Sense of Number

Expanded Visual Calculation Policy

Written Strategies Policy

Sandbrook Community Primary School

February 2024

Graphic Design by Dave Godfrey

Compiled by Dave Godfrey & Anthony Reddy

For sole use in Sandbrook Community Primary School

Watergrove Trust
Providing more

'A picture is worth 1000 words!' www.numberfun.com

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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:

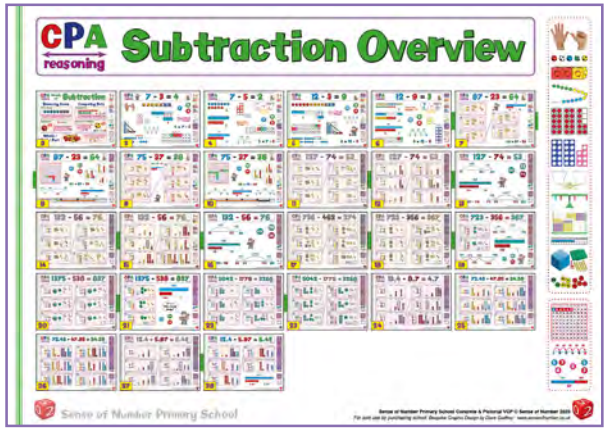
Classoom:	The posters are printed out (e.g. A4) and the appropriate slides are displayed for continual reference or on a working wall. Posters are used on the interactive whiteboard.
Reference:	The summary overviews are printed out and inserted in the teacher's planning folder.
Parents:	The posters are 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.

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CPA reasoning Expanded Visual Calculation Policy

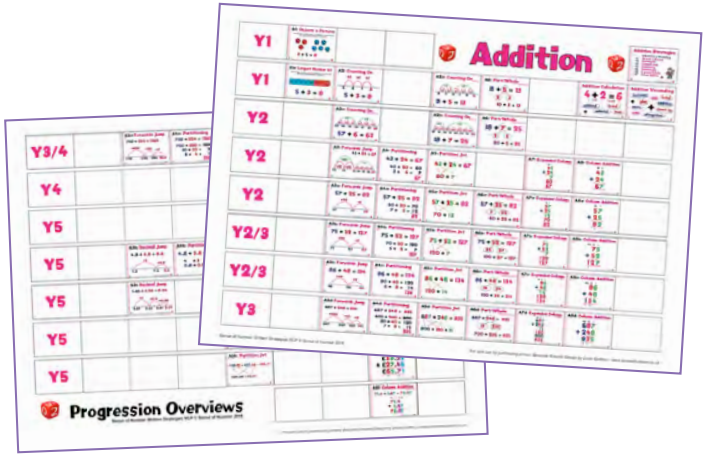
The Expanded Visual Calculation Policy helps children and teaching staff achieve mastery of all aspects of calculation. It contains the following three documents:

Concrete & Pictorial VCP



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

Written Strategies VCP



348 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



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

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Poster Guide

Expanded Visual Calc. Policy

Code	Section	Concrete & Pictorial (92 A3 Wallcharts)		Written VCP (348 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	1-27	48	104-169		
MS	Mental Subtraction					63	68-130
M	*Multiplication	20	1-20	39	170-219		
MM	Mental Multiplication					46	131-176
D	*Division	15	1-15	71	220-291		
MD	Mental Division					39	177-215
	*Multiplication Tables			22	292-313		
	Alternative layouts (Column & Number Lines)			34	314-348		

* Contains some posters which have both 'multiplied by' and 'groups of' options

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Introductory Posters

6 The Equals Sign

7 Key Vocabulary

8 Make? Draw? Head? Jotting? Written?

9 a) Can I make it?

10 b) Can I draw a picture of it?

11 c) Can I do this in my head?

12 d) Do I need to do a jotting?

13 e) Do I need a written method?



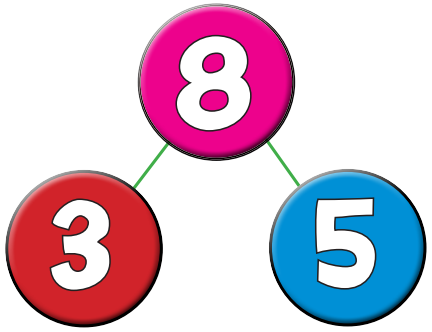
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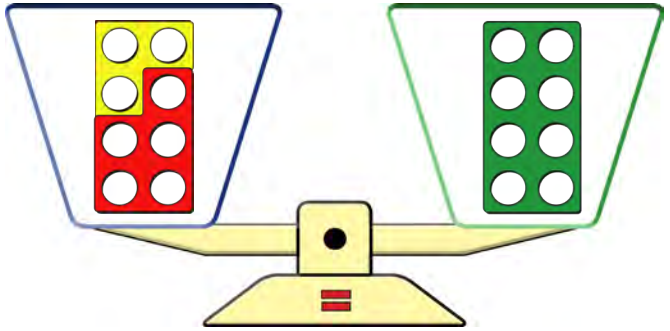
The Equal Sign =

of equal value but may look different

equals

balance





same value as

equivalent to

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Key Vocabulary!

8 + 2 = 10 — Total / Sum

Addend (Augend) + Addend

8 - 2 = 6 — Difference

Minuend - Subtrahend

8 x 2 = 16 — Product

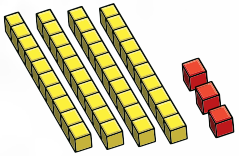
Multiplicand (Factor) x Multiplier (Factor)

8 ÷ 2 = 4 — Quotient

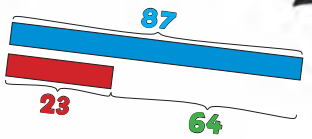
Dividend ÷ Divisor

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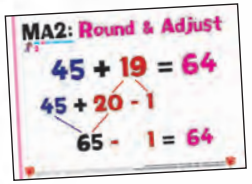
1 Make it?



2 Draw it?



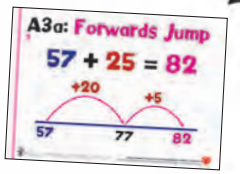
3 In my Head?



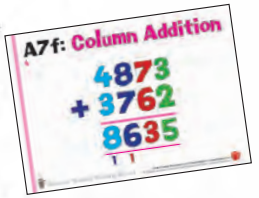
What should I do?



4 Jotting?



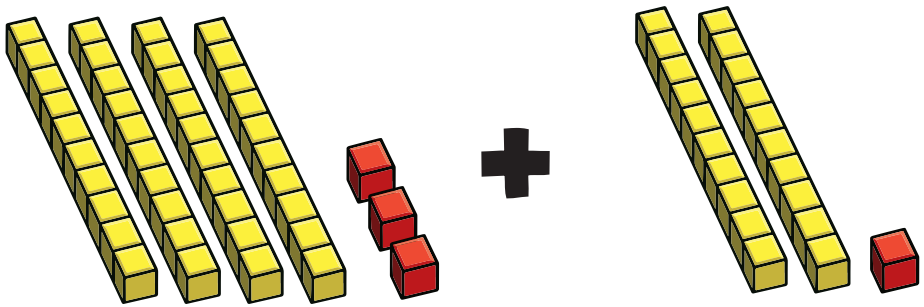
5 Written method?



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1

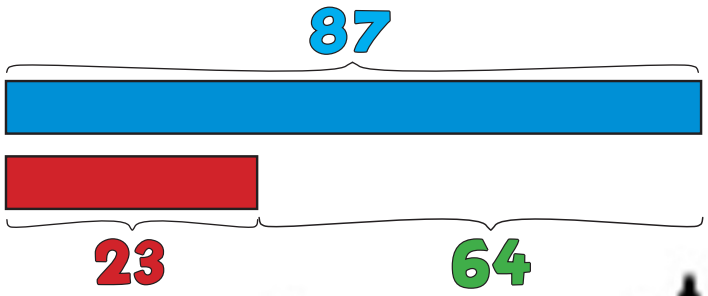
Can I make it?



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2

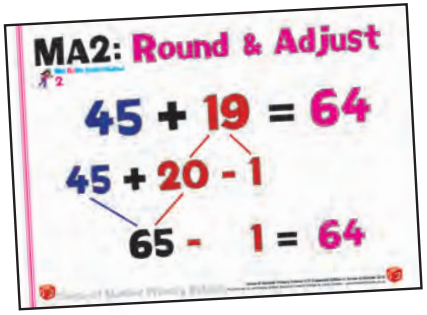
Can I draw a picture?



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3

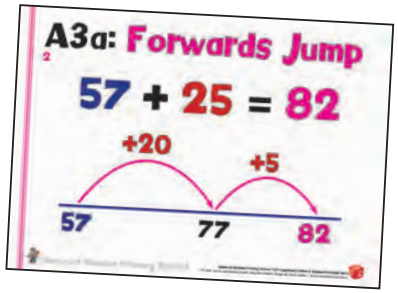
Can I do it in my head?



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4

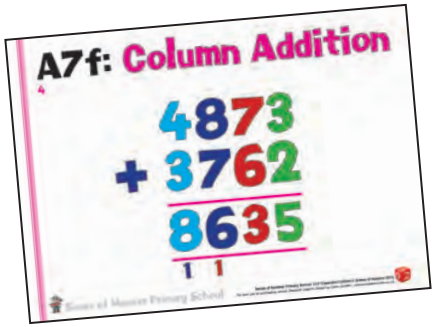
Do I need a jotting?



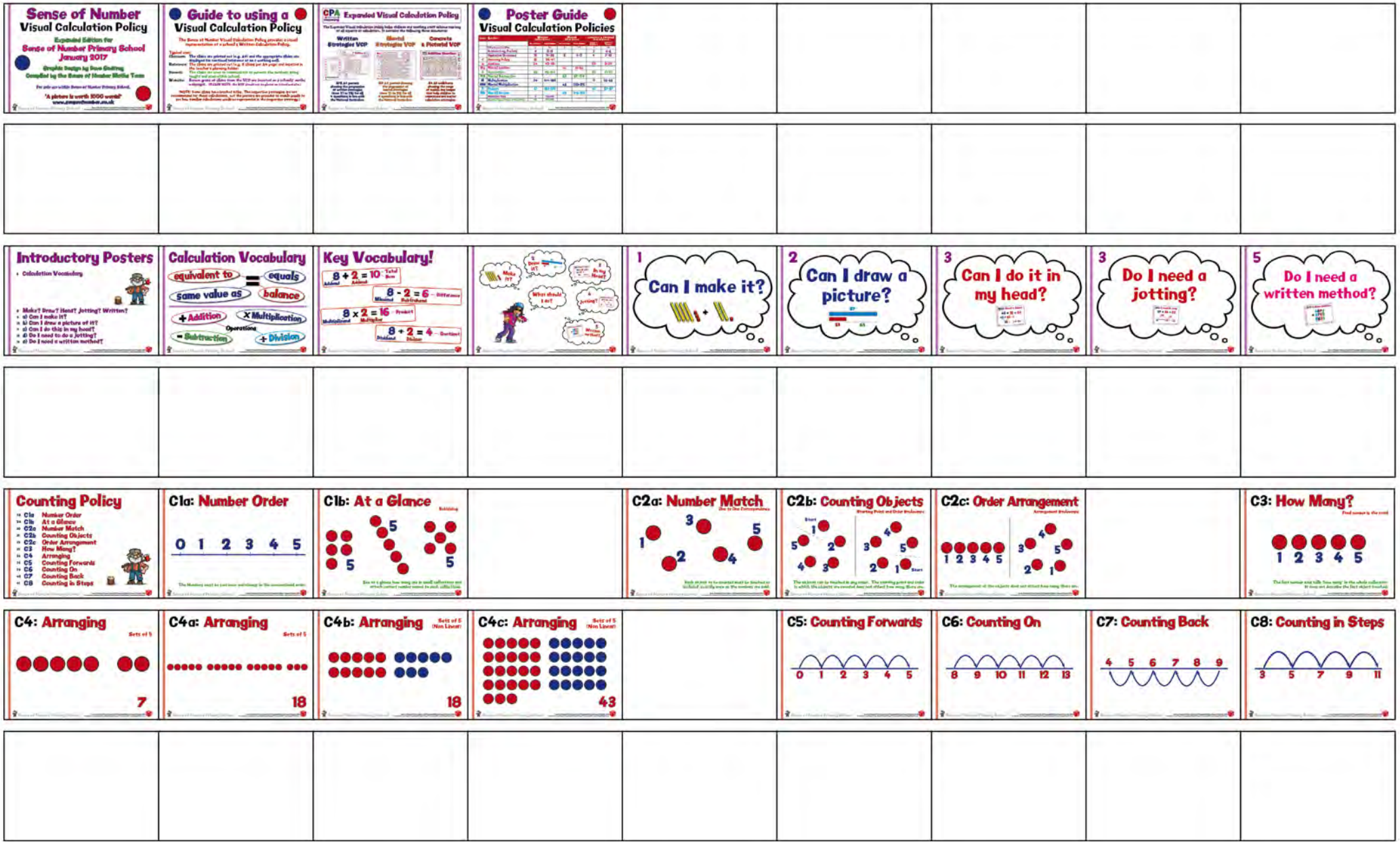
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5

Do I need a written method?



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Progression Overviews

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Addition Strategies

43 Calculation & Vocabulary

45 A1 Objects & Pictures

47 A2 Counting On

51 A3 Forwards Jump

59 A4 Partitioning

66 A5 Partition Jot

77 A6 Part/Whole

85 A7 Expanded Column

91 A8 Column Addition



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Addition

Addition Strategies

- Calculation & Vocabulary
- A1 Objects & Pictures
- A2 Counting On
- A3 Forwards Jump
- A4 Partitioning
- A5 Partition Jot
- A6 Part/Whole
- A7 Expanded Column
- A8 Column Addition

Y1

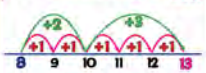
A1: Objects & Pictures



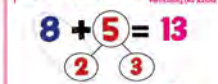
A2: Counting On



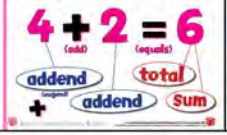
A2a: Counting On



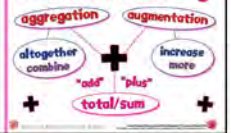
A6: Part/Whole



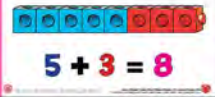
Addition Calculation



Addition Vocabulary

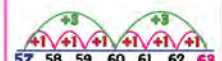


A1a: Largest Number 1st



Y1

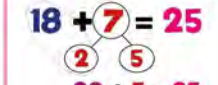
A2c: Counting On



A2b: Counting On

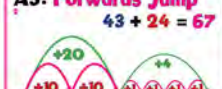


A6: Part/Whole

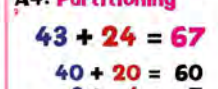


Y2

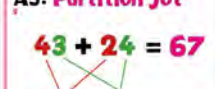
A3: Forwards Jump



A4: Partitioning



A5: Partition Jot



A7: Expanded Column

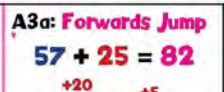


A8: Column Addition

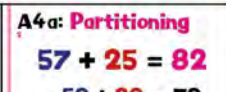


Y2

A3a: Forwards Jump



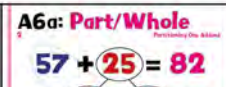
A4a: Partitioning



A5a: Partition Jot



A6a: Part/Whole



A7a: Expanded Column

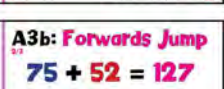


A8a: Column Addition

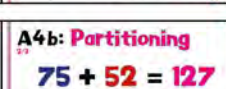


Y2/3

A3b: Forwards Jump



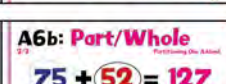
A4b: Partitioning



A5b: Partition Jot



A6b: Part/Whole



A7b: Expanded Column

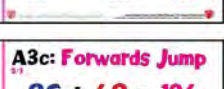


A8b: Column Addition



Y2/3

A3c: Forwards Jump



A4c: Partitioning



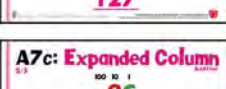
A5c: Partition Jot



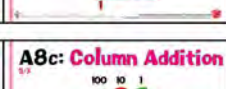
A6c: Part/Whole



A7c: Expanded Column



A8c: Column Addition



Y3

A3d: Forwards Jump



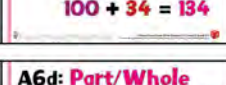
A4d: Partitioning



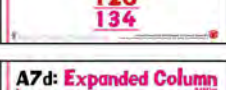
A5d: Partition Jot



A6d: Part/Whole



A7d: Expanded Column



A8d: Column Addition



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Y3/4		**A3e: Forwards Jump** 738 + 524 = 1262 +500 +20 +4 738 1238 1258 1262	**A4e: Partitioning** 738 + 524 = 1262 700 + 500 = 1200 30 + 20 = 50 8 + 4 = 12 1262	**A5e: Partition Jot** 738 + 524 = 1262 1200 + 50 + 12		**A7e: Expanded Column** 738 + 524 12 50 1200 1262	**A8e: Column Addition** 738 + 524 1262	
Y4				**A5f: Partition Jot** 4873 + 3762 = 8635 7000 + 1500 + 130 + 5			**A8f: Column Addition** 4873 + 3762 8635	
Y5							**A8g: Column Addition** 787567 + 446278 1233845	
Y5		**A3h: Decimal Jump** 4.8 + 3.8 = 8.6 +3 +0.8 4.8 7.8 8.6	**A4h: Partitioning** 4.8 + 3.8 = 8.6 4 + 3 = 7 0.8 + 0.8 = 1.6 8.6	**A5h: Partition Jot** 4.8 + 3.8 = 8.6 7 + 1.6	**A6h: Part/Whole** 4.8 + 3.8 = 8.6 0.2 3.6 5 + 3.6 = 8.6		**A8h: Column Addition** 4.8 + 3.8 8.6	
Y5		**A3i: Decimal Jump** 5.65 + 3.29 = 8.94 +3 +0.2 +0.09 5.65 8.65 8.85 8.94		**A5i: Partition Jot** 5.65 + 3.29 = 8.94 8 + 0.8 + 0.14			**A8i: Column Addition** 5.65 + 3.29 8.94	
Y5				**A5j: Partition Jot** 76.7 + 58.5 = 135.2 120 + 14 + 1.2	**A6j: Part/Whole** 76.7 + 58.5 = 135.2 75.2 1.5 75.2 + 60 = 135.2		**A8j: Column Addition** 76.7 + 58.5 135.2	
Y5				**A5k: Partition Jot** £38.25 + £27.46 = £65.71 £65.00 + £0.71			**A8k: Column Addition** £38.25 + £27.46 £65.71	
							A8l: Column Addition 73.4 + 5.67 = 79.07 73.4 + 5.67 79.07	

Progression Overviews

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Subtraction Strategies

105		Calculation & Vocabulary
107	S1	Objects and Pictures
110	S2	Counting Back
112	S3	Counting On
114	S4	Backwards Bounce
116	S5	Backwards Jump
118	S6	10s Jump, 1s Jump
127	S7	Triple Jump
136	S8	Part/Whole (Minuend)
144	S9	Part/Whole (Subtrahend)
152	S10	Expanded Column
158	S11	Column Subtraction



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Subtraction

Y1

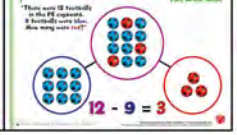
S1: Objects & Pictures



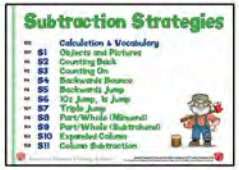
S1a: Objects and Pictures



S1b: Objects and Pictures

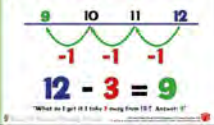


Subtraction Strategies

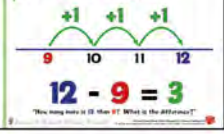


Y1

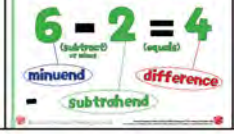
S2: Counting Back



S3: Counting On



Subtraction Calculation

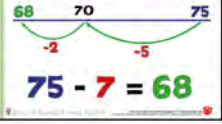


Subtraction Vocabulary

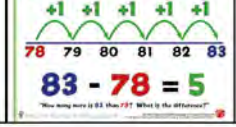


Y2

S2a: Counting Back

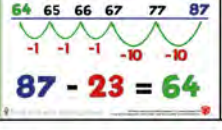


S3a: Counting On

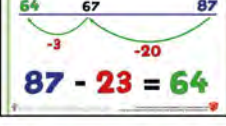


Y2

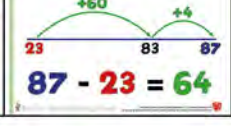
S4: Backwards Bounce



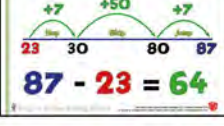
S5: Backwards Jump



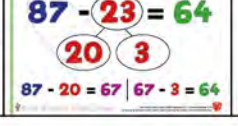
S6: 10s Jump, 1s Jump!



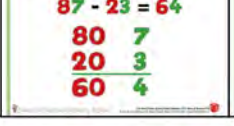
S7: Triple Jump!



S8: Part/Whole (S)



S10: Expanded Column

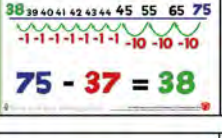


S11: Column Subtraction

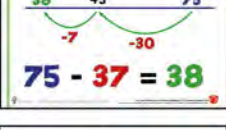


Y2

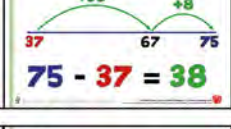
S4a: Backwards Bounce



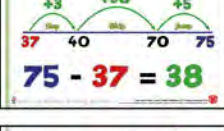
S5a: Backwards Jump



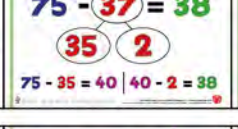
S6a: 10s Jump, 1s Jump!



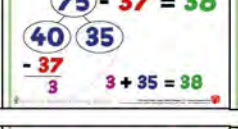
S7a: Triple Jump!



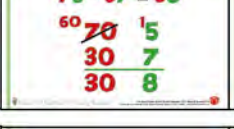
S8a: Part/Whole (S)



S9a: Part/Whole (M)



S10a: Expanded Column

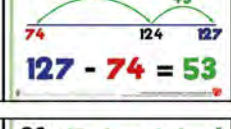


S11a: Column Subtraction

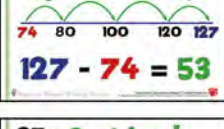


Y3

S6b: 10s Jump, 1s Jump!



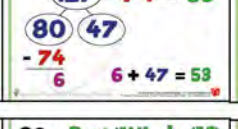
S7b: Quad Jump!



S8b: Part/Whole (S)



S9b: Part/Whole (M)



S10b: Expanded Column

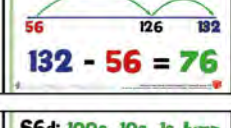


S11b: Column Subtraction

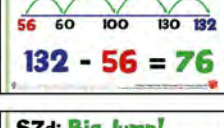


Y3

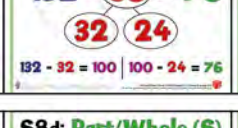
S6c: 10s Jump, 1s Jump!



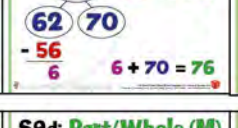
S7c: Quad Jump!



S8c: Part/Whole (S)



S9c: Part/Whole (M)



S10c: Expanded Column

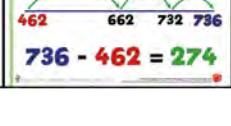


S11c: Column Subtraction

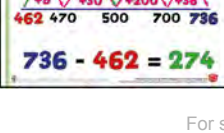


Y3

S6d: 100s, 10s, 1s Jump



S7d: Big Jump!



S8d: Part/Whole (S)

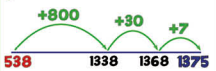
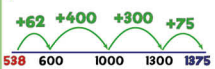
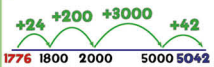
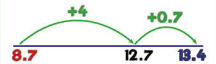
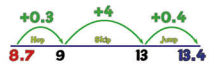


S9d: Part/Whole (M)

S10d: Expanded Column

S11d: Column Subtraction

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Y3			**S6e:** 100s, 10s, 1s Jump  723 - 356 = 367	**S7e:** Big Jump!  723 - 356 = 367	**S8e:** Part/Whole (S) Partition the Subtrahend 723 - 356 = 367 (323, 33) 723 - 323 = 400 | 400 - 33 = 367	**S9e:** Part/Whole (M) Partition the Minuend 723 - 356 = 367 (400, 323) - 356 = 44 44 + 323 = 367	**S10e:** Expanded Column Subtraction (100_10_1s) 723 - 356 = 367 	**S11e:** Column Subtraction 
Y4			**S6f:** 100s, 10s, 1s Jump  1375 - 538 = 837	**S7f:** Quad Jump Extreme  1375 - 538 = 837	**S8f:** Part/Whole (S) Partition the Subtrahend 1375 - 538 = 837 (525, 13) 1375 - 525 = 850 | 850 - 13 = 837	**S9f:** Part/Whole (M) Partition the Minuend 1375 - 538 = 837 (800, 575) - 538 = 37 37 + 800 = 837		**S11f:** Column Subtraction 
Y4			**S6g:** 1000s, 100s, 10s, 1s Jump  5042 - 1776 = 3266	**S7g:** Quad Jump Extreme  5042 - 1776 = 3266		**S9g:** Part/Whole (M) Partition the Minuend 5042 - 1776 = 3266 (2000, 3042) - 1776 = 224 224 + 3042 = 3266		**S11g:** Column Subtraction 
Y5								**S11h:** Column Subtraction 
Y5			**S6i:** 1s Jump, Tenths Jump!  13.4 - 8.7 = 4.7	**S7i:** Decimal T-J!  13.4 - 8.7 = 4.7	**S8h:** Part/Whole (S) Partition the Subtrahend 13.4 - 8.7 = 4.7 (8.4, 0.3) 13.4 - 8.4 = 5 | 5 - 0.3 = 4.7	**S9h:** Part/Whole (M) Partition the Minuend 13.4 - 8.7 = 4.7 (9, 4.4) - 8.7 = 0.3 0.3 + 4.4 = 4.7		**S11i:** Column Subtraction 
Y5								**S11j:** Column Subtraction 
Y5								**S11k:** Column Subtraction (With Decimals) 12.4 - 5.97 = 6.43 

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Multiplication Strategies

171 Calculation & Vocabulary

173 M1 Objects and Pictures

175 M2 *Repeated Addition

179 M3 Arrays

181 M4 Multi Boing!

183 M5 Partitoning

185 M6 Grid Method

188 M7 *Expanded Column

194 M8 Column Multiplication

198 M9 Grid Method (Long Mult.)

206 M10 *Long Multiplication

* The strategies marked with an asterisk have both 'multiplied by' and 'groups of' posters



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Multiplication

Y1

M1: Objects and Pictures



"A bag of 5 red footballs and a bag of 5 blue footballs makes 10 footballs altogether."

M1a: Objects and Pictures



M3: Arrays



"2 groups of 5 counters" or "5 groups of 2 counters" - "10 counters altogether"

Multiplication Strategies

- Calculation & Vocabulary
- M1 Objects and Pictures
- M2 Repeated Addition
- M3 Arrays
- M4 Multi Boing!
- M5 Partitioning
- M6 Grid Method
- M7 Expanded Column
- M8 Column Multiplication
- M9 Grid Method Long Multi
- M10 Long Multiplication

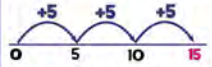
Y2

M2: Repeated Addition (Groups)



5 x 3 = 5 + 5 + 5 = 15

M2a: Repeated Addition (Number Line)



5 x 3 = 5 + 5 + 5 = 15

M3: Arrays



3 x 5 = 15 or 5 x 3 = 15

Multiplication Calculation

4 x 2 = 8

(multiplied by) (equals)

multiplicand (factor) product

x multiplier (factor)

Multiplication Vocabulary



Y2

MF: 2x Table Facts

2 x 1 = 2	2 x 7 = 14
2 x 2 = 4	2 x 8 = 16
2 x 3 = 6	2 x 9 = 18
2 x 4 = 8	2 x 10 = 20
2 x 5 = 10	2 x 11 = 22
2 x 6 = 12	2 x 12 = 24

MF: 5x Table Facts

5 x 1 = 5	5 x 7 = 35
5 x 2 = 10	5 x 8 = 40
5 x 3 = 15	5 x 9 = 45
5 x 4 = 20	5 x 10 = 50
5 x 5 = 25	5 x 11 = 55
5 x 6 = 30	5 x 12 = 60

MF: 10x Table Facts

10 x 1 = 10	10 x 7 = 70
10 x 2 = 20	10 x 8 = 80
10 x 3 = 30	10 x 9 = 90
10 x 4 = 40	10 x 10 = 100
10 x 5 = 50	10 x 11 = 110
10 x 6 = 60	10 x 12 = 120

Y3

MF: 3x Table Facts

3 x 1 = 3	3 x 7 = 21
3 x 2 = 6	3 x 8 = 24
3 x 3 = 9	3 x 9 = 27
3 x 4 = 12	3 x 10 = 30
3 x 5 = 15	3 x 11 = 33
3 x 6 = 18	3 x 12 = 36

MF: 4x Table Facts

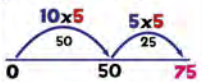
4 x 1 = 4	4 x 7 = 28
4 x 2 = 8	4 x 8 = 32
4 x 3 = 12	4 x 9 = 36
4 x 4 = 16	4 x 10 = 40
4 x 5 = 20	4 x 11 = 44
4 x 6 = 24	4 x 12 = 48

MF: 8x Table Facts

8 x 1 = 8	8 x 7 = 56
8 x 2 = 16	8 x 8 = 64
8 x 3 = 24	8 x 9 = 72
8 x 4 = 32	8 x 10 = 80
8 x 5 = 40	8 x 11 = 88
8 x 6 = 48	8 x 12 = 96

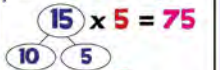
Y3

M4: Multi Boing!



15 x 5 = 75

M5: Partitioning



50 + 25 = 75

M6: Grid Method (Short Multiplication)

15 x 5 = 75

x	10	5
5	50	25

50 + 25 = 75

(M7: Expanded Column)



(M8: Column Multiplication)



Y4

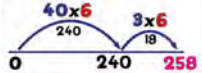
MF: 6x Table Facts

6 x 1 = 6	6 x 7 = 42
6 x 2 = 12	6 x 8 = 48
6 x 3 = 18	6 x 9 = 54
6 x 4 = 24	6 x 10 = 60
6 x 5 = 30	6 x 11 = 66
6 x 6 = 36	6 x 12 = 72

MF: 7x Table Facts

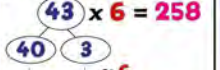
7 x 1 = 7	7 x 7 = 49
7 x 2 = 14	7 x 8 = 56
7 x 3 = 21	7 x 9 = 63
7 x 4 = 28	7 x 10 = 70
7 x 5 = 35	7 x 11 = 77
7 x 6 = 42	7 x 12 = 84

M4a: Multi Boing!



43 x 6 = 258

M5a: Partitioning



240 + 18 = 258

M6a: Grid Method (Short Multiplication)

43 x 6 = 258

x	40	3
6	240	18

240 + 18 = 258

(M7: Expanded Column)



(M8: Column Multiplication)



Y4

MF: 9x Table Facts

9 x 1 = 9	9 x 7 = 63
9 x 2 = 18	9 x 8 = 72
9 x 3 = 27	9 x 9 = 81
9 x 4 = 36	9 x 10 = 90
9 x 5 = 45	9 x 11 = 99
9 x 6 = 54	9 x 12 = 108

MF: 11x Table Facts

11 x 1 = 11	11 x 7 = 77
11 x 2 = 22	11 x 8 = 88
11 x 3 = 33	11 x 9 = 99
11 x 4 = 44	11 x 10 = 110
11 x 5 = 55	11 x 11 = 121
11 x 6 = 66	11 x 12 = 132

MF: 12x Table Facts

12 x 1 = 12	12 x 7 = 84
12 x 2 = 24	12 x 8 = 96
12 x 3 = 36	12 x 9 = 108
12 x 4 = 48	12 x 10 = 120
12 x 5 = 60	12 x 11 = 132
12 x 6 = 72	12 x 12 = 144

M6b: Grid Method (Short Multiplication)

147 x 4 = 588

x	100	40	7
4	400	160	28

400 + 160 + 28 = 588

M7: Expanded Column



M8: Column Multiplication



M8a: Column Multiplication



Y5

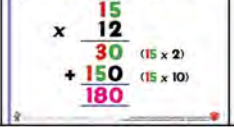
M9: Grid Method (Long Multiplication)

15 x 12 = 180

x	10	5
10	100	50
2	20	10

100 + 50 + 20 + 10 = 180

M10: Long Multiplication



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Y5					**M9a: Grid Method** (Long Multiplication) 43 x 65 = 2795 x | 40 | 3 60 | 2400 | 180 5 | 200 | 15 2400 + 180 + 200 + 15 = 2795		**M10a: Long Multiplication** (Column) 43 x 65 215 (43 x 5) + 2580 (43 x 60) 2795
Y5					**M9b: Grid Method** (Long Multiplication) 243 x 68 = 16,524 x | 200 | 40 | 3 60 | 12000 | 2400 | 180 = 14,580 8 | 1600 | 320 | 24 = 1,944 14580 + 1944 = 16,524		**M10b: Long Multiplication** (Column) 243 x 68 1944 (243 x 8) + 14580 (243 x 60) 16524
Y5					**M9c: Grid Method** (Long Multiplication) 203 x 68 = 13,804 x | 200 | 0 | 3 60 | 12000 | 0 | 180 = 12,180 8 | 1600 | 0 | 24 = 1,624 12180 + 1624 = 13,804		**M10c: Long Multiplication** (Column) 203 x 68 1624 (203 x 8) + 12180 (203 x 60) 13804
Y5					**M9d: Decimal Grid** (Short Multiplication) 3.6 x 4 = 14.4 x | 3 | 0.6 4 | 12 | 2.4 12 + 2.4 = 14.4		**M10d: Column Multiplication** (Short Multiplication) 3.6 x 4 14.4
Y6					**M9e: Decimal Grid** (Short Multiplication) 47.2 x 3 = 141.6 x | 40 | 7 | 0.2 3 | 120 | 21 | 0.6 120 + 21 + 0.6 = 141.6		**M10e: Column Multiplication** (Short Multiplication) 47.2 x 3 141.6
Y6					**M9f: Grid Method** (Short Multiplication) 7.38 x 6 = 44.28 x | 7 | 0.3 | 0.08 6 | 42 | 1.8 | 0.48 42 + 1.8 + 0.48 = 44.28		**M10f: Column Multiplication** (Short Multiplication) 7.38 x 6 44.28
Y6					**M9g: Grid Method** (Long Multiplication) 24.3 x 2.5 = 60.75 x | 20 | 4 | 0.3 2 | 40 | 8 | 0.6 = 48.6 0.5 | 10 | 2 | 0.15 = 12.15 48.6 + 12.15 = 60.75		**M10g: Long Multiplication** (Column Decimals) 24.3 x 2.5 12.15 (24.3 x 0.5) + 48.60 (24.3 x 2) 60.75
							M10h: Long Multiplication (Column) 3786 x 48 30288 (3786 x 8) + 151440 (3786 x 40) 181728

Progression Overviews

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Division Strategies

221		Calculation & Vocabulary
223	D1	Objects and Pictures (Sharing)
224	D2	Objects and Pictures (Grouping)
225	D3	Sharing
226	D4	Grouping
227	D5	Grouping on a Number Line
230	D6	Grouping Grid
231	D7	Chunking Jump
233	D8	Find the Hunk
235	D9	Mega Hunk
245	D10	Short Division
255	D11	*Chunking
267	D12	Long Division (Short Division Method)
268	D13	Long Division (Chunking Method)
270	D14	Long Division (Traditional Method)

* The strategies marked with an asterisk have both 'multiplied by' and 'groups of' posters

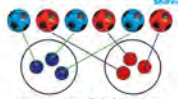


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Division

Y1

D1: Objects and Pictures (Sharing)



"If I share 6 footballs fairly into 2 bags, how many footballs in each bag?" Answer: 3

D2: Objects and Pictures (Grouping)

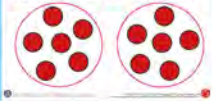


"If a child can carry 2 footballs, how many children do I need to carry 6 footballs?" Answer: 3

Y2

D3: Division as Sharing

12 ÷ 2 = 6



D4: Division as Grouping

12 ÷ 2 = 6



D5: Grouping on a Number Line



20 ÷ 5 = 4

D5a: Grouping on a Number Line



23 ÷ 5 = 4r3

Division Calculation

8 ÷ 2 = 4 (8 divided by 2 equals 4)

dividend ÷ divisor = quotient

Division Vocabulary

grouping — How many groups? — sharing — equal groups — "divided by" — quotient — remainder

Y3

D5b: Grouping on a Number Line



48 ÷ 8 = 6

Y3

D6: Grouping Grid

4	4	4	4	4
4				3

27 ÷ 4 = 6r3

D7: Chunking Jump



72 ÷ 4 = 18

D8: Find the Hunk!

72 ÷ 4 = 18

The Hunk! 40 + Chunk 32 ÷ 4 = 10 + 8 = 18

D10: Short Division

72 ÷ 4 = 18

$$4\overline{)7^{3}2} \quad 18$$

D11: Chunking

72 ÷ 4 = 18

4 | 72
- 40 (4 x 10)
32
- 32 (4 x 8)
0

Y3

D7a: Chunking Jump (Remainders)



65 ÷ 4 = 16r1

D8a: Find the Hunk! (Remainders)

65 ÷ 4 = 16r1

The Hunk! 40 + Chunk 25 ÷ 4 = 10 + 6r1 = 16r1

D10a: Short Division

65 ÷ 4 = 16r1

$$4\overline{)6^{2}5} \quad 16\text{r}1$$

D11: Chunking

65 ÷ 4 = 16r1

4 | 65
- 40 (4 x 10)
25
- 24 (4 x 6)
1

Y4

D9: Mega Hunk!

