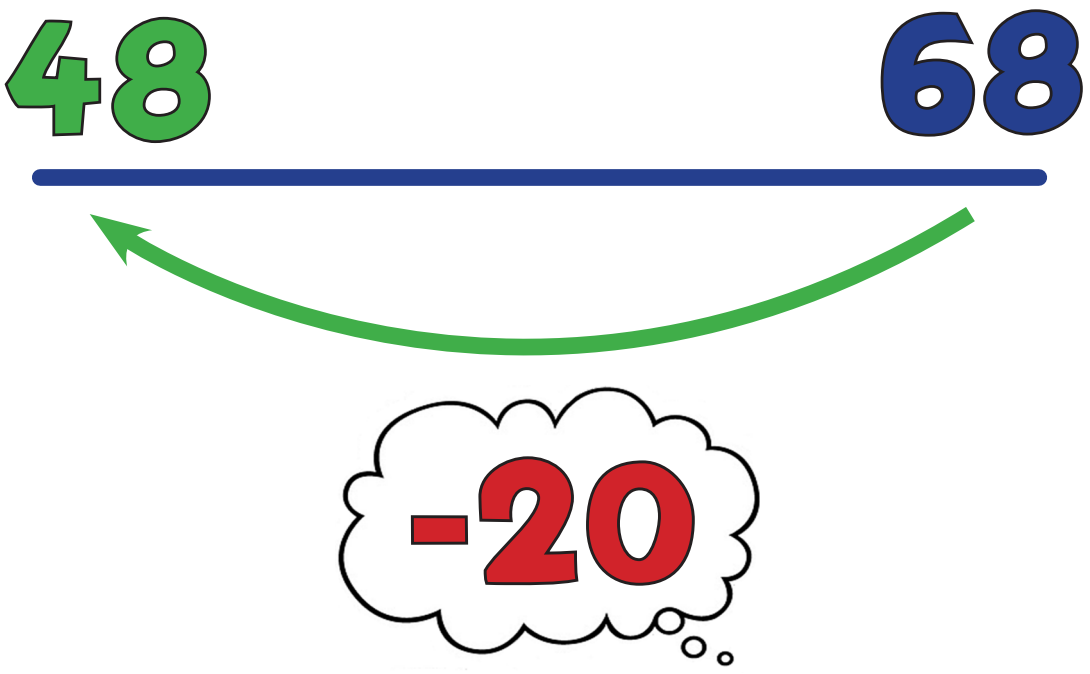
$$15 - 4 = 11$$



MS5a: Counting Back

MC RaPa CoOCoB NumFa 2

68 - 20 = 48



MS5a: Counting Back

MC RaPa CoOCoB NumFa 3

378 - 50 = 328

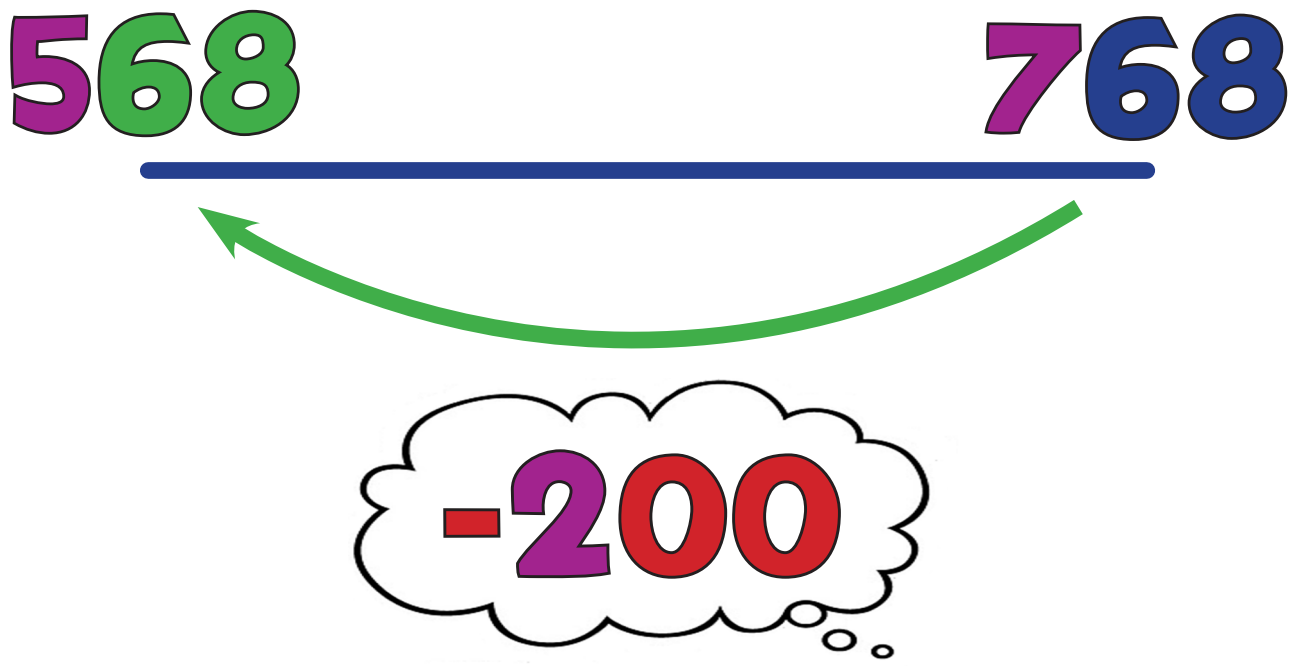
328 378

-50

MS5a: Counting Back

MC RaPa CoOCoB NumFa 4

768 - 200 = 568



MS5a: Counting Back

MC RaPa CoOCoB NumFa
5

7291 - 2000 = 5291

5291 7291

-2000

MS5a: Counting Back

MC RaPa CoOCoB NumFa 6

86374 - 20000 = 66374

66374 86374

-20000

MS5b: Counting Back

MC RaPa CoOCoB NumFa

Jumps

$$86 - 12 = 74$$

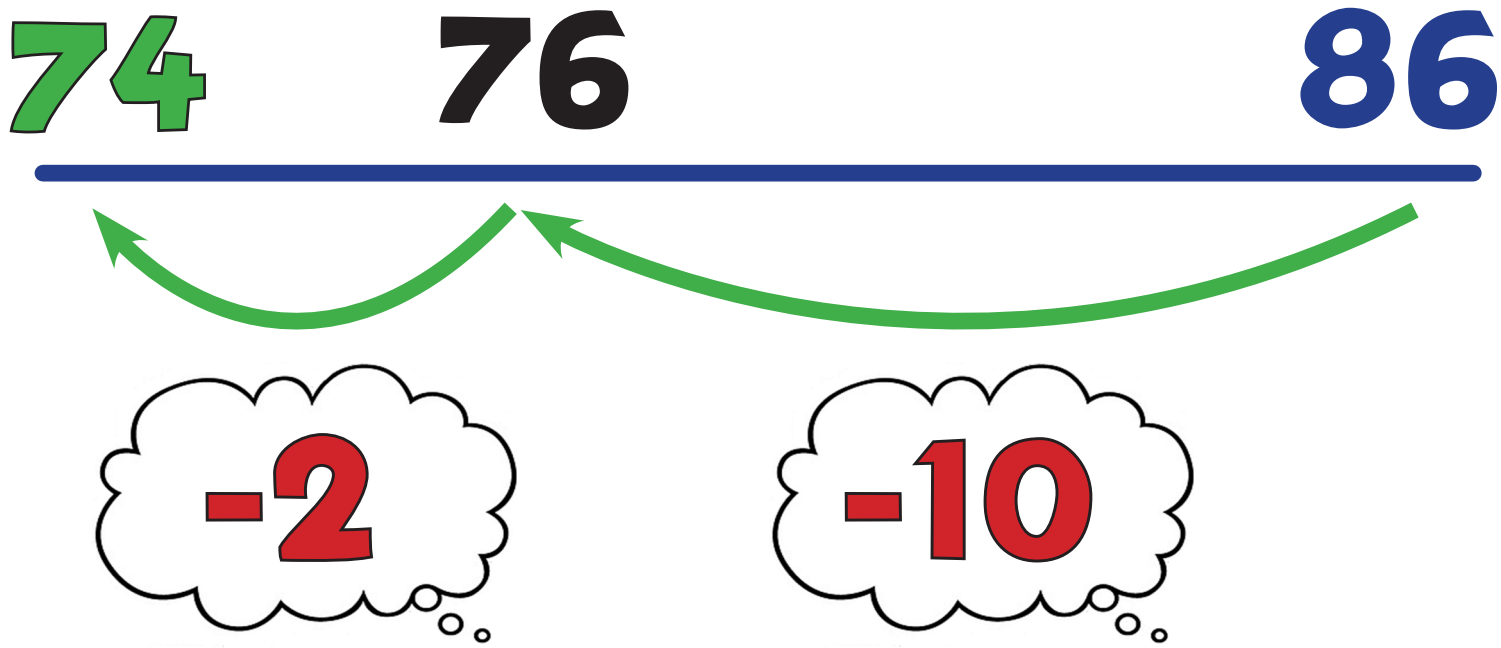
$$-12 = -10 - 2$$

MS5b: Counting Back

MC RaPa CoOCoB NumFa
Visualisation

Jumps

86 - 12 = 74



MS5b: Counting Back

MC RaPa CoOCoB NumFa 2

Jumps

$$86 - 12 = 74$$

$$12 = 10 + 2$$

$$86 - 10 = 76$$

$$76 - 2 = 74$$

MS5b: Counting Back

MC RaPa CoOCoB NumFa 3

Jumps

89 - 34 = 55

- 30
- 4

89

59

55

MS5b: Counting Back

MC RaPa CoOCoB NumFa 4

Jumps

578 - 45 = 533

- 40

- 5

578

538

533

MS5b: Counting Back

MC RaPa CoOCoB NumFa
5

Jumps

$$8.6 - 4.1 = 4.5$$

$$-4 \quad -0.1$$

MS5b: Counting Back

MC RaPa CoOCoB NumFa

6

Jumps

£65.87 - £30.24 = £35.63

- £30
- 24p

MS6: Number Facts

MC RaPa CoOCoB NumFa

$61 - 41 = 20$

$41 + 20 = 61$

MS6: Number Facts

MC RaPa CoOCoB NumFa
Visualisation

61 - 41 = 20

41 + 20 = 61

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

MS6: Number Facts

MC RaPa CoOCoB NumFa 1

$$19 - 9 = 10$$

$$9 + 10 = 19$$

MS6: Number Facts

MC RaPa CoOCoB NumFa 2

$$61 - 41 = 20$$

$$41 + 20 = 61$$

MS6: Number Facts

MC RaPa CoOCoB NumFa 3

$$123 - 83 = 40$$

$$83 + 40 = 123$$

MS6: Number Facts

MC RaPa CoOCoB NumFa 4

$$847 - 447 = 400$$

$$447 + 400 = 847$$

MS6: Number Facts

MC RaPa CoOCoB NumFa 5

$$1424 - 724 = 700$$

$$724 + 700 = 1424$$

MS6: Number Facts

MC RaPa CoOCoB NumFa 6

$$13.2 - 9.2 = 4$$

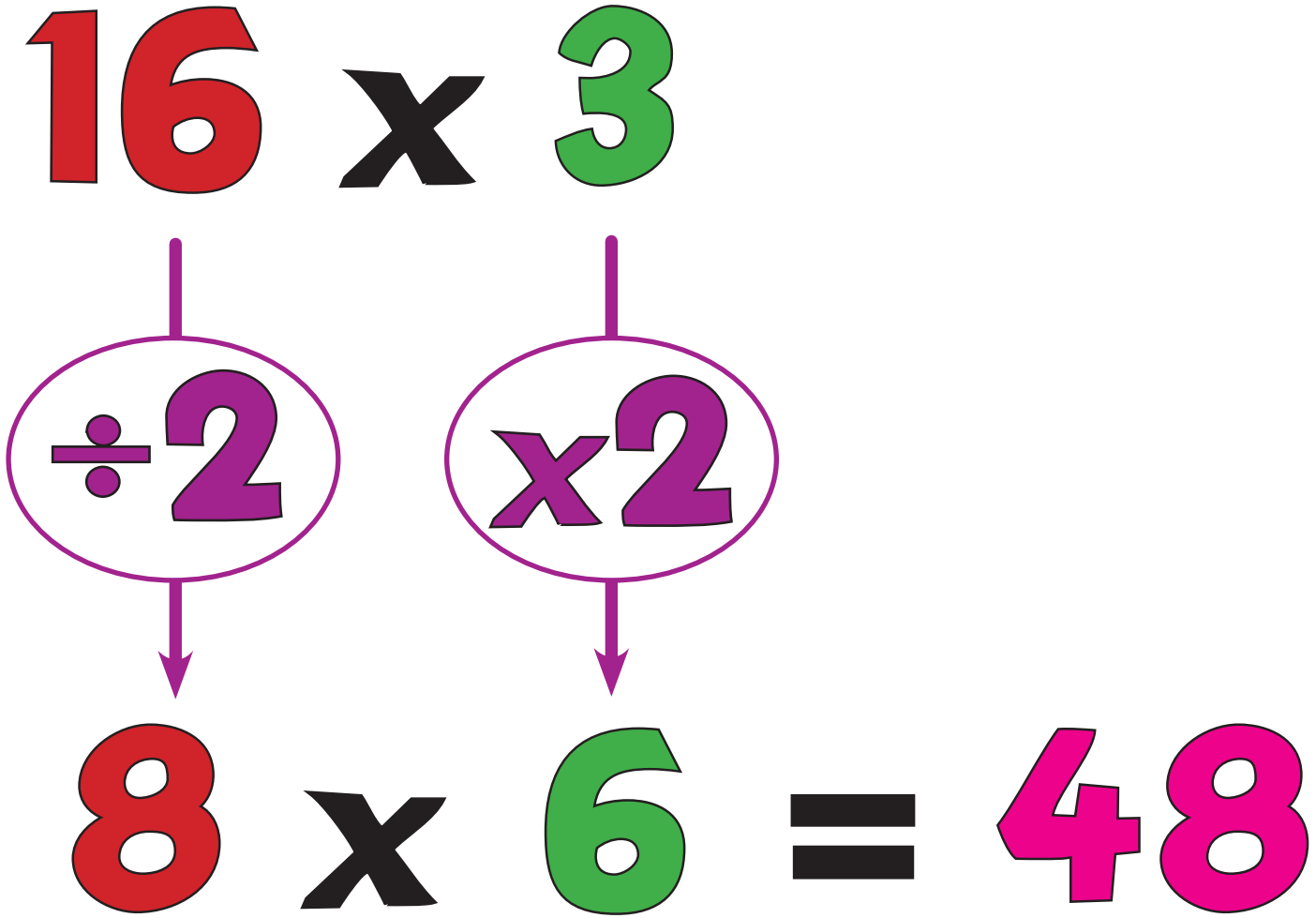