136 ÷ 4 = 34

The Hunk! 120 + Chunk 16 ÷ 4 = 30 + 4 = 34

D10b: Short Division

136 ÷ 4 = 34

$$4\overline{)1^{1}3^{2}6} \quad 34$$

D11bA: Chunking

136 ÷ 4 = 34

4 | 136
-120 (4 x 30)
16
- 16 (4 x 4)
0

D11bB: Chunking

136 ÷ 4 = 34

4 | 136
- 40 (4 x 10)
96
- 40 (4 x 10)
56
- 40 (4 x 10)
16
- 16 (4 x 4)
0

Y4

D9c: Mega Hunk! (Remainders)

145 ÷ 6 = 24r1

Mega Hunk! 120 + Chunk 25 ÷ 6 = 20 + 4r1 = 24r1

D10c: Short Division

145 ÷ 6 = 24r1

$$6\overline{)1^{1}4^{2}5} \quad 24\text{r}1$$

D11c: Chunking (Remainders)

145 ÷ 4 = 24r1

6 | 145
-120 (6 x 20)
25
- 24 (6 x 4)
1

Y5

D9d: Mega Hunk! (Remainders)

394 ÷ 6 = 65r4

Mega Hunk! 360 + Chunk 34 ÷ 6 = 60 + 5r4 = 65r4

D10d: Short Division

394 ÷ 6 = 65r4

$$6\overline{)3^{3}9^{3}4} \quad 65\text{r}4$$

D11d: Chunking (Remainders)

394 ÷ 6 = 65r4

6 | 394
- 360 (6 x 60)
34
- 30 (6 x 5)
4

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Y5				D9e: Mega Hunk! 536 ÷ 4 = 134 400 + 120 + 16 ÷4 100 + 30 + 4 = 134	D10e: Short Division 536 ÷ 4 = 134 134 4 5 3 6	D11e: Chunking 134 4 536 - 400 (4 x 100) 136 - 120 (4 x 30) 16 - 16 (4 x 4) 0 536 ÷ 4 = 134		
Y5				D9f: Mega Hunk! 1278 ÷ 6 = 213 1200 + 60 + 18 ÷6 200 + 10 + 3 = 213	D10f: Short Division 1278 ÷ 6 = 213 213 6 1 2 7 8	D11f: Chunking 213 6 1278 - 1200 (6 x 200) 78 - 60 (6 x 10) 18 - 18 (6 x 3) 0 1278 ÷ 6 = 213		
Y5				D9g: Mega Hunk! 5978 ÷ 7 = 854 5600 + 350 + 28 ÷7 800 + 50 + 4 = 854	D10g: Short Division 5978 ÷ 7 = 854 854 7 5 9 7 8	D11g: Chunking 854 7 5978 - 5600 (7 x 800) 378 - 350 (7 x 50) 28 - 28 (7 x 4) 0 5978 ÷ 7 = 854		
Y5				D9h: Mega Hunk! 846 ÷ 5 = 169r1 500 + 300 + 46 ÷5 100 + 60 + 9r1 = 169r1	D10h: Short Division Different Remainders 169.2 5 8 4 6.0 846 ÷ 5 169r1 5 8 4 6 169 1/5 5 8 4 6	D11h: Chunking 169r1 5 846 - 500 (5 x 100) 346 - 300 (5 x 60) 46 - 45 (5 x 9) 1 846 ÷ 5 = 169r1		
Y6				D9i: Mega Hunk! Simple Long Division 480 ÷ 15 = 32 Mega Hunk! 450 + Chunk 30 ÷15 30 + 2 = 32		D11iA: Chunking Long Division 32 15 480 - 450 (15 x 30) 30 - 30 (15 x 2) 0 480 ÷ 15 = 32	D11iB: Chunking Long Division 32 15 480 - 150 (15 x 10) 330 - 150 (15 x 10) 180 - 150 (15 x 10) 30 - 30 (15 x 2) 0 480 ÷ 15 = 32	
Y6			D9j: Decimal Hunk! 18 ÷ 1.5 = 12 The Hunk! 15 + Chunk 3 ÷1.5 10 + 2 = 12	D9k: Decimal Hunk! 87.5 ÷ 7 = 12.5 70 + 14 + 3.5 ÷7 10 + 2 + 0.5 = 12.5	D10k: Short Division 87.5 ÷ 7 = 12.5 12.5 7 8 7.5			
Y6					D12: Long Division Short Division Method 26r21 37 9 8 3	D13a1: Long Division Chunking Method 26r21 37 983 - 740 (37 x 20) 243 - 222 (37 x 6) 21 983 ÷ 37 = 26r21	D13a2: Long Division Chunking Method 26r21 37 983 - 370 (37 x 10) 613 - 370 (37 x 10) 243 - 222 (37 x 6) 21 983 ÷ 37 = 26r21	D14: Long Division Traditional Method 26r21 37 983 - 74 243 - 222 21 983 ÷ 37 = 26r21
					D12b: Long Division Short Division Method 38 59 2 22 47 2	D13b1: Long Division Chunking Method 38 59 2242 - 1770 (59 x 30) 472 - 472 (59 x 8) 0 2242 ÷ 59 = 38	D13b2: Long Division Chunking Method 39 59 2242 - 590 (59 x 10) 1652 - 590 (59 x 10) 1062 - 590 (59 x 10) 472 - 472 (59 x 8) 0 2242 ÷ 59 = 38	D14b: Long Division Traditional Method 38 59 2242 - 177 472 - 472 0 2242 ÷ 59 = 38

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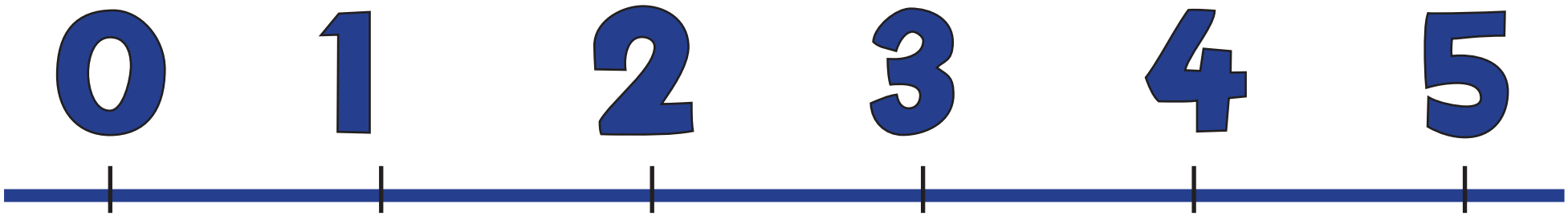
Counting Policy

28 C1a Number Order
29 C1b At a Glance
30 C2a Number Match
31 C2b Counting Objects
32 C2c Order Arrangement
33 C3 How Many?
34 C4 Arranging
38 C5 Counting Forwards
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41 C8 Counting in Steps



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C1a: Number Order

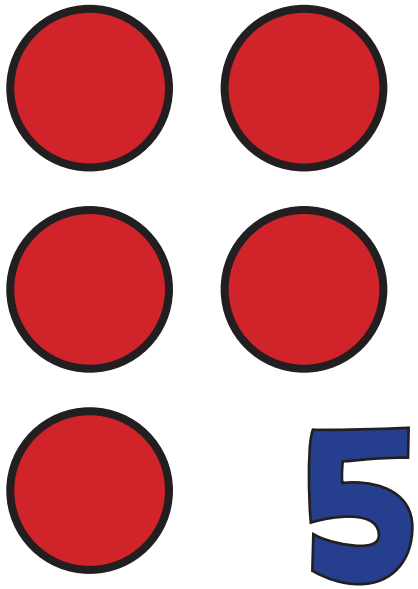


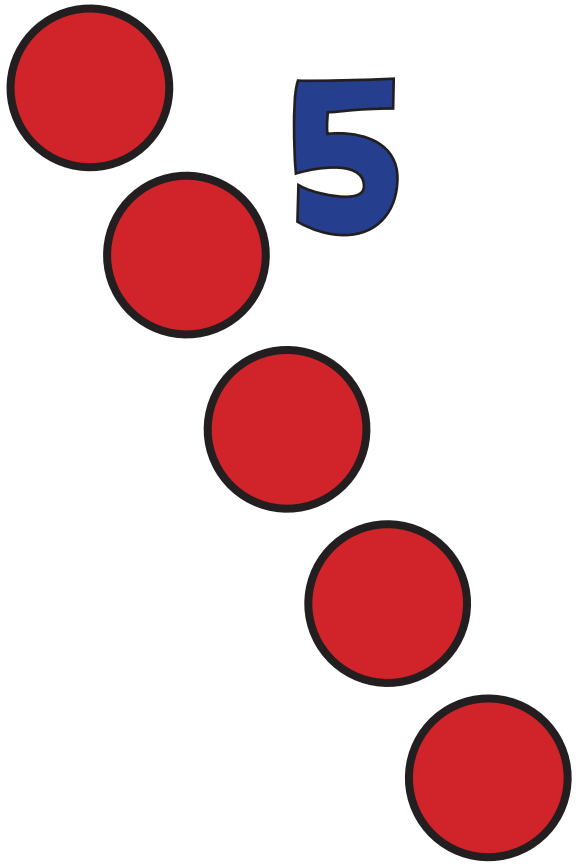
The Numbers must be said once and always in the conventional order.

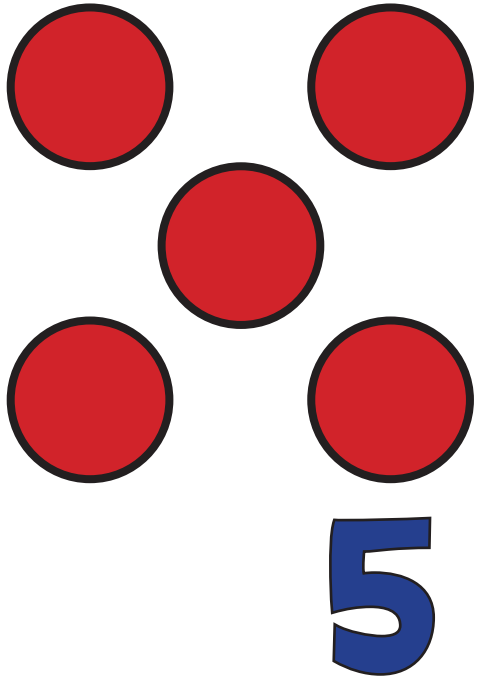
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C1b: At a Glance

Subitising





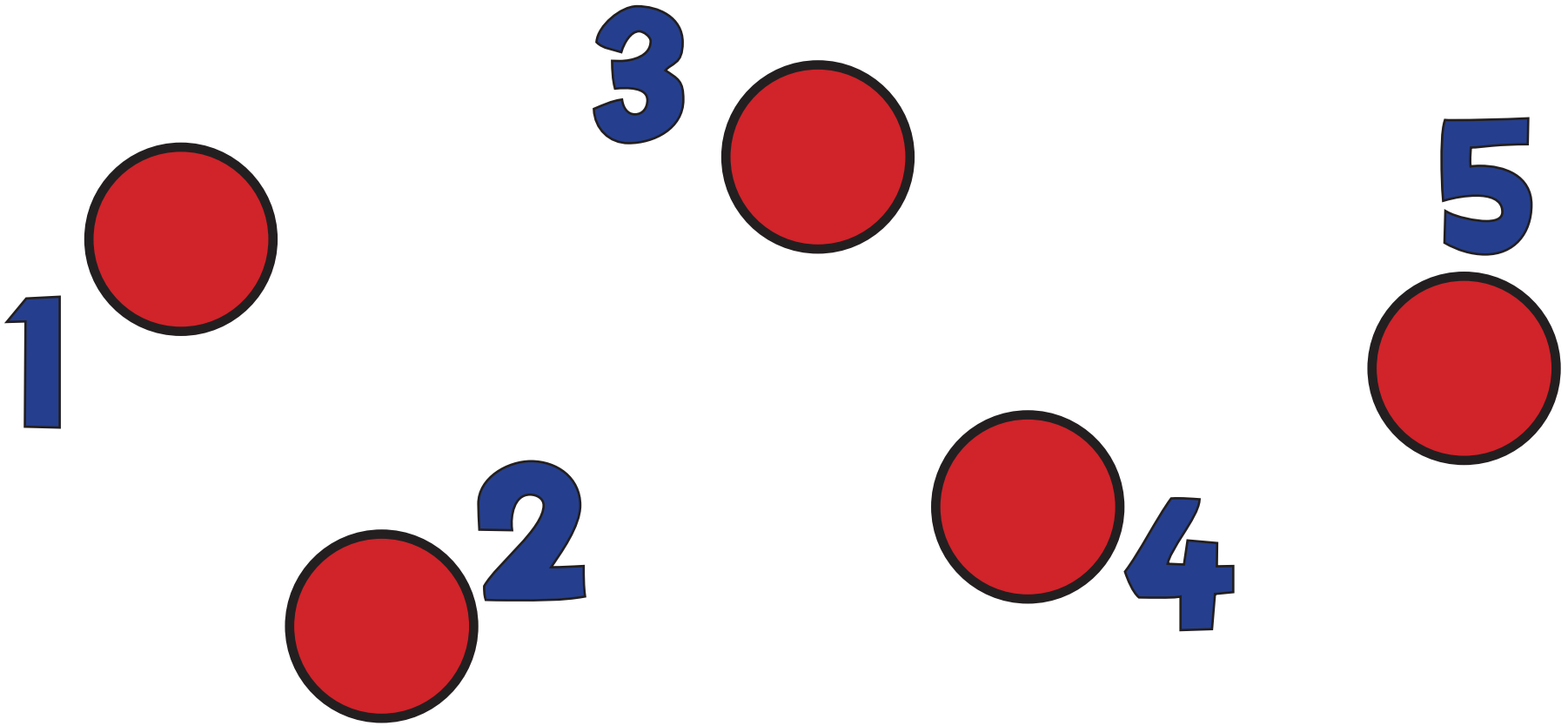


See at a glance how many are in small collections and attach correct number names to such collections.

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C2a: Number Match

One to One Correspondence

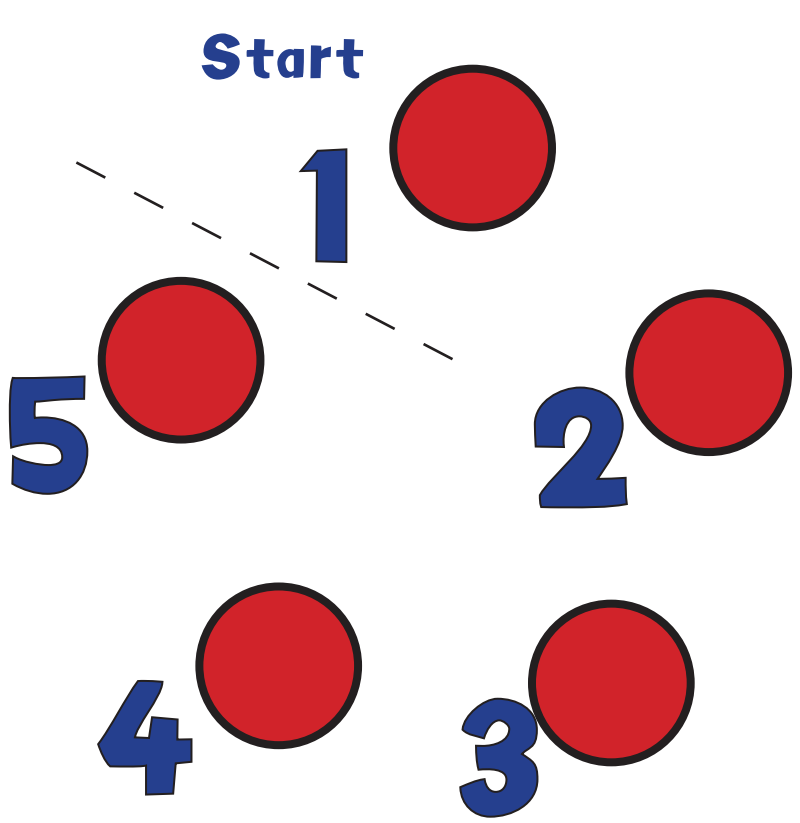


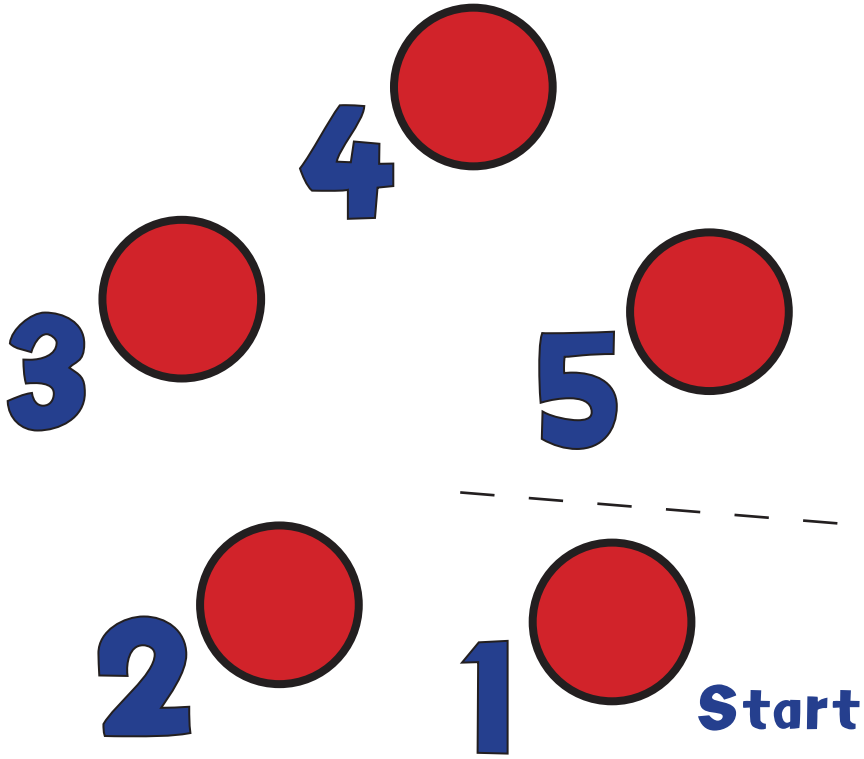
Each object to be counted must be touched or 'included' exactly once as the numbers are said.

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C2b: Counting Objects

Starting Point and Order Irrelevance



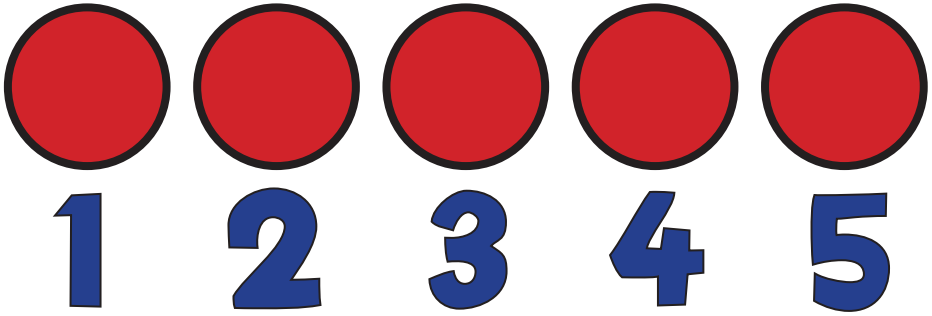


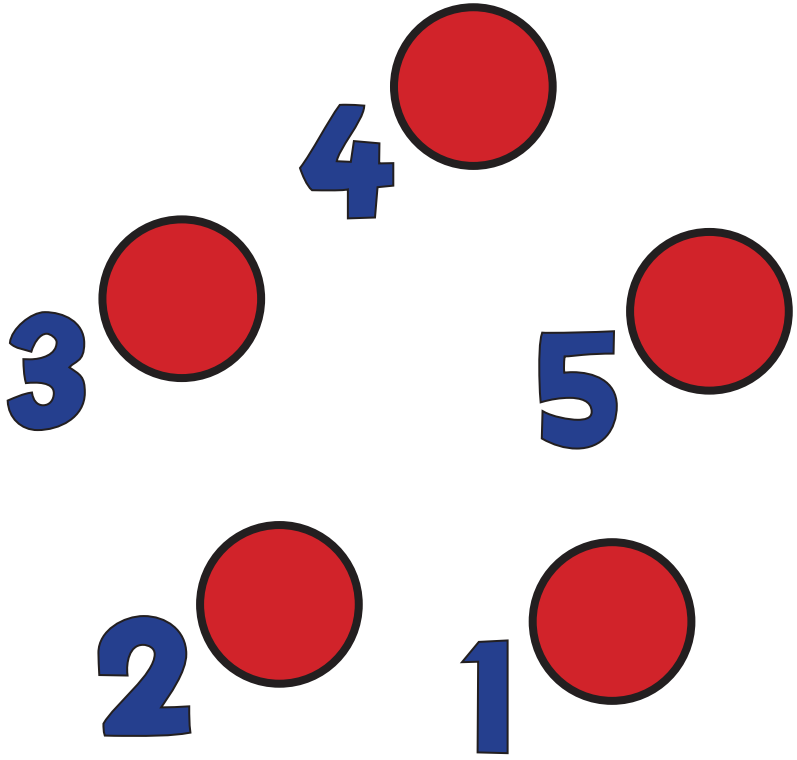
The objects can be touched in any order. The starting point and order in which the objects are counted does not affect how many there are.

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C2c: Order Arrangement

Arrangement Irrelevance



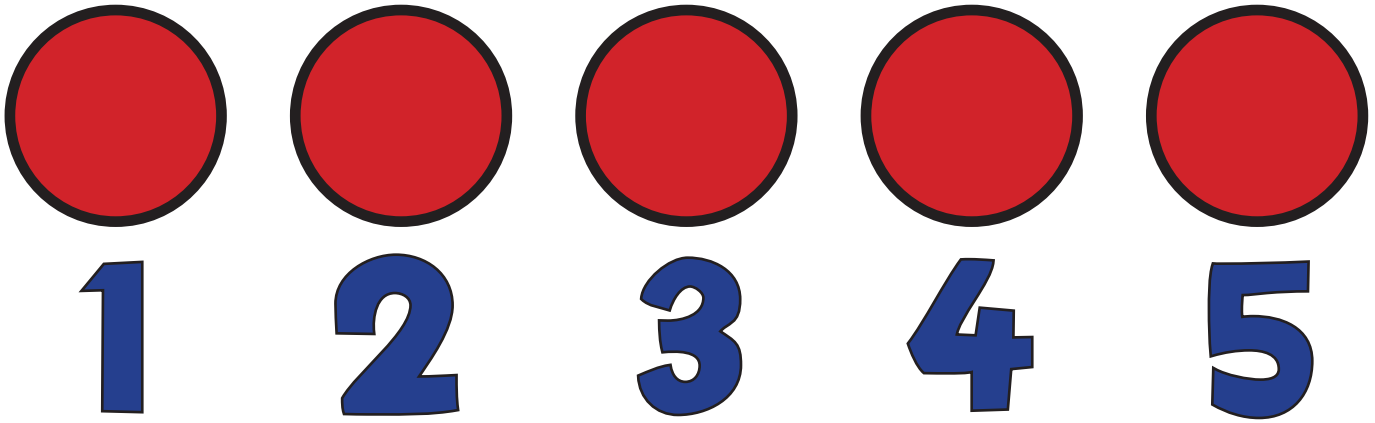


The arrangement of the objects does not affect how many there are.

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C3: How Many?

Final number is the total

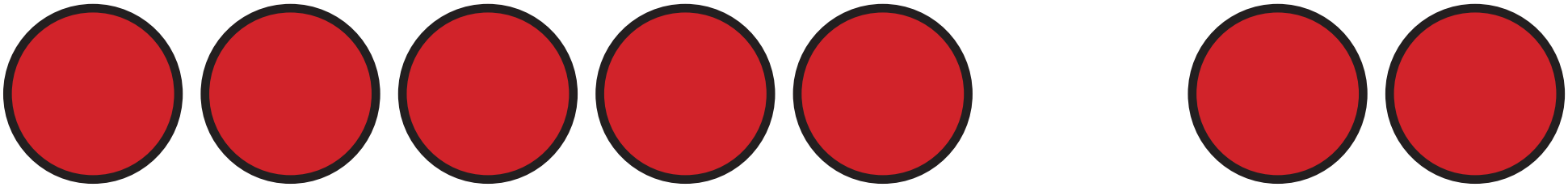


The last number said tells 'how many' in the whole collection.
It does not describe the last object touched.

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C4: Arranging

Sets of 5

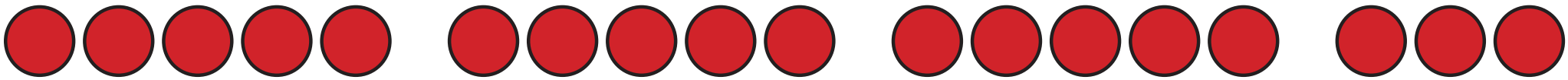


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C4a: Arranging

Sets of 5

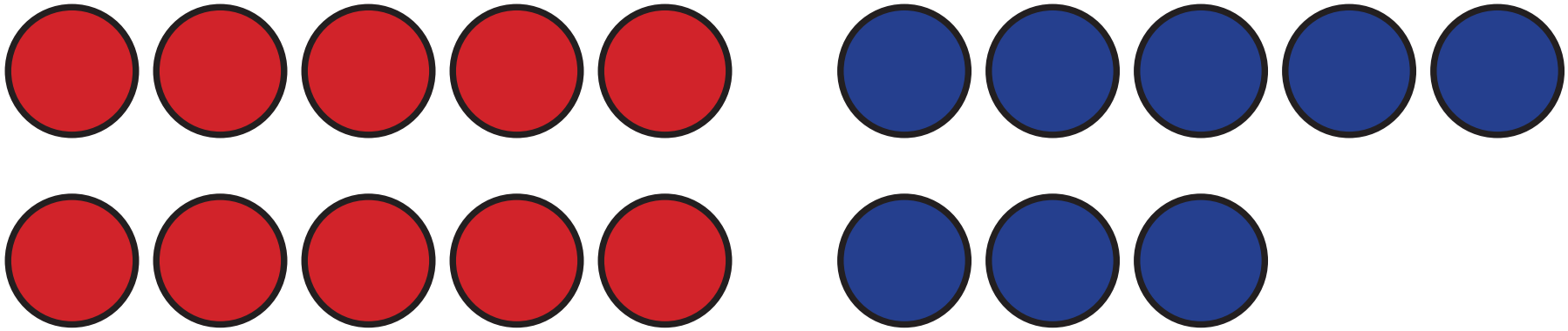


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C4b: Arranging

Sets of 5 (Non Linear)

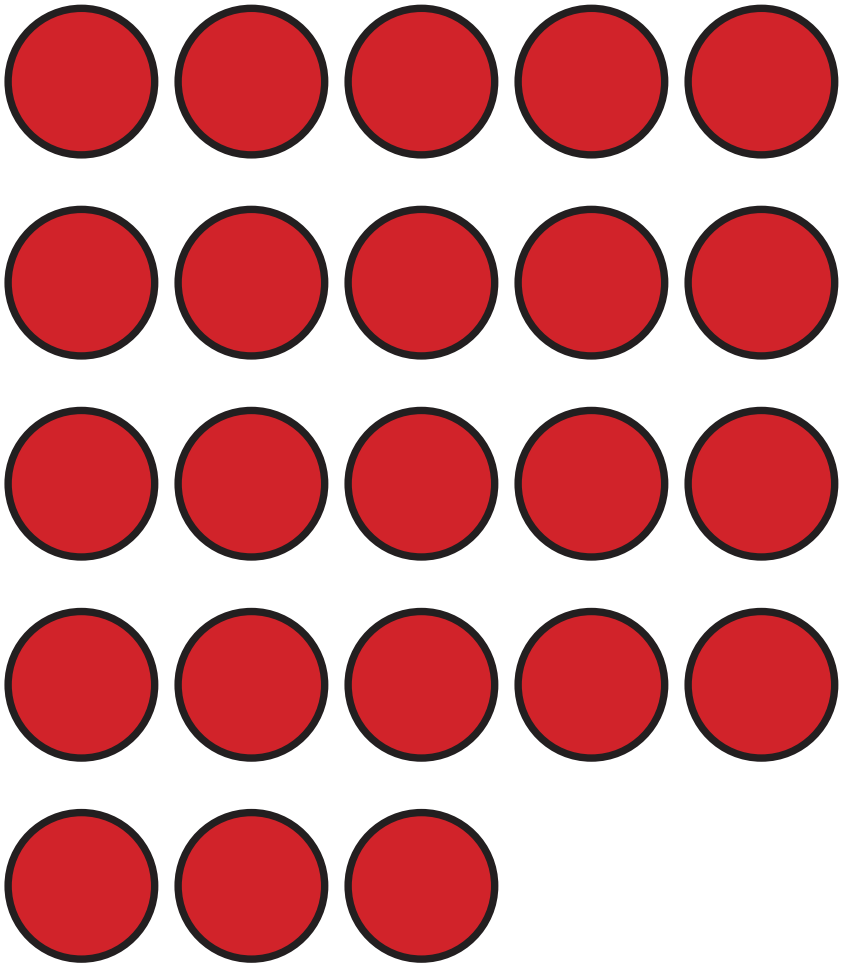


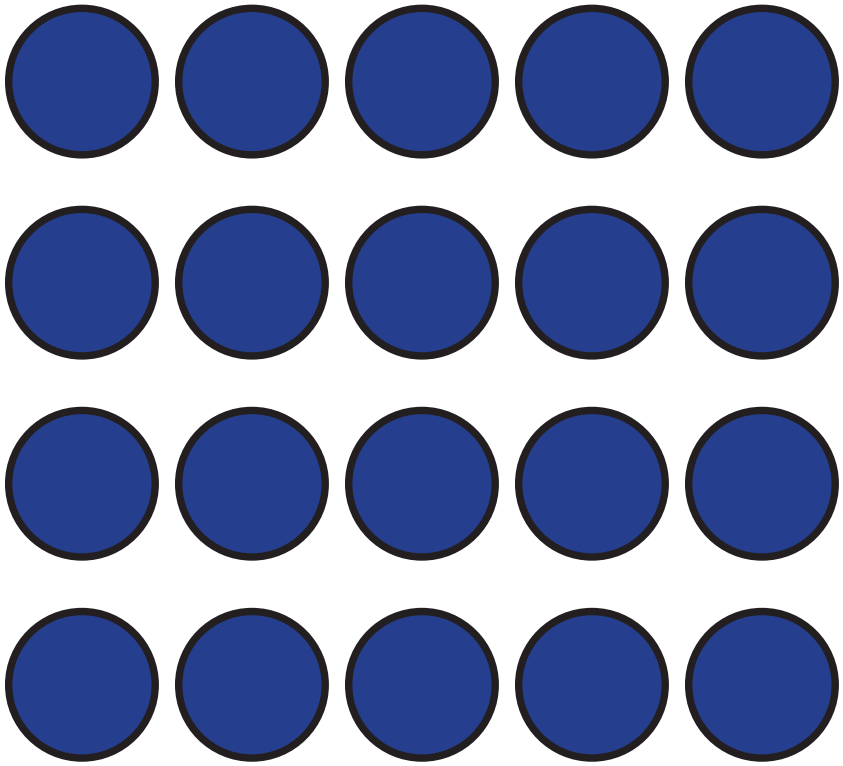
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C4c: Arranging

Sets of 5 (Non Linear)

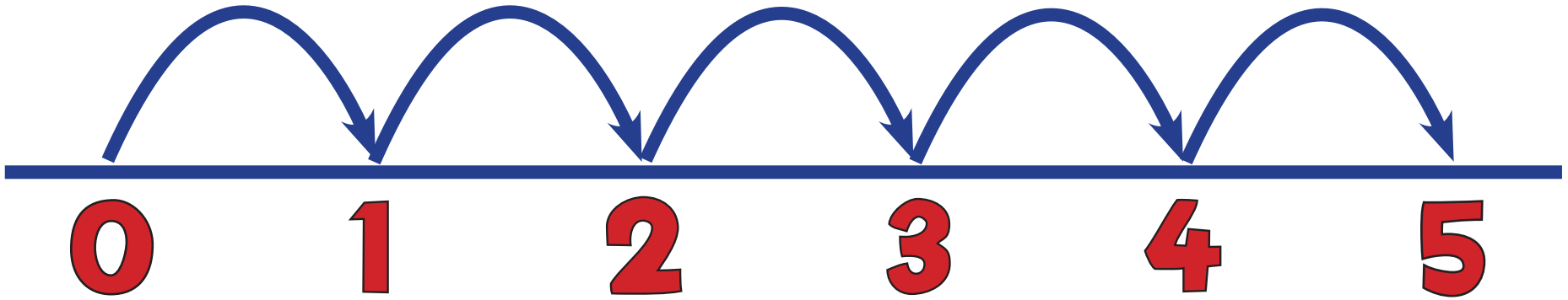




43

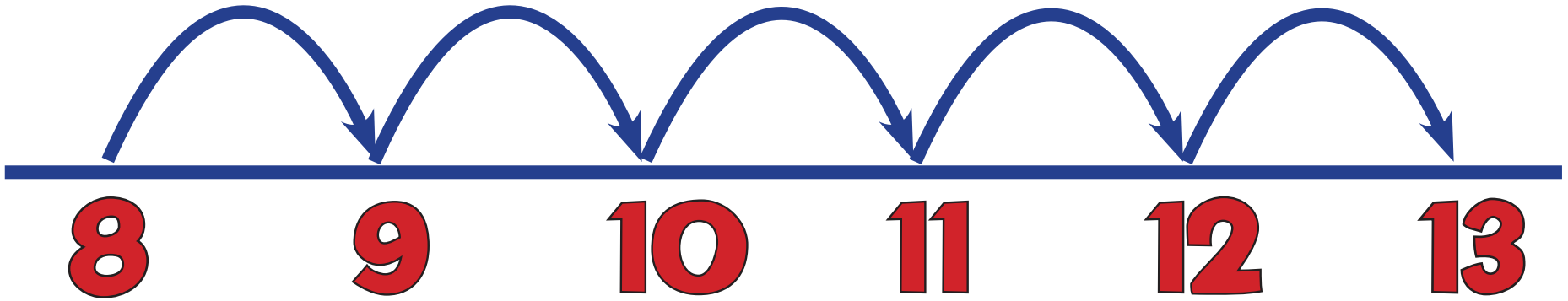
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C5: Counting Forwards



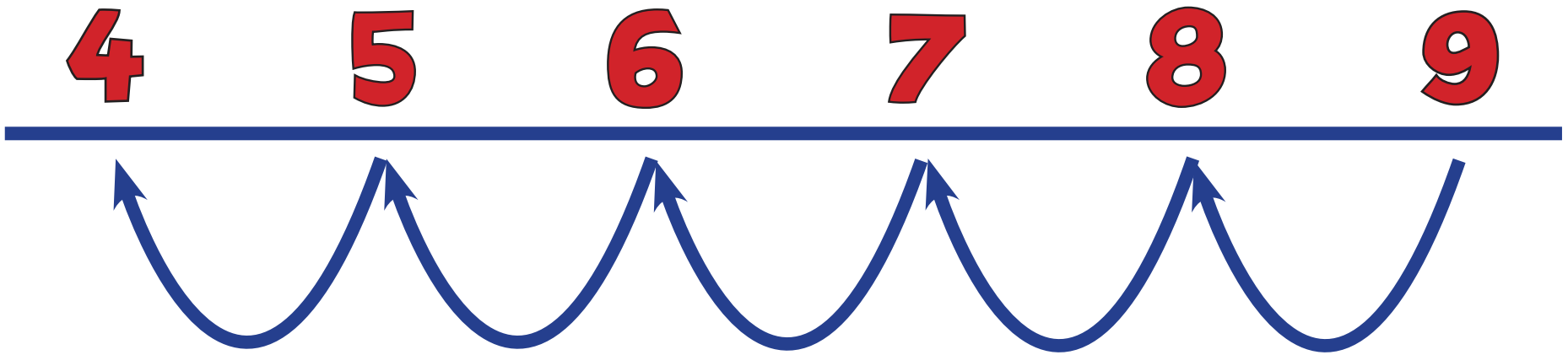
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C6: Counting On



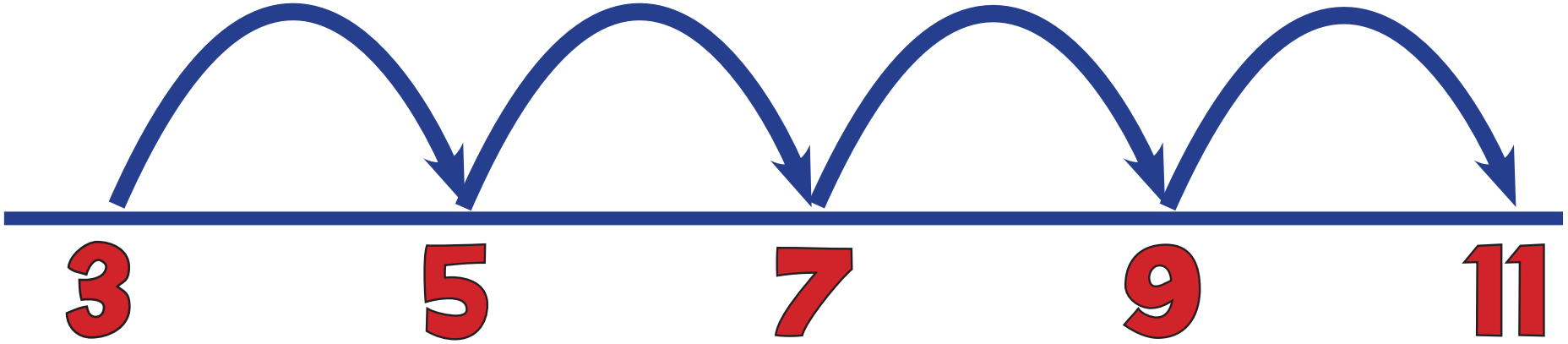
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C7: Counting Back