$$9.2 + 4 = 13.2$$

Mental Multiplication

10 Cool Strategies for Mental Multiplication

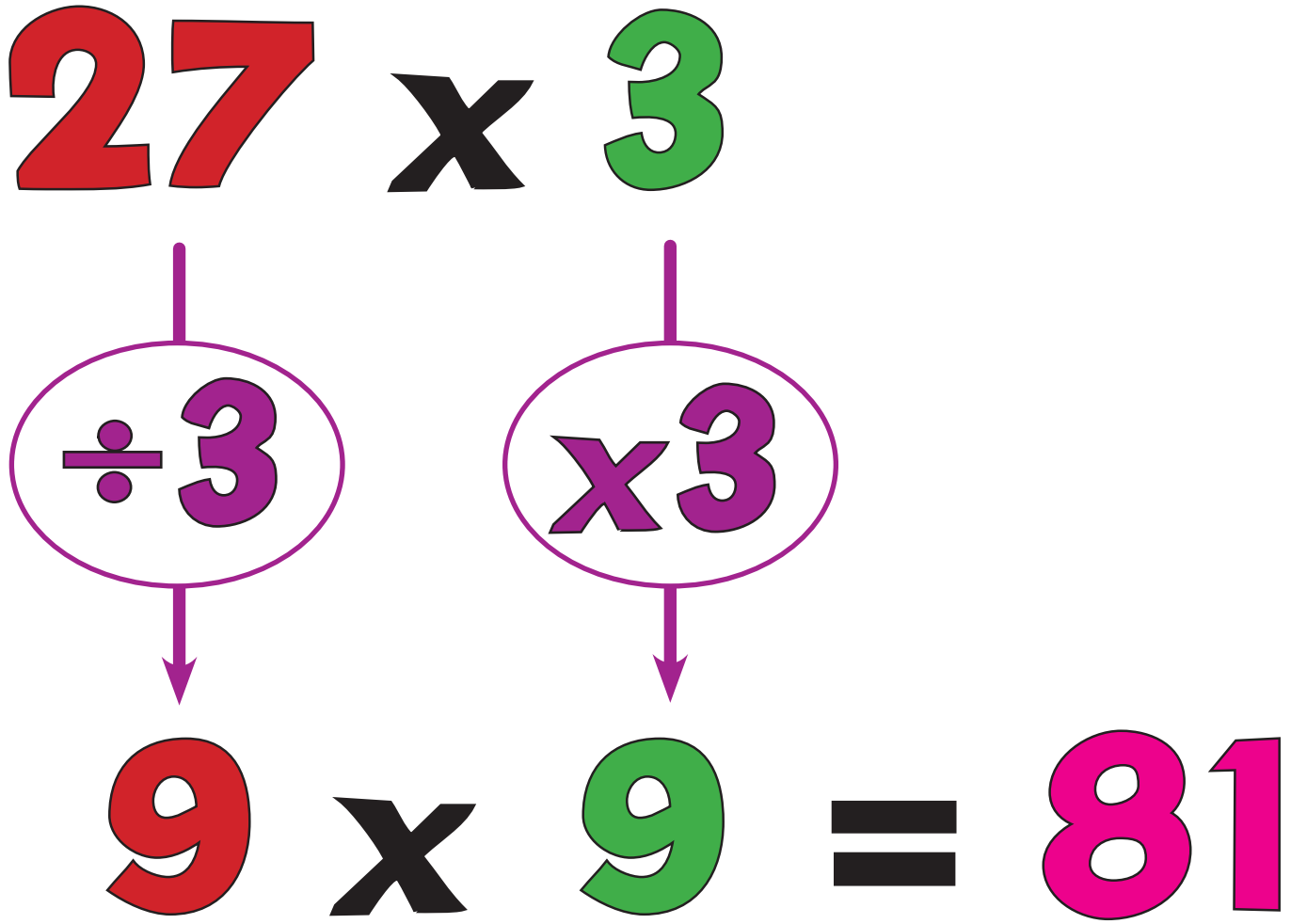
MM1: Manipulate Calculation

5



MM1a: Manipulate Calculation

5



MM1b: Manipulate Calculation

5

45 x 14

×2 ÷2

90 x 7 = 630

MM1c: Manipulate Calculation

5/6

$$36 \times 25$$

÷4 ×4

$$9 \times 100 = 900$$

MM1d: Manipulate Calculation

6

$$32 \times 15$$

$\times 5$ $\qquad$ $\div 5$

$$160 \times 3 = 480$$

MM1e: Manipulate Calculation

6

$$26 \times 32$$

$\times 4$ $\qquad$ $\div 4$

$$104 \times 8 = 832$$

MM1f: Manipulate Calculation

6

$$52 \times 24$$

$\times 4$ $\qquad$ $\div 4$

$$208 \times 6 = 1248$$

MM2: Factorising

4

$$16 \times 3 = 48$$

$$(8 \times 2 \times 3)$$

$$8 \times 6 = 48$$

MM2a: Factorising

4

$$27 \times 3 = 81$$

$$(9 \times 3 \times 3)$$

$$9 \times 9 = 81$$

MM2b: Factorising

5

$$45 \times 14 = 630$$

$$(45 \times 2 \times 7)$$

$$90 \times 7 = 630$$

MM2c: Factorising

5/6

$$36 \times 25 = 900$$

$$(9 \times 4 \times 25)$$

$$9 \times 100 = 900$$

MM2d: Factorising

6

$$32 \times 15 = 480$$

$$(32 \times 5 \times 3)$$

$$160 \times 3 = 480$$

MM2e: Factorising

6

$$26 \times 32 = 832$$

$$(26 \times 4 \times 8)$$

$$104 \times 8 = 832$$

MM2f: Factorising

6

$$52 \times 24 = 1248$$

$$(52 \times 4 \times 6)$$

$$208 \times 6 = 1248$$

MM3: Re-ordering

5

$(9 \times 2) \times 5$

$18 \times 5 = 90$

$(9 \times 5) \times 2$

$45 \times 2 = 90$

$(2 \times 5) \times 9$

$10 \times 9 = 90$ *

MM3a: Re-ordering

5/6

$(7 \times 4) \times 5$

$28 \times 5 = 140$

$(7 \times 5) \times 4$

$35 \times 4 = 140$

$(4 \times 5) \times 7$

$20 \times 7 = 140$ *

MM3b: Re-ordering

6

$(9 \times 8) \times 6$

$72 \times 6 = 432$

$(9 \times 6) \times 8$

$54 \times 8 = 432$ *

$(8 \times 6) \times 9$

$48 \times 9 = 432$

MM4: Partitioning

4

15 x 5 = 75

50 + 25 = 75

(10 x 5) (5 x 5)

MM4a: Partitioning

4/5

$$37 \times 4 = 148$$

$$120 + 28 = 148$$

(30 x 4) (7 x 4)

MM4b: Partitioning

5

126 x 6 = 756

600 + 120 + 36 = 756

(100 x 6) (20 x 6) (6 x 6)

MM4c: Partitioning

6

$$4.3 \times 8 = 34.4$$

$$32 + 2.4 = 34.4$$

(4 x 8) (0.3 x 8)

MM4d: Partitioning

6

2.16 x 3 = 6.48

6 + 0.3 + 0.18 = 6.48

(2 x 3) (0.1 x 3) (0.06 x 3)

MM5: Round & Adjust

4

$$49 \times 3 = 147$$

$$(50 \times 3) - (1 \times 3)$$

$$150 - 3 = 147$$

MM5a: Round & Adjust

5

$$198 \times 4 = 792$$

$$(200 \times 4) - (2 \times 4)$$

$$800 - 8 = 792$$

MM5b: Round & Adjust

$$3.9 \times 5 = 19.5$$

$$(4 \times 5) - (0.1 \times 5)$$

$$20 - 0.5 = 19.5$$

MM5c: Round & Adjust

6

£5.99 x 6 = £35.94

(£6 x 6) - (1p x 6)

£36 - 6p = £35.94

MM6: Doubling

2

20 + 14 = 34

Double 17 = 34

(15 + 2)

30 + 4 = 34

MM6a: Doubling

3

60 + 14 = 74

Double 37 = 74

(35 + 2)

70 + 4 = 74

MM6b: Doubling

4

$$140 + 16 = 156$$

Double 78 = 156

(75 + 3)

$$150 + 6 = 156$$

MM6c: Doubling

4

Double 340 = 680

600 + 80 = 680

MM6d: Doubling

4/5

800 + 160 = 960

Double 480 = 960

(450 + 30)

900 + 60 = 960

Hawkesley Church Primary Academy

MM6e: Doubling

5

400 + 140 + 16 = 556

Double 278 = 556

(250 + 28)

500 + 28 = 556

MM6f: Doubling

5/6

1400 + 120 + 16 = 1536

Double 768 = 1536

(750 + 18)

1500 + 36 = 1536

MM6g: Doubling

6

Double 3.7 = 7.4

6 + 1.4 = 7.4

MM7: Doubling Table Facts

3

$8 \times 6 = 48$

(4 x 2)

$4 \times 6 = 24$

↓ ↓ x 2

$8 \times 6 = 48$

MM7a: Doubling Table Facts

4

$$12 \times 7 = 84$$

(6 x 2)

$$6 \times 7 = 42$$

↓ ↓ x 2

$$12 \times 7 = 84$$

MM7b: Doubling Table Facts

5

$$16 \times 7 = 112$$

(8 x 2)

$$8 \times 7 = 56$$

↓ ↓ x 2

$$16 \times 7 = 112$$

MM7c: Doubling Table Facts

6

$22 \times 12 = 264$

(11 x 2)

$11 \times 12 = 132$

↓ ↓ x 2

$22 \times 12 = 264$

MM8: Doubling Up

3/4

17 x 4 = 68

Double 17 = 34 (17 x 2)

Double 34 = 68 (17 x 4)

MM8a: Doubling Up

5

36 x 8 = 288

Double 36 = 72 (36 x 2)

Double 72 = 144 (36 x 4)

Double 144 = 288 (36 x 8)

MM8b: Doubling Up

6

125 x 16 = 2000

Double 125 = 250 (125 x 2)

Double 250 = 500 (125 x 4)

Double 500 = 1000 (125 x 8)

Double 1000 = 2000 (125 x 16)

MM9: Mult by 10, 100 & 1000 then Halve

5

$$86 \times 5 = 430$$

$$86 \times 10 = 860$$

$$860 \div 2 = 430$$

MM9a: Mult by 10, 100 & 1000 then Halve

6

$$56 \times 25 = 1400$$

$$56 \times 100 = 5600$$

$$5600 \div 2 = 2800$$

$$2800 \div 2 = 1400$$

MM10: Jump!

3/4

x100

x10

1000	100	10	1
3	4	0	0
	3	4	0
		3	4

Hawkesley Church Primary Academy

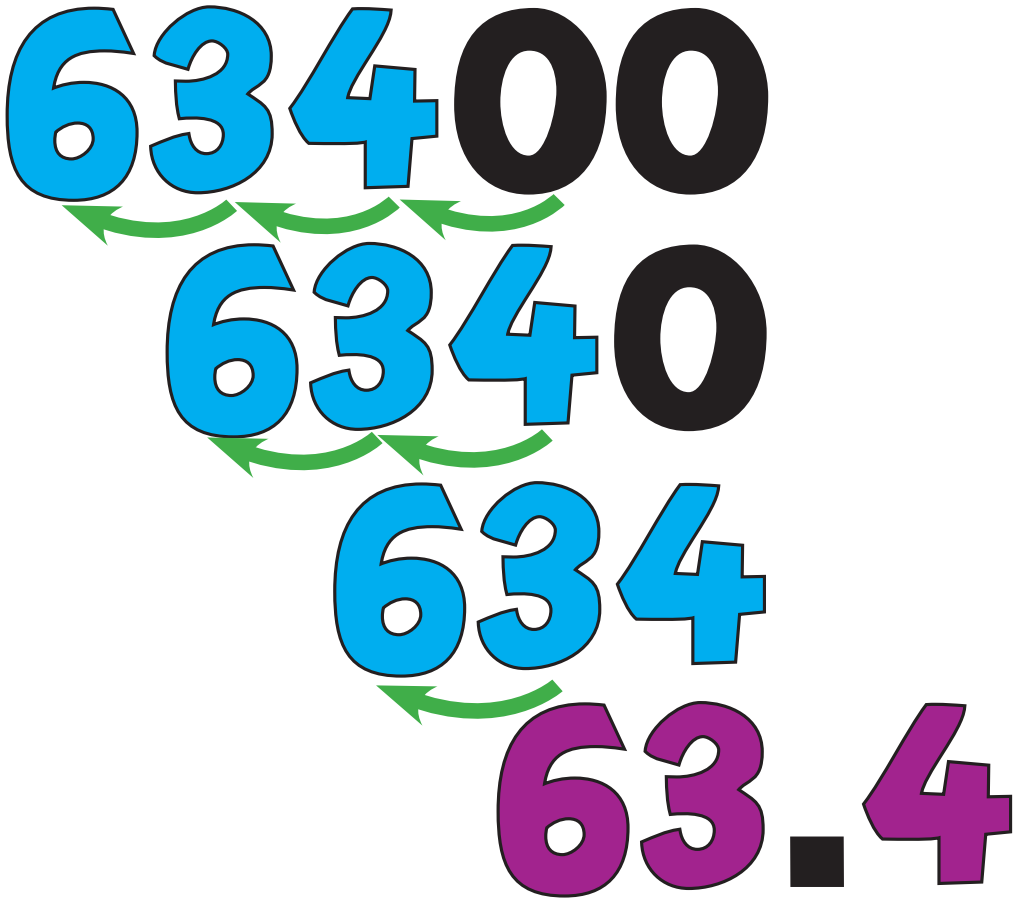
MM10a: Jump!