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C8: Counting in Steps



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Addition Strategies

43 Calculation & Vocabulary

45 A1 Objects & Pictures

47 A2 Counting On

51 A3 Forwards Jump

59 A4 Partitioning

66 A5 Partition Jot

77 A6 Part/Whole

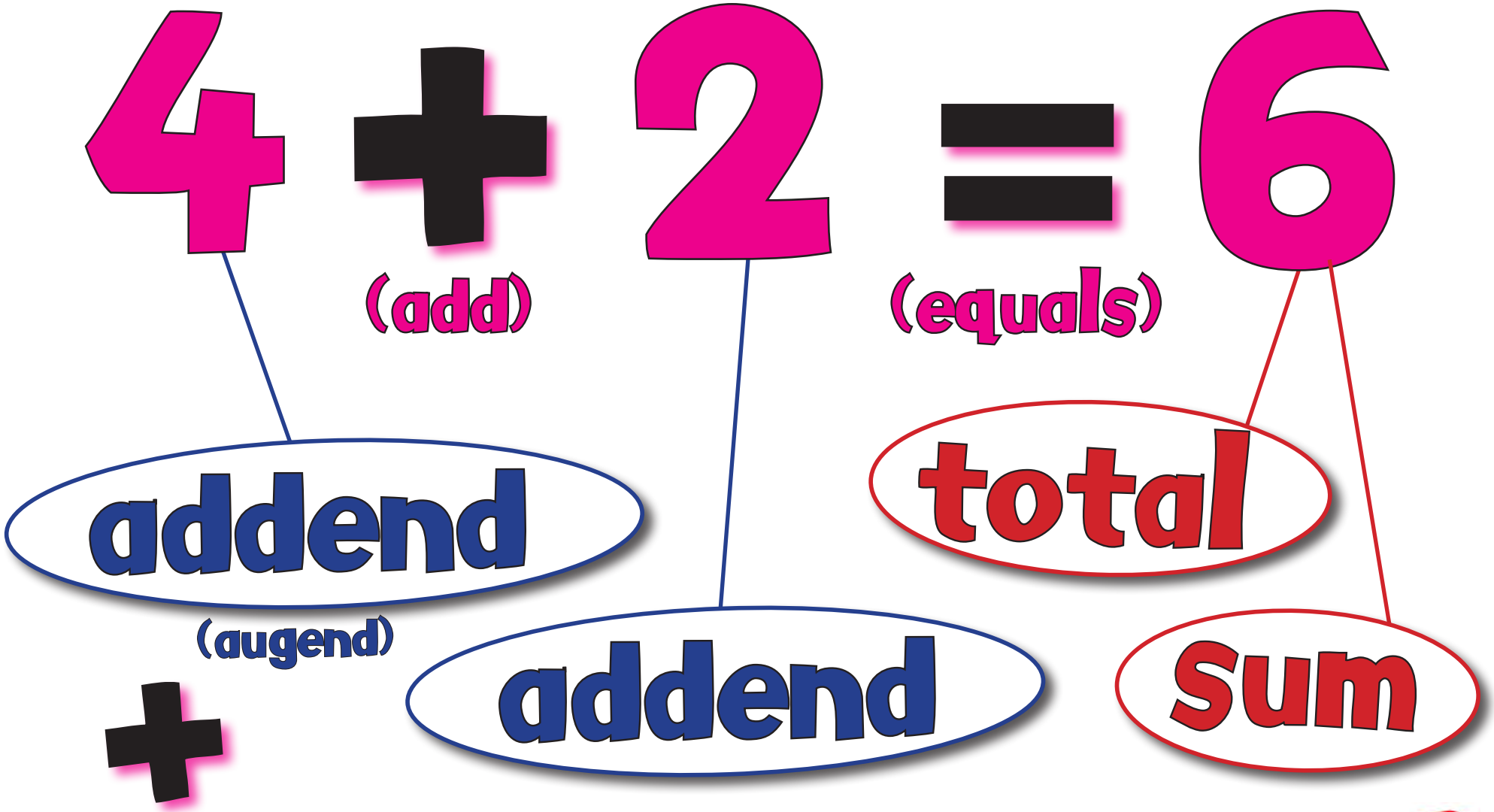
85 A7 Expanded Column

91 A8 Column Addition



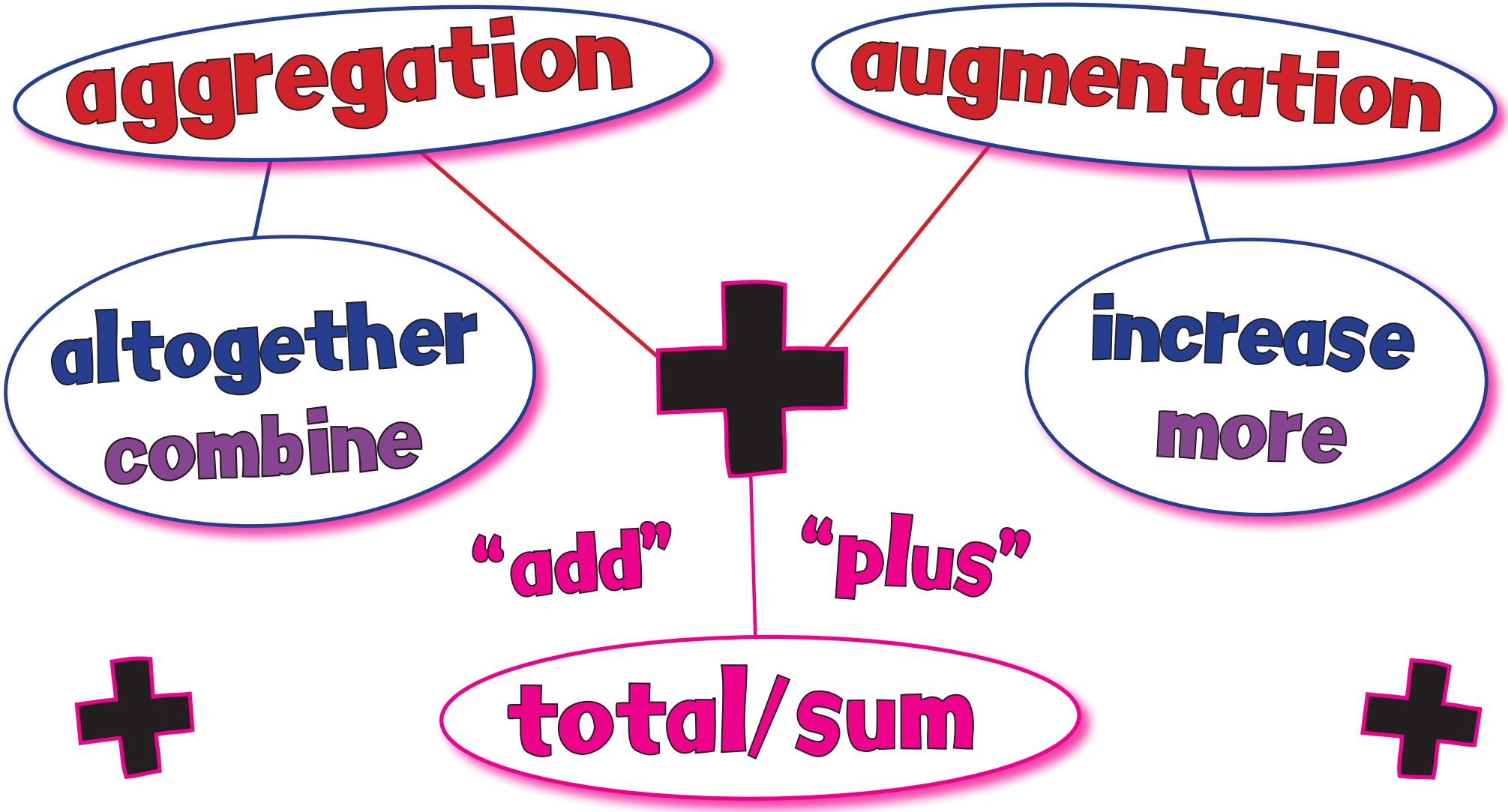
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Addition Calculation



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Addition Vocabulary

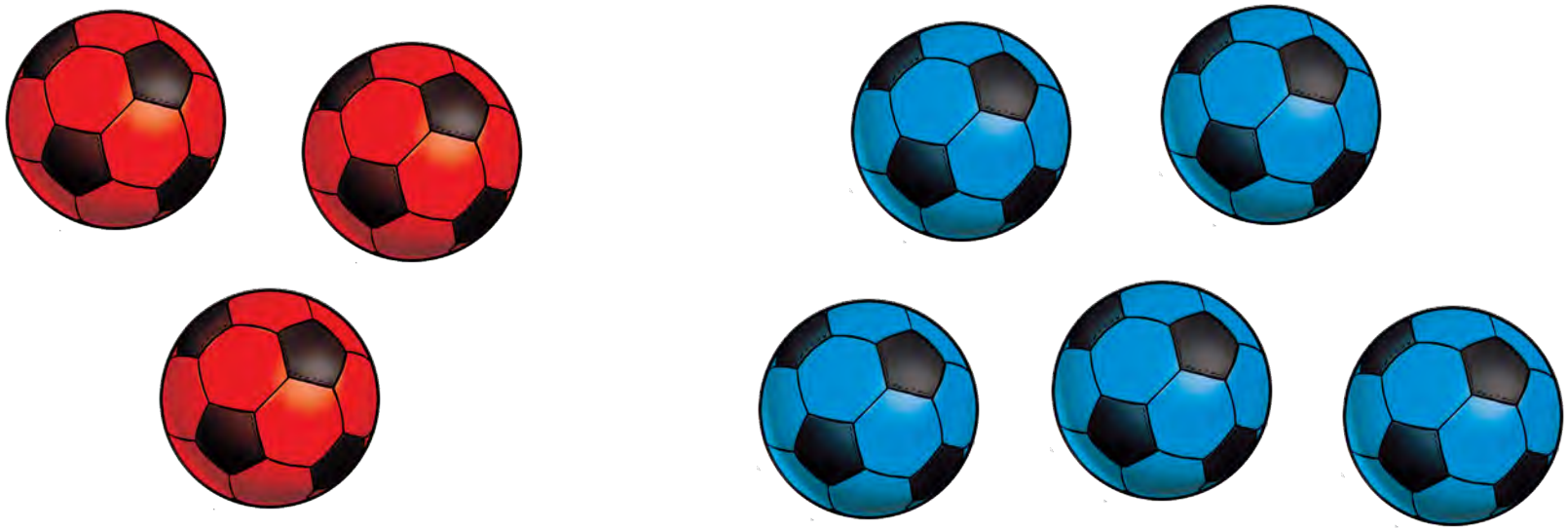


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A1: Objects & Pictures

1

"In the PE cupboard there were 3 red footballs and 5 blue footballs.
How many footballs altogether? Answer: 8"



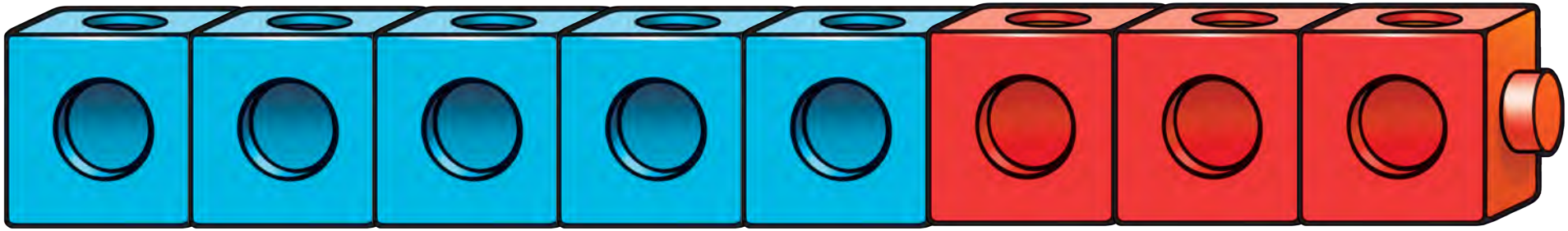
3 + 5 = 8

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A1a: Largest Number 1st

1

"In the PE cupboard there were 3 red footballs and 5 blue footballs.
How many footballs altogether? Answer: 8"