5/6

x1000

x100

x10



Mental Division

7 Cool Strategies for Mental Division!

MD1: Manipulate Calculation

3

Small Quotient

$$140 \div 20$$

÷10 ÷10

$$14 \div 2 = 7$$

MD1a: Manipulate Calculation

4

Small Quotient

$$84 \div 12$$

$\div 2$ $\div 2$

$$42 \div 6 = 7$$

$\div 2$ $\div 2$

$$21 \div 3 = 7$$

MD1b: Manipulate Calculation

4

Small Quotient

$$1200 \div 400$$

÷100 ÷100

$$12 \div 4 = 3$$

MD1c: Manipulate Calculation

5

Small Quotient

$$162 \div 18$$

÷2 ÷2

$$81 \div 9 = 9$$

MD1d: Manipulate Calculation

6

Small Quotient

$18 \div 1.5$

×2 ×2

$36 \div 3 = 12$

MD1e: Manipulate Calculation

6

Small Quotient

$$9.3 \div 0.3$$

x10 x10

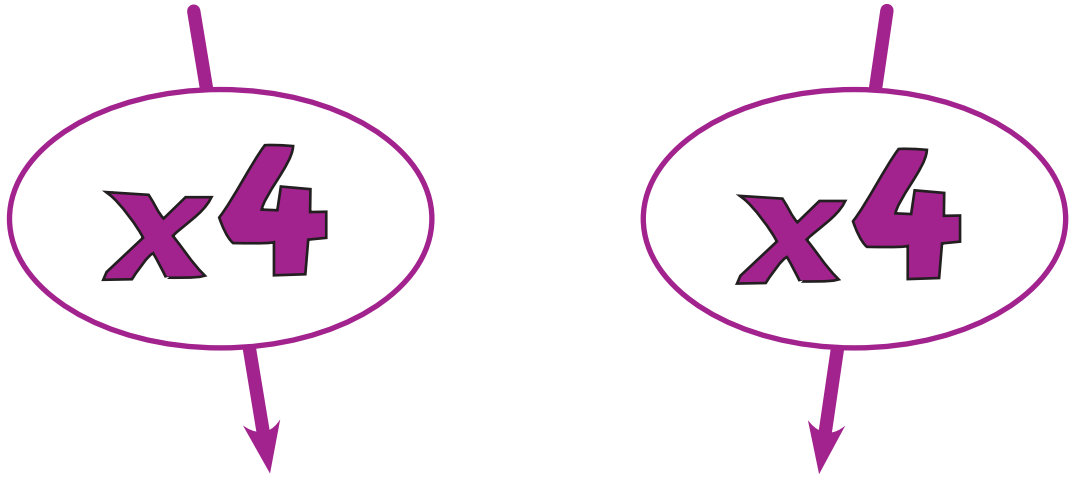
$$93 \div 3 = 31$$

MD1f: Manipulate Calculation

6

Small Quotient

$$6.25 \div 0.25$$



$$25 \div 1 = 25$$

MD2: Divide by 100 then Double

4

$$800 \div 50 = 16$$

$$800 \div 100 = 8$$

$$8 \times 2 = 16$$

MD2a: Divide by 100 then Double twice

5

$$800 \div 25 = 32$$

$$800 \div 100 = 8$$

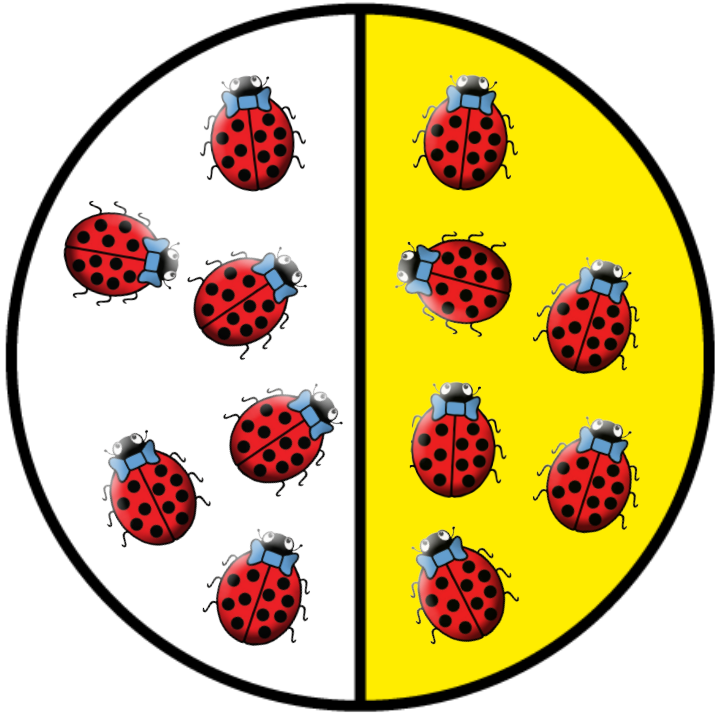
$$8 \times 2 = 16$$

$$16 \times 2 = 32$$

MD3: Halving

1

Half of 12 is equivalent to 12÷2



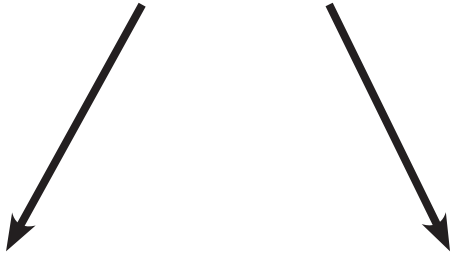
$\frac{1}{2}$ of 12 = 12÷2

MD3a: Halving

2

(20)

Half of 26



10 + 3 = 13

MD3b: Halving

3

Half of 58

(50)

25 + 4 = 29

MD3c: Halving

4

Half of 92

(80 + 12)

40 + 6 = 46

Half of 92

45 + 1 = 46

MD3d: Halving

5

(32 tens)

Half of 326

160 + 3 = 163

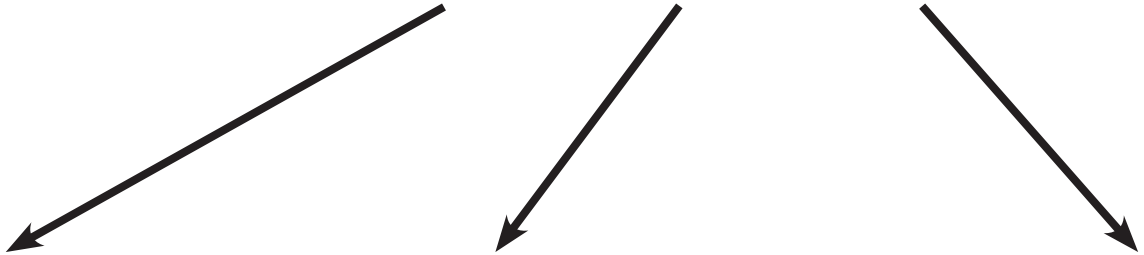
Half of 326

150 + 10 + 3 = 163

MD3e: Halving

6

Half of 5.84



2.5 + 0.4 + 0.02

= 2.92

MD3f: Halving

6

Half of 34.72 = 17.36

15 + 2 + 0.35 + 0.01

(2 tens + 14 ones + 6 tenths + 12 hundredths)

Half of 34.72

10 + 7 + 0.3 + 0.06

MD4: Halve & Halve Again

3

84 ÷ 4 = 21

Half of 84 = 42 (84 ÷ 2)

Half of 42 = 21 (84 ÷ 4)

MD4a: Halve & Halve Again

4

(finding a quarter)

$$128 \div 4 = 32$$

Half of 128 = 64 (128 ÷ 2)

Half of 64 = 32 (128 ÷ 4)

MD4b: Halve, Halve, Halve

5

(finding an eighth)

$$360 \div 8 = 45$$

Half of 360 = 180 (360 ÷ 2)

Half of 180 = 90 (360 ÷ 4)

Half of 90 = 45 (360 ÷ 8)

MD4c: Halve, Halve, Halve

6

5000 ÷ 8 = 625

Half of 5000 = 2500 (5000 ÷ 2)

Half of 2500 = 1250 (5000 ÷ 4)

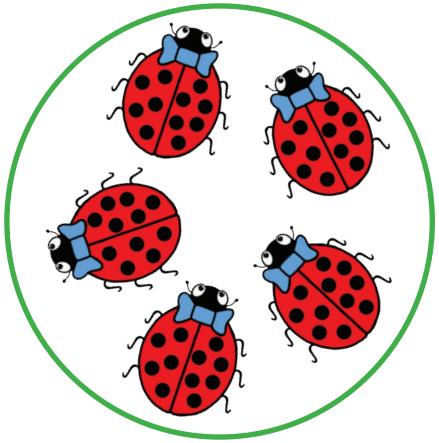
Half of 1250 = 625 (5000 ÷ 8)

MD5: Division as a Fraction

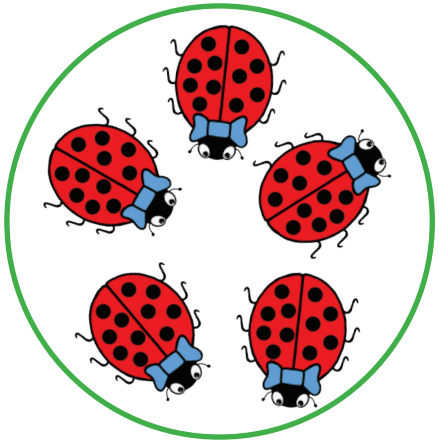
3

Sharing Model

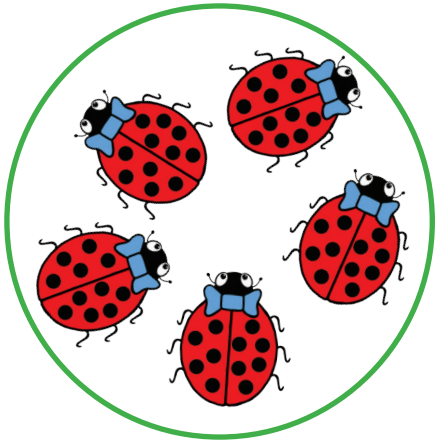
$\frac{1}{4}$ of 20 = 20 ÷ 4 = 5



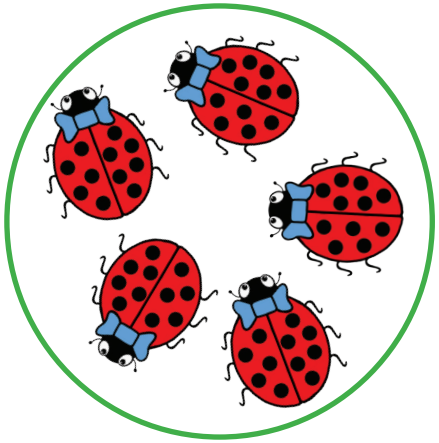
$\frac{1}{4}$



$\frac{1}{4}$



$\frac{1}{4}$



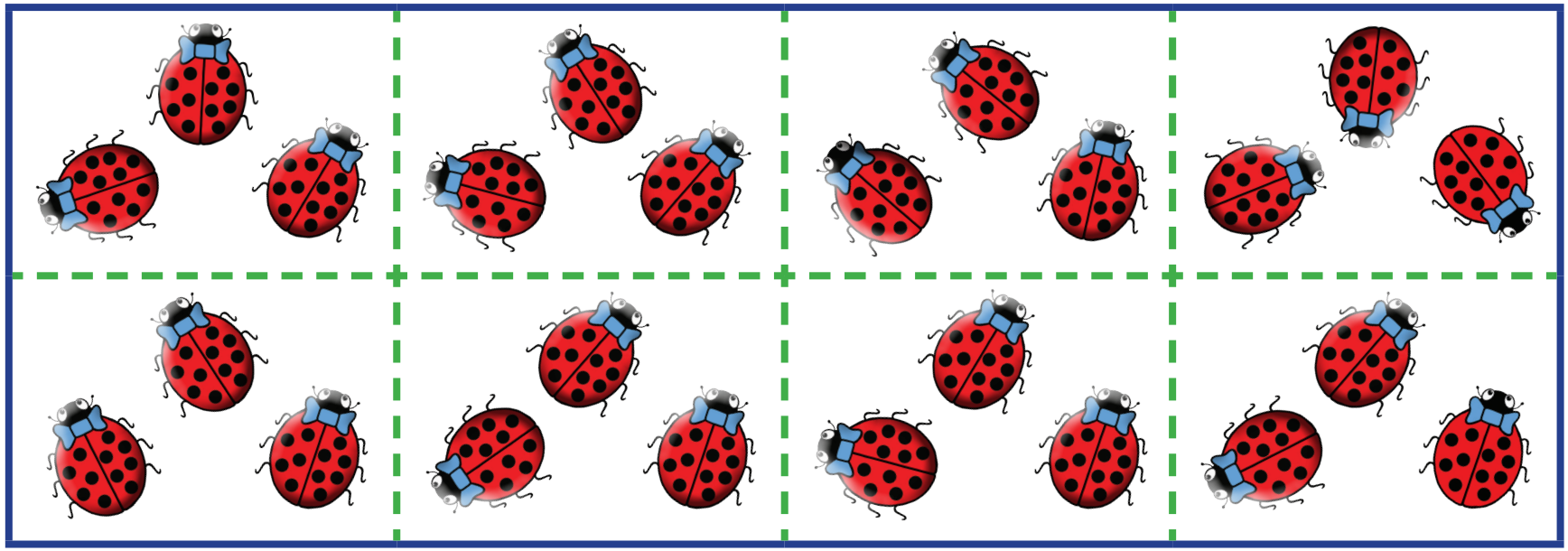
$\frac{1}{4}$

MD5a: Division as a Fraction

4

Sharing Model

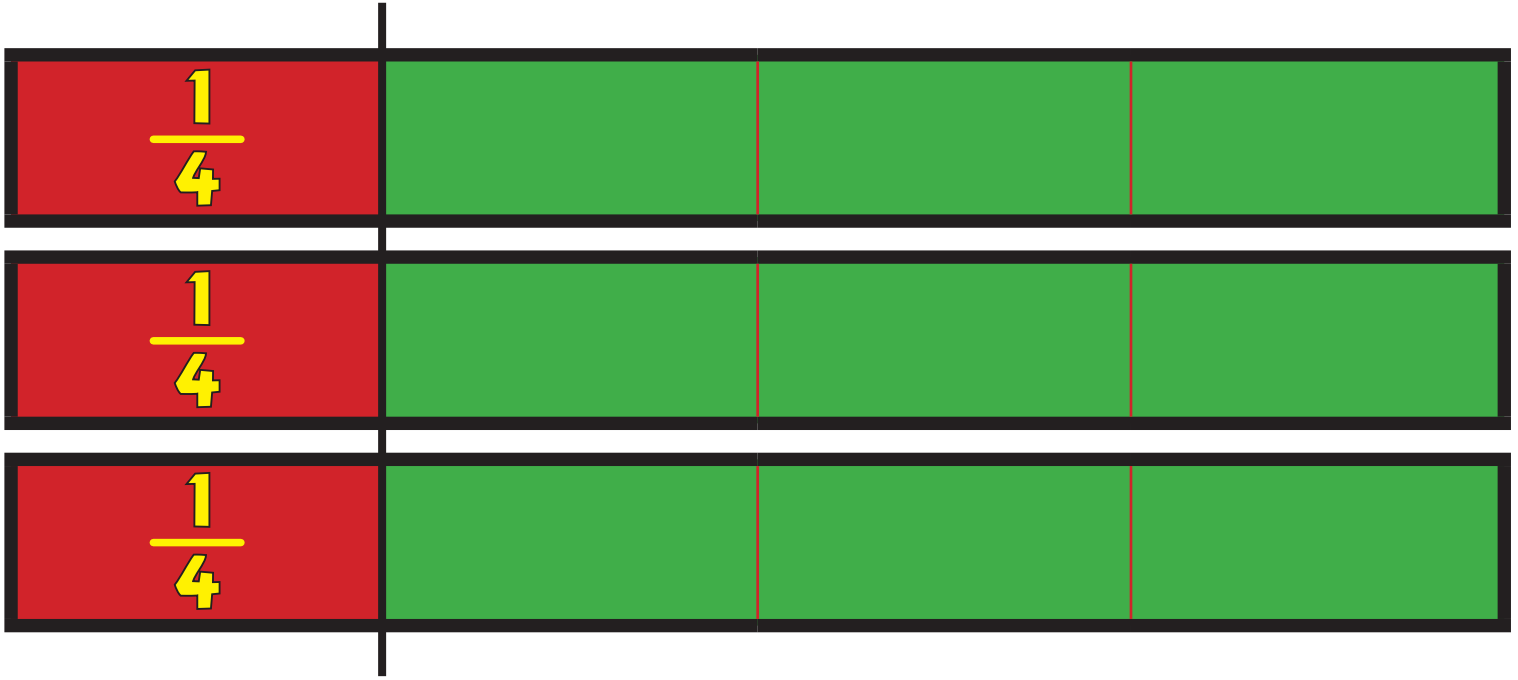
$$\frac{1}{8} \text{ of } 24 = 24 \div 8 = 3$$



MD5b: Division as a Fraction

4

$$\frac{1}{4} \text{ of } 3 = 3 \div 4 = \frac{3}{4}$$

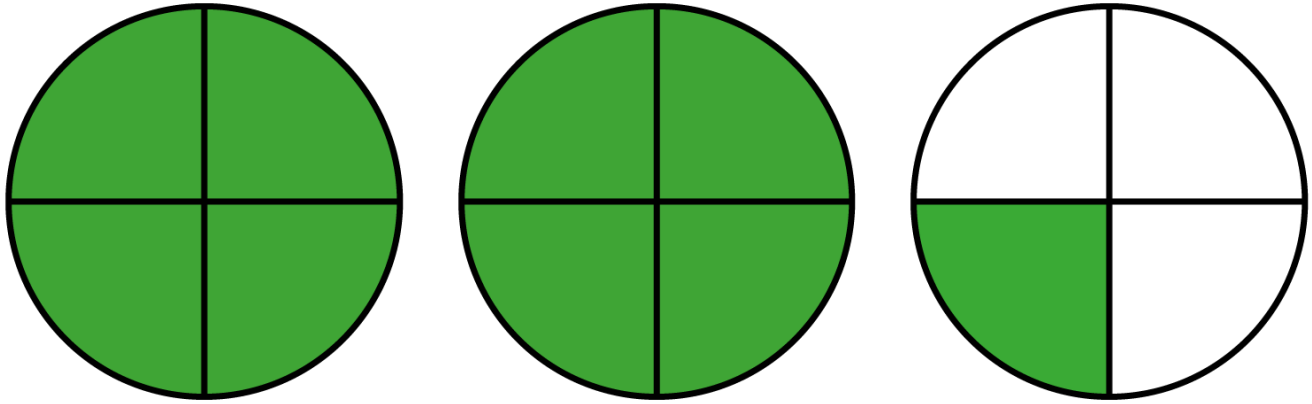


MD5c: Division as a Fraction

5

Mixed Number Model

$\frac{1}{4}$ of 9 = 9 ÷ 4 = $\frac{9}{4}$ = $2\frac{1}{4}$



(9 quarters = 2 and a quarter)

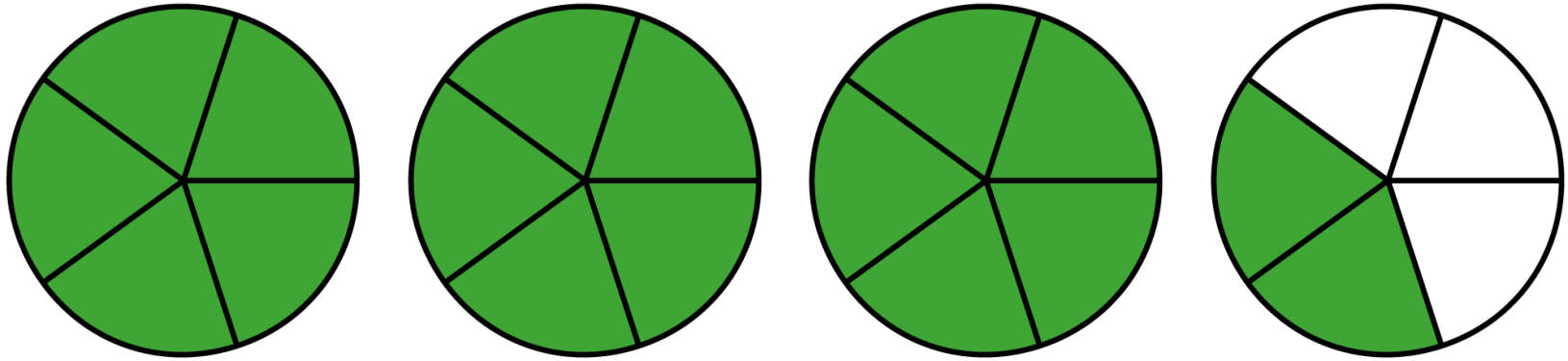
MD5d: Division as a Fraction

5

Mixed Number Model

$$\frac{1}{5} \text{ of } 17 = 17 \div 5 = \frac{17}{5} = 3\frac{2}{5}$$

(3.4)



(17 fifths = 3 wholes and 2 fifths)

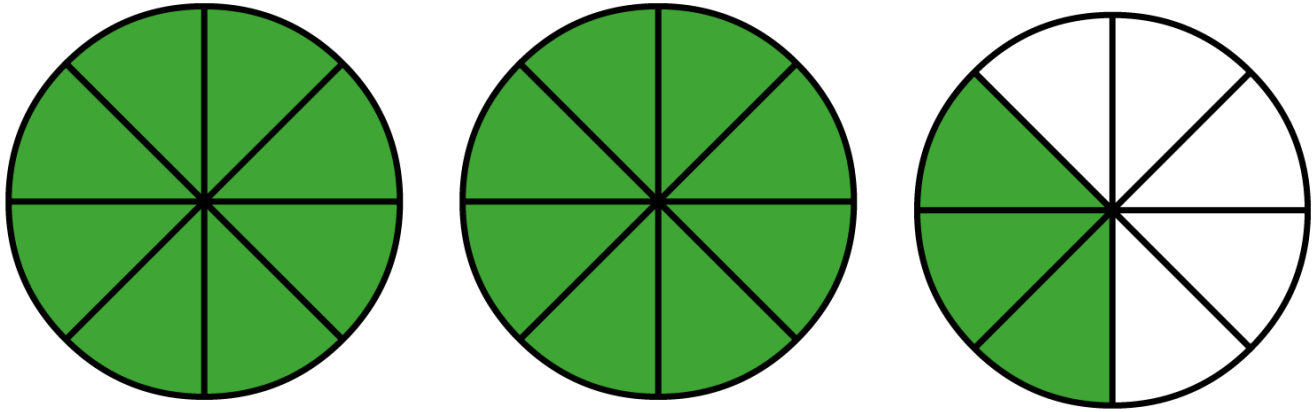
MD5e: Division as a Fraction

6

Mixed Number Model

$$\frac{1}{8} \text{ of } 19 = 19 \div 8 = \frac{19}{8} = 2\frac{3}{8}$$

(2.375)