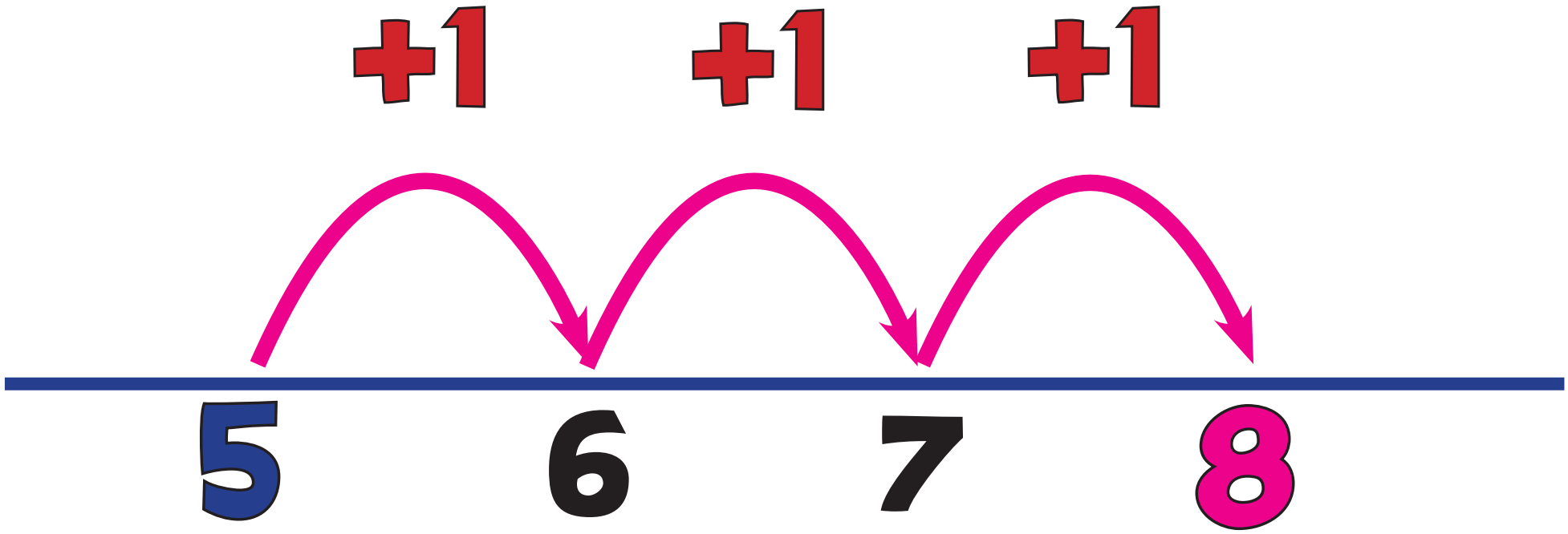


5 + 3 = 8

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A2: Counting On

1



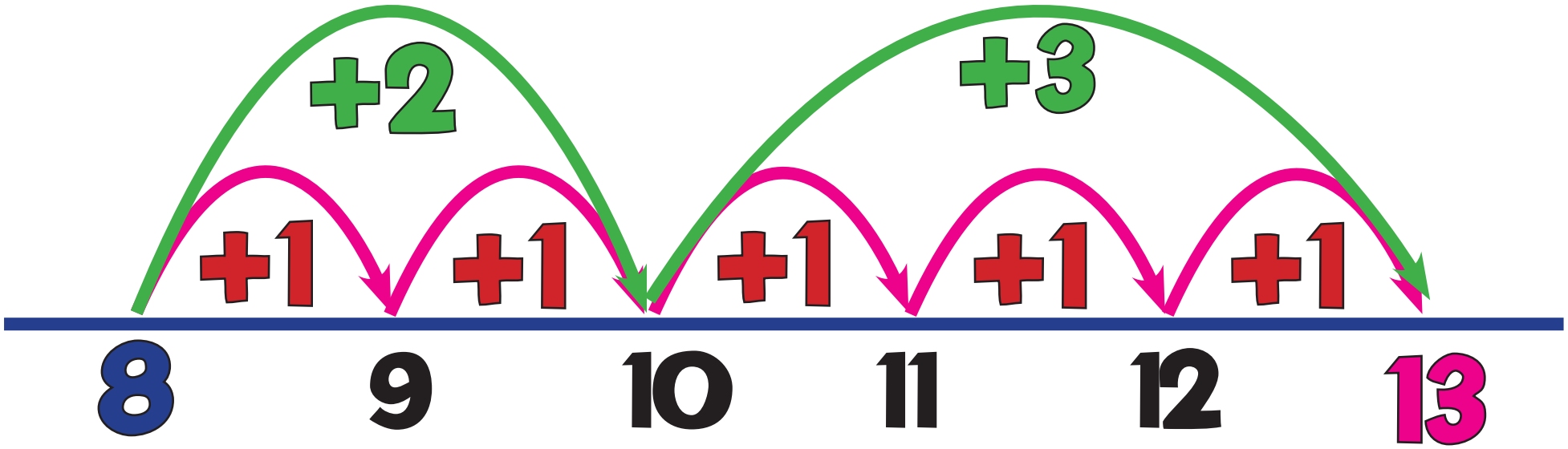
$5 + 3 = 8$

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A2a: Counting On

1

Bridging 10



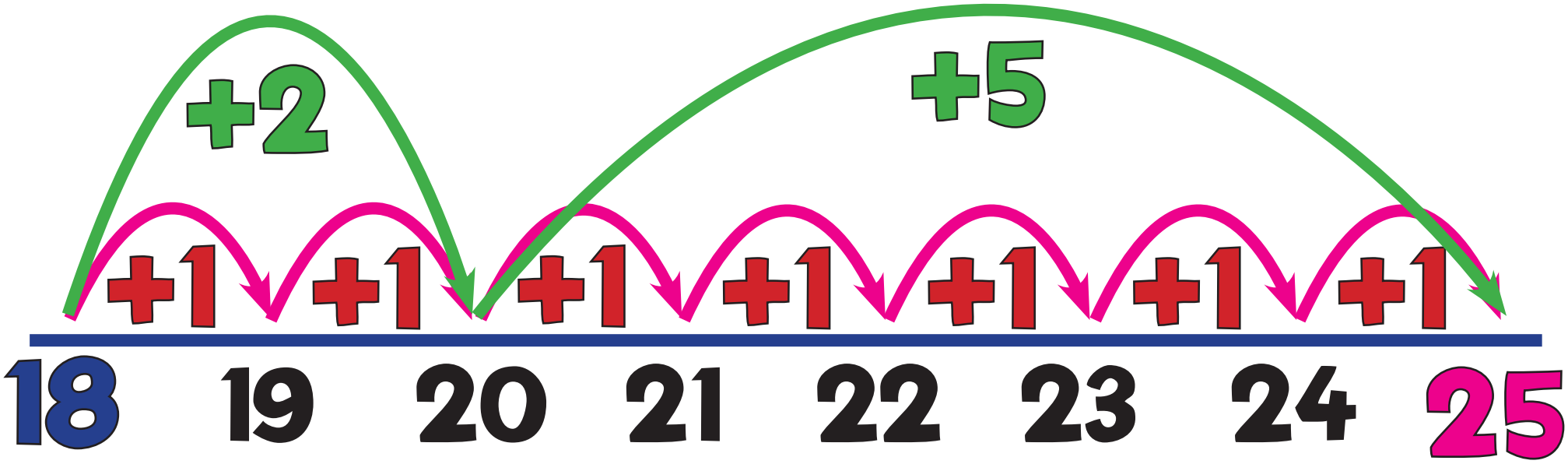
$$8 + 5 = 13$$

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A2b: Counting On

1

Bridging 10



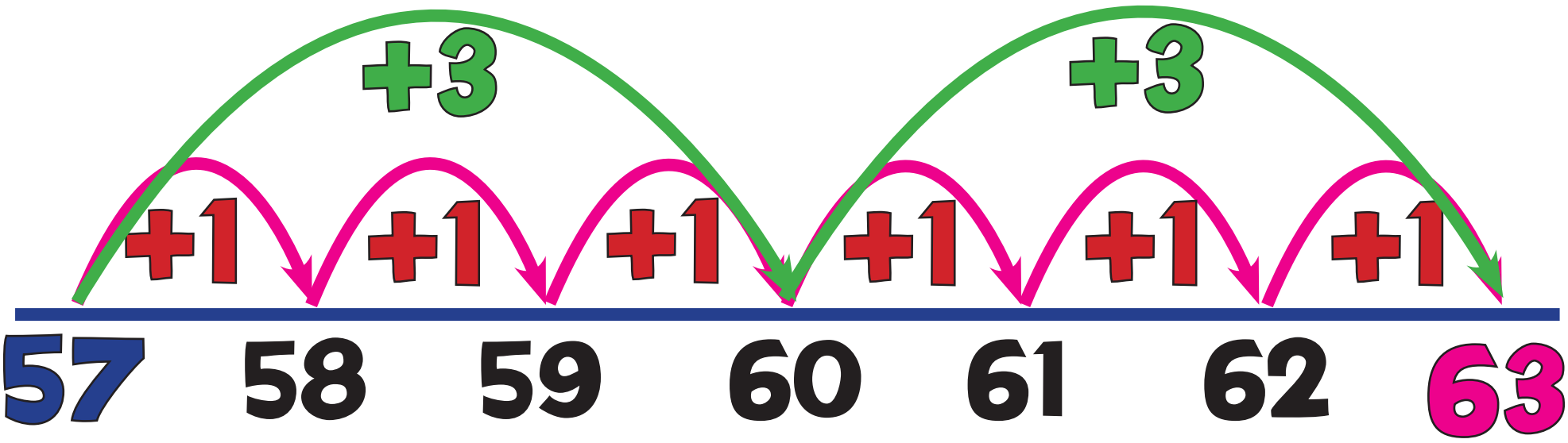
18 + 7 = 25

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A2c: Counting On

2

Bridging 10s Number



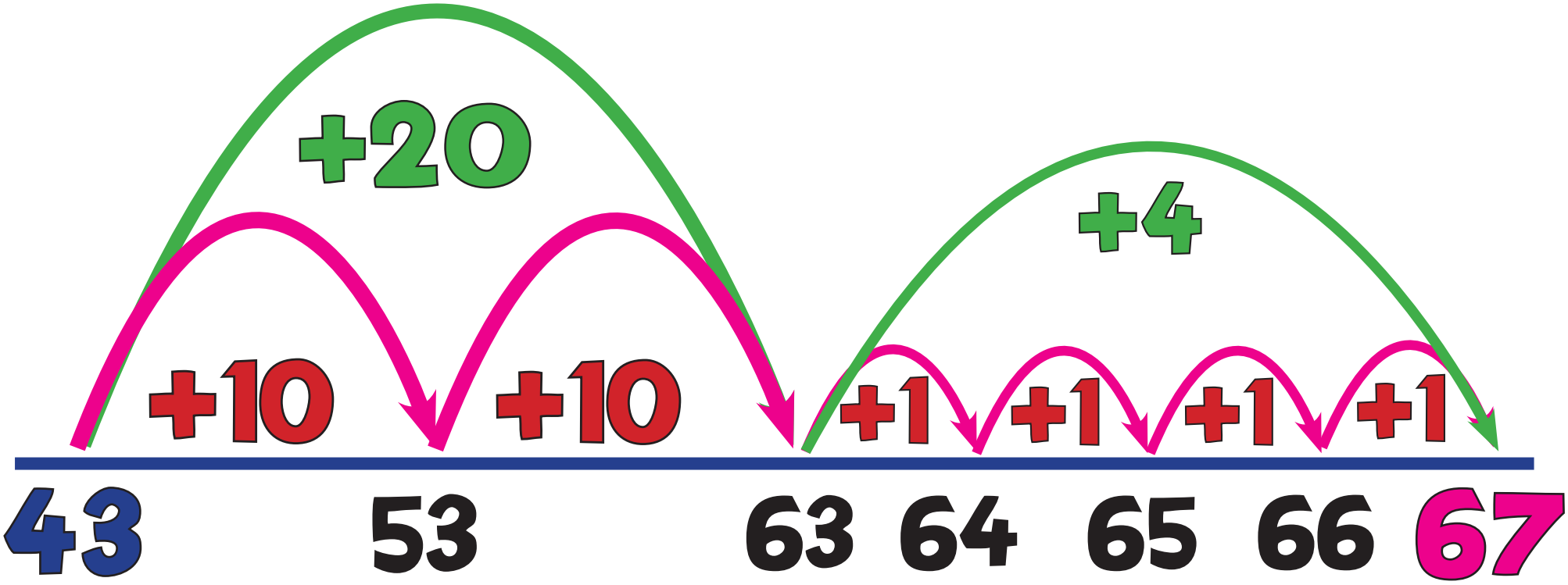
57 + 6 = 63

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A3: Forwards Jump

2

43 + 24 = 67

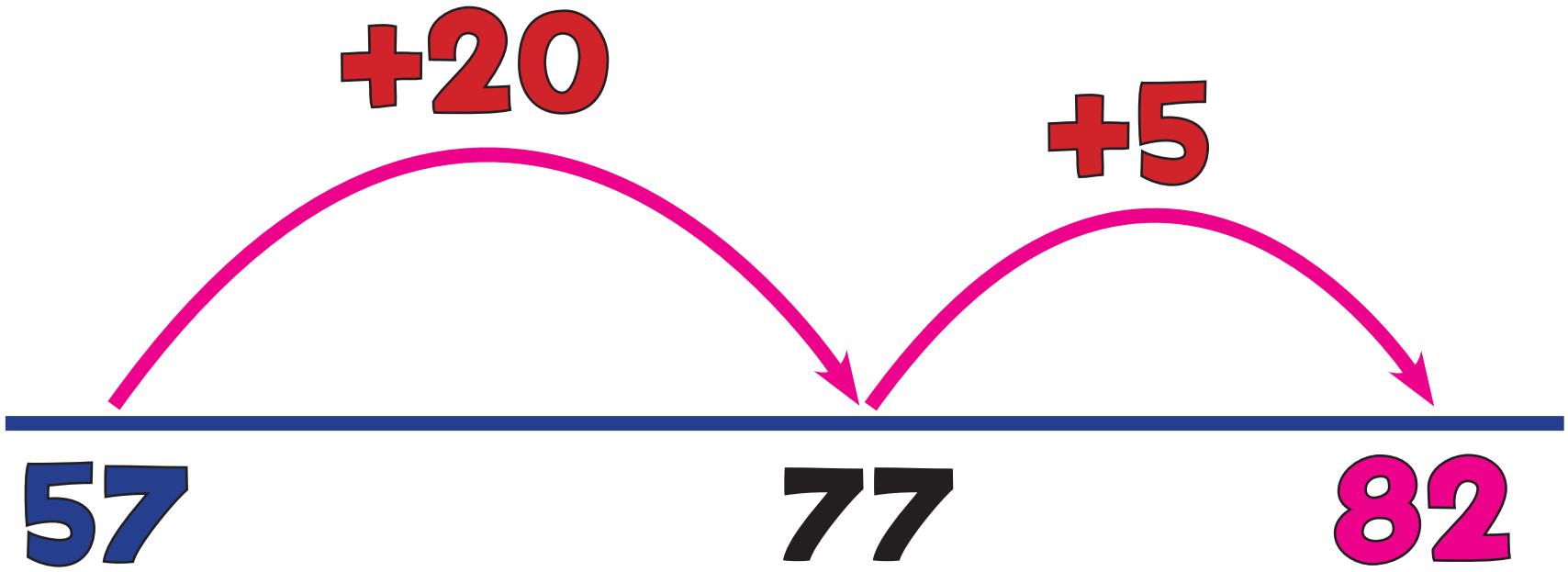


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A3a: Forwards Jump

2

57 + 25 = 82

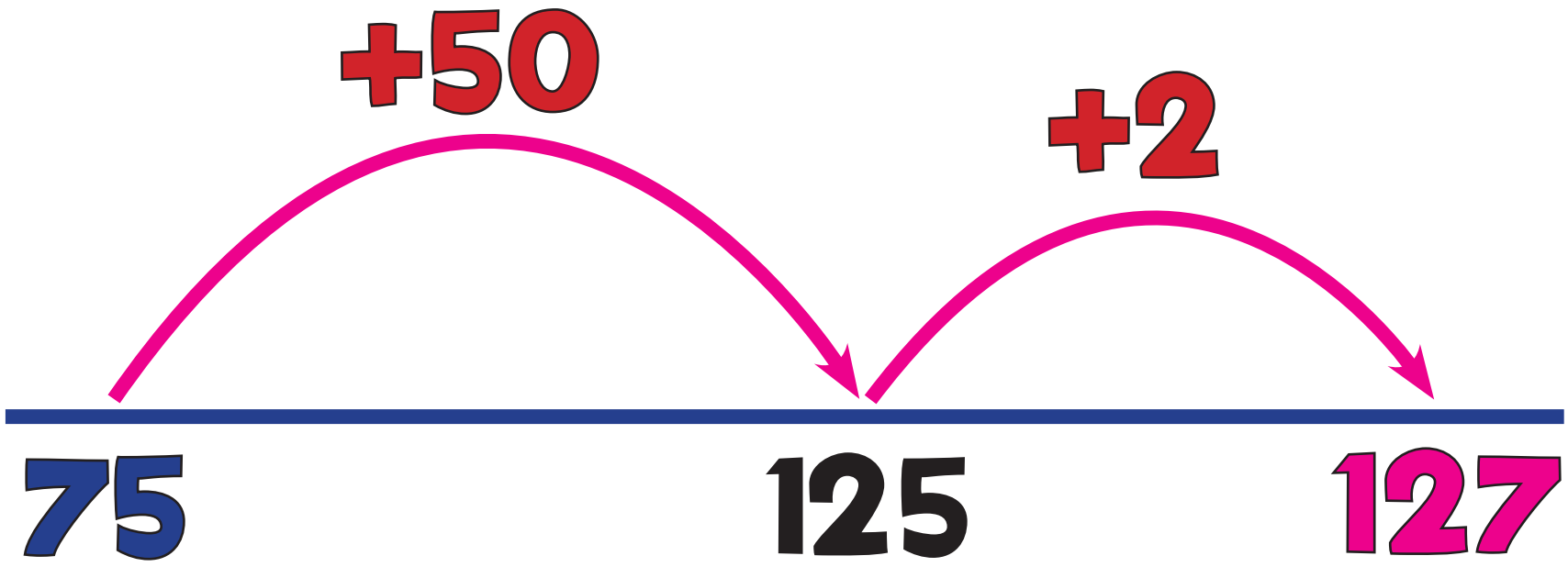


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A3b: Forwards Jump

2/3

75 + 52 = 127

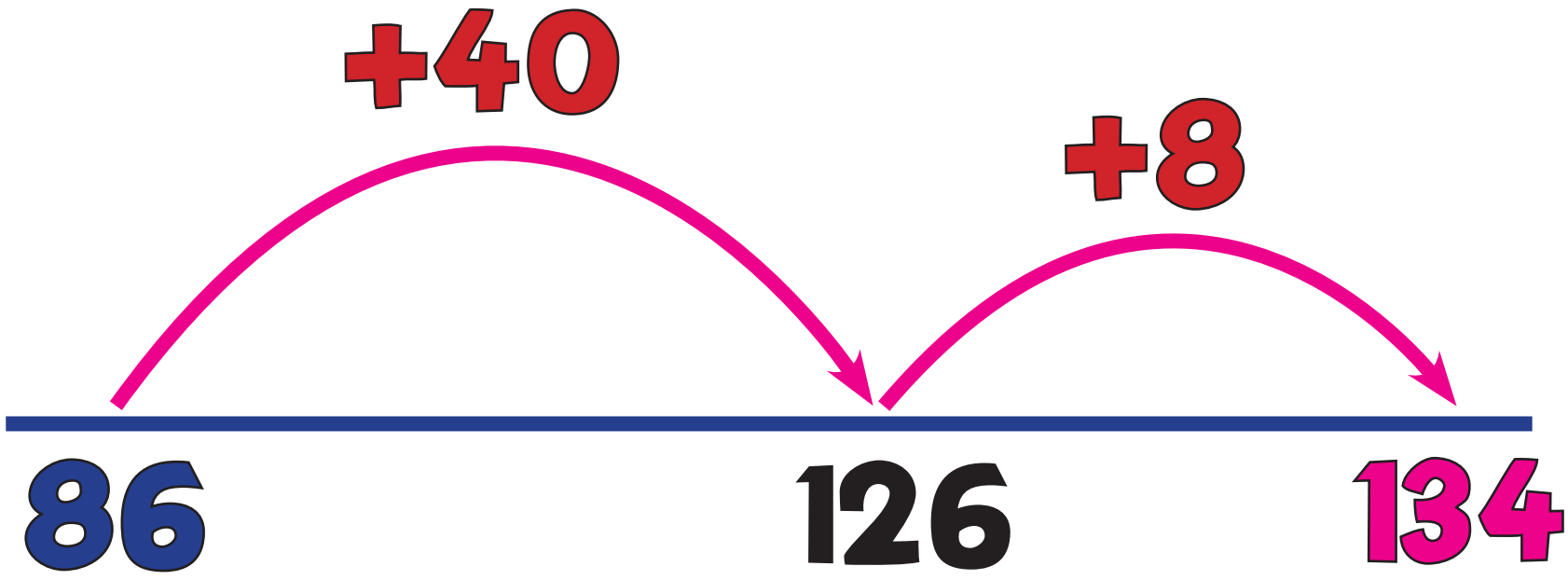


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A3c: Forwards Jump

2/3

86 + 48 = 134

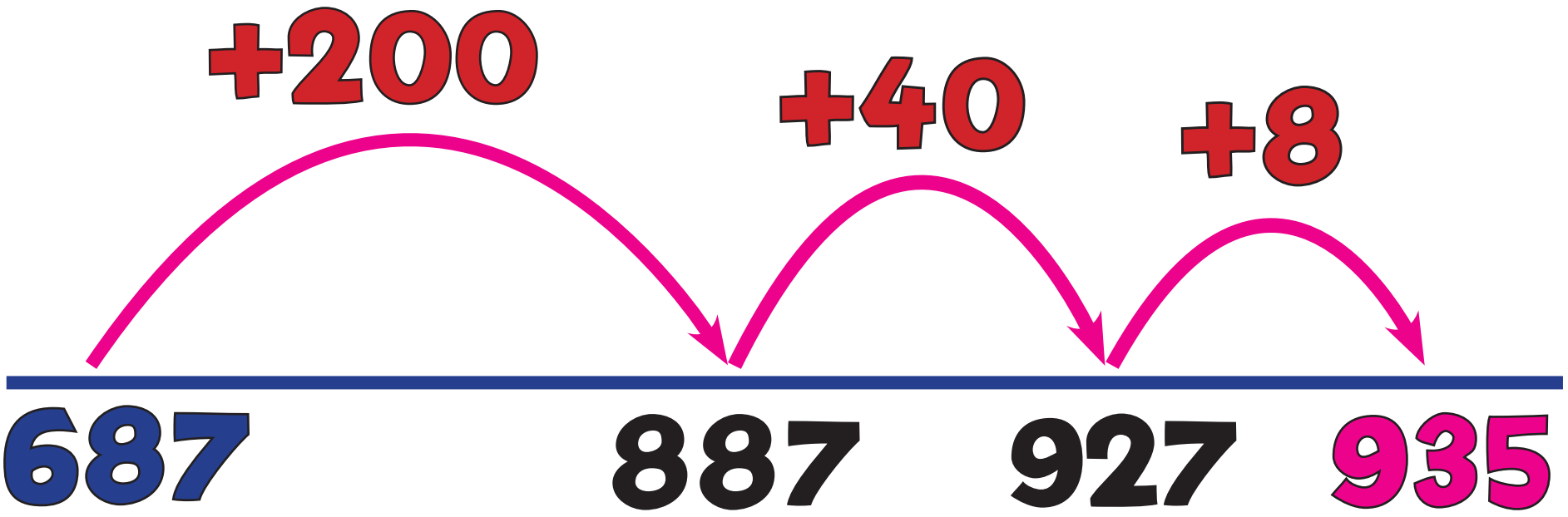


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A3d: Forwards Jump

3

687 + 248 = 935

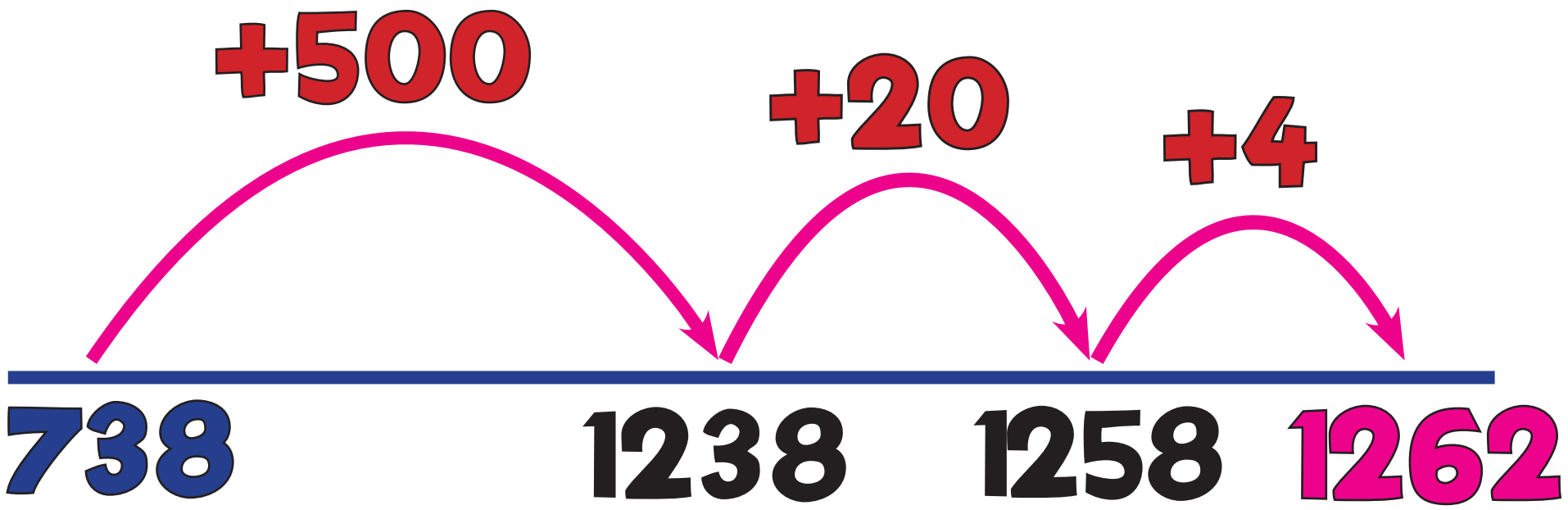


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A3e: Forwards Jump

3/4

738 + 524 = 1262

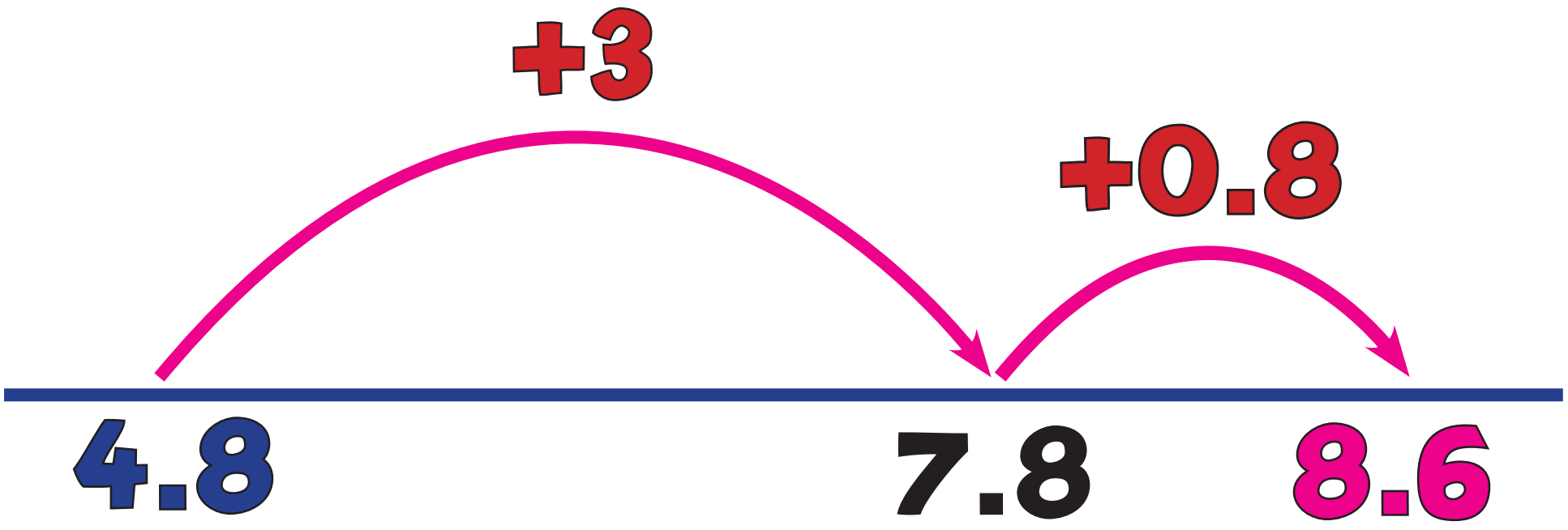


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A3h: Decimal Jump

5

4.8 + 3.8 = 8.6

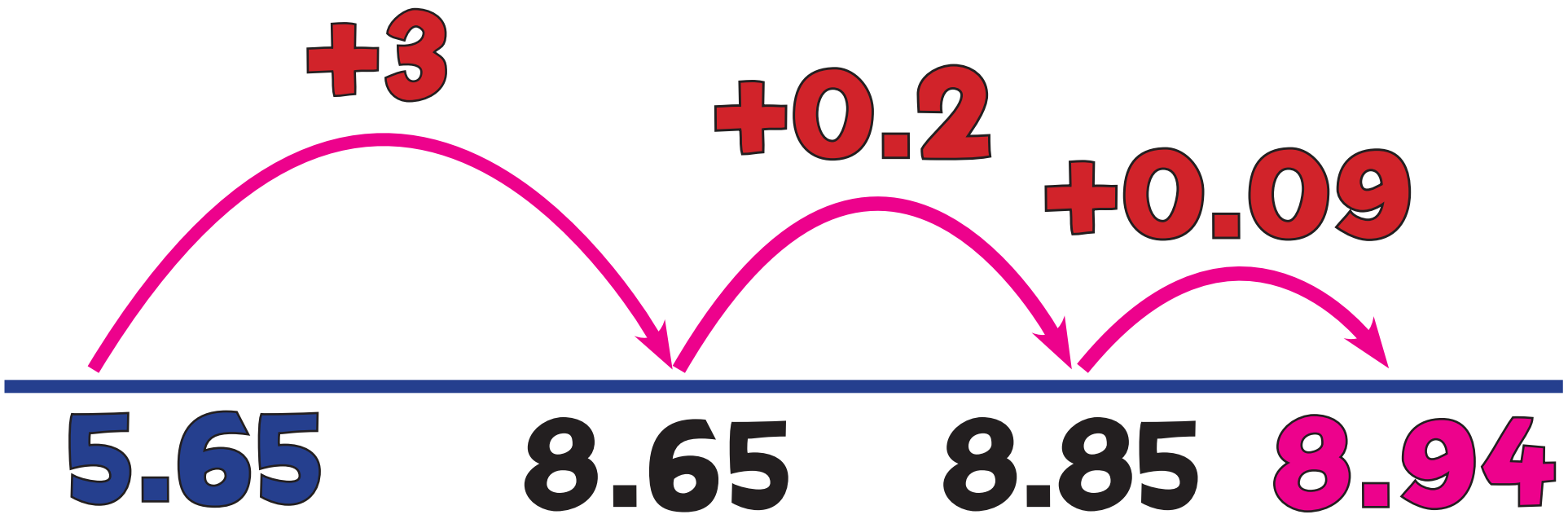


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A3i: Decimal Jump

5

5.65 + 3.29 = 8.94



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A4: Partitioning

2

$$43 + 24 = 67$$

$$40 + 20 = 60$$

$$3 + 4 = 7$$

$$67$$

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A4a: Partitioning

2

$$57 + 25 = 82$$

$$50 + 20 = 70$$

$$7 + 5 = 12$$

$$82$$

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A4b: Partitioning

2/3

$$75 + 52 = 127$$

$$70 + 50 = 120$$

$$5 + 2 = 7$$

$$120 + 7 = 127$$

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A4c: Partitioning

2/3

$$86 + 48 = 134$$

$$80 + 40 = 120$$

$$6 + 8 = 14$$

$$120 + 14 = 134$$

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A4d: Partitioning

3

687 + 248 = 935

600 + 200 = 800

80 + 40 = 120

7 + 8 = 15

935

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A4e: Partitioning

3/4

738 + 524 = 1262

700 + 500 = 1200

30 + 20 = 50

8 + 4 = 12

1262

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A4h: Partitioning

5

$$4.8 + 3.8 = 8.6$$

$$4 + 3 = 7$$

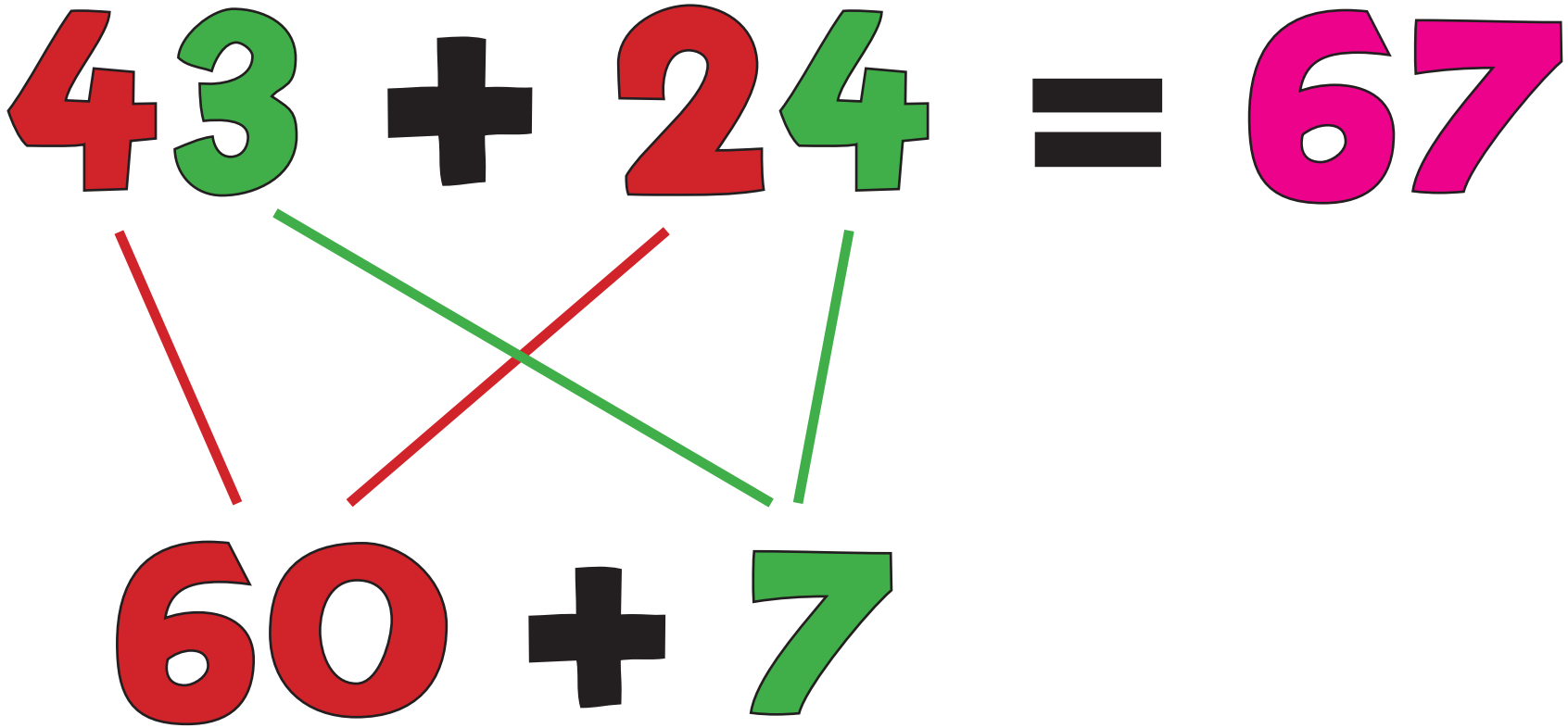
$$0.8 + 0.8 = 1.6$$

$$8.6$$

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A5: Partition Jot

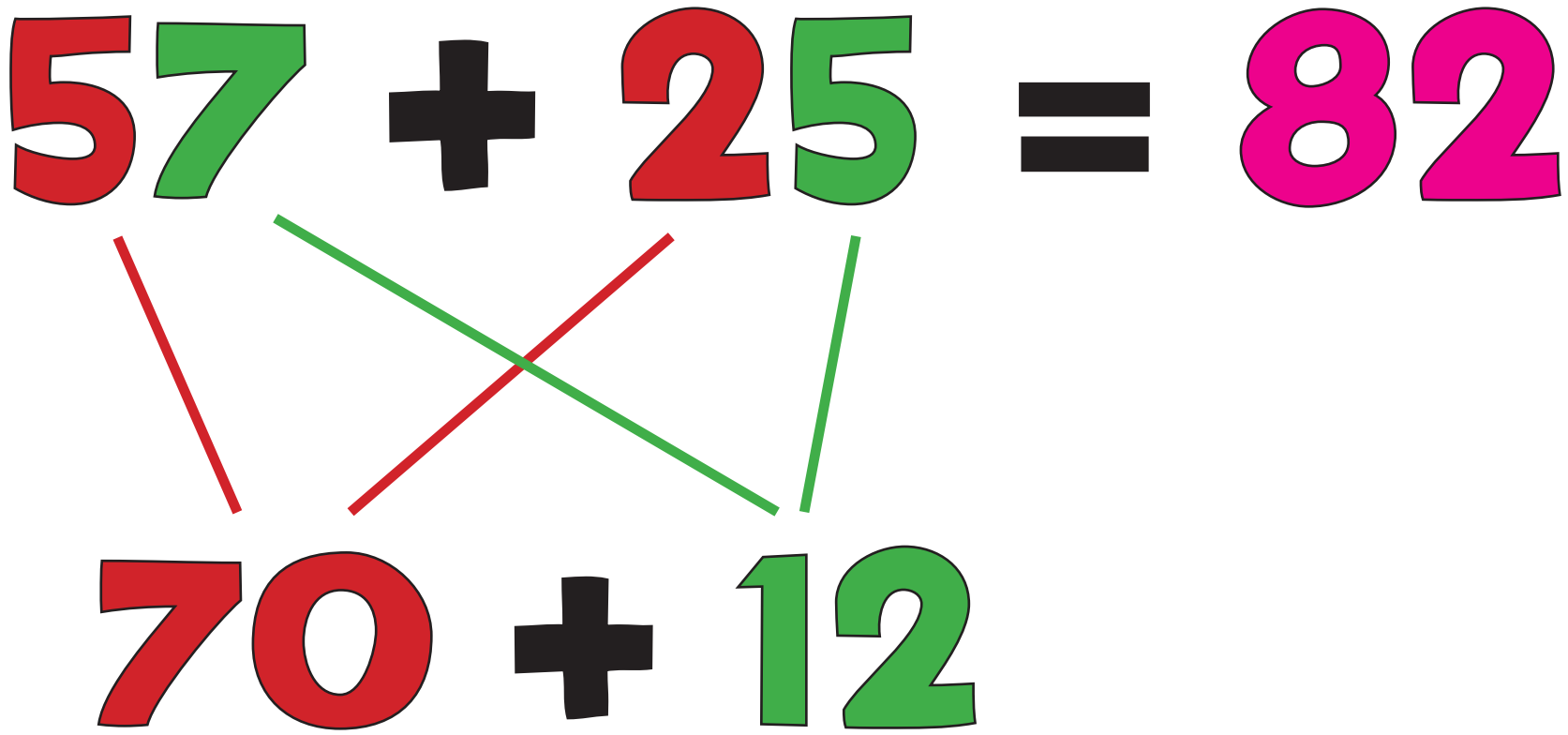
2



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A5a: Partition Jot

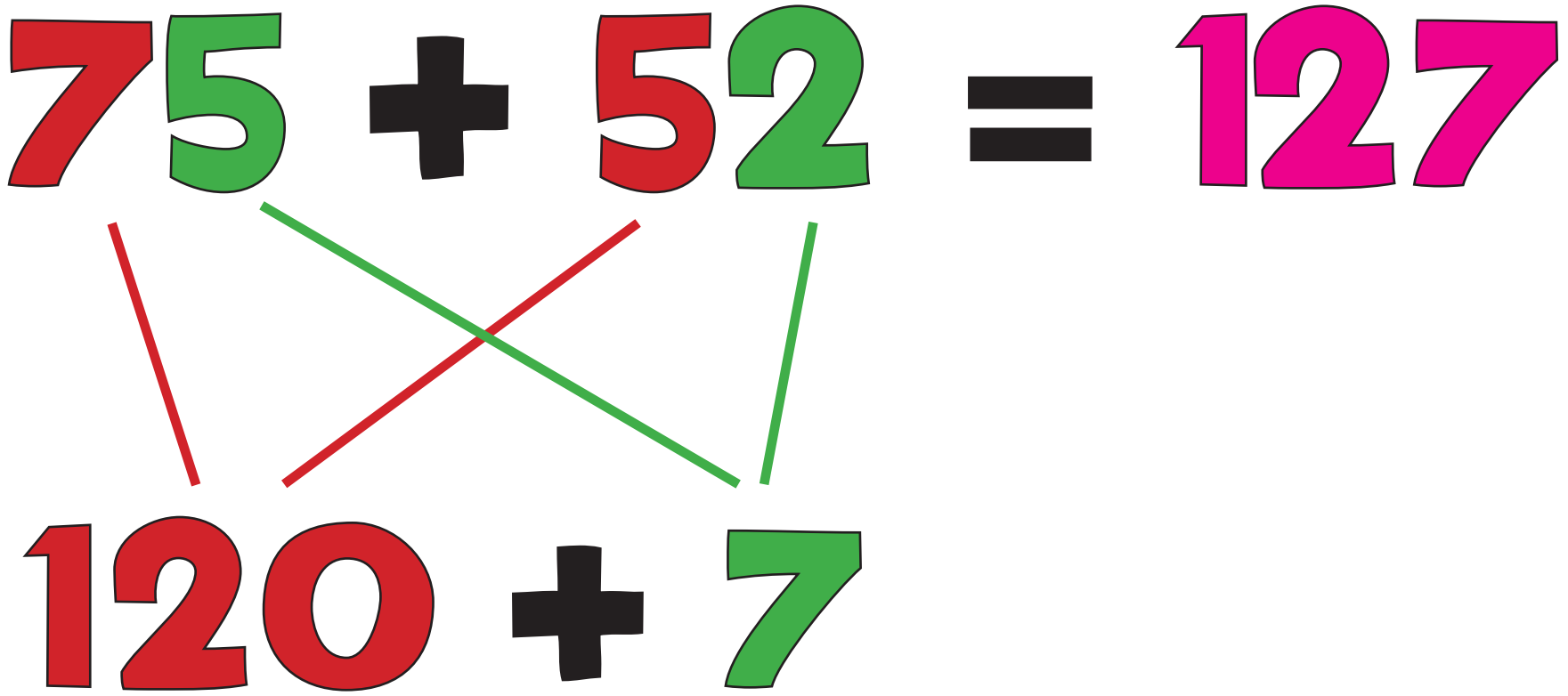
2



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A5b: Partition Jot

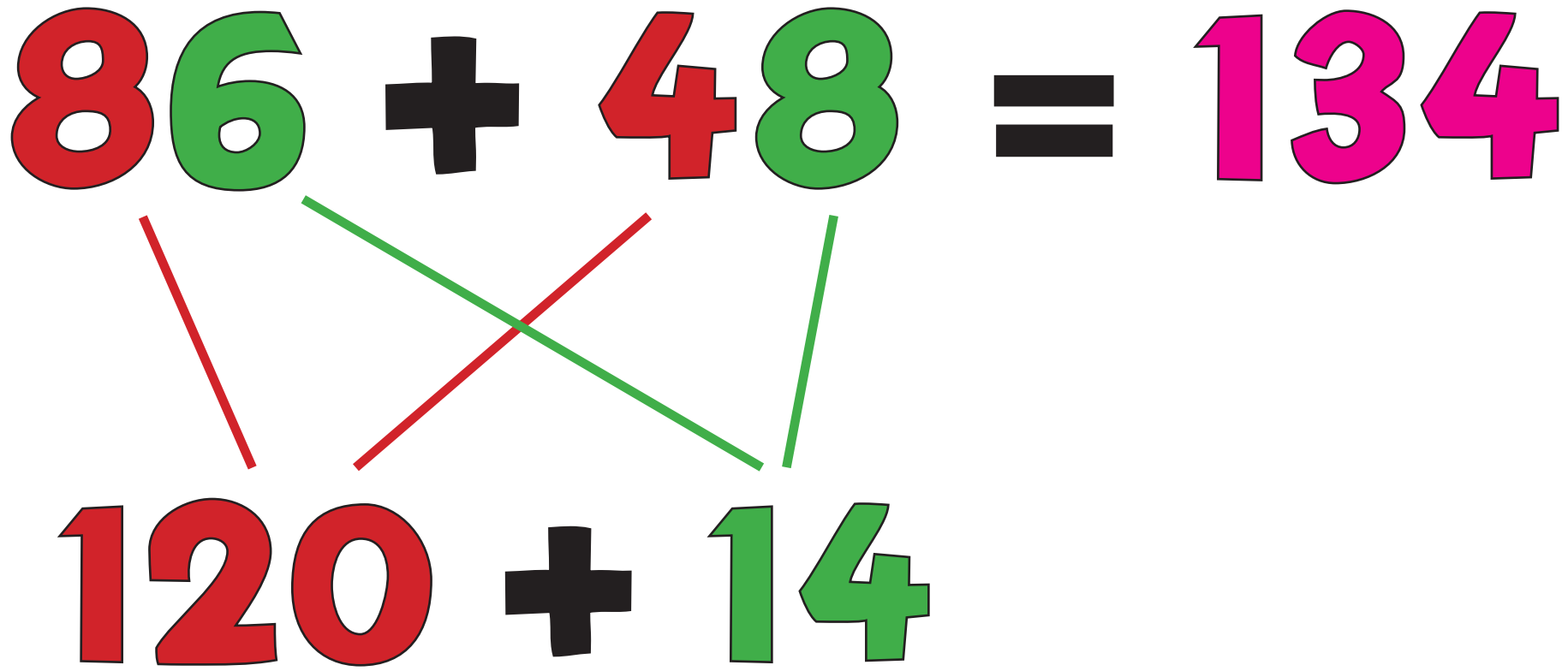
2/3



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A5c: Partition Jot

2/3

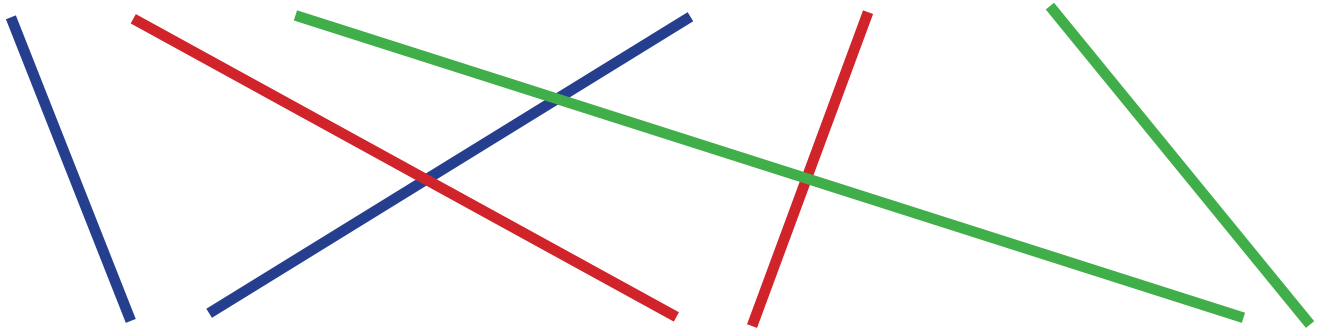


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A5d: Partition Jot

3

687 + 248 = 935



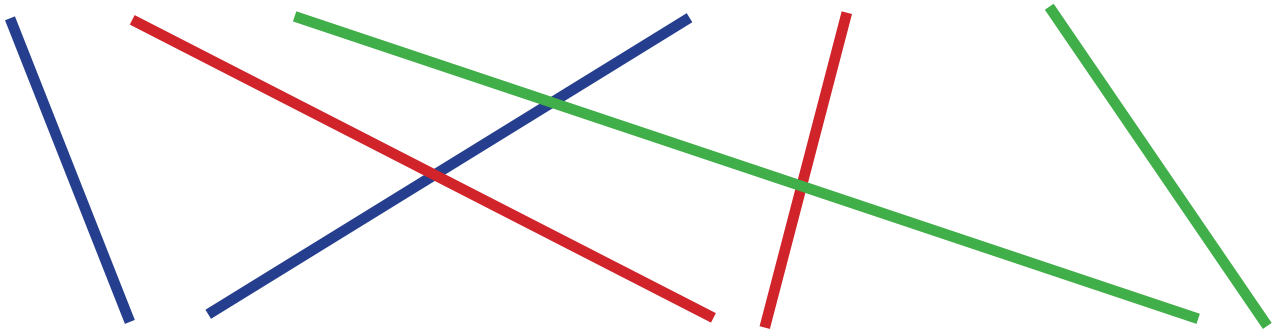
800 + 120 + 15

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A5e: Partition Jot

3/4

738 + 524 = 1262



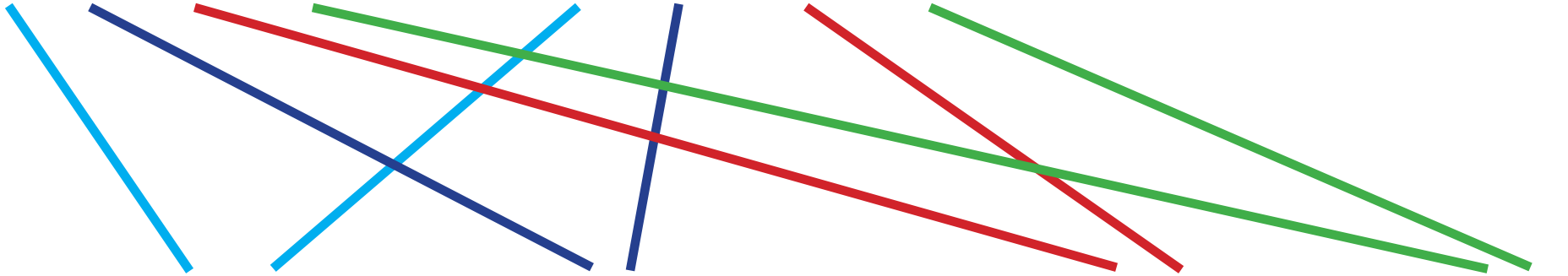
1200 + 50 + 12

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A5f: Partition Jot

4

4873 + 3762 = 8635



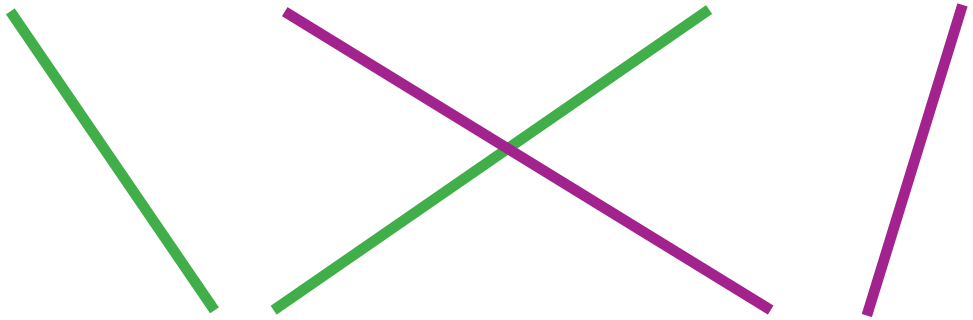
7000 + 1500 + 130 + 5

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A5h: Partition Jot

5

$$4.8 + 3.8 = 8.6$$

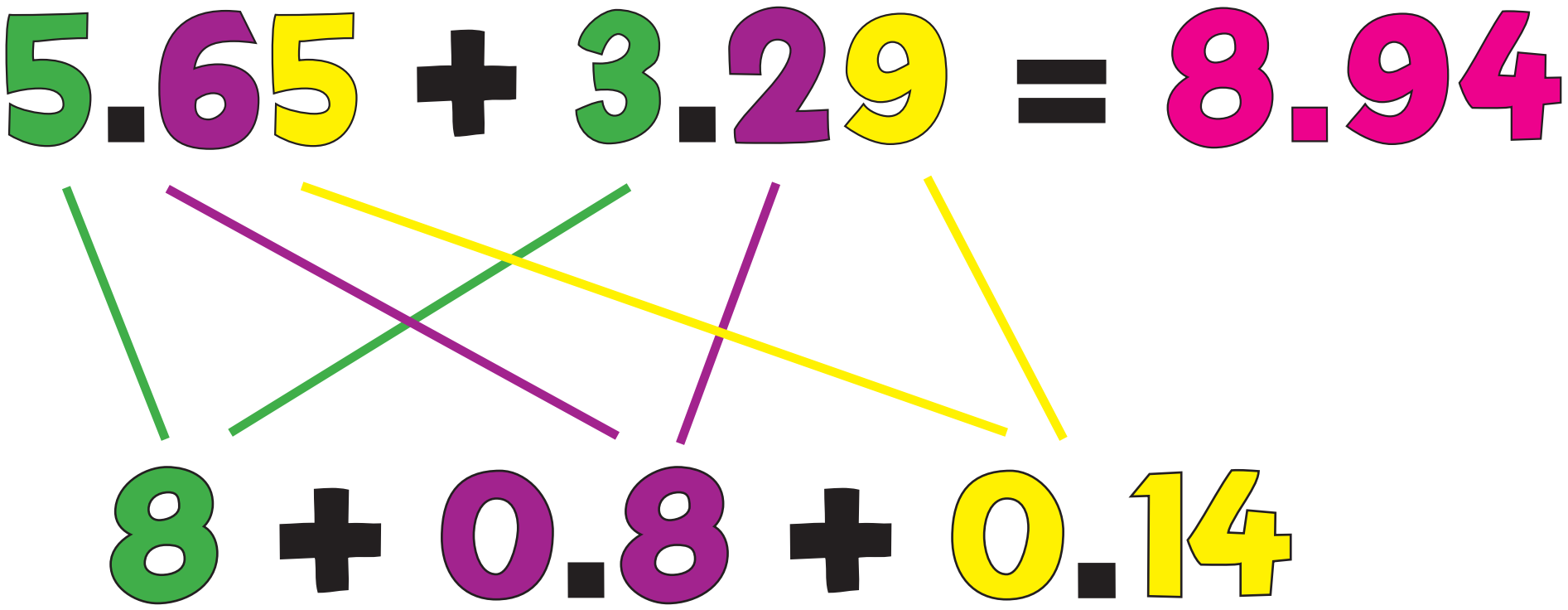


$$7 + 1.6$$

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A5i: Partition Jot

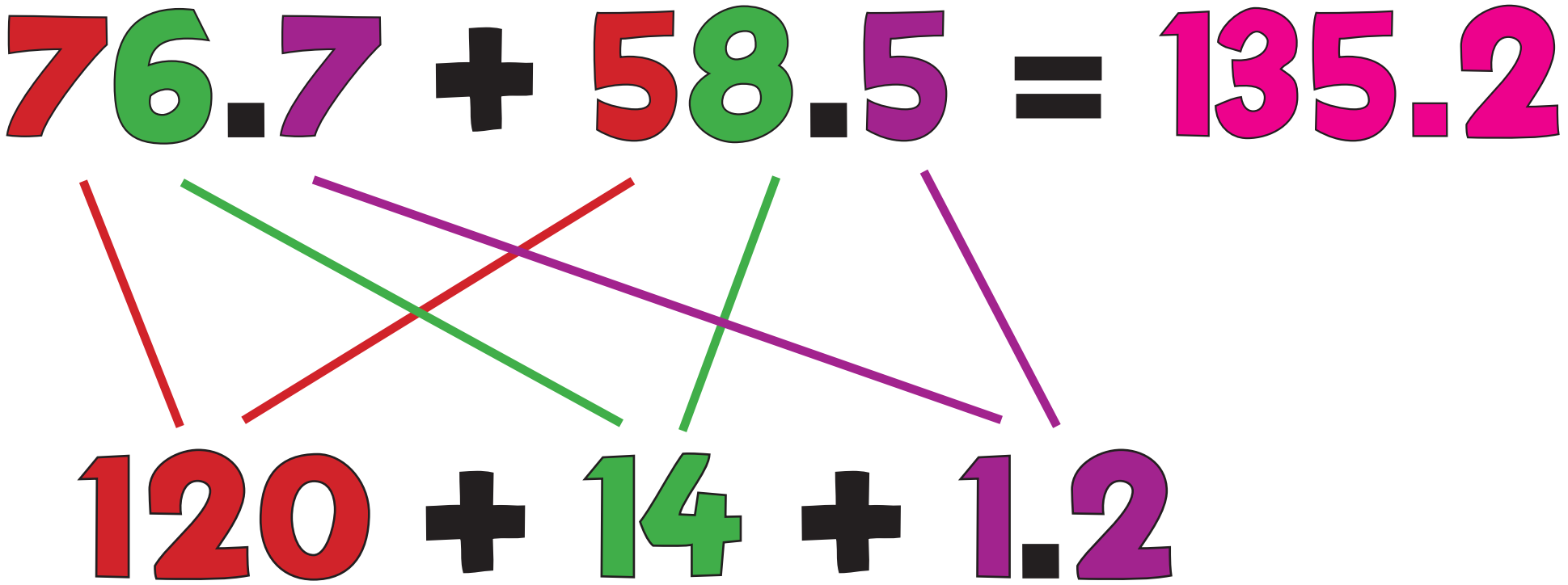
5



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A5 j: Partition Jot

5

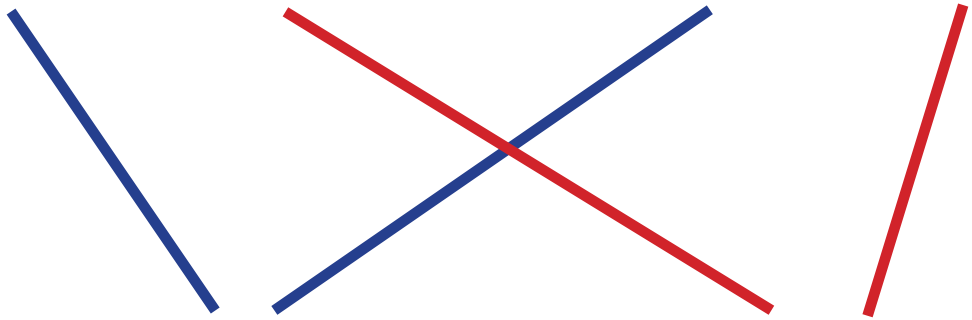


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A5k: Partition Jot

5

£38.25 + £27.46 = £65.71



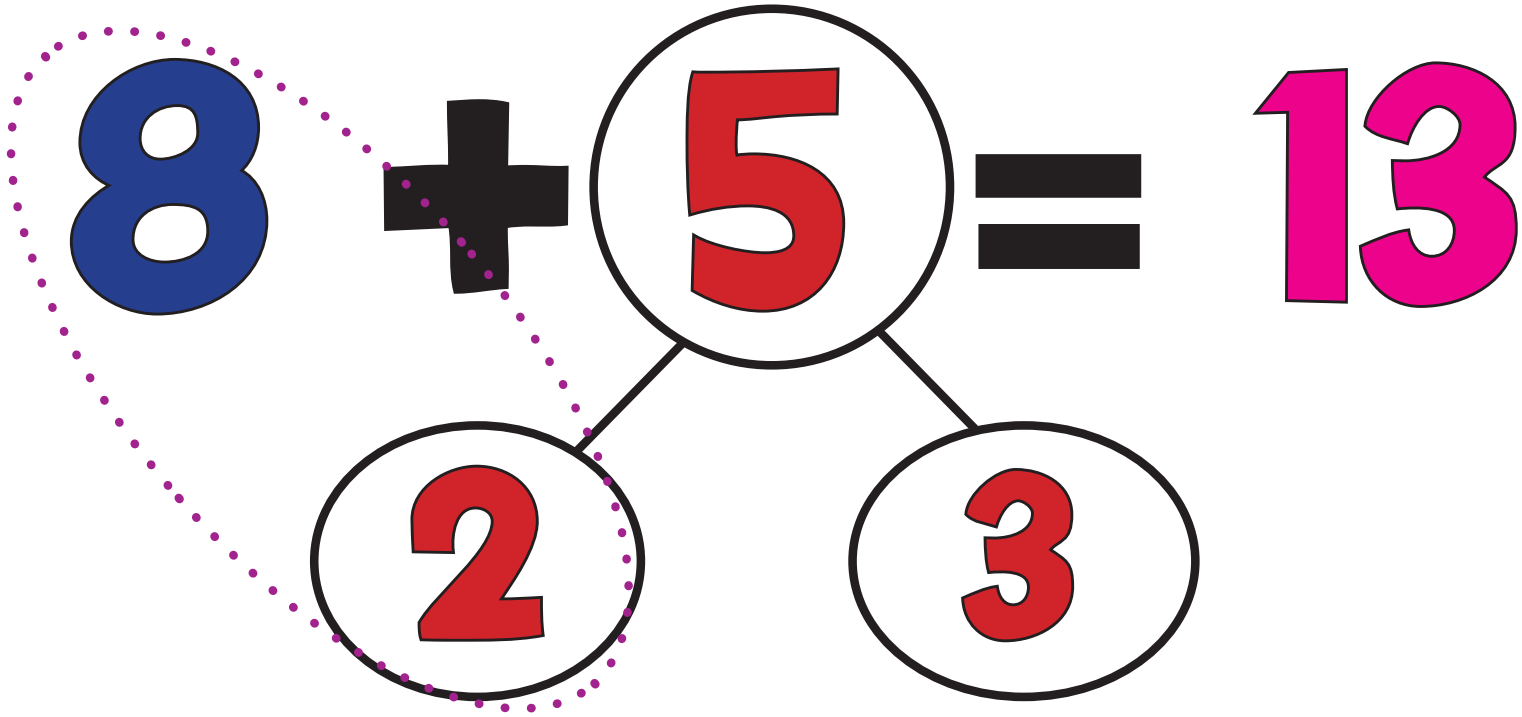
£65.00 + £0.71

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A6: Part/Whole

1

Partitioning One Addend



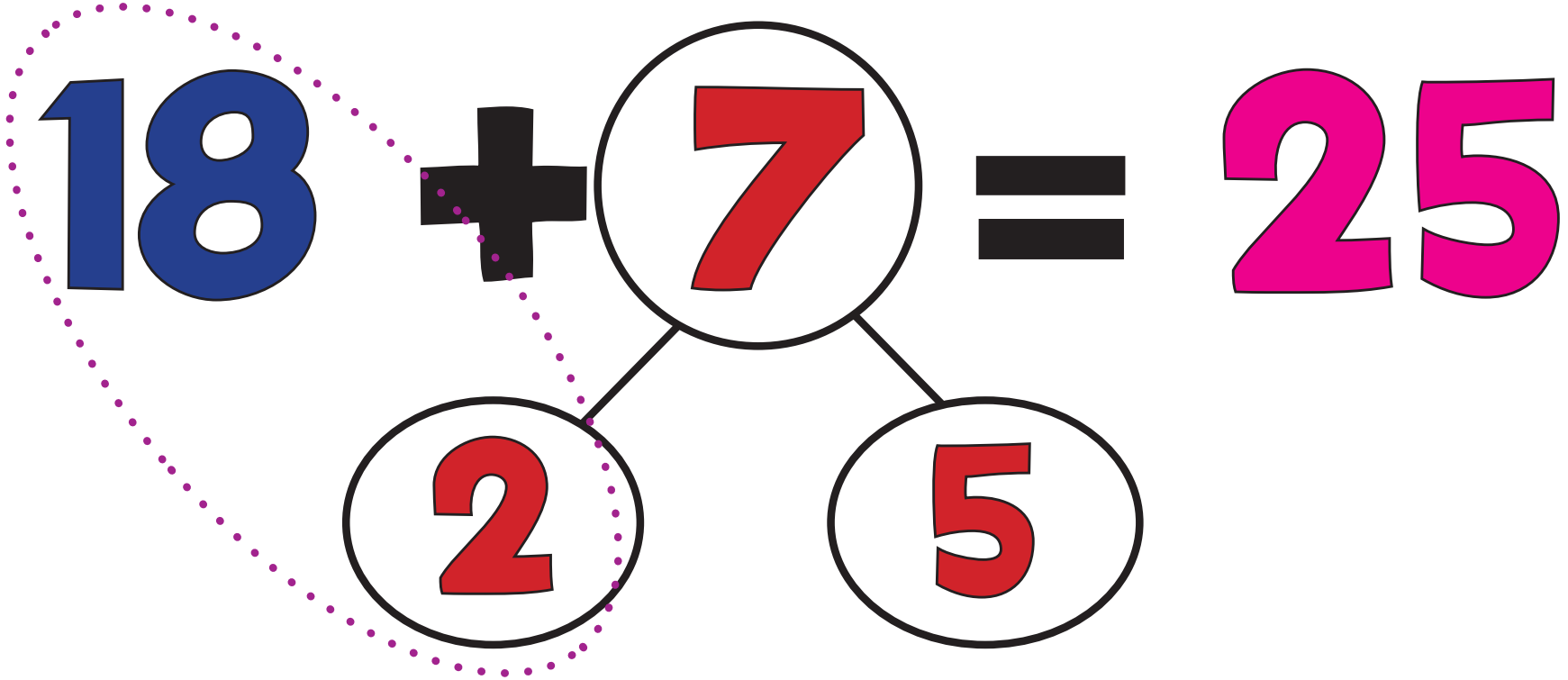
10 + 3 = 13

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A6: Part/Whole

1

Partitioning One Addend



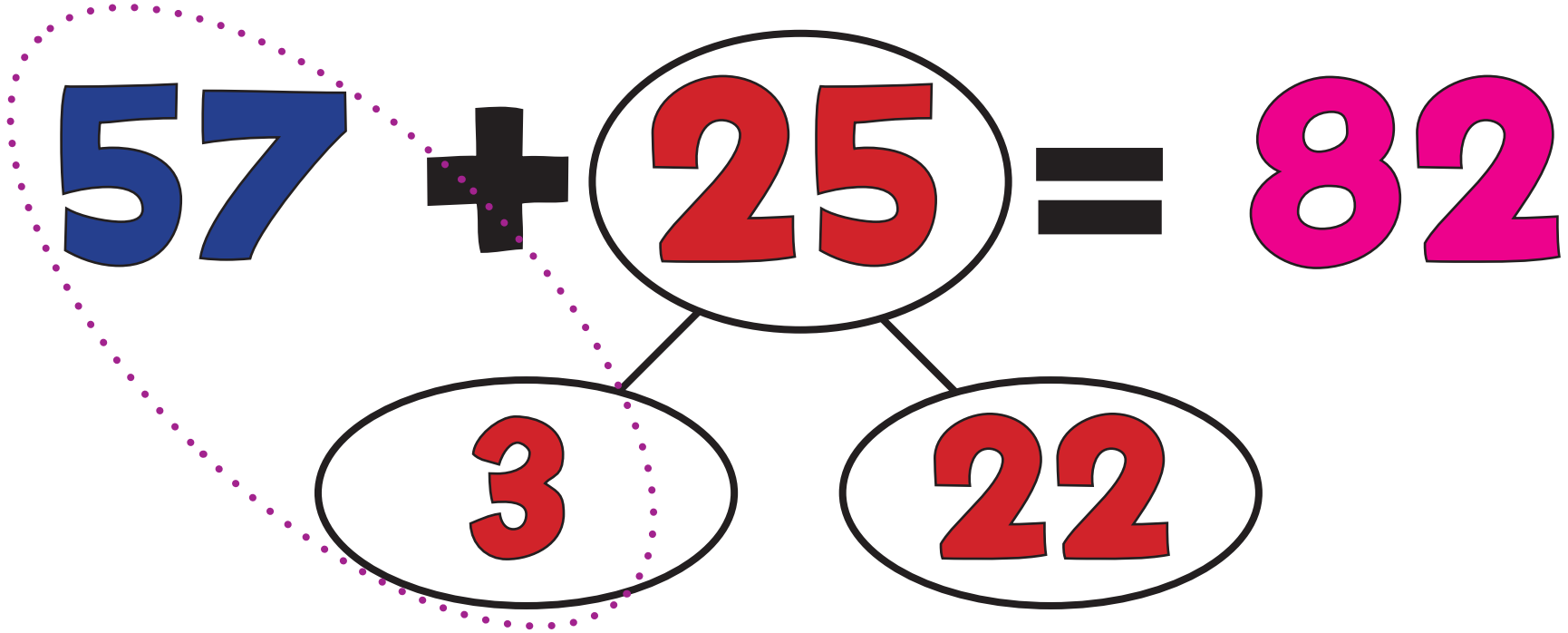
20 + 5 = 25

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A6a: Part/Whole

2

Partitioning One Addend



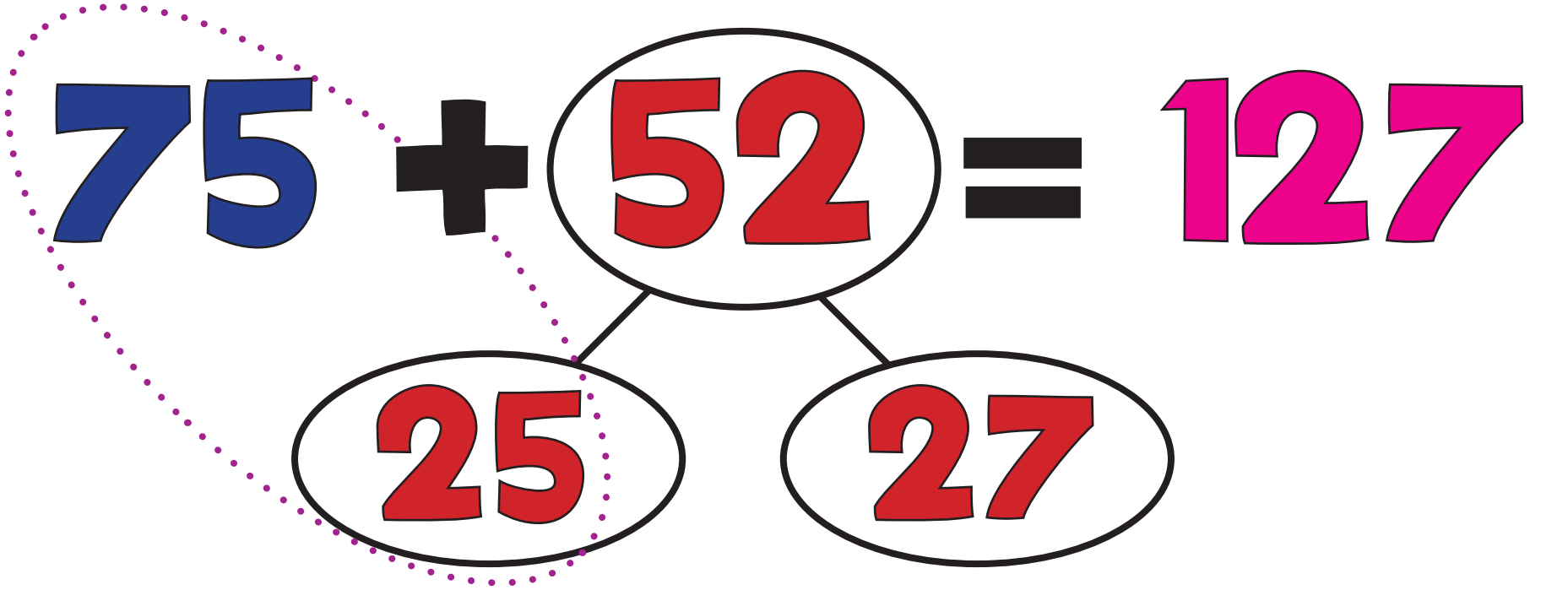
60 + 22 = 82

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A6b: Part/Whole

2/3