(19 eighths = 2 and 3 eighths)

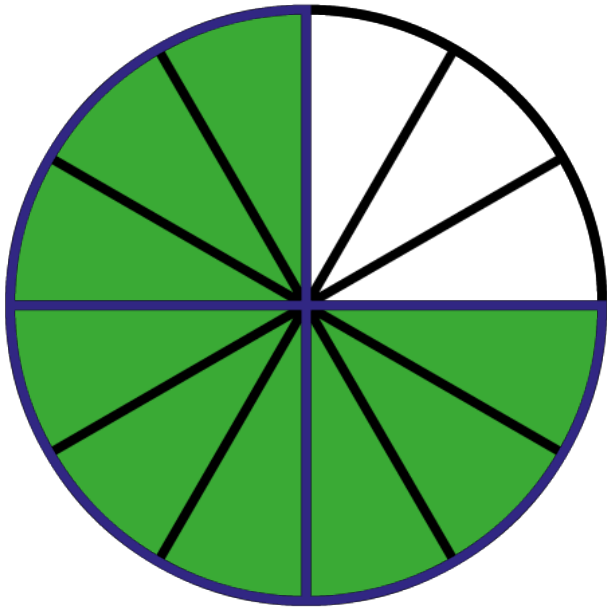
MD5f: Division as a Fraction

6

Mixed Number Model

$$\frac{1}{12} \text{ of } 9 = 9 \div 12 = \frac{9}{12} = \frac{3}{4}$$

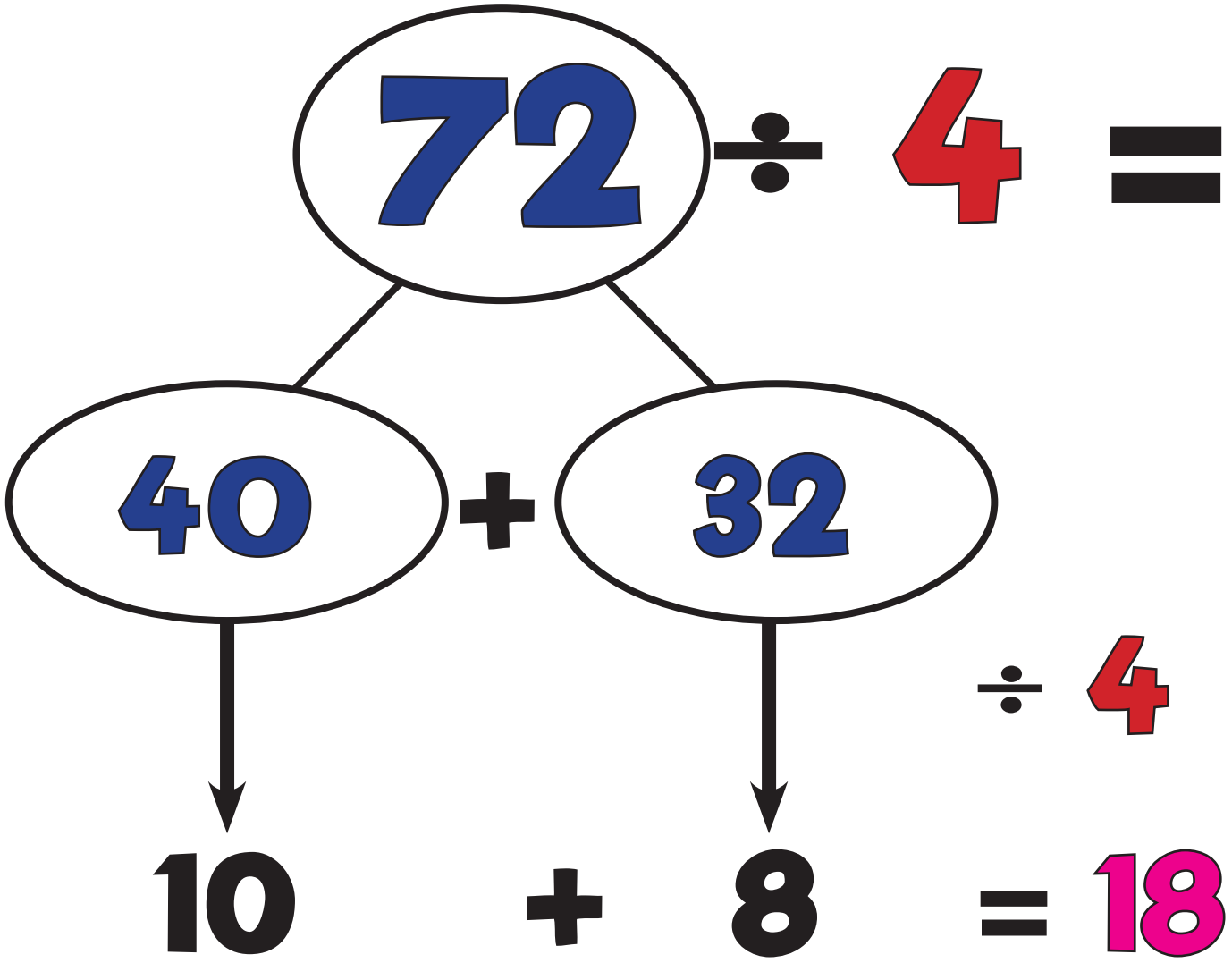
(0.75)



(9 twelfths = 3 quarters)

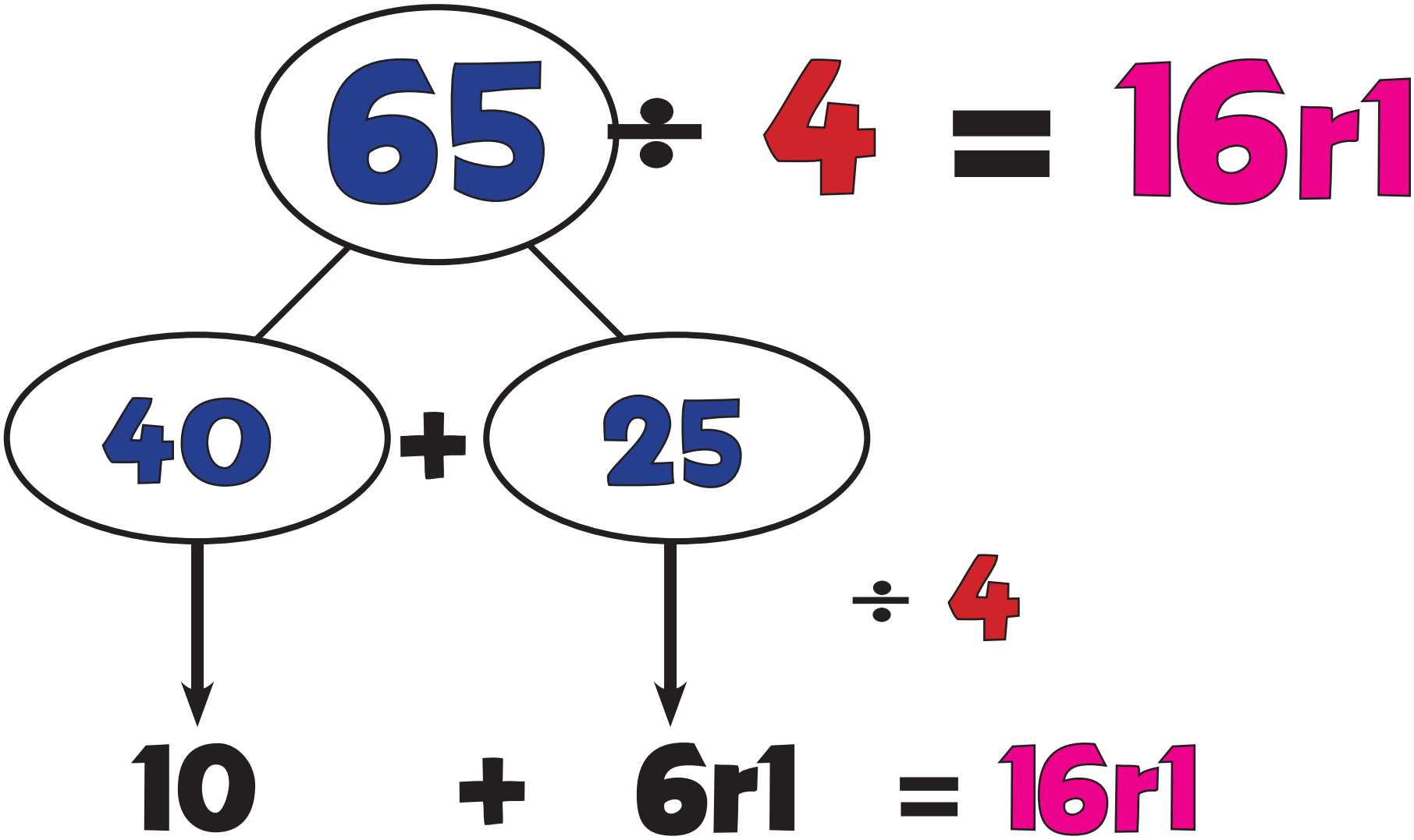
MD6: Find the Hunk!