Partitioning One Addend



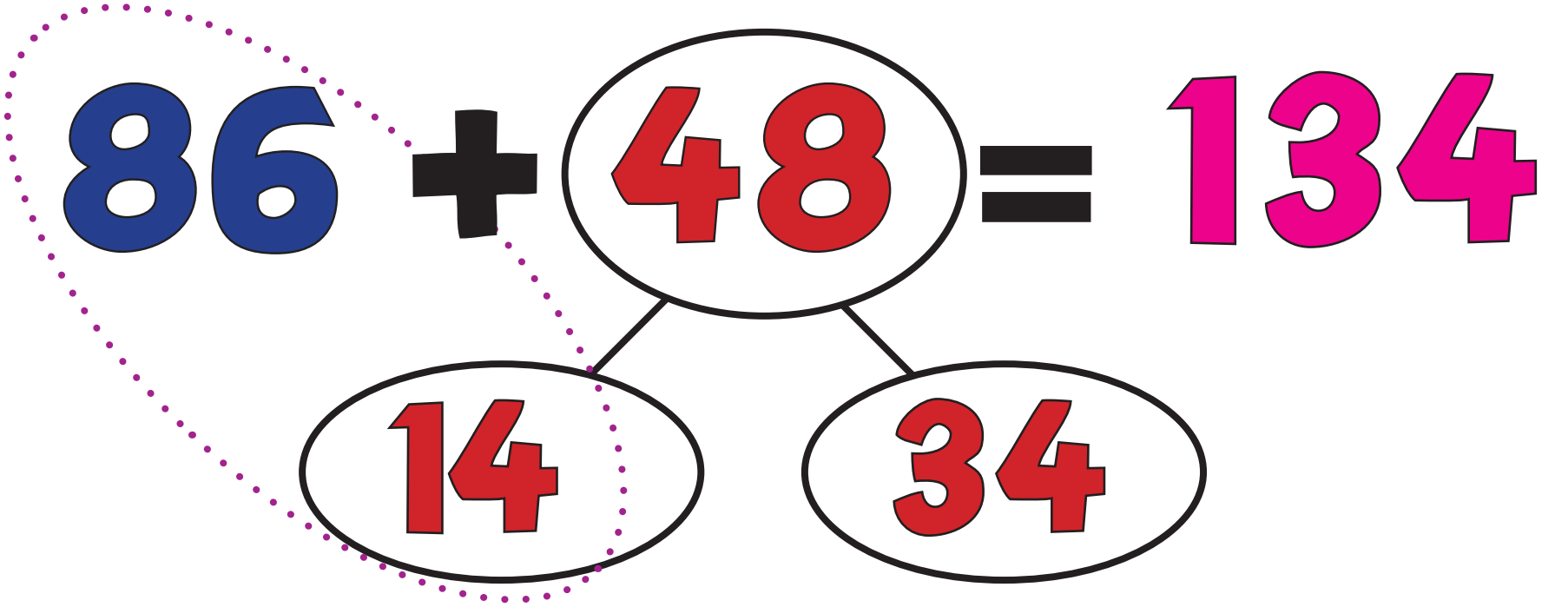
100 + 27 = 127

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A6c: Part/Whole

2/3

Partitioning One Addend



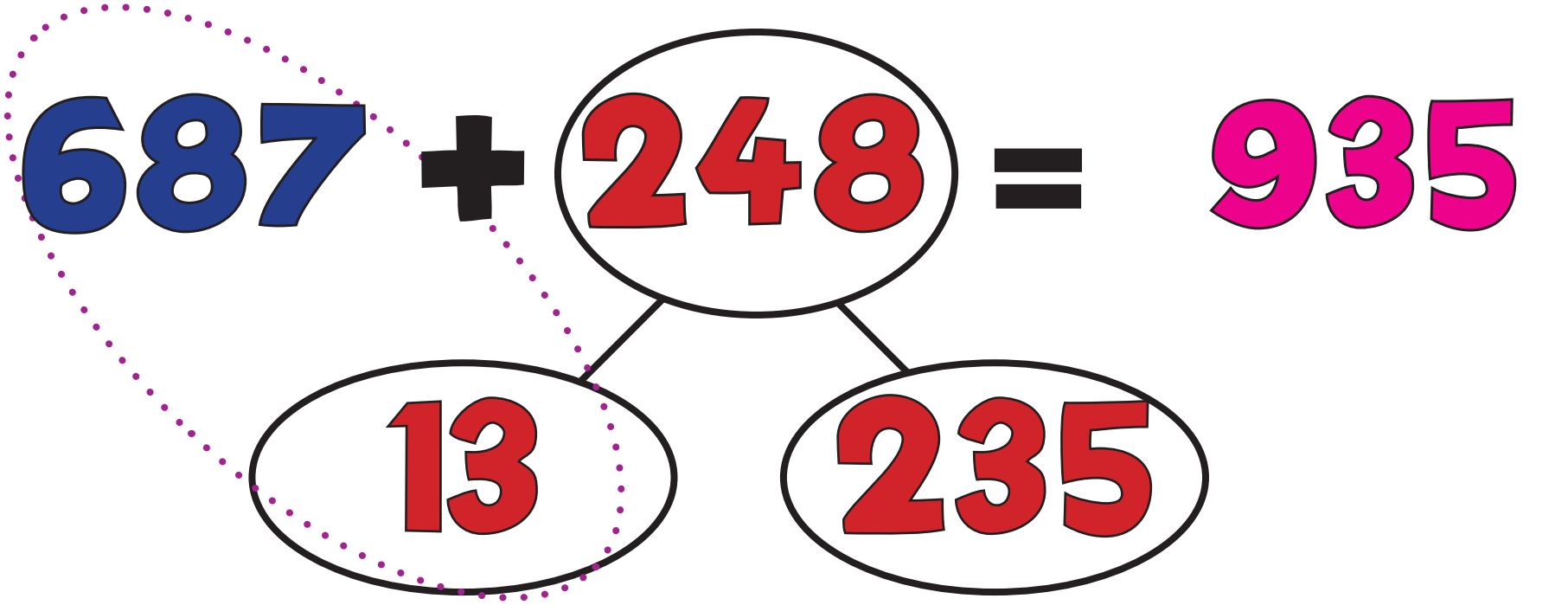
100 + 34 = 134

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A6d: Part/Whole

3

Partitioning One Addend



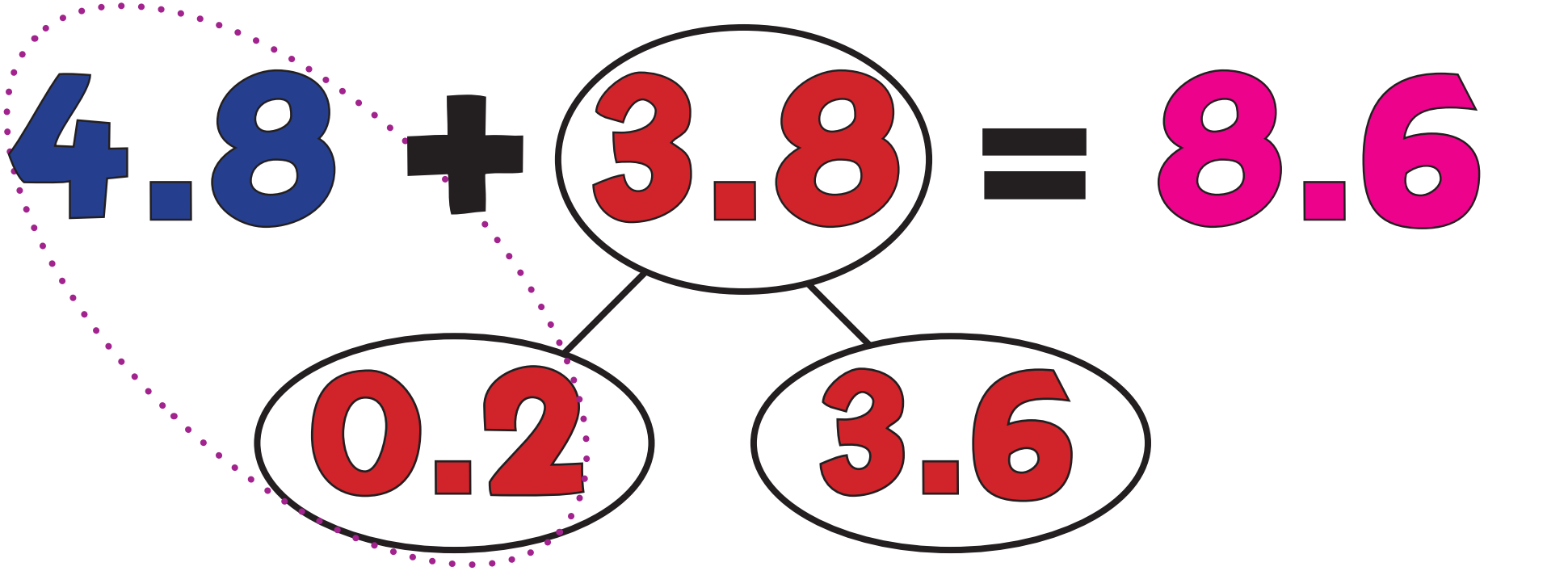
700 + 235 = 935

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A6h: Part/Whole

5

Partitioning One Addend



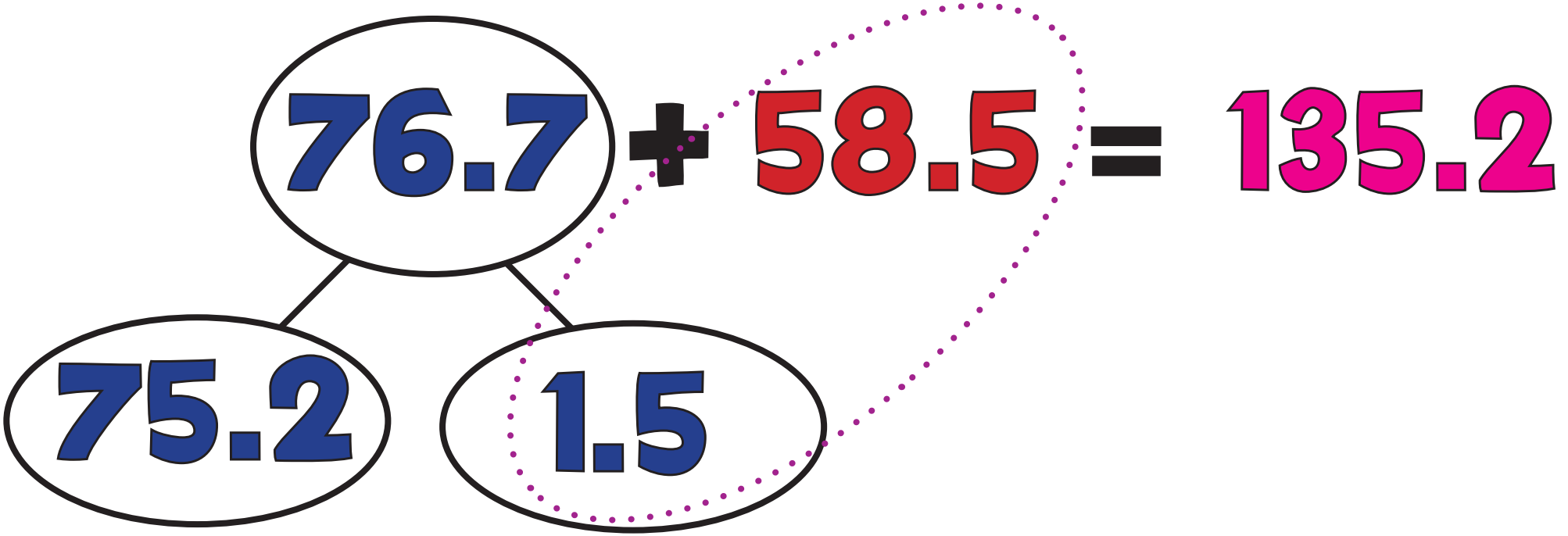
5 + 3.6 = 8.6

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A6 j: Part/Whole

5

Partitioning One Addend



75.2 + 60 = 135.2

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A7: Expanded Column

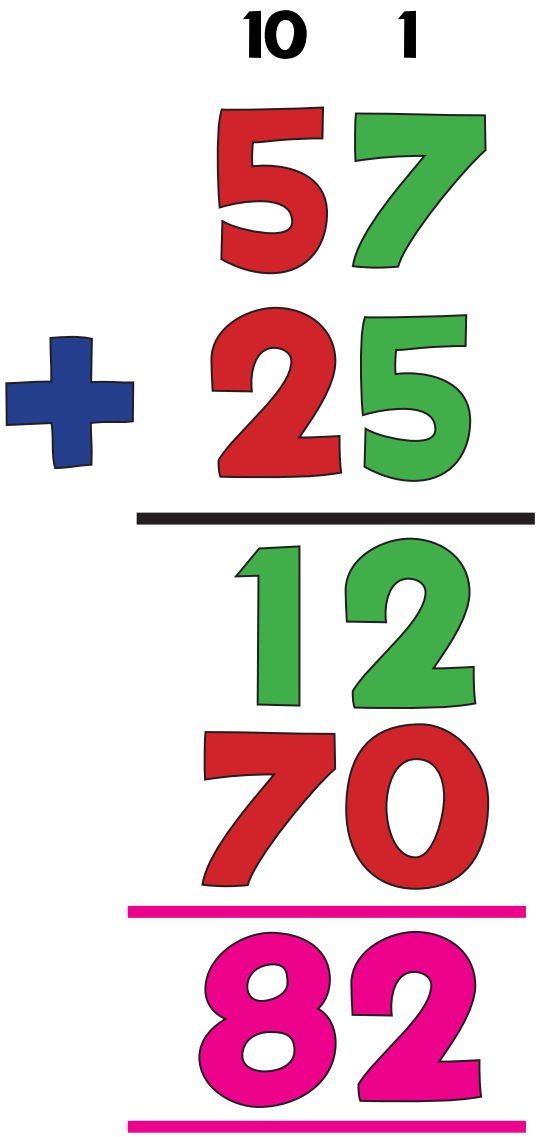
2 Addition

	10	1
	40	3
+	20	4
	60	7
	67	

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A7a: Expanded Column Addition

2



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A7b: Expanded Column Addition

2/3

	10	1
	7	5
+	5	2
		7
	120	
	127	

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A7c: Expanded Column Addition

2/3

	100	10	1
		8	6
+		4	8
		1	4
	1	2	0
	1	3	4

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A7d: Expanded Column Addition

3

	100	10	1
	6	8	7
+	2	4	8
		1	5
	1	2	0
	8	0	0
	9	3	5

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A7e: Expanded Column Addition

3

1000	100	10	1
	7	3	8
+	5	2	4
		1	2
		5	0
1	2	0	0
1	2	6	2

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A8: Column Addition

2

10	1
4	3
+ 2	4
6	7

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A8a: Column Addition

2

10	1
5	7
+ 2	5
8	2
1	

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A8b: Column Addition

2/3

100	10	1
	7	5
+	5	2
1	2	7
1		

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A8c: Column Addition

2/3

100	10	1
	8	6
+	4	8
1	3	4
1	1	

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A8d: Column Addition

3

	100	10	1
	6	8	7
+	2	4	8
	9	3	5
	1	1	

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A8e: Column Addition

3

100	10	1
7	3	8
+ 5	2	4
1	2	6	2
1		1	

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A8f: Column Addition

4

$$\begin{array}{r} 4873 \\ +\ 3762 \\ \hline 8635 \\ \hline 1\ \ 1 \end{array}$$

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A8g: Column Addition

5

$$
\begin{array}{r}
787567 \\
+\ 446278 \\
\hline
1238345 \\
\hline
1\ 1\ 1\ \ \ 1\ 1
\end{array}
$$

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A8h: Column Addition

5

$$\begin{array}{r} {\scriptstyle 1} \quad {\scriptstyle \frac{1}{10}} \\ 4.8 \\ +\ 3.8 \\ \hline 8.6 \\ \hline 1 \end{array}$$

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A8i: Column Addition

5

1	.	$\frac{1}{10}$	$\frac{1}{100}$
5	.	6	5
+ 3	.	2	9
8	.	9	4
1			

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A8 j: Column Addition

5

10	1	.	$\frac{1}{10}$
	76	.	7
+	58	.	5
1	35	.	2
1	1		1

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A8k: Column Addition

5

With Money

	£	38	.25
+	£	27	.46
	£	65	.71
		1	1

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A8l: Column Addition

5

With Decimals

73.4 + 5.67 = 79.07

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	7	3	.	4
+	5	.	6	7
7	9	.	0	7
	1			

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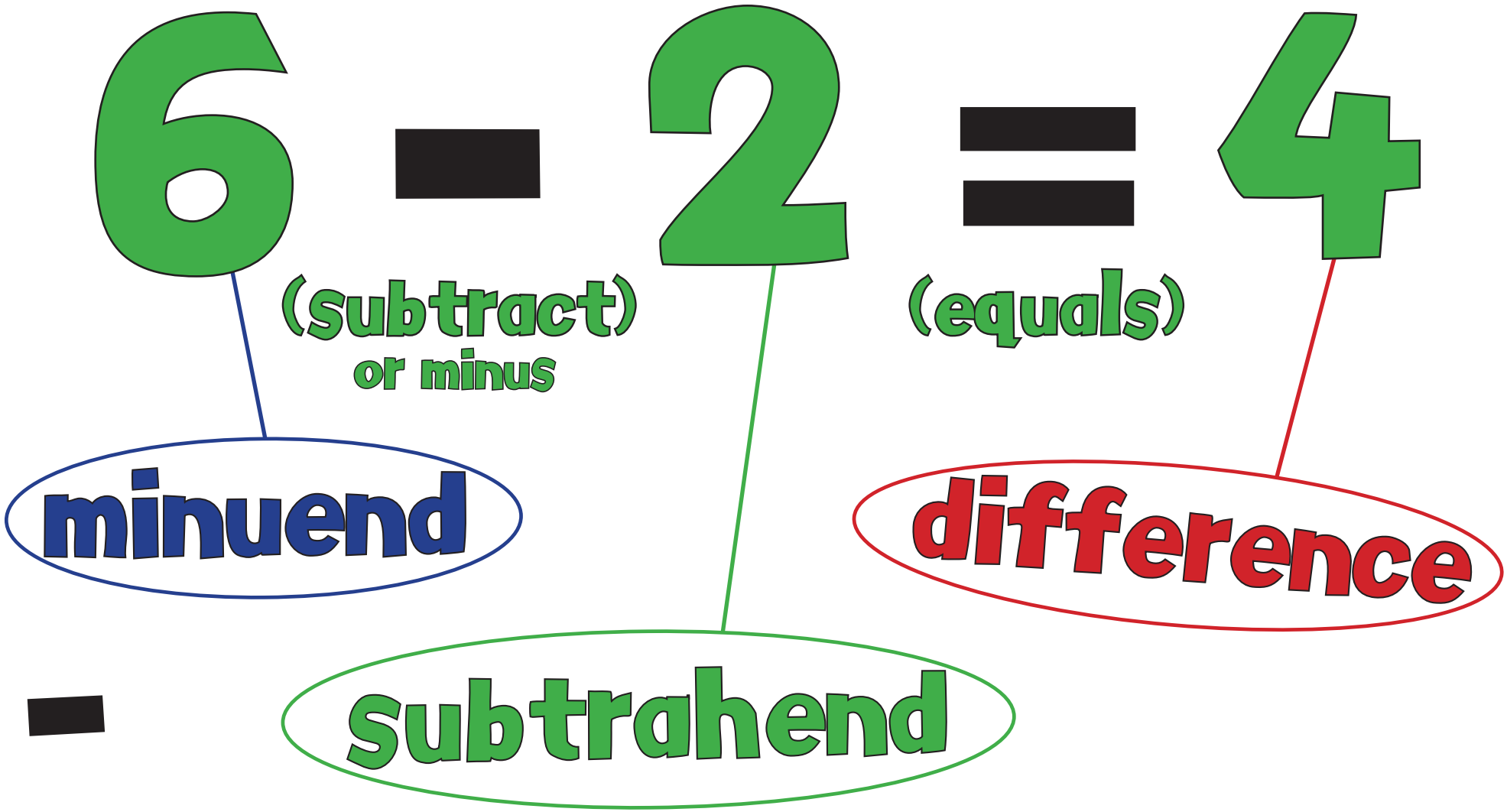
Subtraction Strategies

105		Calculation & Vocabulary
107	S1	Objects and Pictures
110	S2	Counting Back
112	S3	Counting On
114	S4	Backwards Bounce
116	S5	Backwards Jump
118	S6	10s Jump, 1s Jump
127	S7	Triple Jump
136	S8	Part/Whole (Minuend)
144	S9	Part/Whole (Subtrahend)
152	S10	Expanded Column
158	S11	Column Subtraction



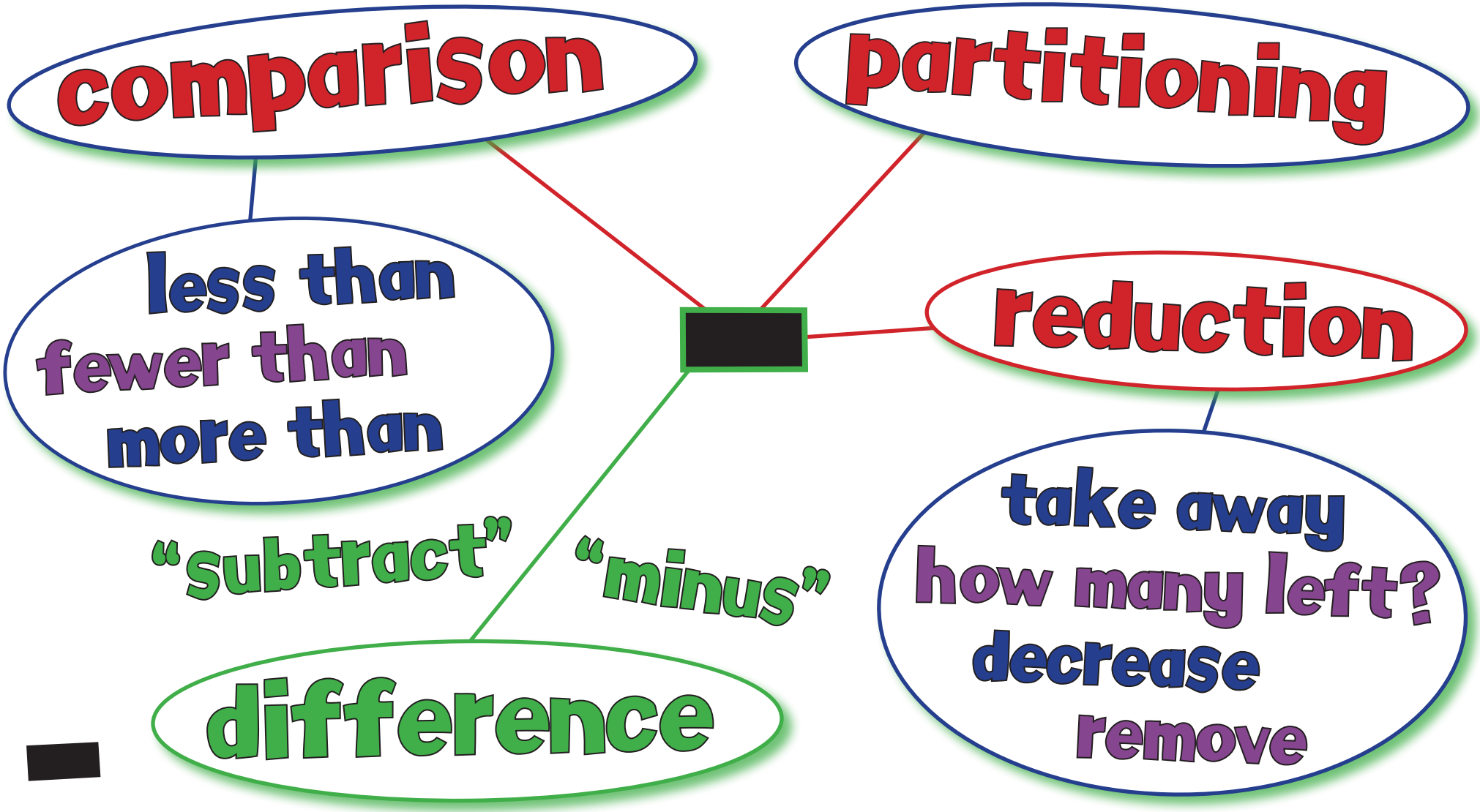
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Subtraction Calculation



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Subtraction Vocabulary



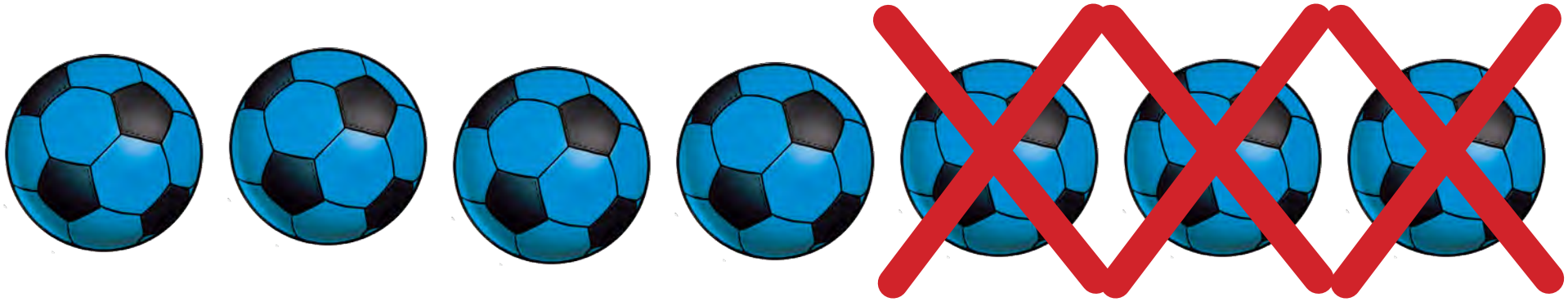
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S1: Objects & Pictures

1

Removing Items (Taking Away)

"There were 7 footballs in the PE cupboard. 3 of them were taken out. How many were left in the cupboard? Answer: 4"



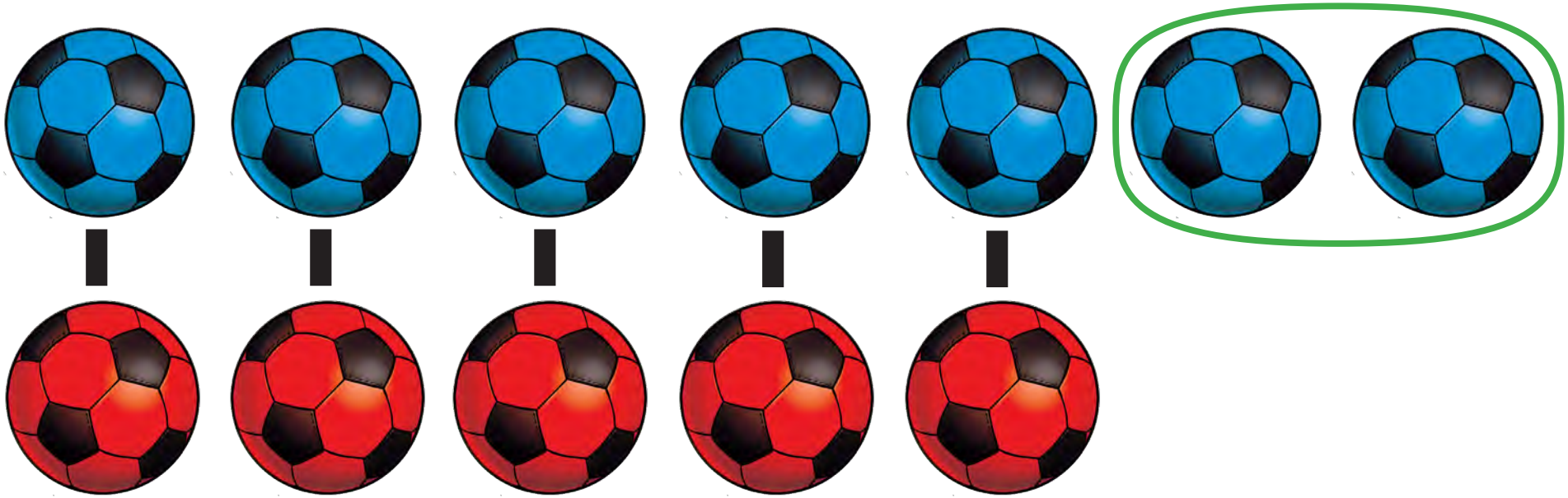
7 - 3 = 4

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S1a: Objects and Pictures

1

Comparing Sets



$$7 - 5 = 2$$

"There were 7 blue footballs and 5 red footballs? How many more blue footballs were there than red?" (What is the difference?)

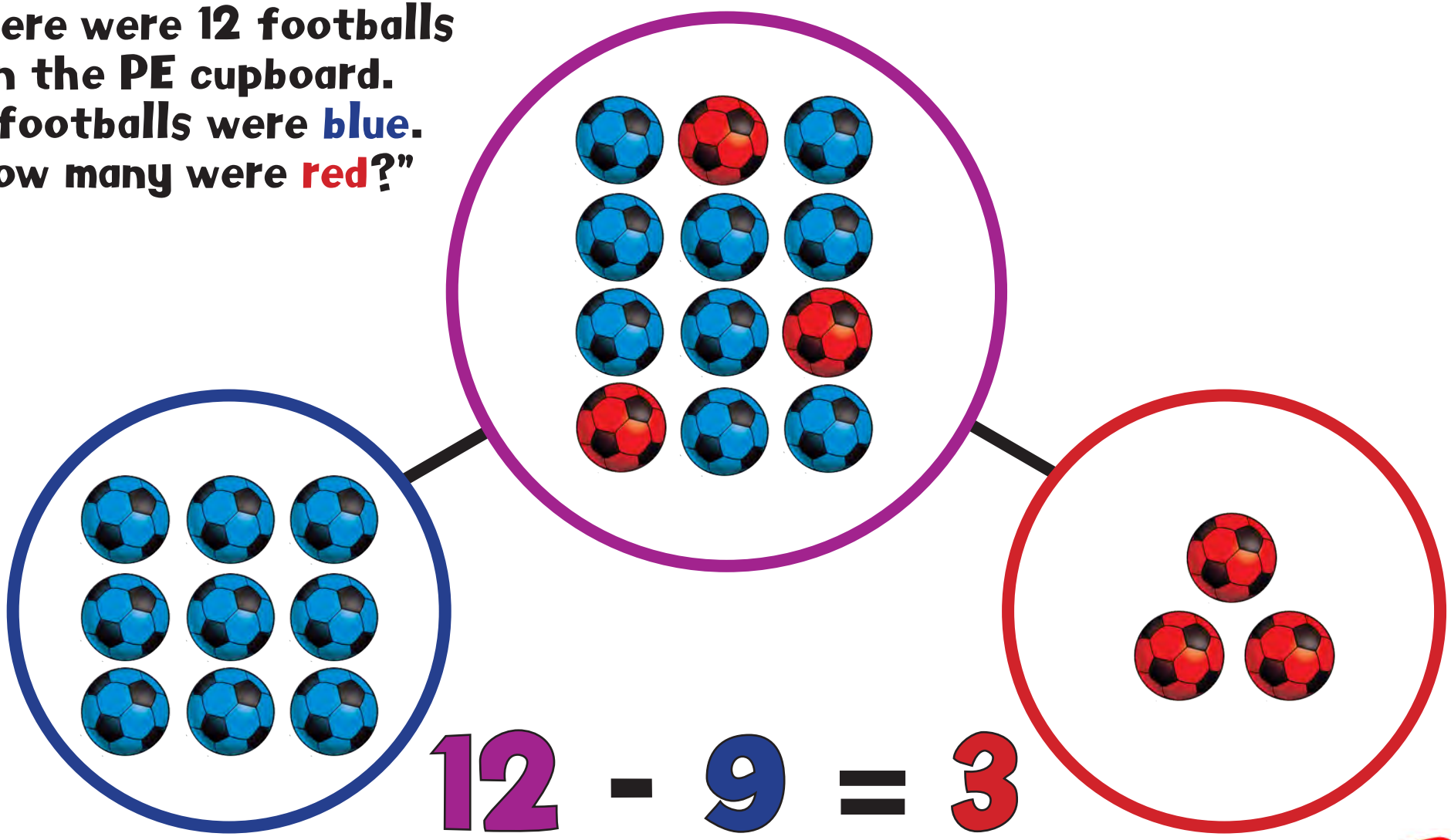
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S1b: Objects and Pictures

1

Part/Whole Model

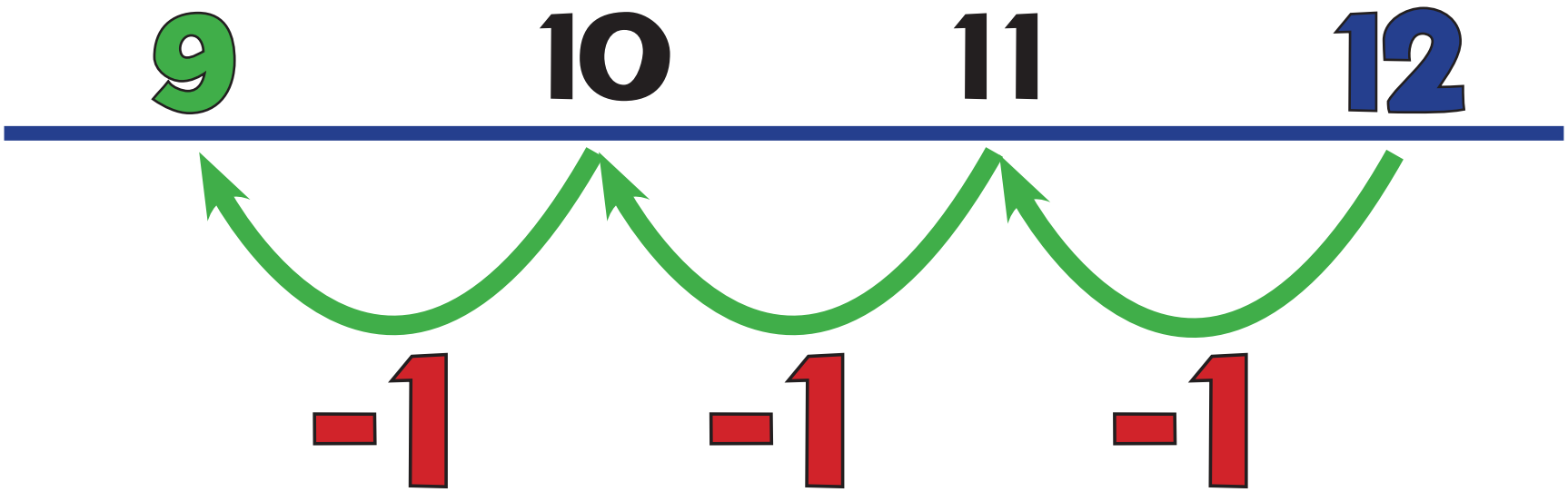
"There were 12 footballs
in the PE cupboard.
9 footballs were blue.
How many were red?"