4



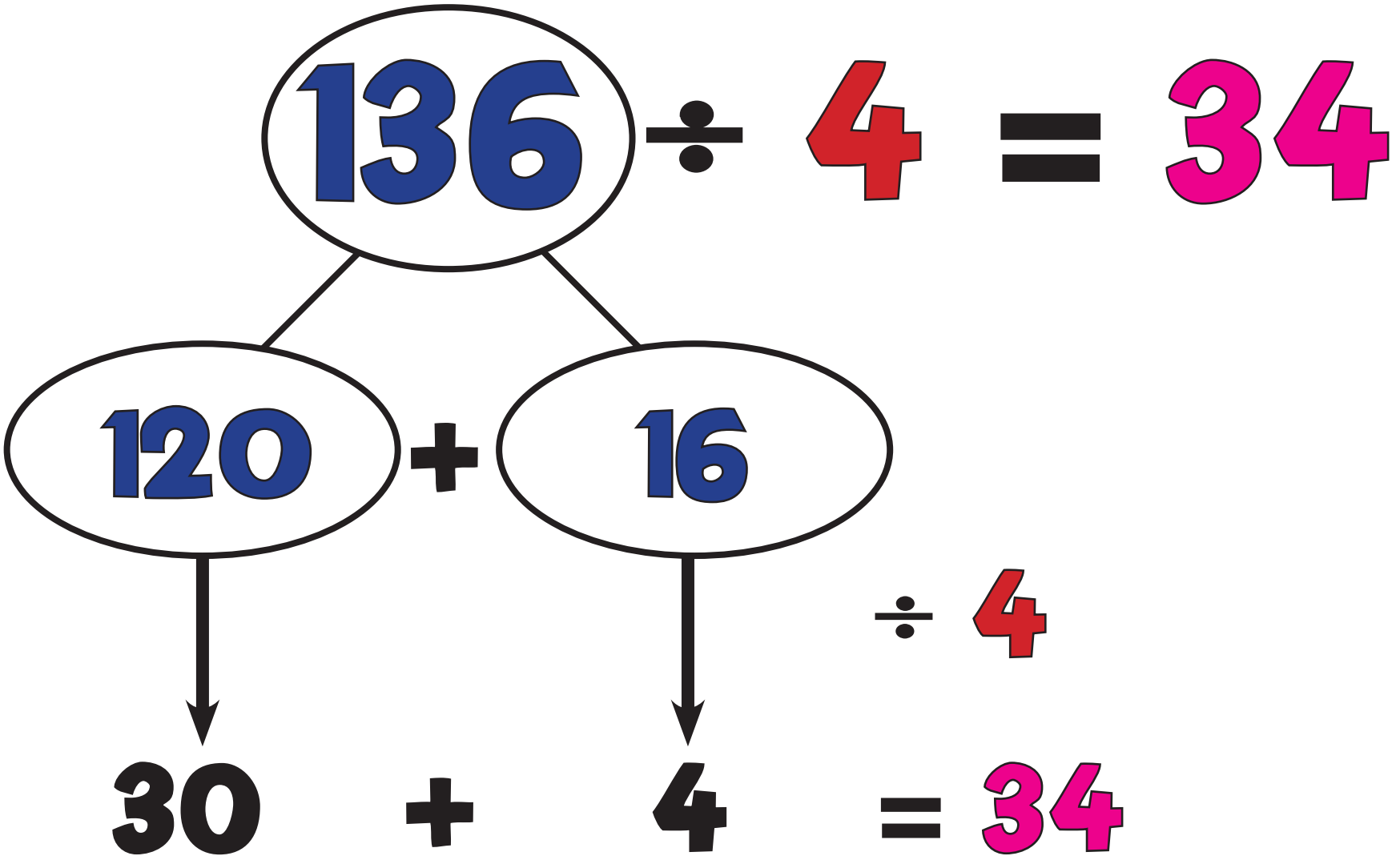
MD6a: Find the Hunk!

4



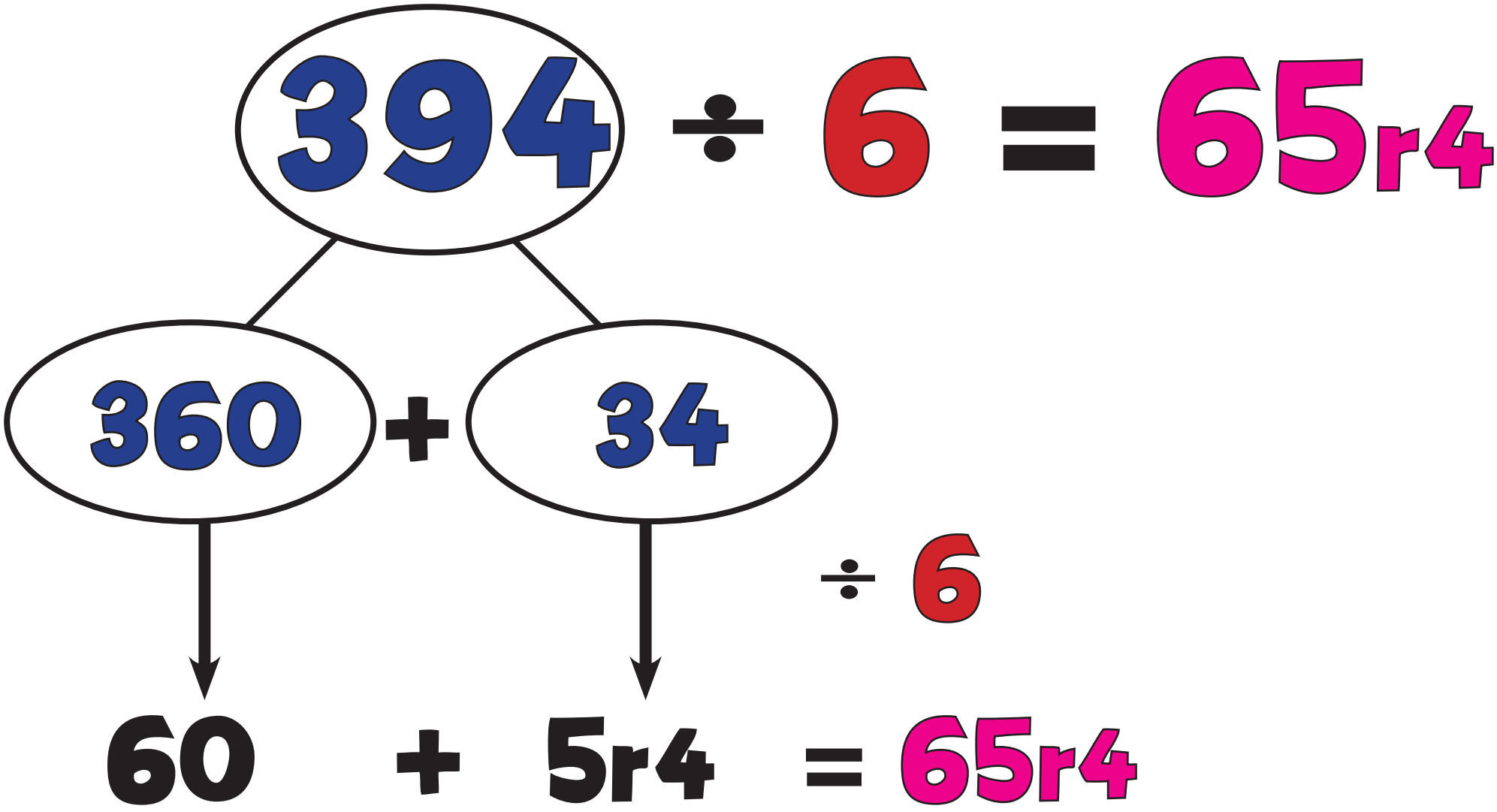
MD6b: Find the Hunk!

5



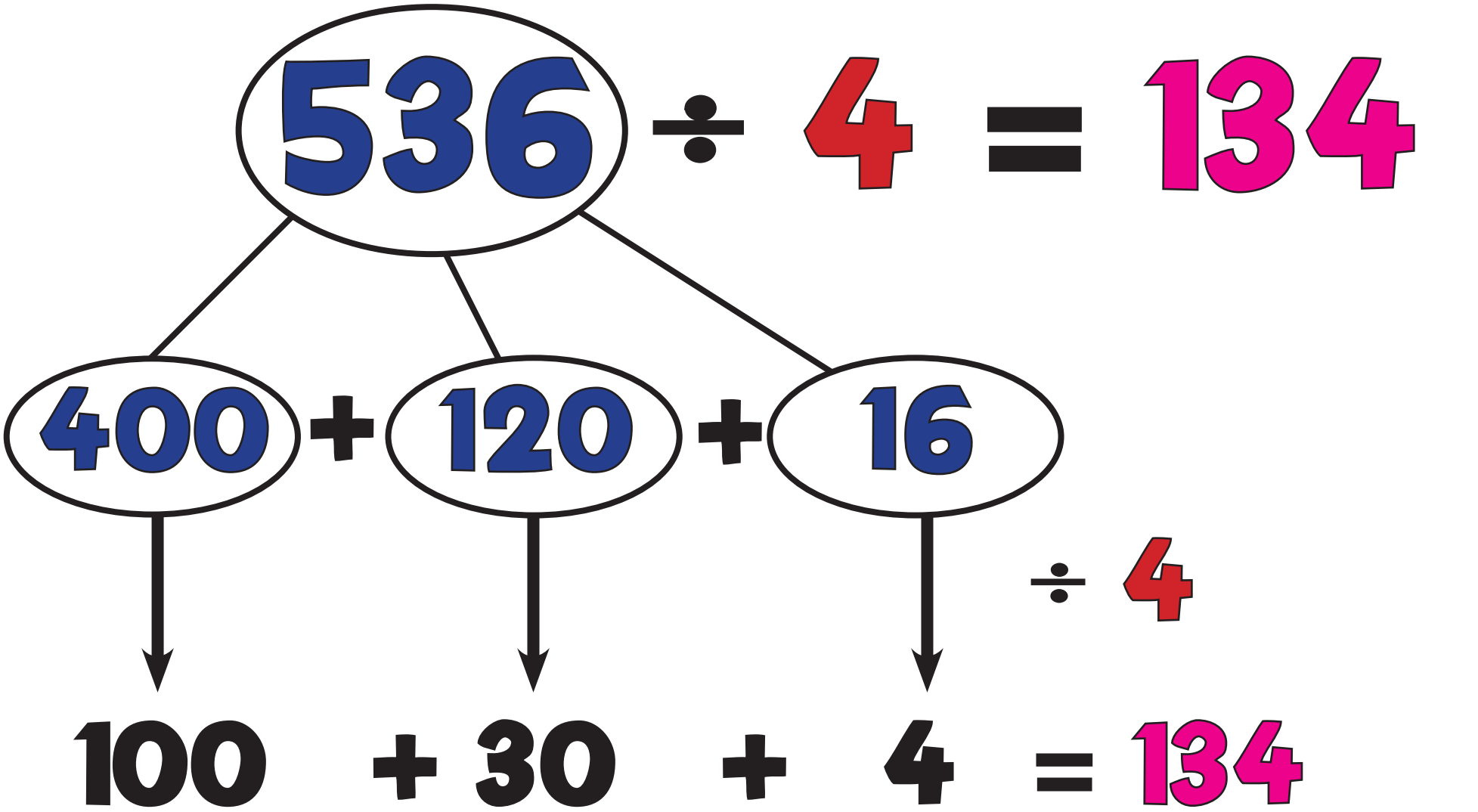
MD6c: Find the Hunk!