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S2: Counting Back

1



12 - 3 = 9

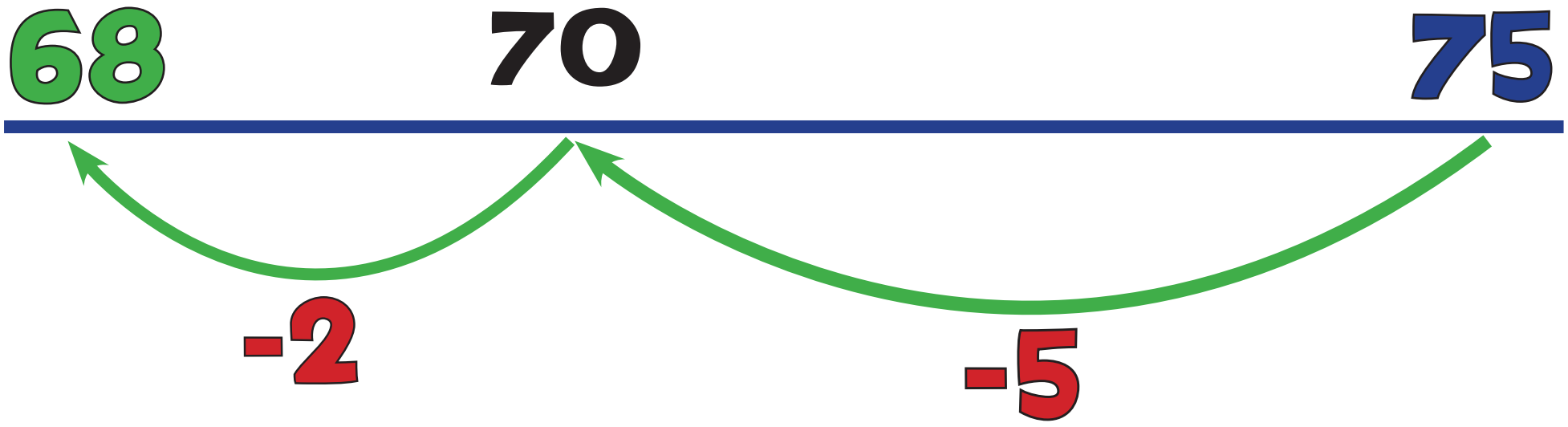
"What do I get if I take 3 away from 12? Answer: 9"

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S2a: Counting Back

2

Big Steps

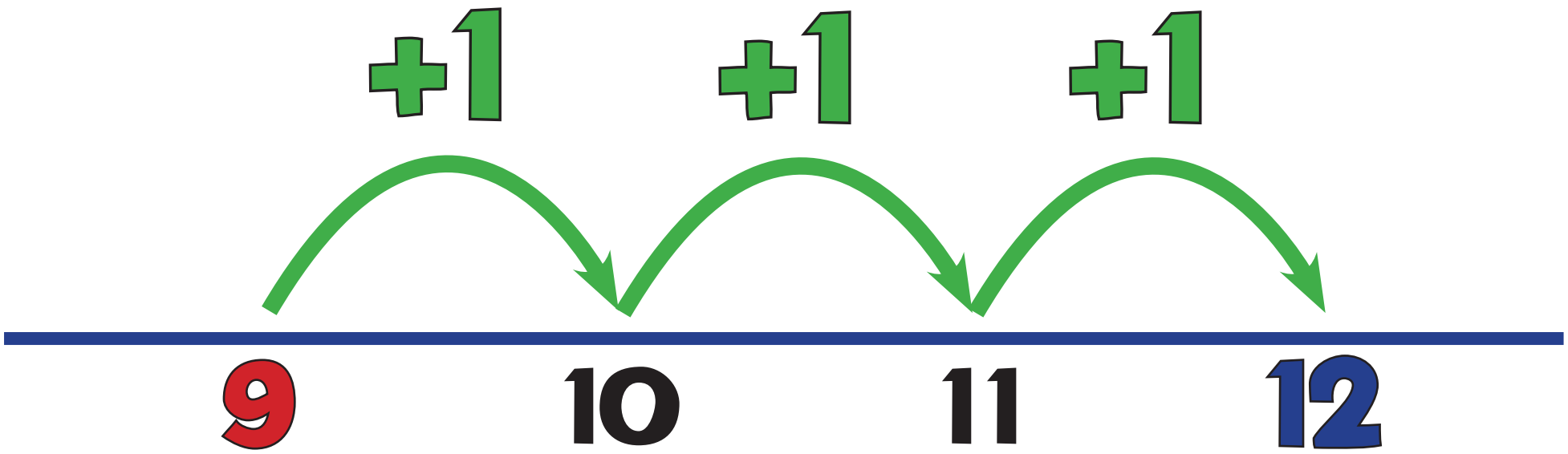


75 - 7 = 68

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S3: Counting On

1



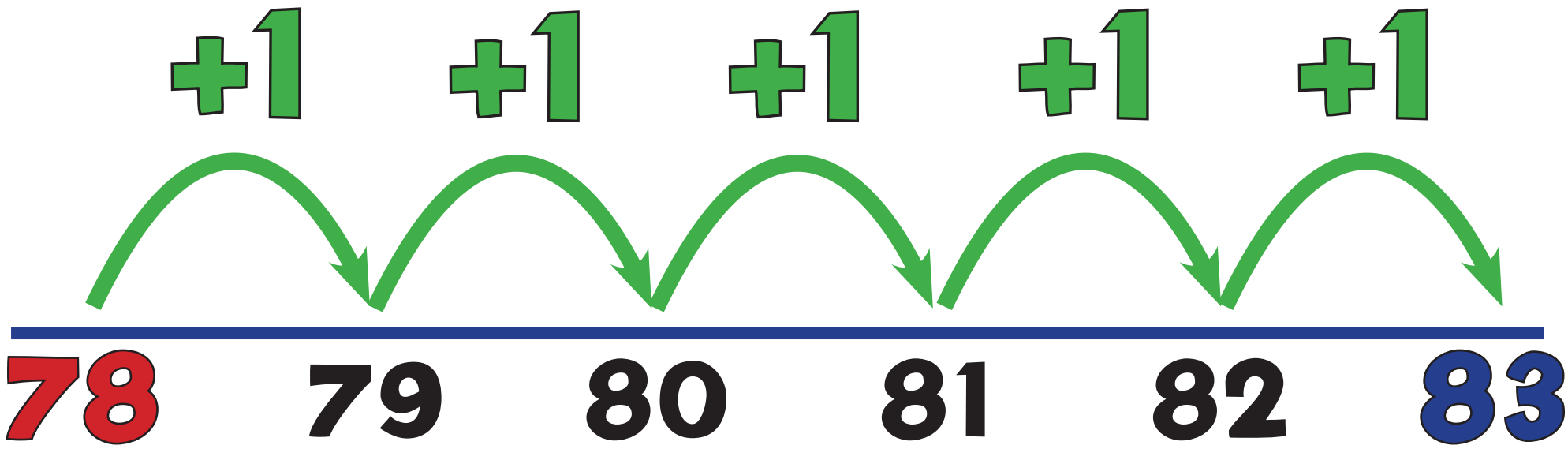
12 - 9 = 3

"How many more is 12 than 9? What is the difference?"

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S3a: Counting On

2



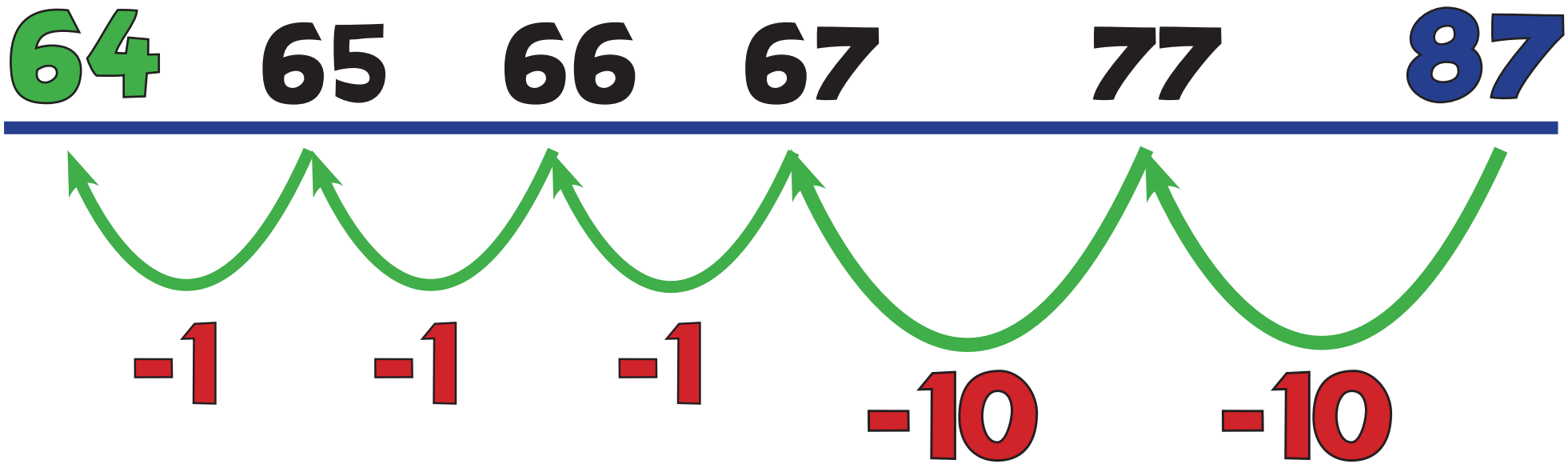
83 - 78 = 5

"How many more is 83 than 78? What is the difference?"

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S4: Backwards Bounce

2

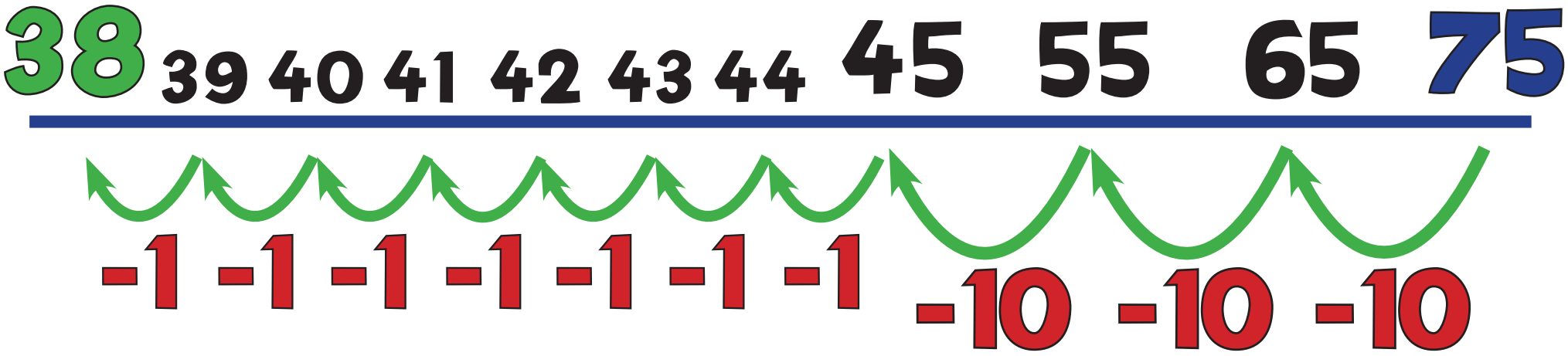


87 - 23 = 64

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S4a: Backwards Bounce

2

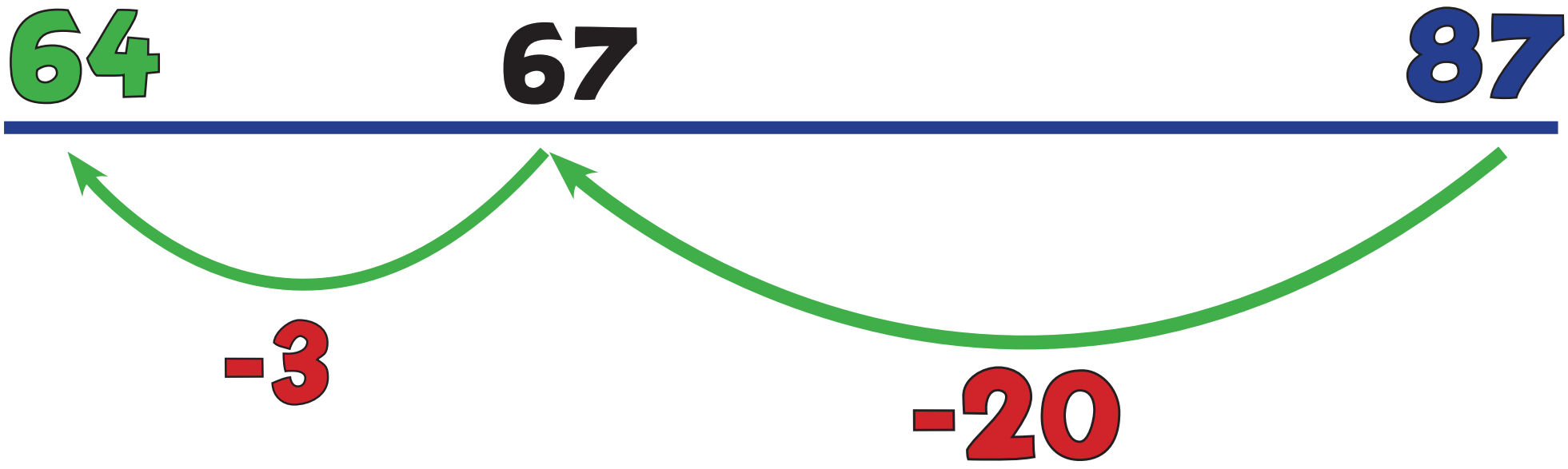


75 - 37 = 38

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S5: Backwards Jump

2

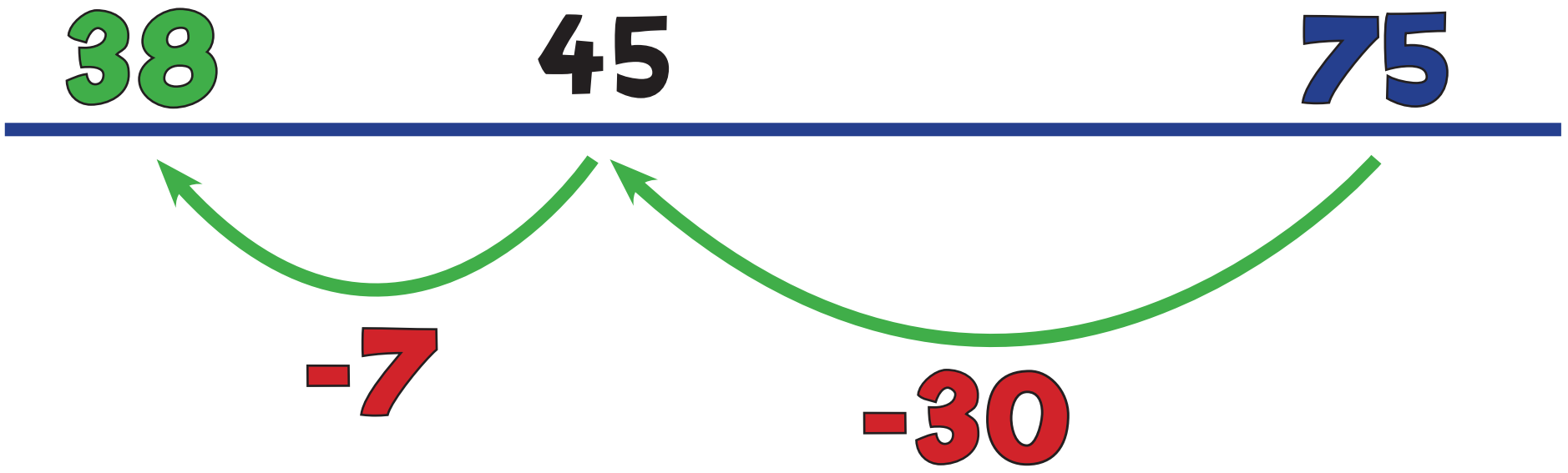


87 - 23 = 64

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S5a: Backwards Jump

2

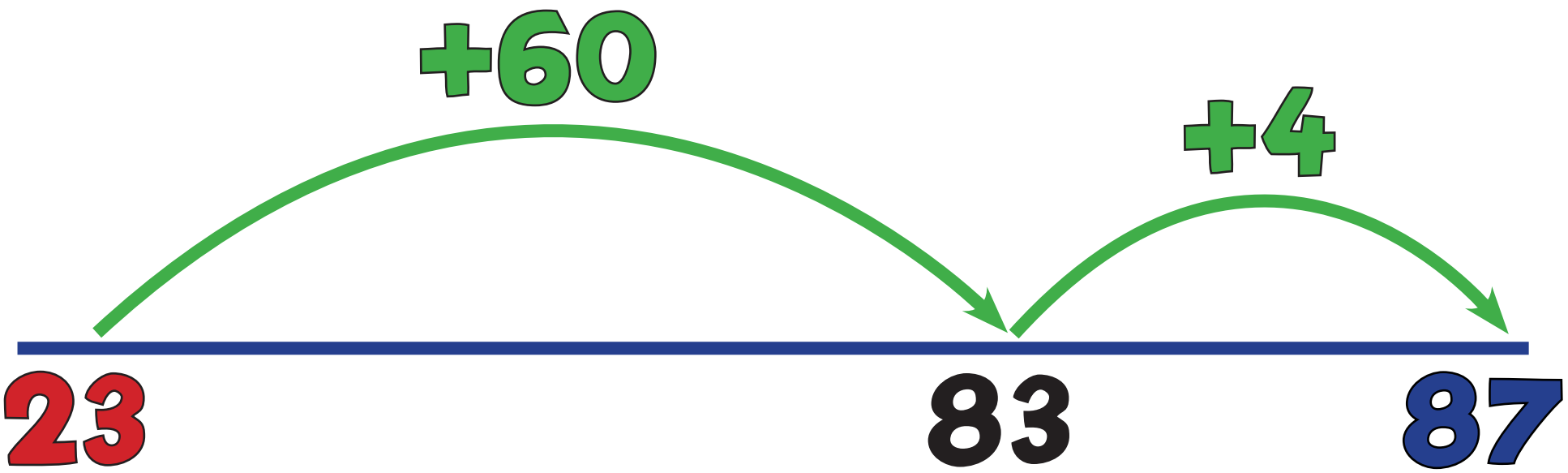


75 - 37 = 38

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S6: 10s Jump, 1s Jump!

2

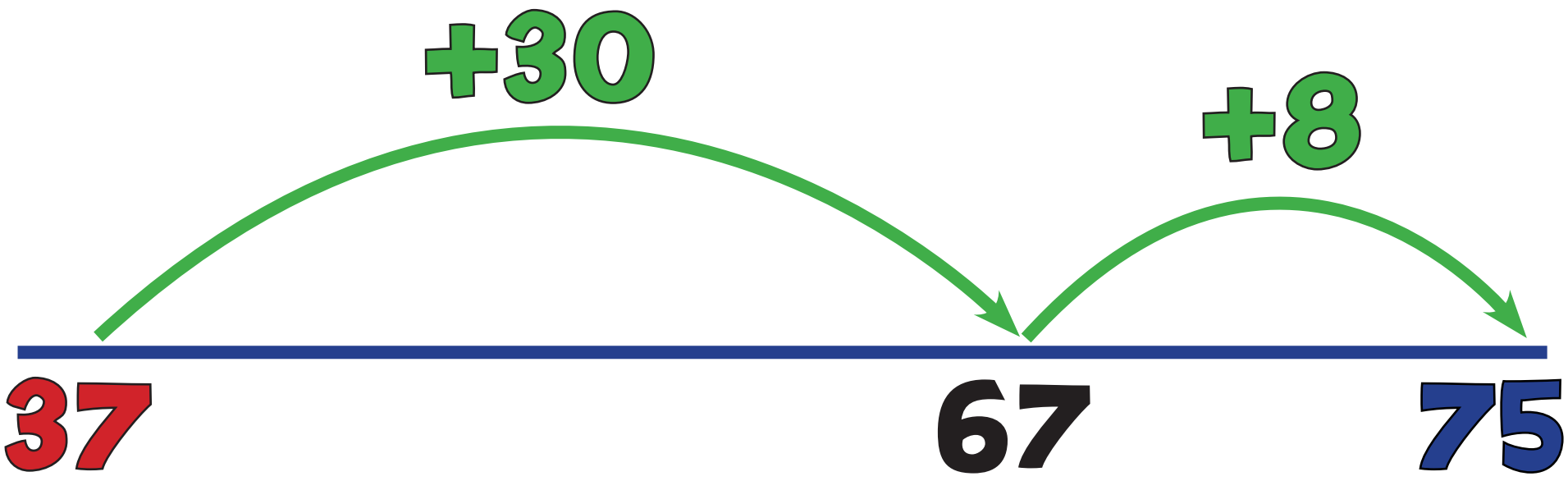


87 - 23 = 64

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S6a: 10s Jump, 1s Jump!

2

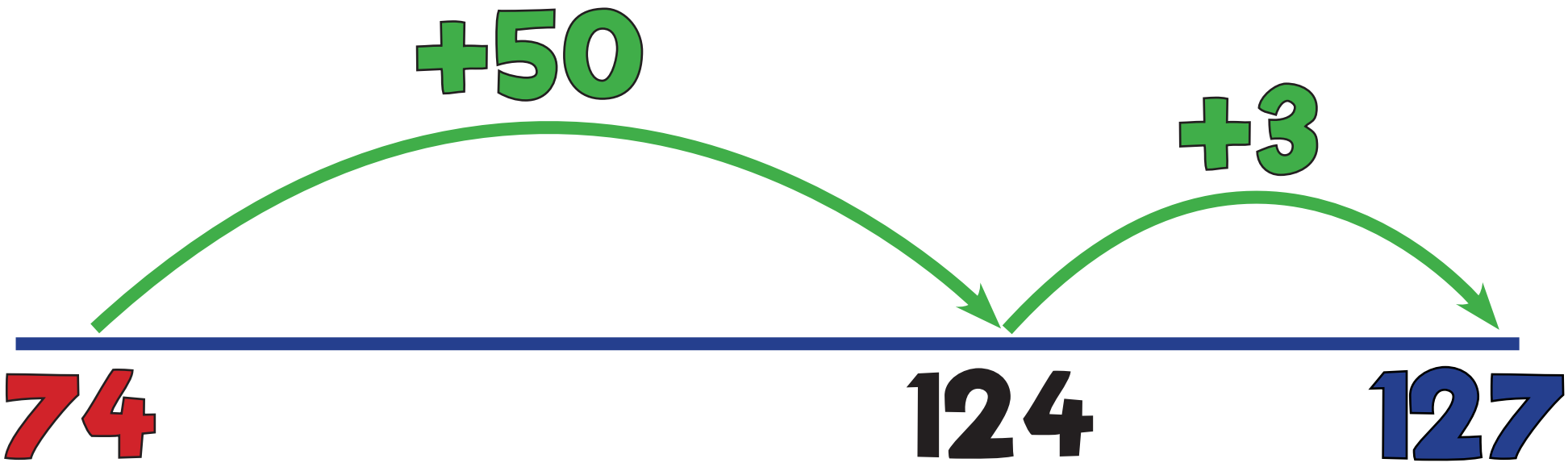


75 - 37 = 38

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S6b: 10s Jump, 1s Jump!

3

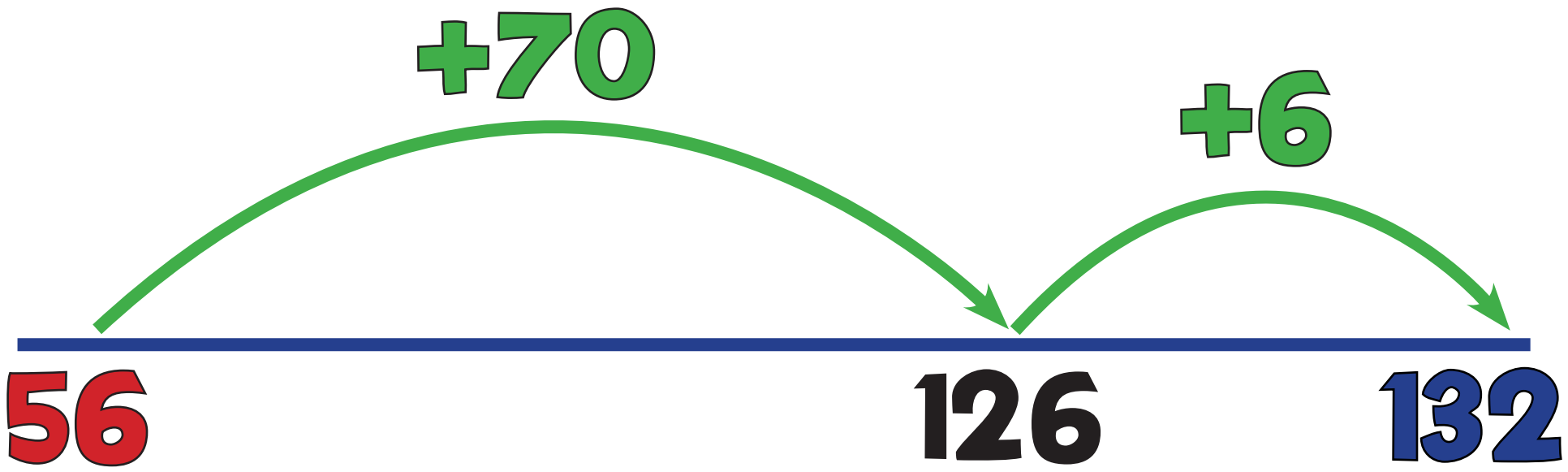


127 - 74 = 53

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S6c: 10s Jump, 1s Jump!

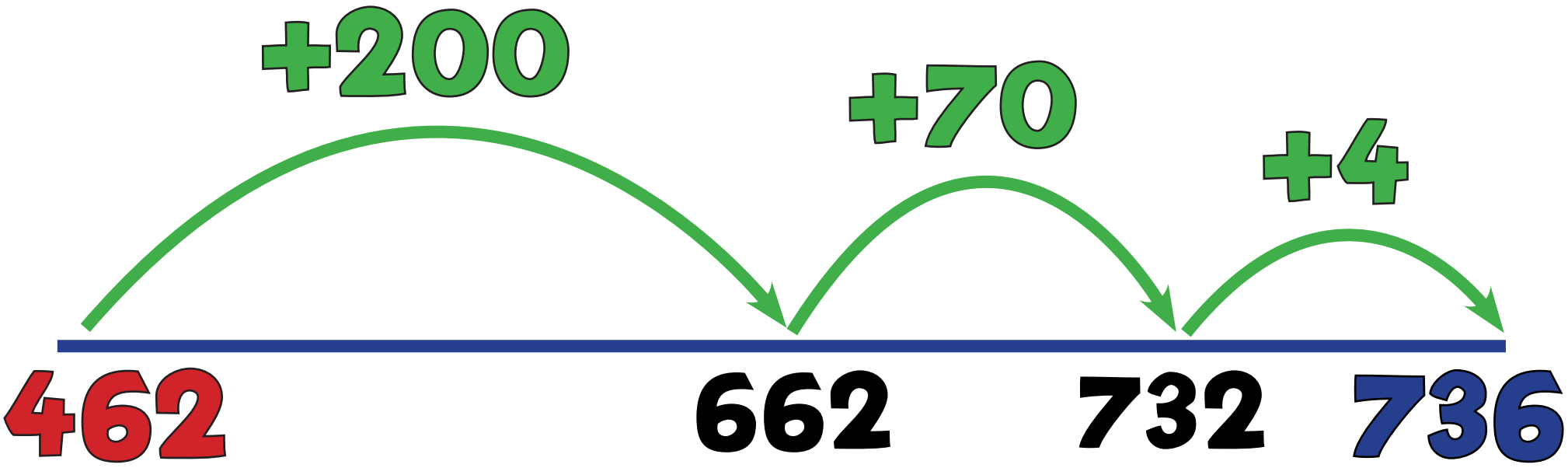
3



132 - 56 = 76

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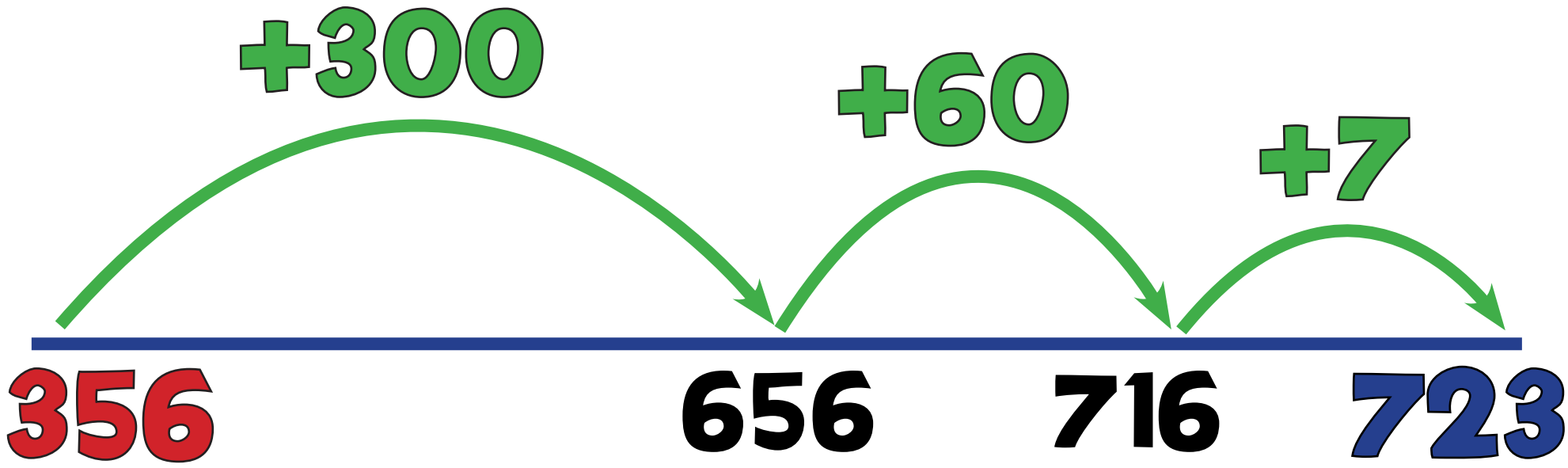
S6d: 100s, 10s, 1s Jump 3



736 - 462 = 274

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S6e: 100s, 10s, 1s Jump 3

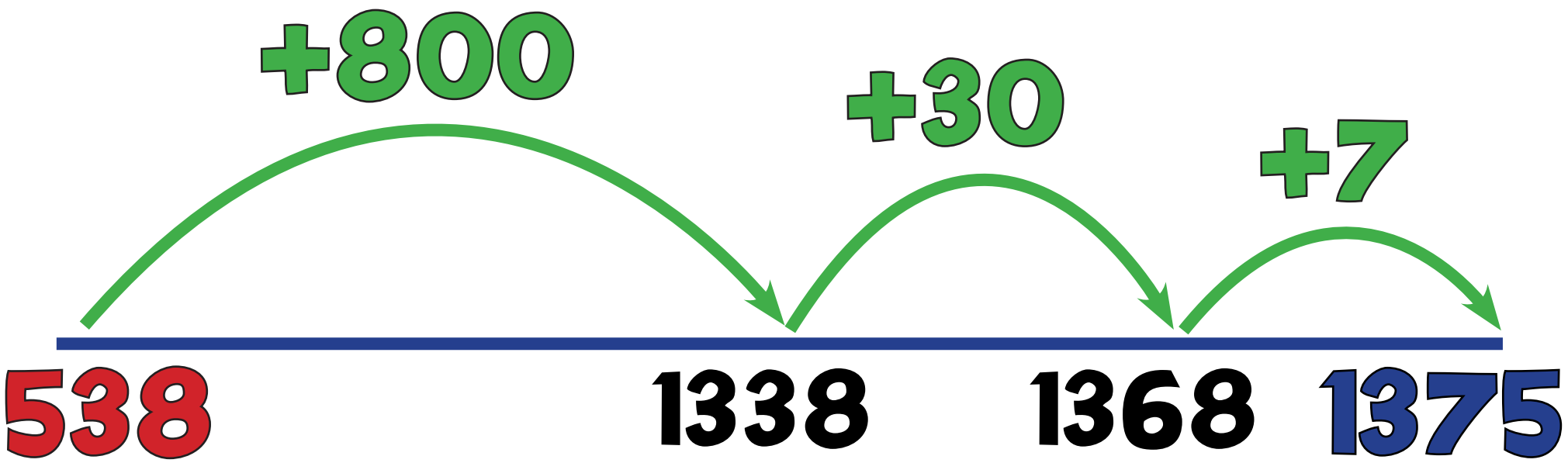


723 - 356 = 367

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S6f: 100s, 10s, 1s Jump

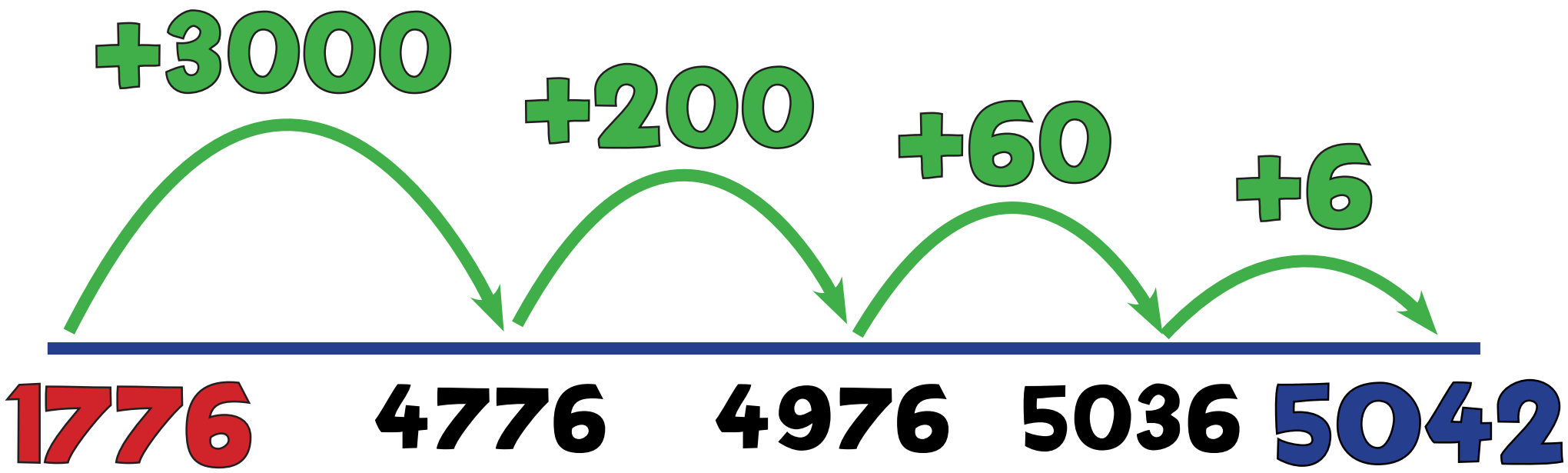
4



1375 - 538 = 837

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S6g: 1000s, 100s, 10s, 1s Jump 4

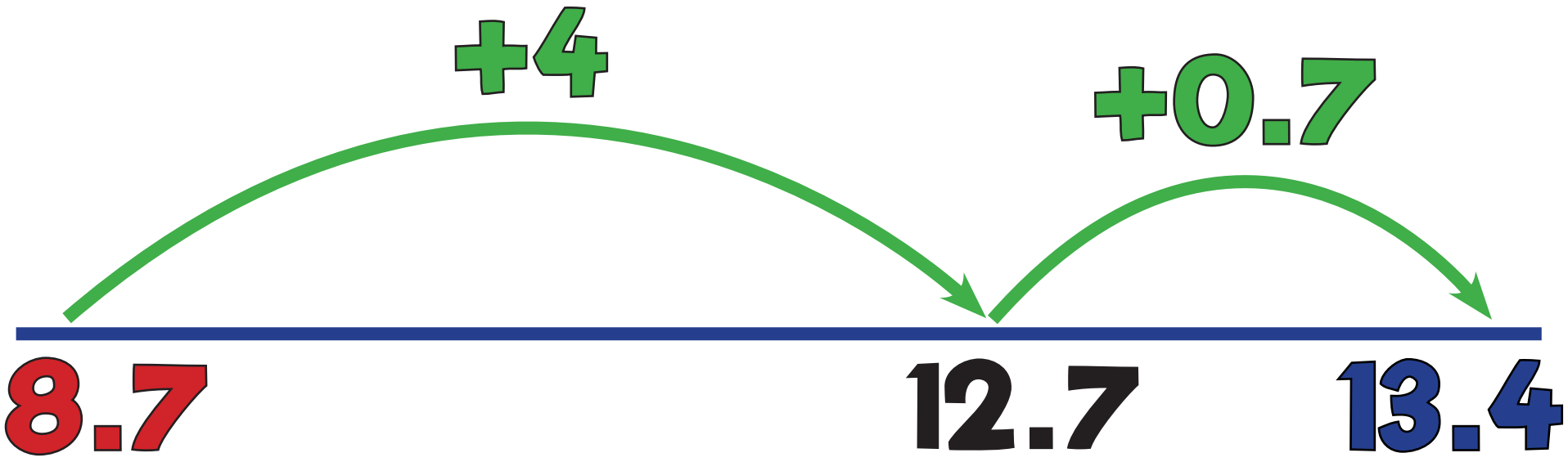


5042 - 1776 = 3266

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S6i: 1s Jump, Tenths Jump!

5

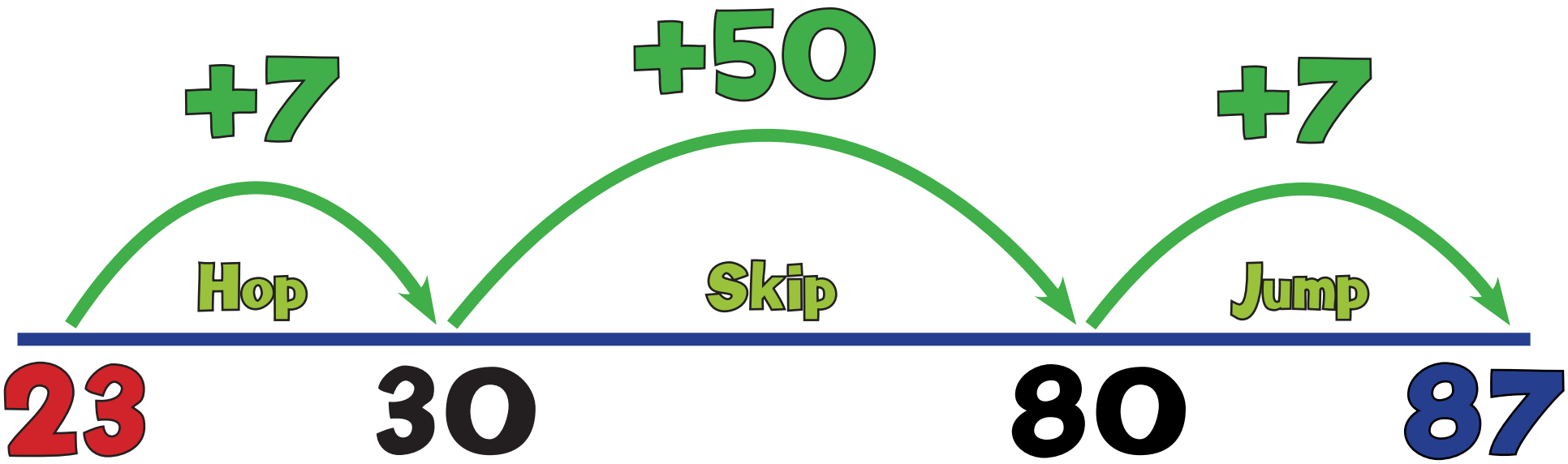


13.4 - 8.7 = 4.7

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S7: Triple Jump!

2

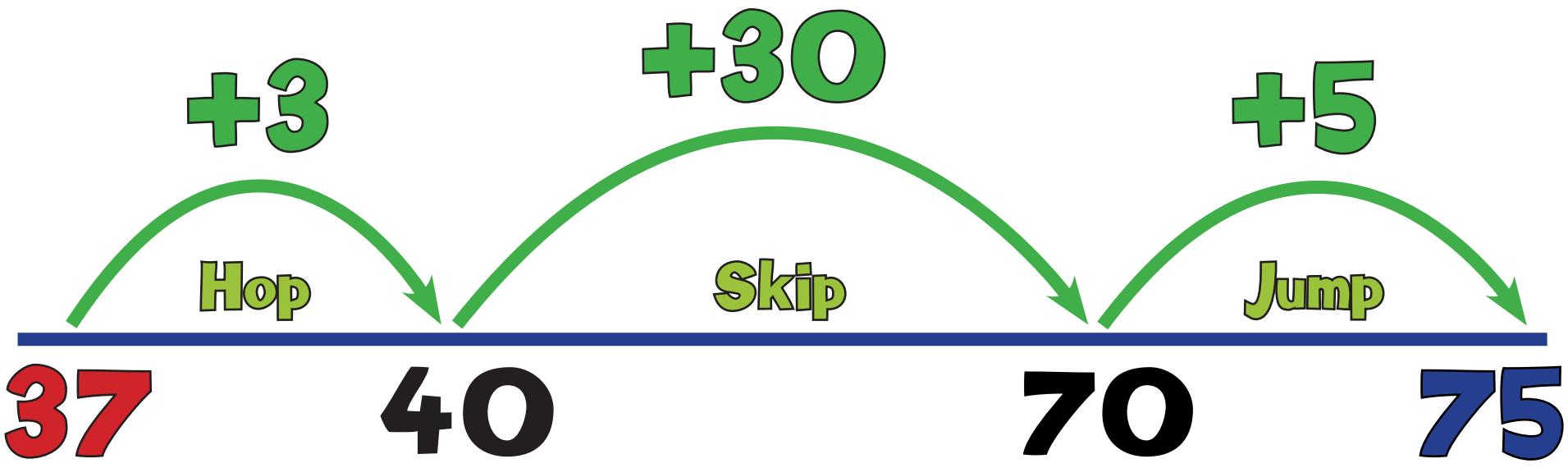


87 - 23 = 64

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S7a: Triple Jump!