5



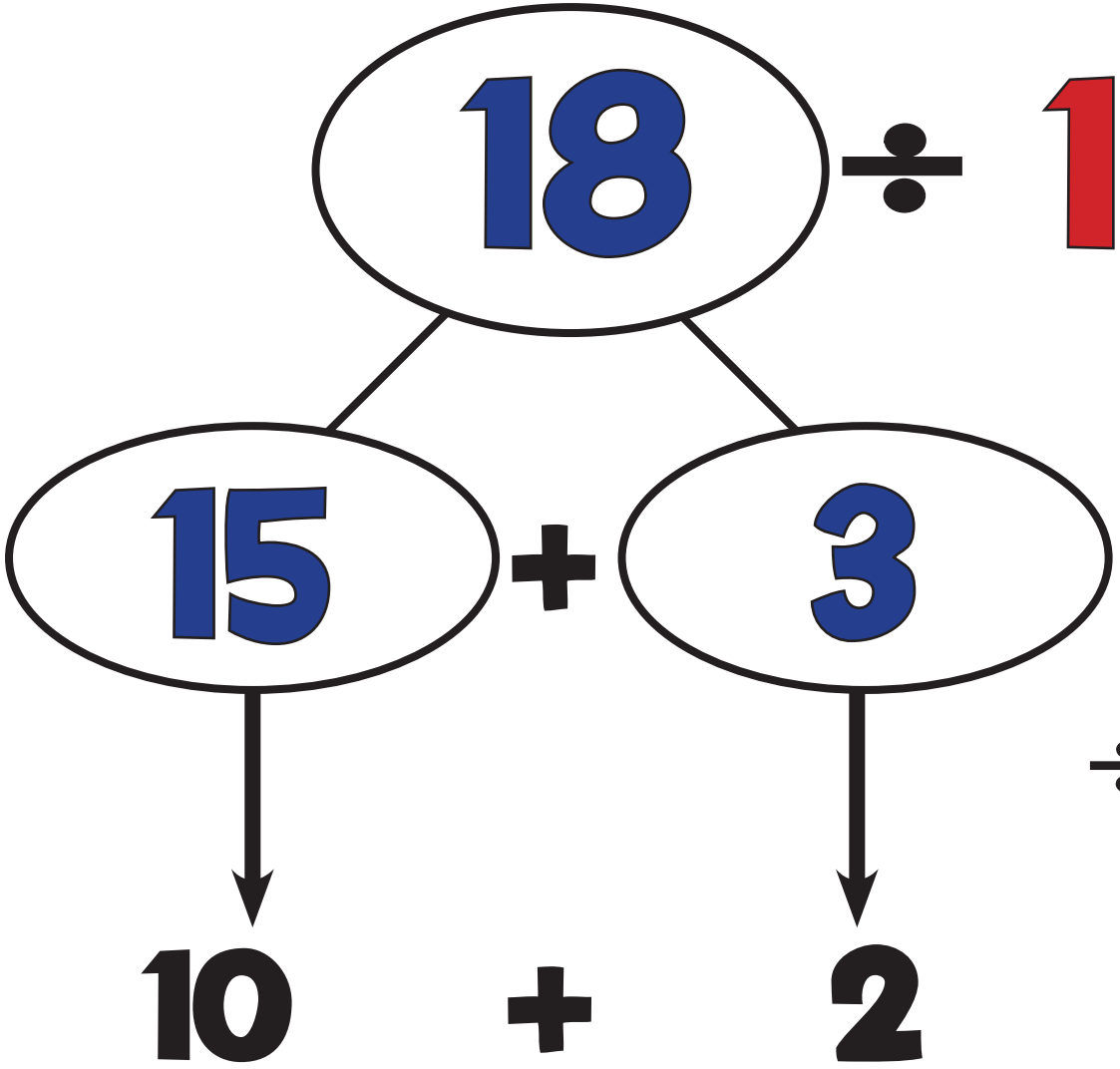
MD6d: Find the Hunk!

5/6



MD6e: Find the Hunk!

6



18 ÷ 1.5 = 12

÷ 1.5

= 12

MD7: Jump (÷10)

2

10	1
80	
	8

÷10

MD7a: Jump (÷10)

3

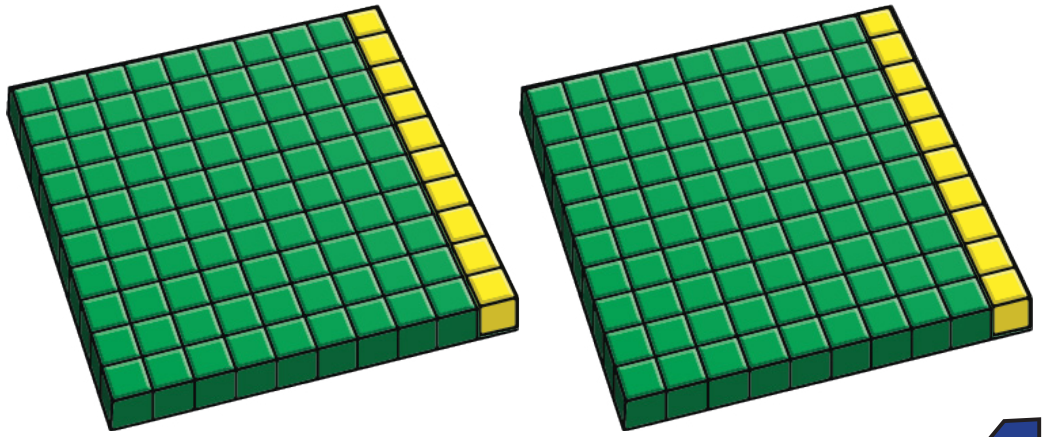
100	10	1
360		
	36	

÷10

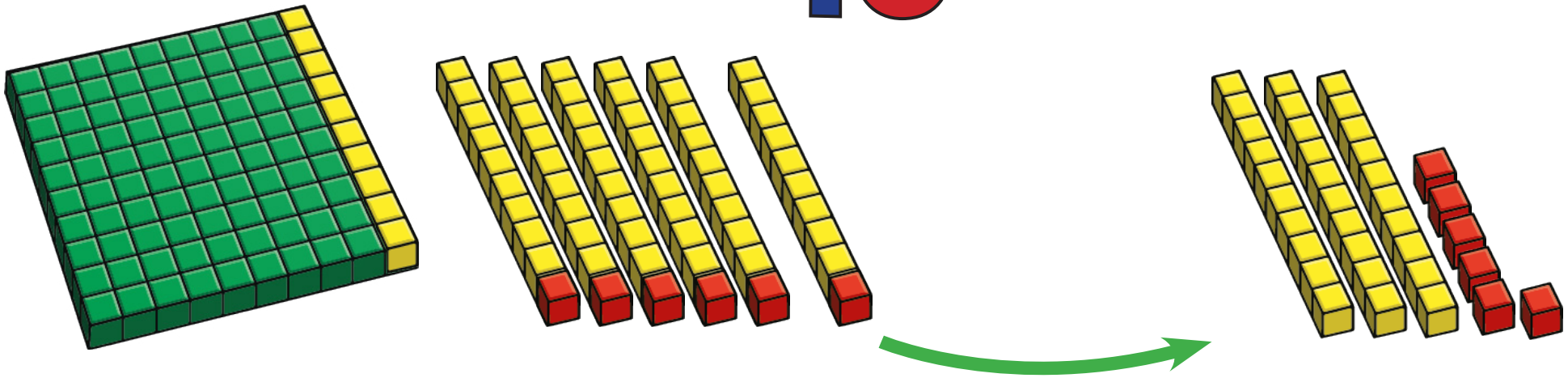
MD7a: Jump (÷10)

3/4 (Pictorial)

100	10	1
3	6	0
	3	6



÷10



MD7b: Jump (÷10/100)

4/5

1000	100	10	1
6	3	0	0

÷10

1000	100	10	1
	6	3	0

÷100

1000	100	10	1
		6	3

Hawkesley Church Primary Academy

MD7c: Jump (÷10/100/1000)

5/6

100 10 1 . $\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$

634

÷10 63.4

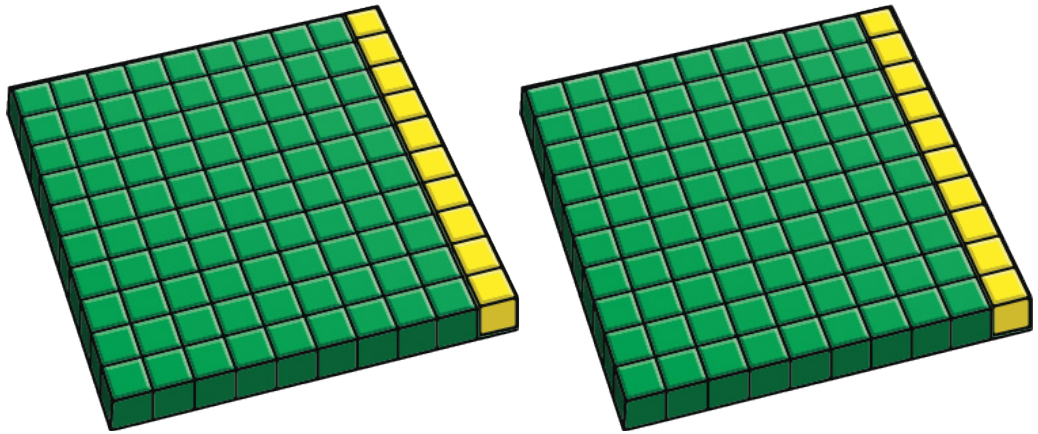
÷100 6.34

÷1000 0.634

MD10b: Jump! (x10)

3/4 (Pictorial)

100	10	1
	3	6



x10

100	10	1
3	6	0