2

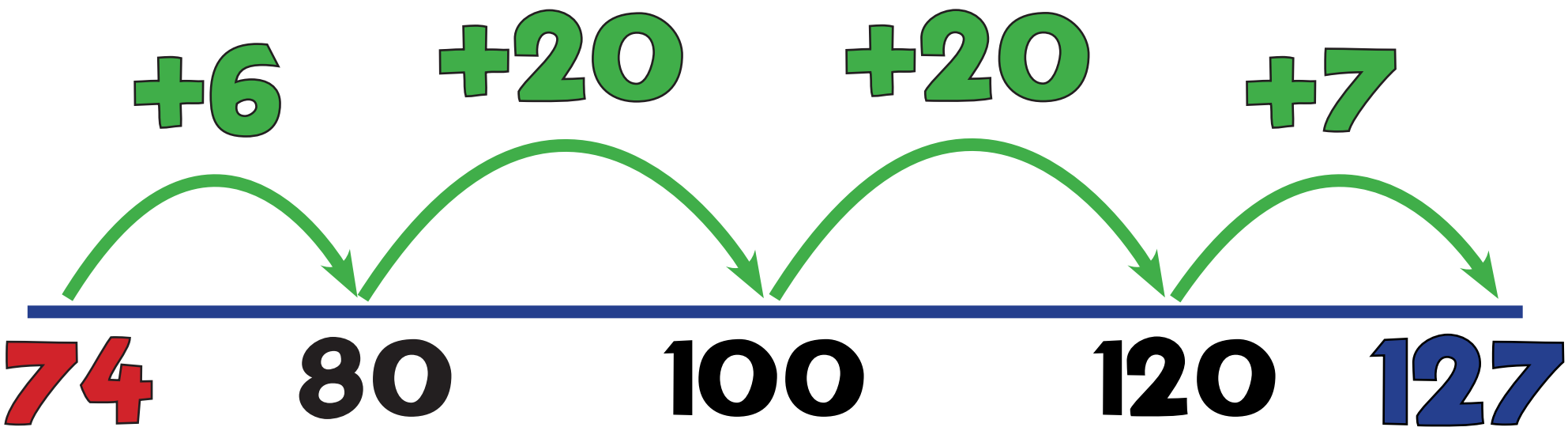


75 - 37 = 38

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S7b: Quad Jump!

3

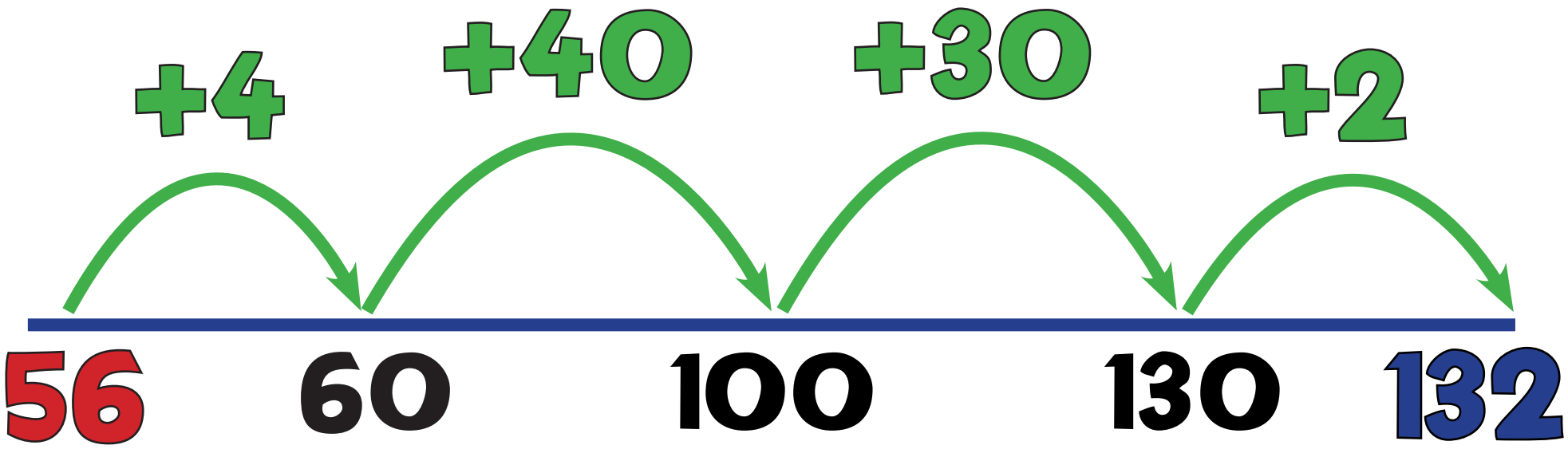


127 - 74 = 53

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S7c: Quad Jump!

3

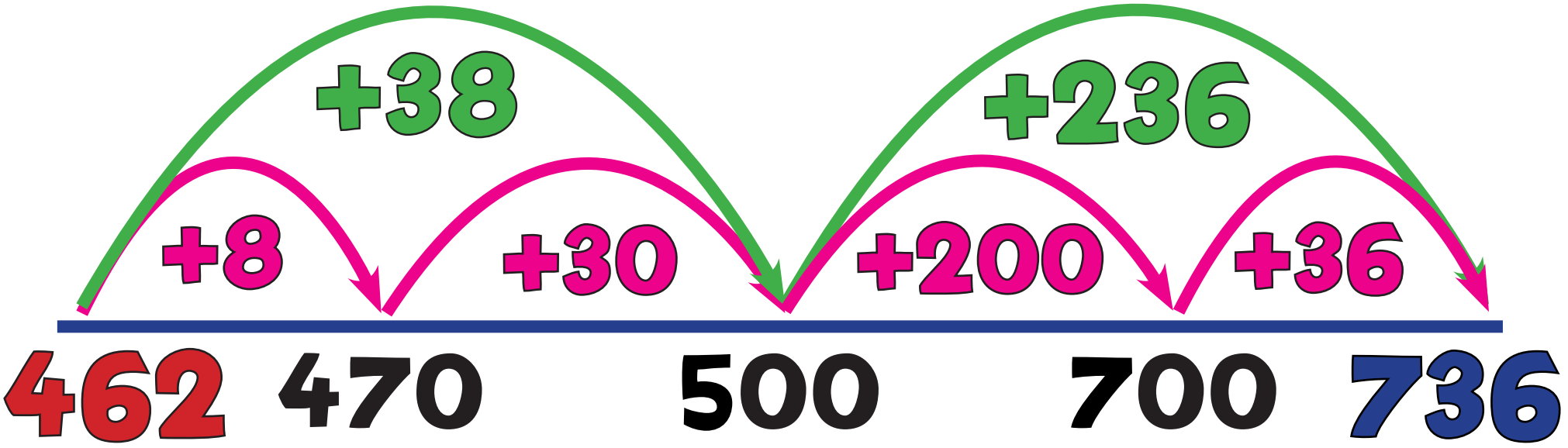


132 - 56 = 76

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S7d: Big Jump!

3

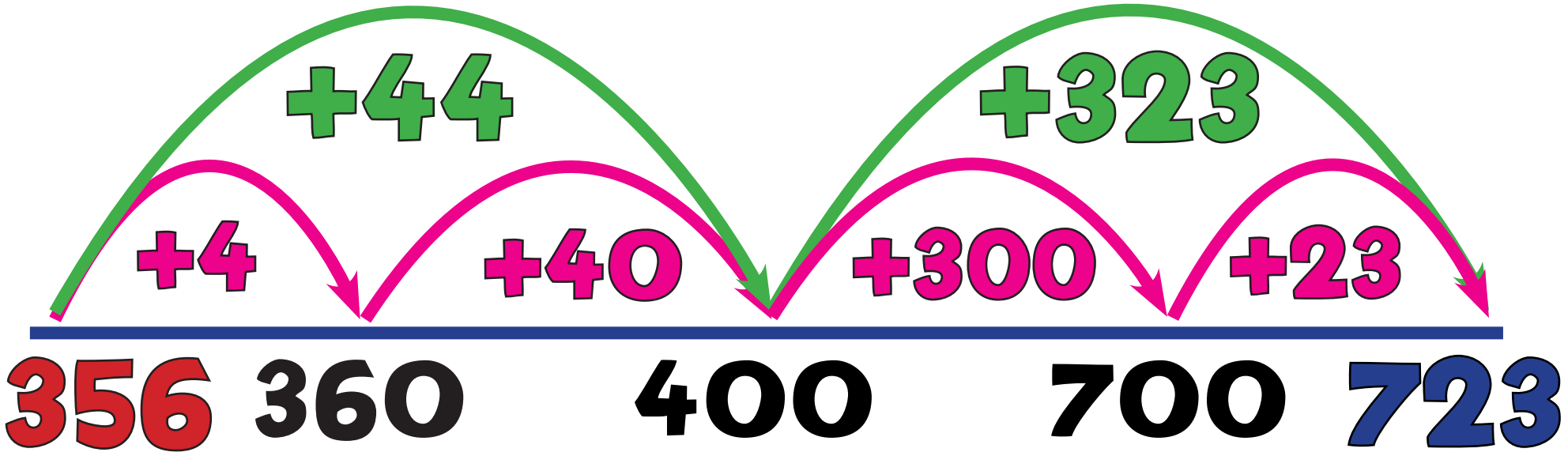


736 - 462 = 274

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S7e: Big Jump!

3

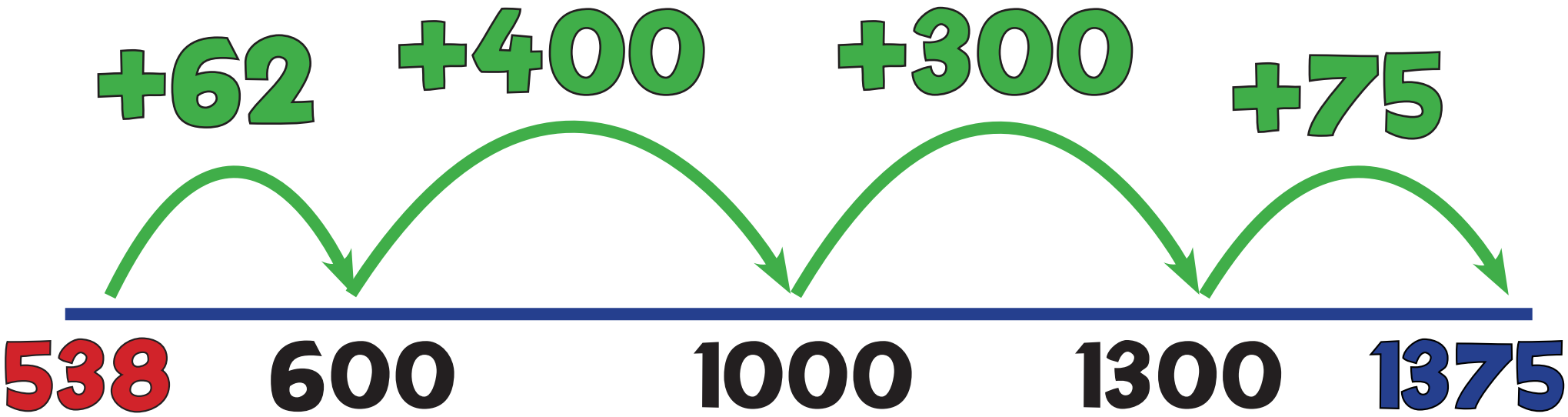


723 - 356 = 367

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S7f: Quad Jump Extreme

4

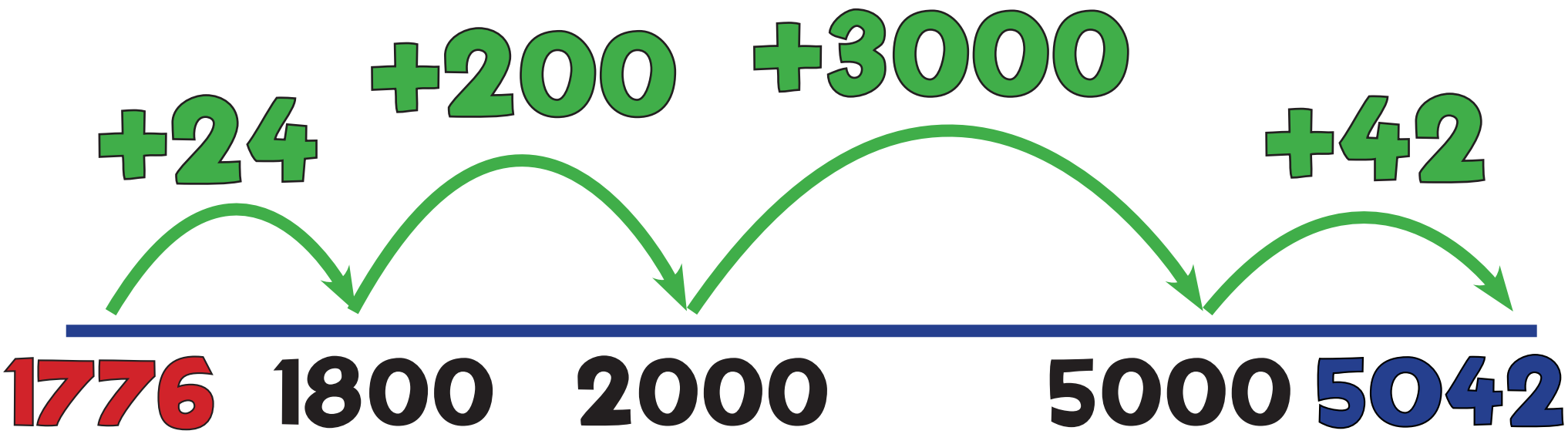


1375 - 538 = 837

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S7g: Quad Jump Extreme

4

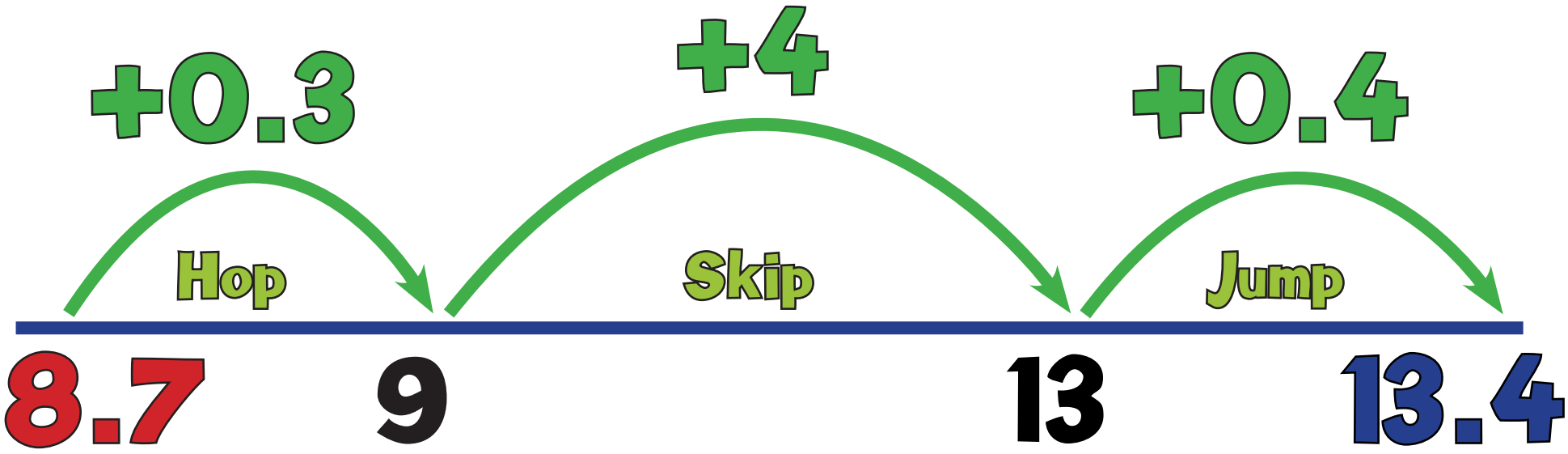


5042 - 1776 = 3266

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S7i: Decimal T-J!

5



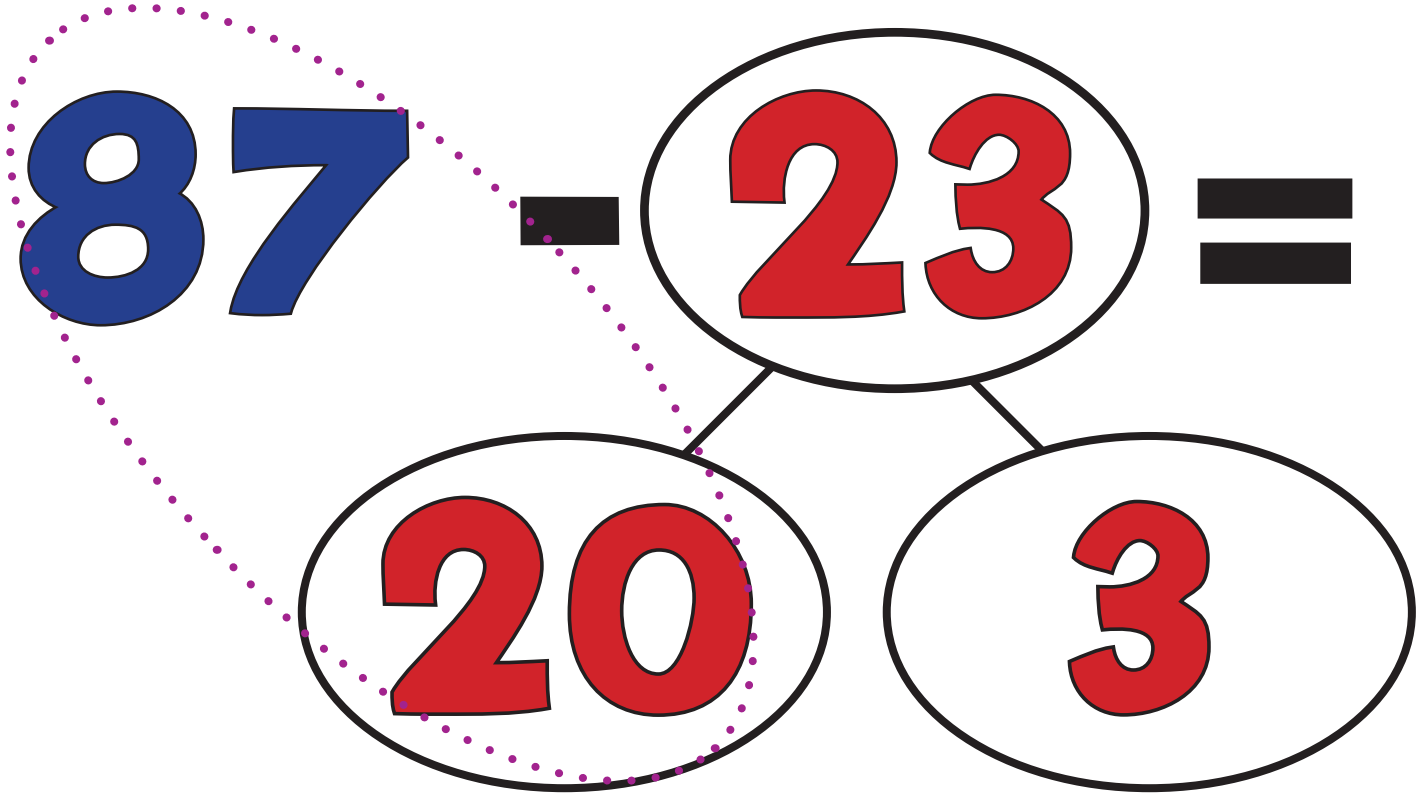
13.4 - 8.7 = 4.7

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S8: Part/Whole (S)

2

Partition the Subtrahend



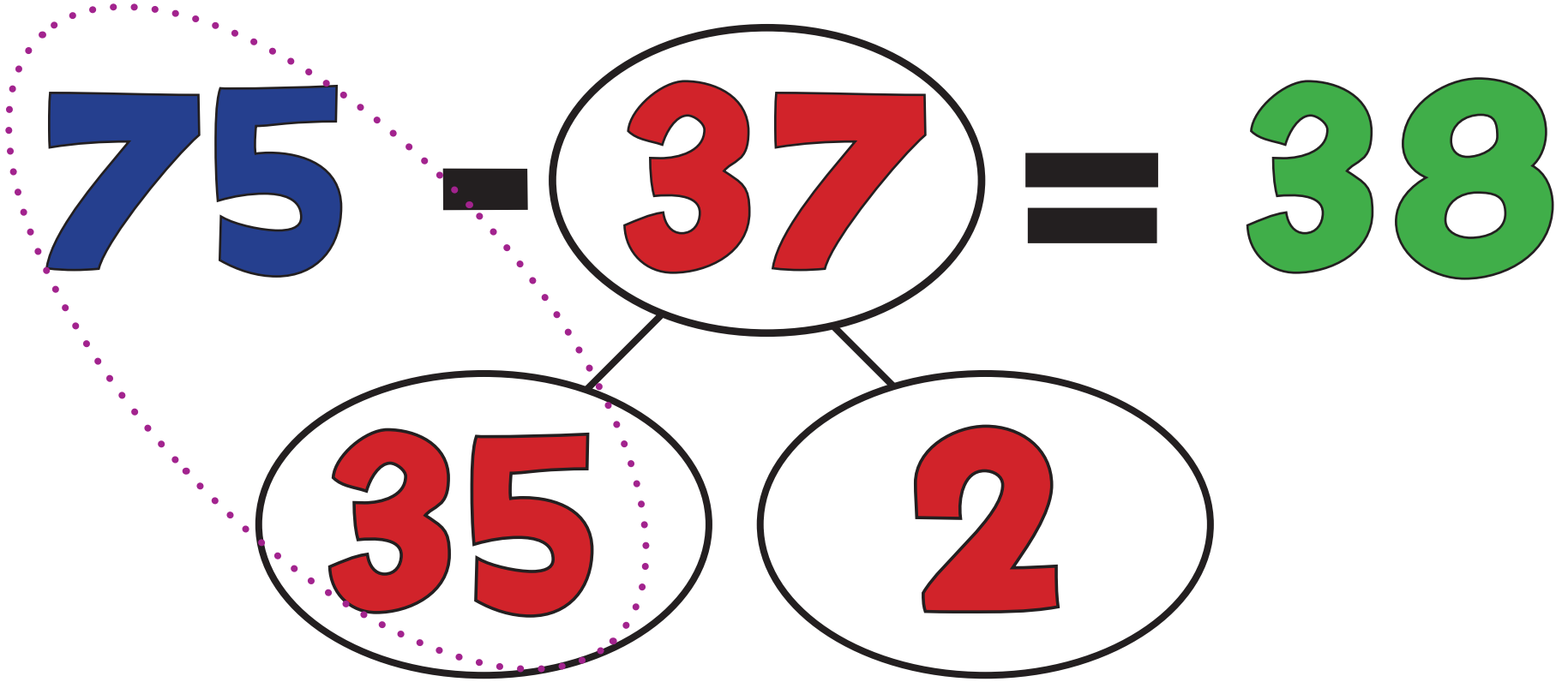
87 - 20 = 67 | 67 - 3 = 64

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S8a: Part/Whole (S)

2

Partition the Subtrahend



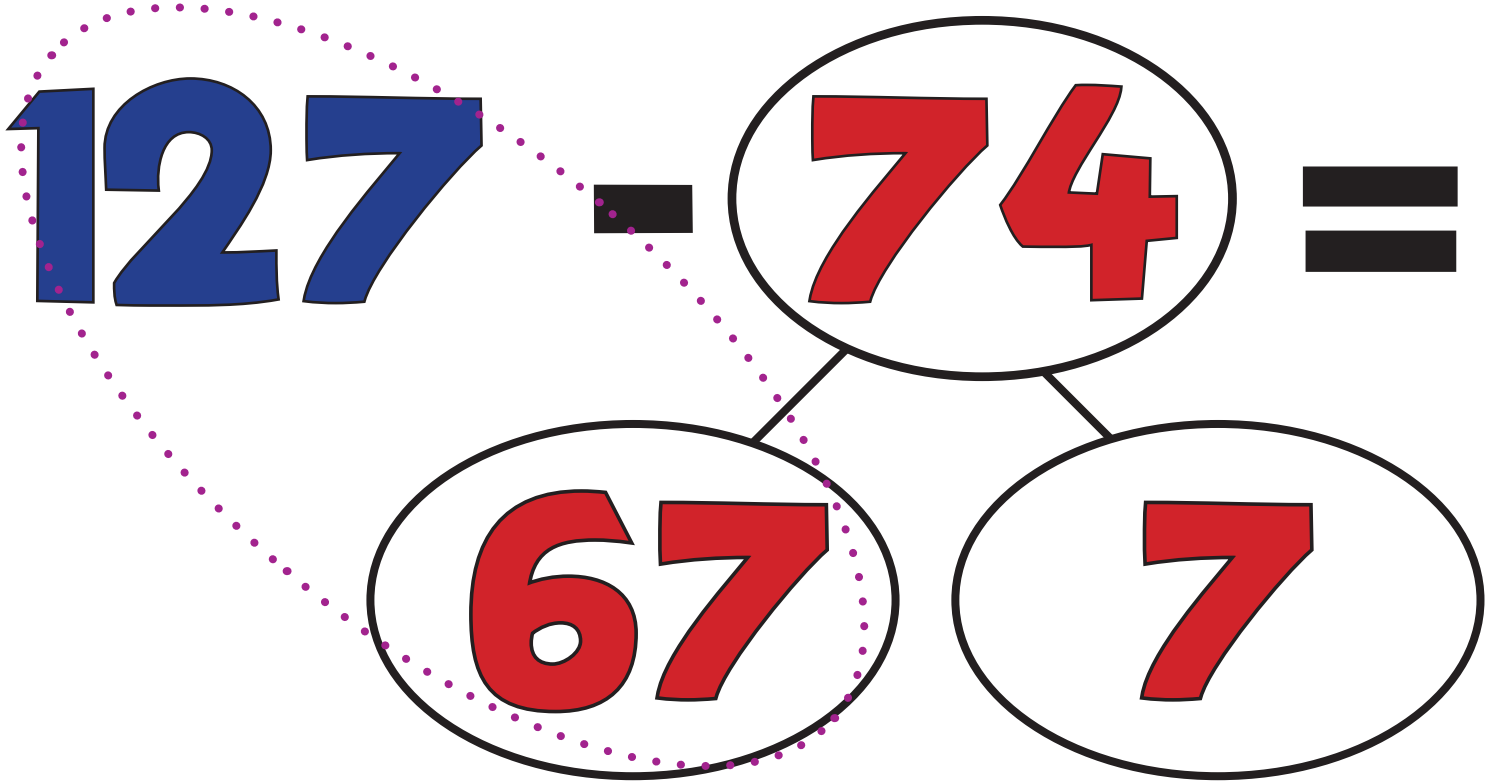
75 - 35 = 40 | 40 - 2 = 38

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S8b: Part/Whole (S)

3

Partition the Subtrahend



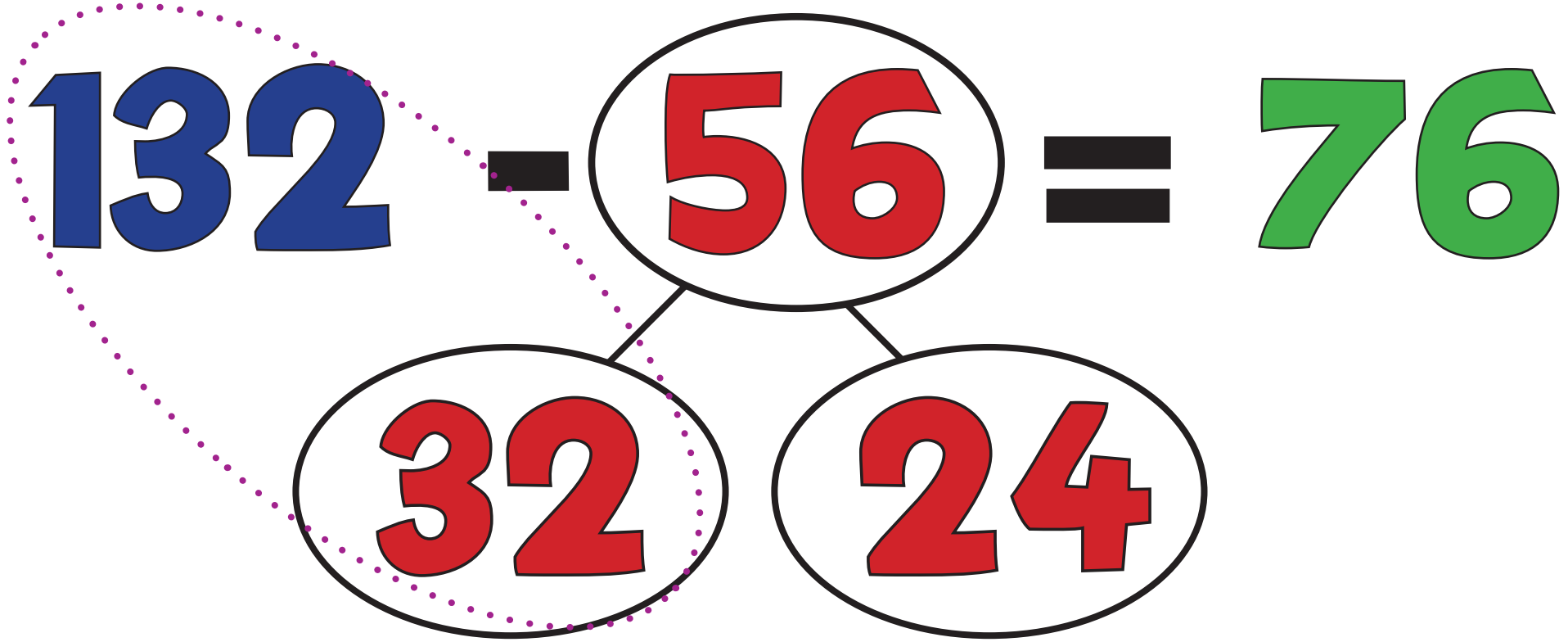
127 - 67 = 60 | 60 - 7 = 53

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S8c: Part/Whole (S)

3

Partition the Subtrahend



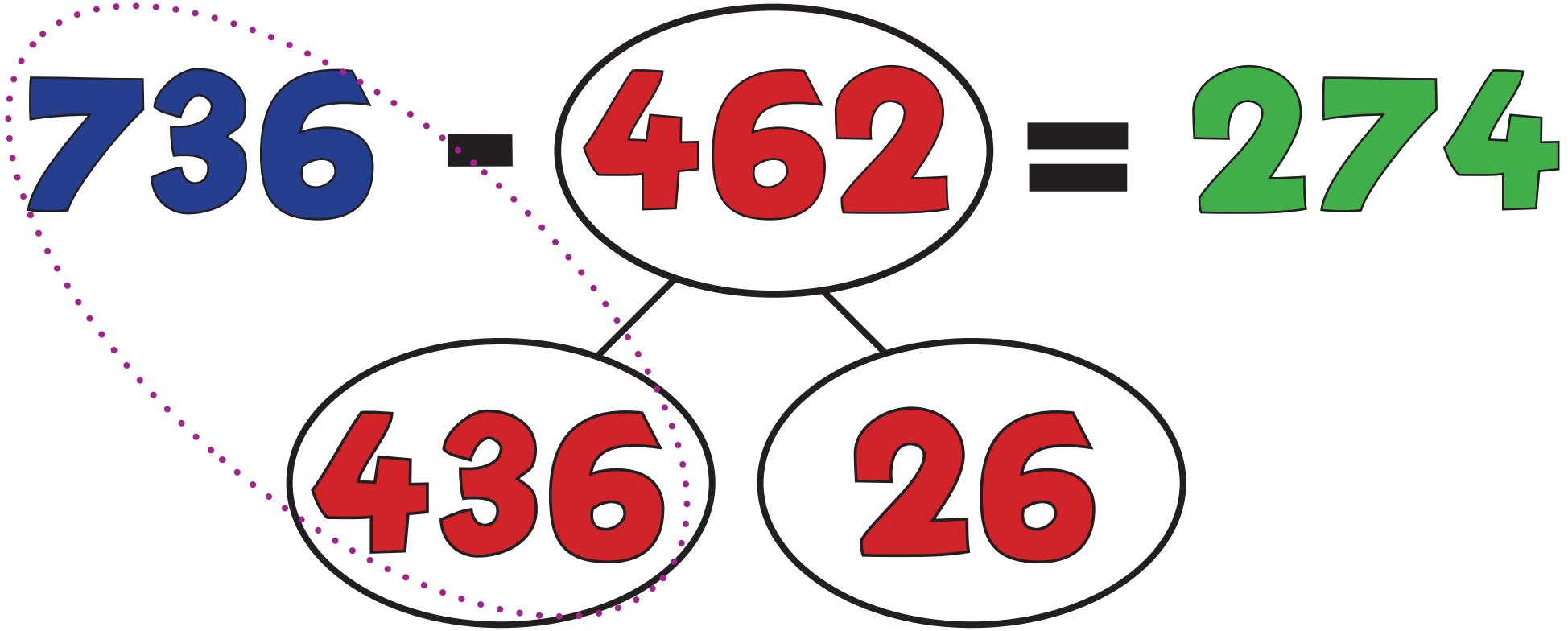
132 - 32 = 100 | 100 - 24 = 76

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S8d: Part/Whole (S)

3

Partition the Subtrahend



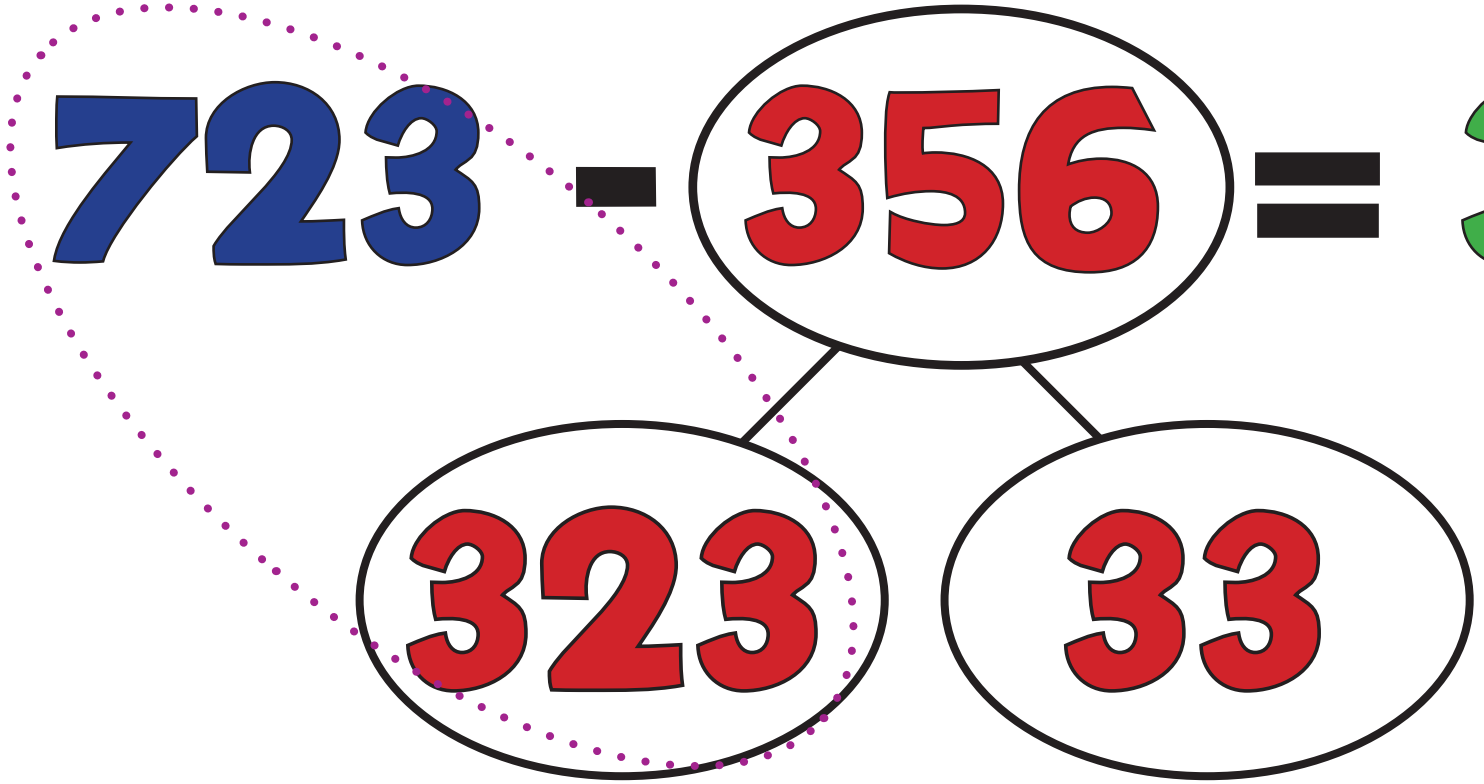
736 - 436 = 300 | 300 - 26 = 274

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S8e: Part/Whole (S)

3

Partition the Subtrahend



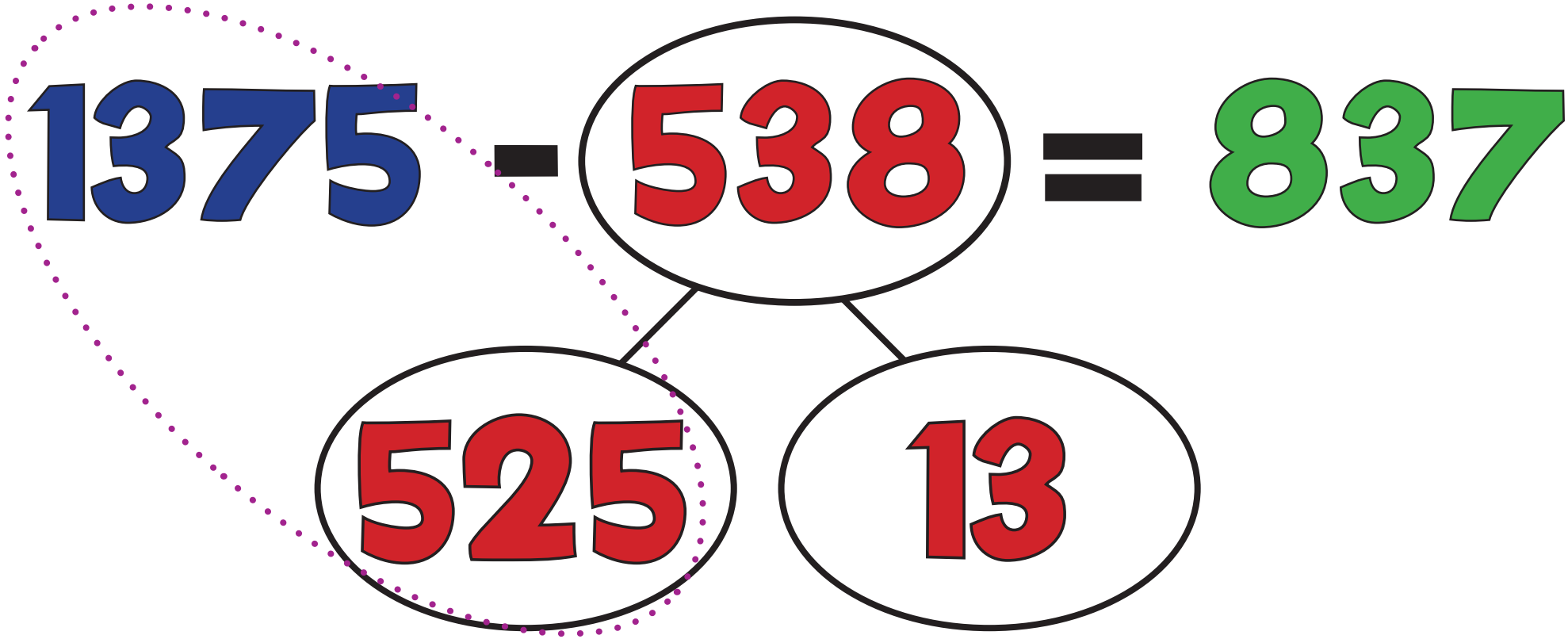
723 - 323 = 400 | 400 - 33 = 367

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S8f: Part/Whole (S)

4

Partition the Subtrahend



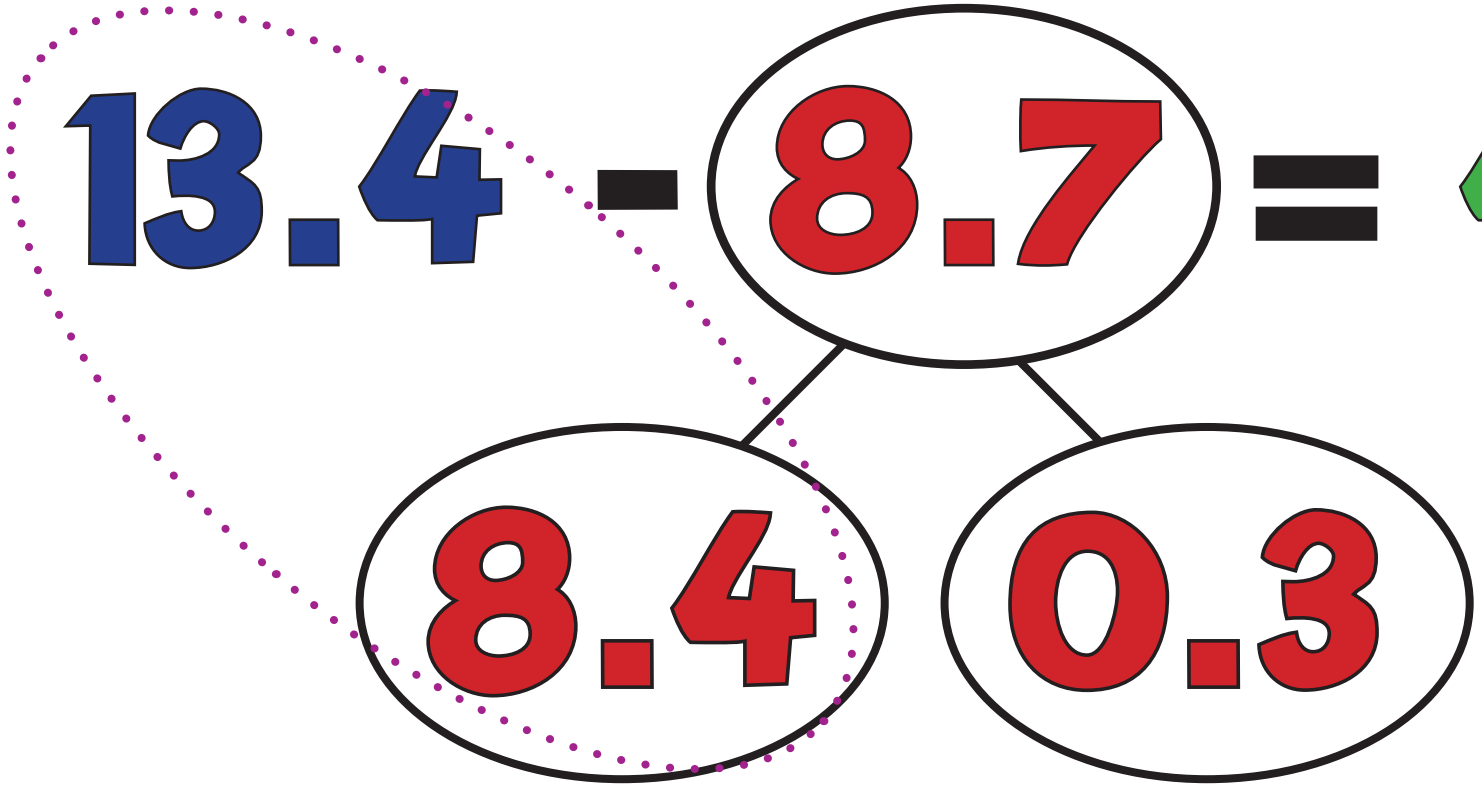
1375 - 525 = 850 | 850 - 13 = 837

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S8h: Part/Whole (S)

5

Partition the Subtrahend



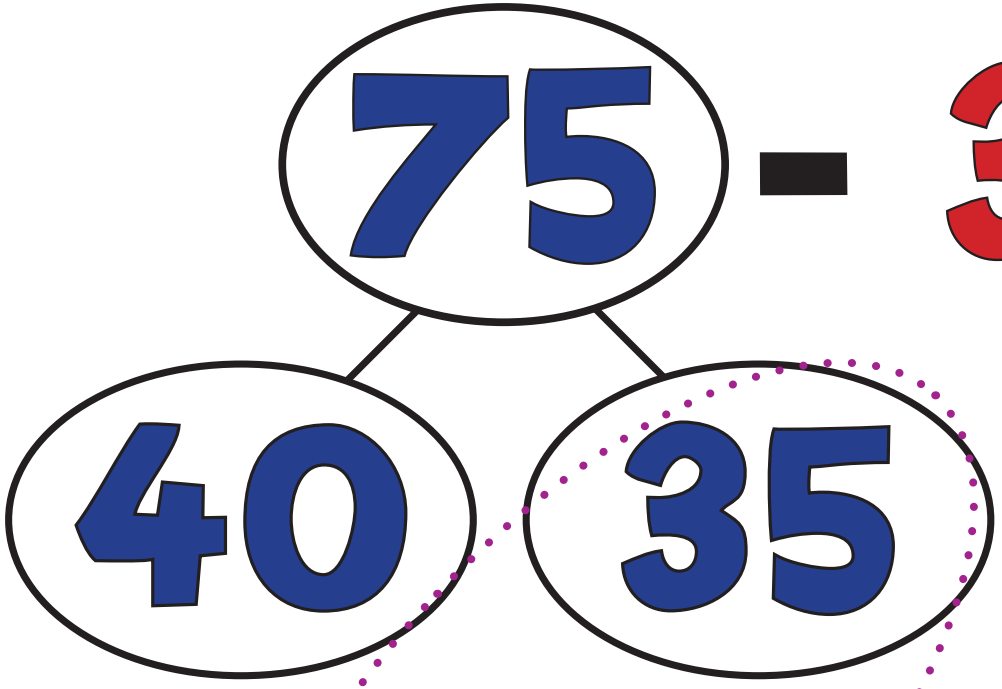
13.4 - 8.4 = 5 | 5 - 0.3 = 4.7

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S9a: Part/Whole (M)

2

Partition the Minuend



$$75 - 37 = 38$$

$$\begin{array}{r} -\ 37 \\ \hline 3 \end{array}$$

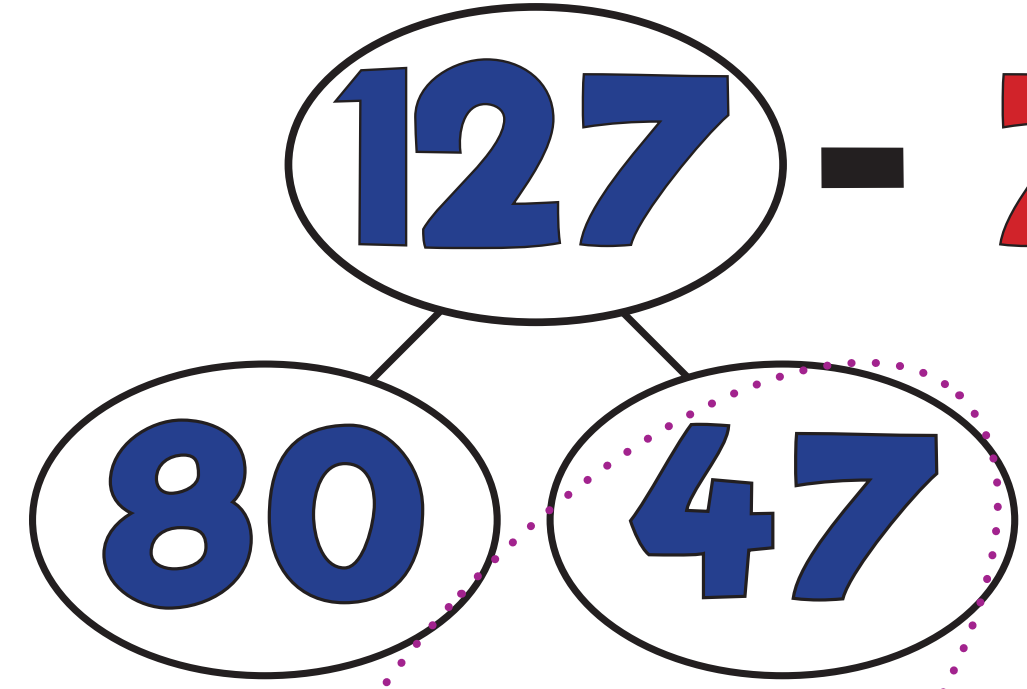
$$3 + 35 = 38$$

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S9b: Part/Whole (M)

3

Partition the Minuend



$$127 - 74 = 53$$

$$\begin{array}{r} -\ 74 \\ \hline 6 \end{array}$$

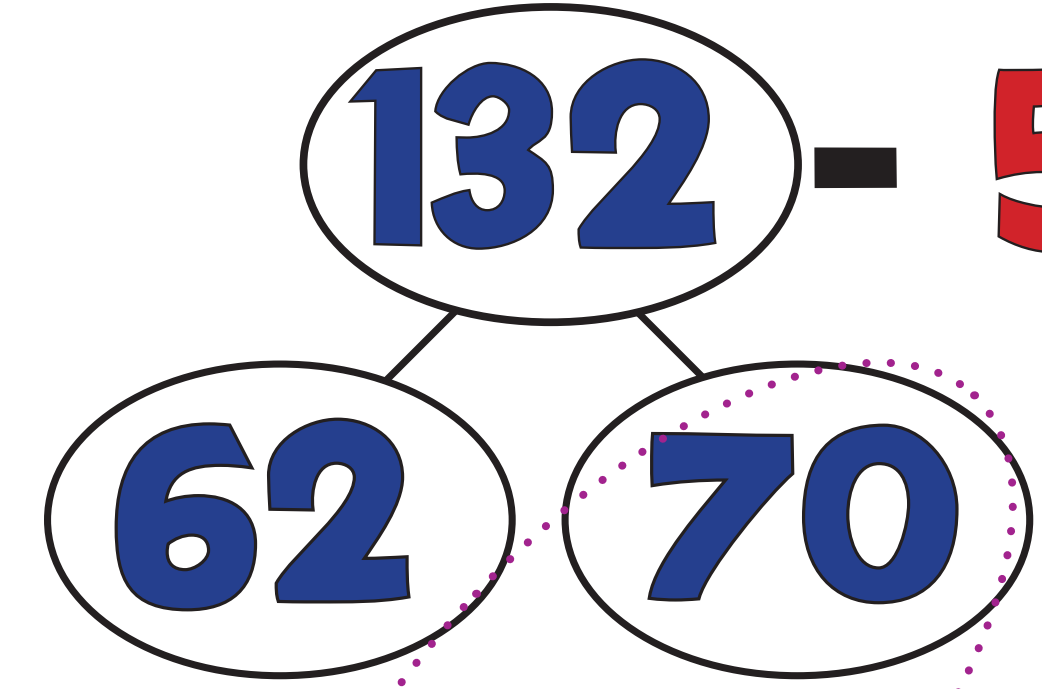
$$6 + 47 = 53$$

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S9c: Part/Whole (M)

3

Partition the Minuend



132 - 56 = 76

- 56

6

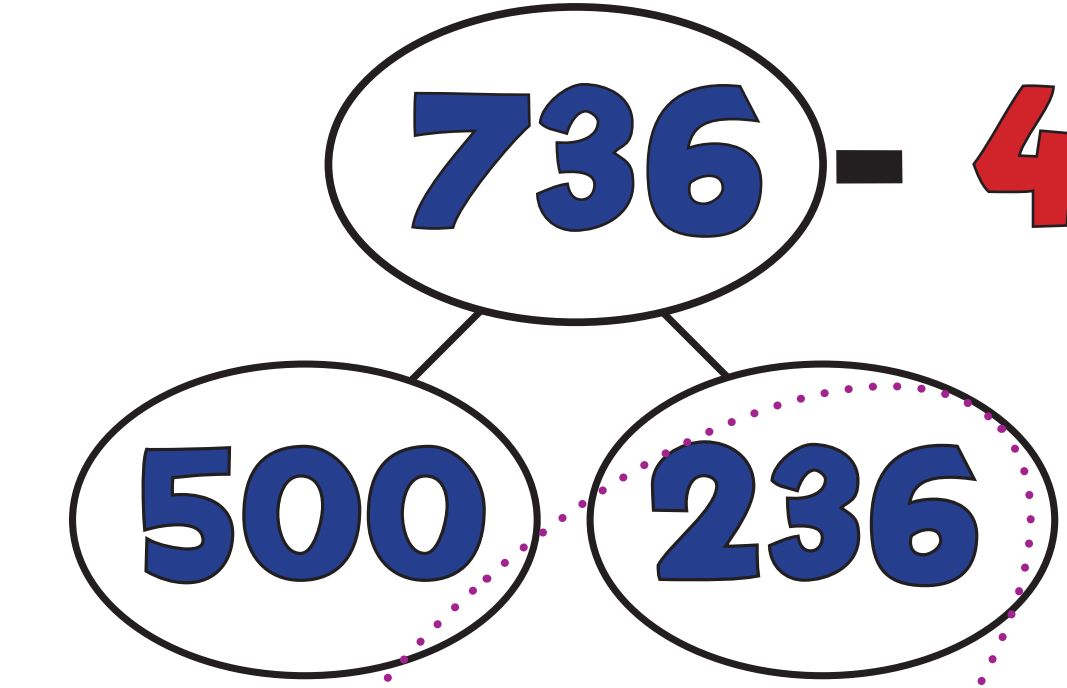
6 + 70 = 76

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S9d: Part/Whole (M)

3

Partition the Minuend



736 - 462 = 274

- 462

38

38 + 236 = 274

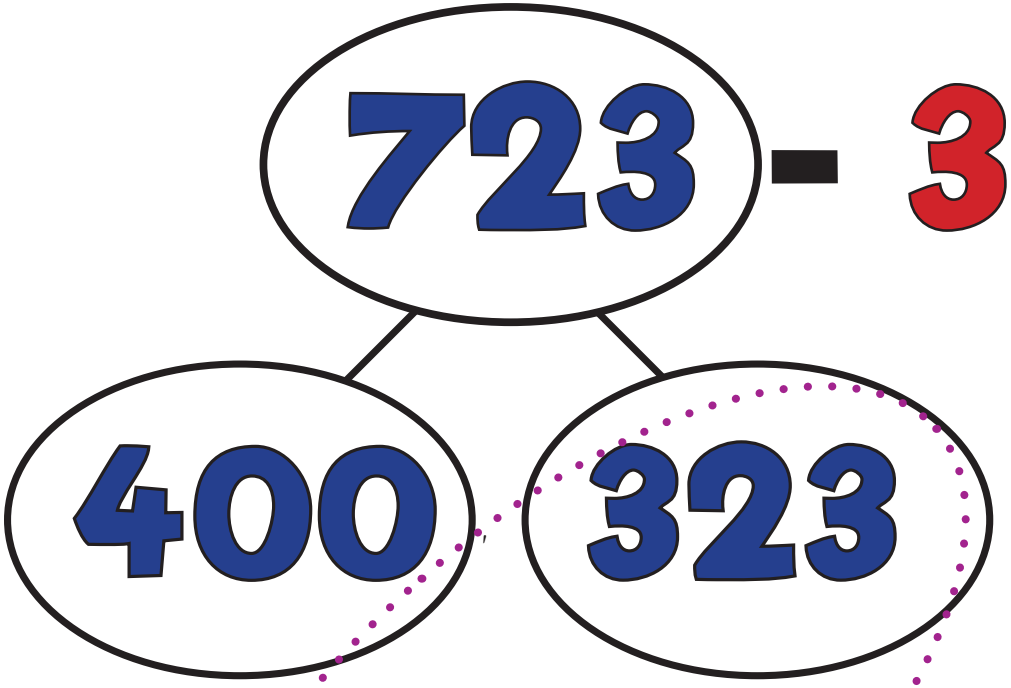
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S9e: Part/Whole (M)

3

Partition the Minuend

723 - 356 = 367



- 356

44

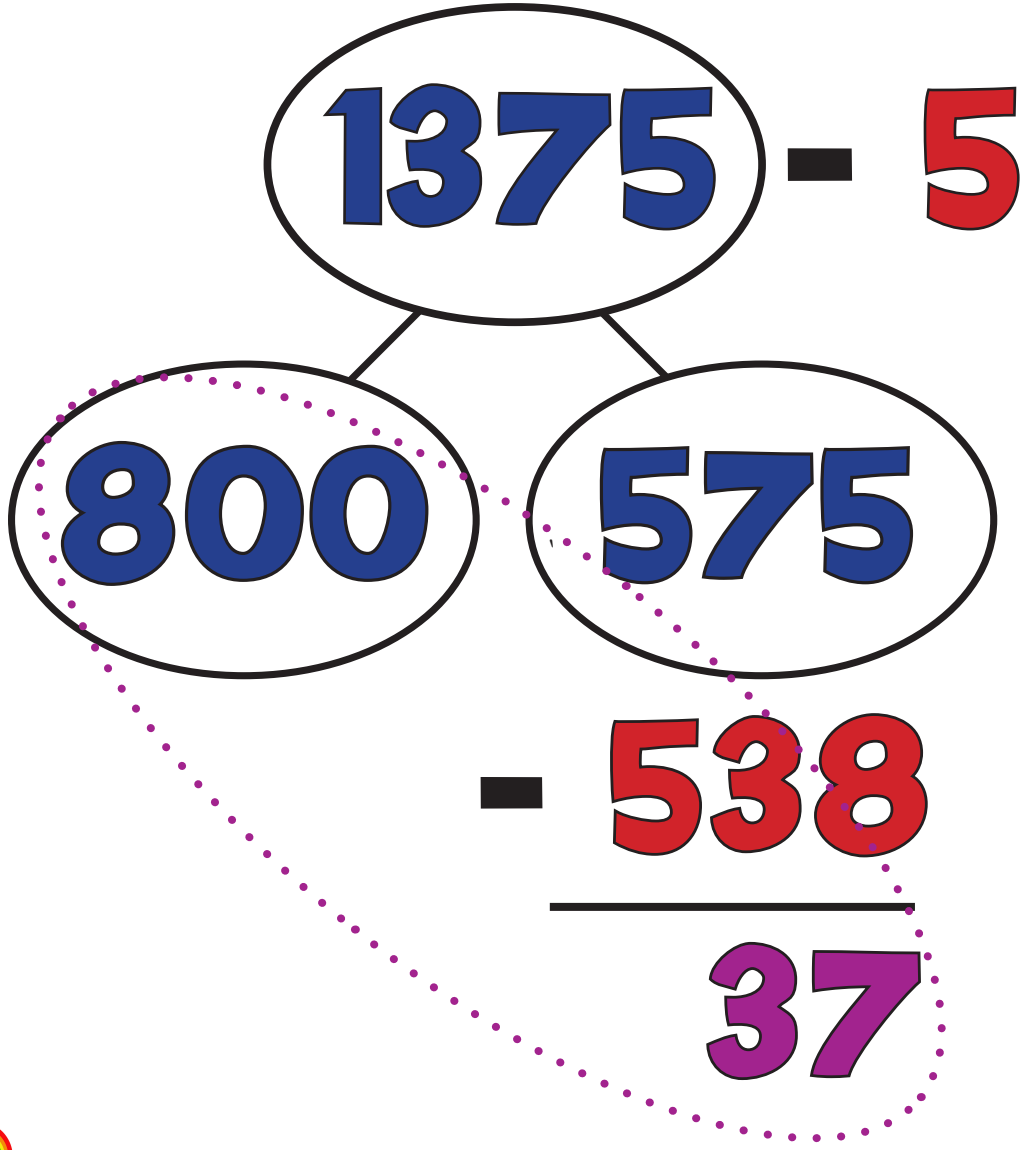
44 + 323 = 367

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S9f: Part/Whole (M)

4

Partition the Minuend



1375 - 538 = 837

37 + 800 = 837

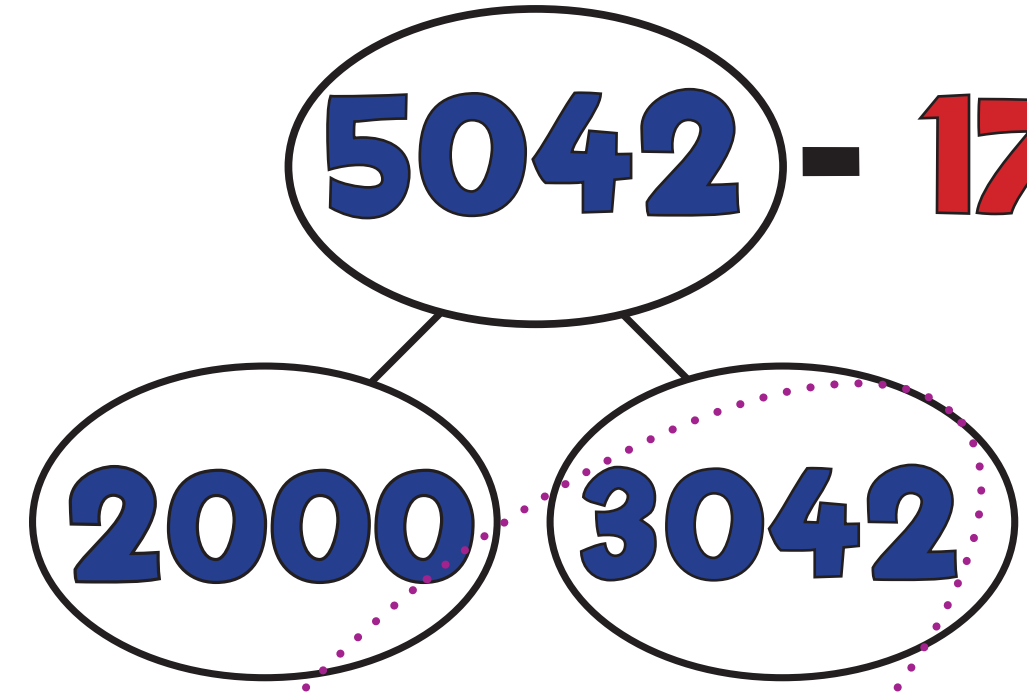
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S9g: Part/Whole (M)

4

Partition the Minuend

5042 - 1776 = 3266



- 1776

224

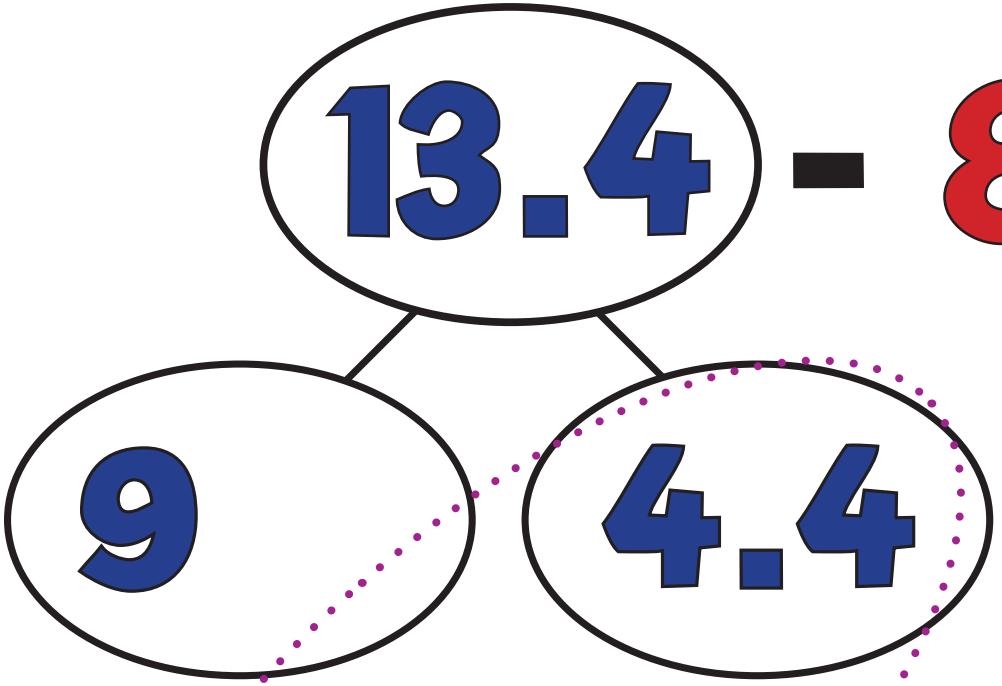
224 + 3042 = 3266

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S9h: Part/Whole (M)

5

Partition the Minuend



13.4 - 8.7 = 4.7

- 8.7

0.3

0.3 + 4.4 = 4.7

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S10: Expanded Column

2

Subtraction

$$87 - 23 = 64$$

80	7
20	3
60	4

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S10a: Expanded Column Subtraction

2

$$75 - 37 = 38$$

$$\begin{array}{rr} {}^{60}\cancel{70} & {}^{1}5 \\ 30 & 7 \\ \hline 30 & 8 \end{array}$$

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S10b: Expanded Column

3

Subtraction

$$127 - 74 = 53$$

	0	1	
	~~100~~	20	7
−		70	4
		50	3

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S10c: Expanded Column Subtraction

3

$$132 - 56 = 76$$

0	120	1
~~100~~	~~30~~	2
−	50	6
	70	6

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S10d: Expanded Column

3

Subtraction (100, 10, 1s)

736 - 462 = 274

	600	1	
	~~700~~	30	6
-	400	60	2
	200	70	4

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S10e: Expanded Column

3

Subtraction (100, 10, 1s)

723 - 356 = 367

	600	110	1
	~~700~~	~~20~~	3
-	300	50	6
	300	60	7

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S11: Column Subtraction

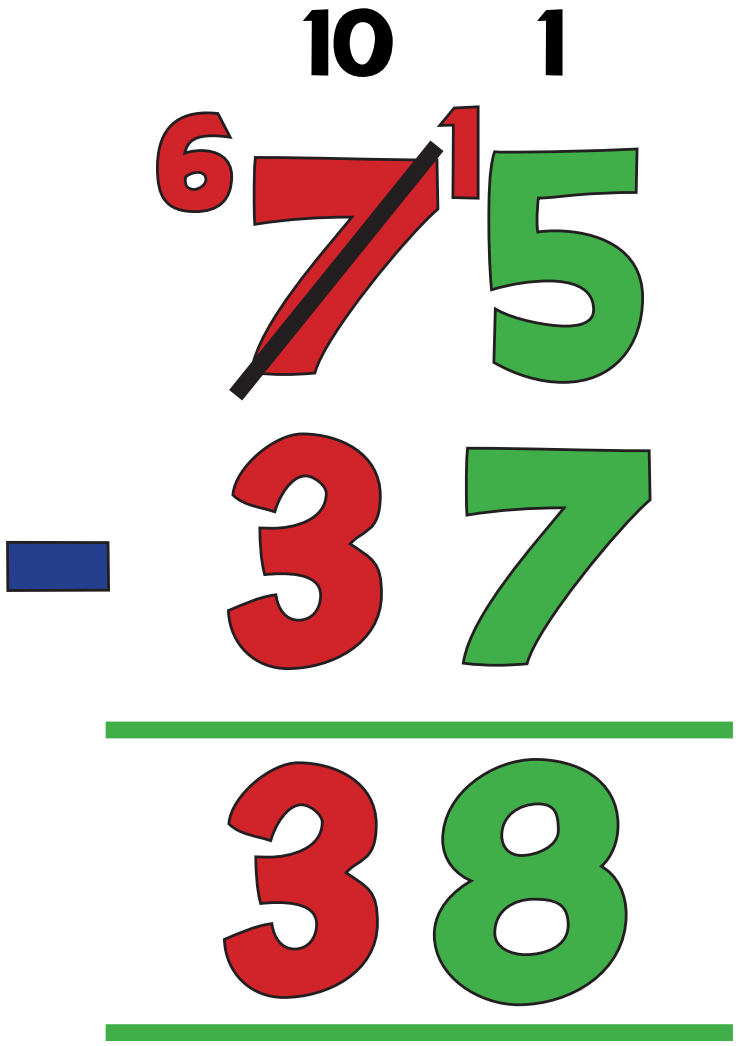
2 Additional

	10	1
	8	7
−	2	3
	6	4

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S11a: Column Subtraction

2



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S11b: Column Subtraction

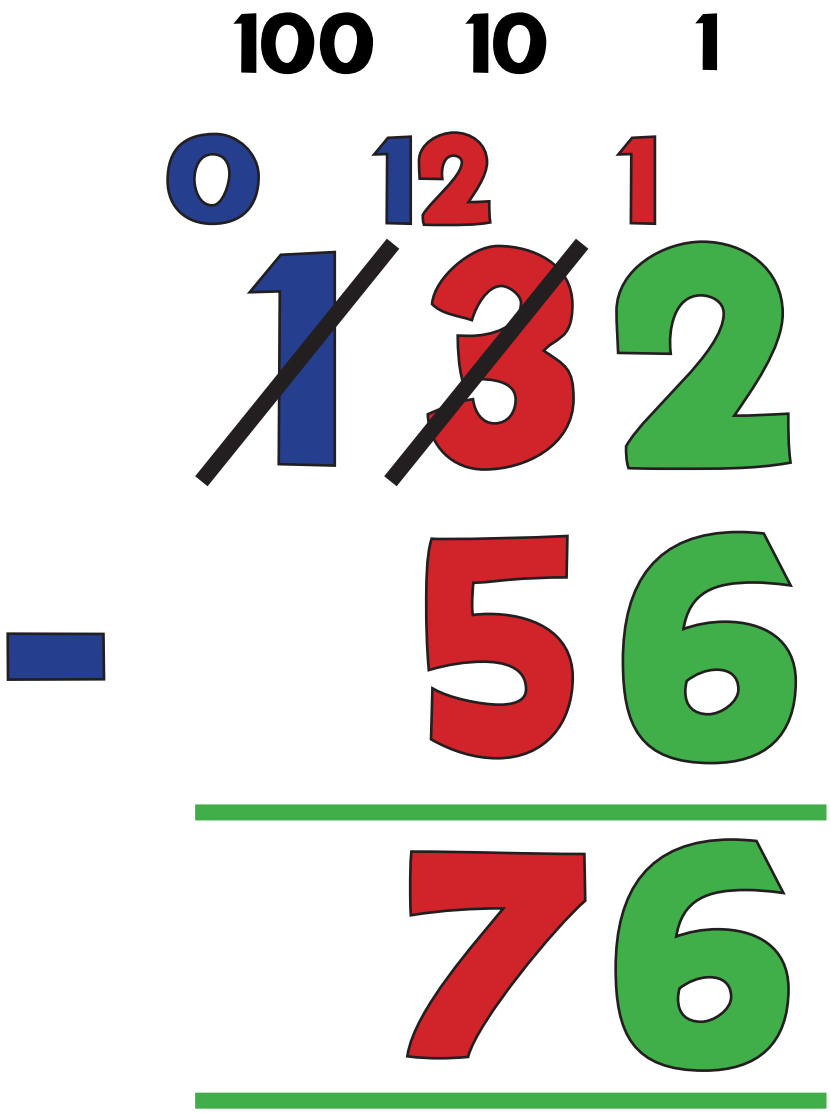
3

	100	10	1
	0	1	
	~~1~~	2	7
−		7	4
		5	3

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S11c: Column Subtraction

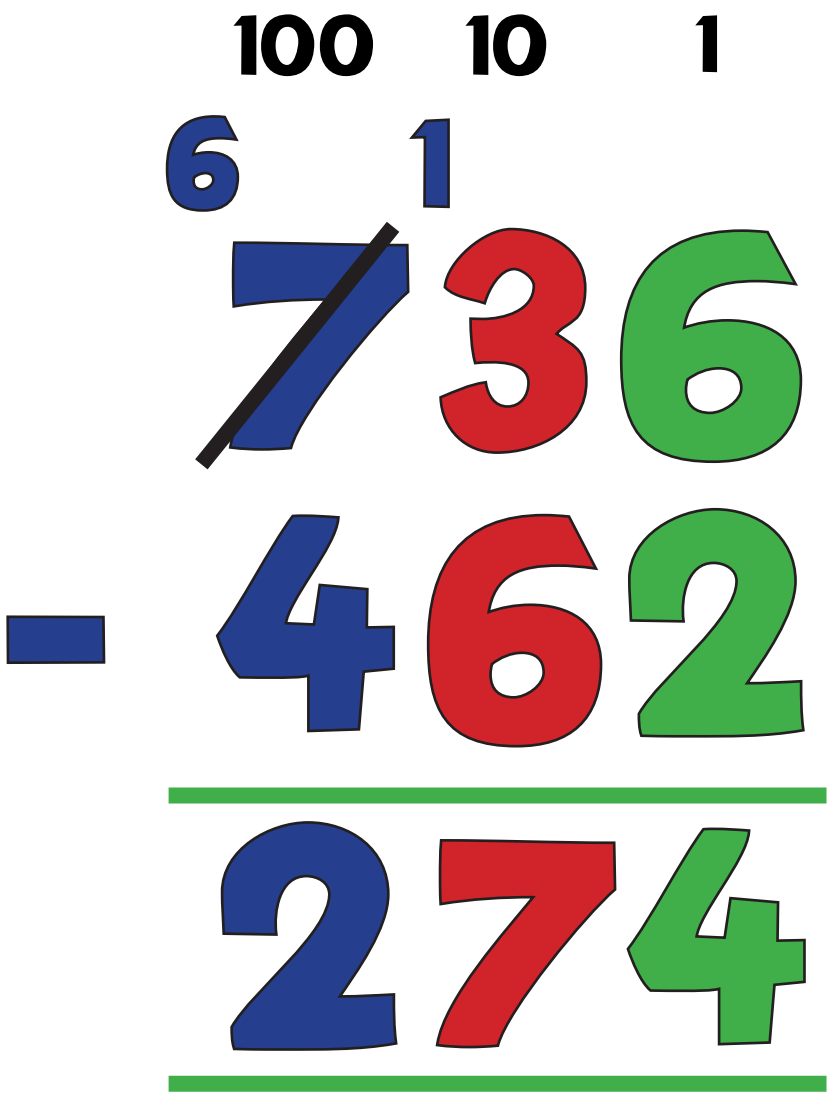
3



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S11d: Column Subtraction

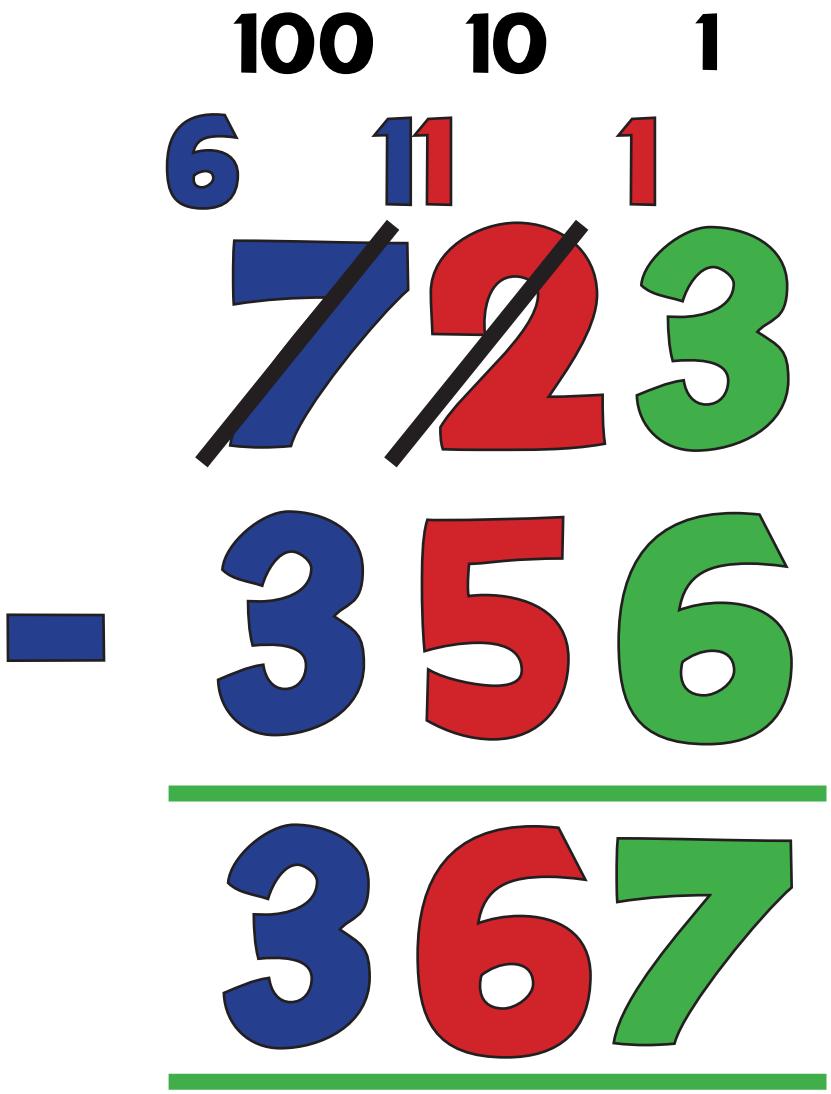
3



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S11e: Column Subtraction

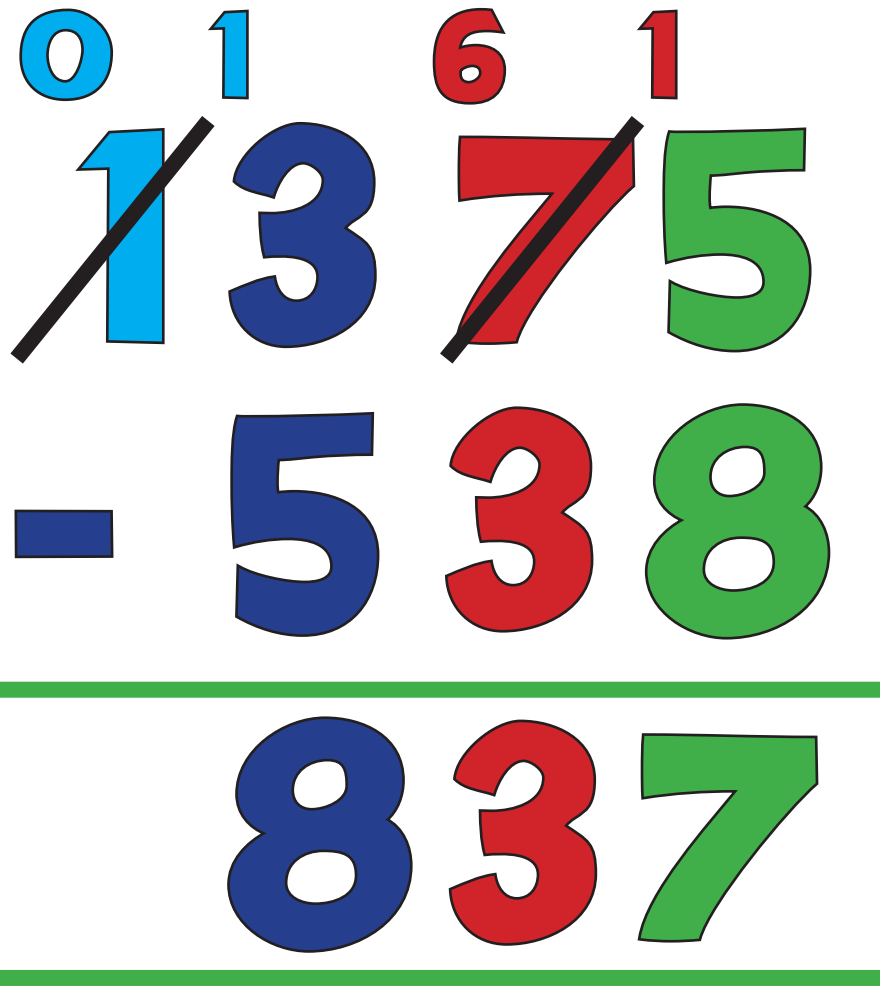
3



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S11f: Column Subtraction

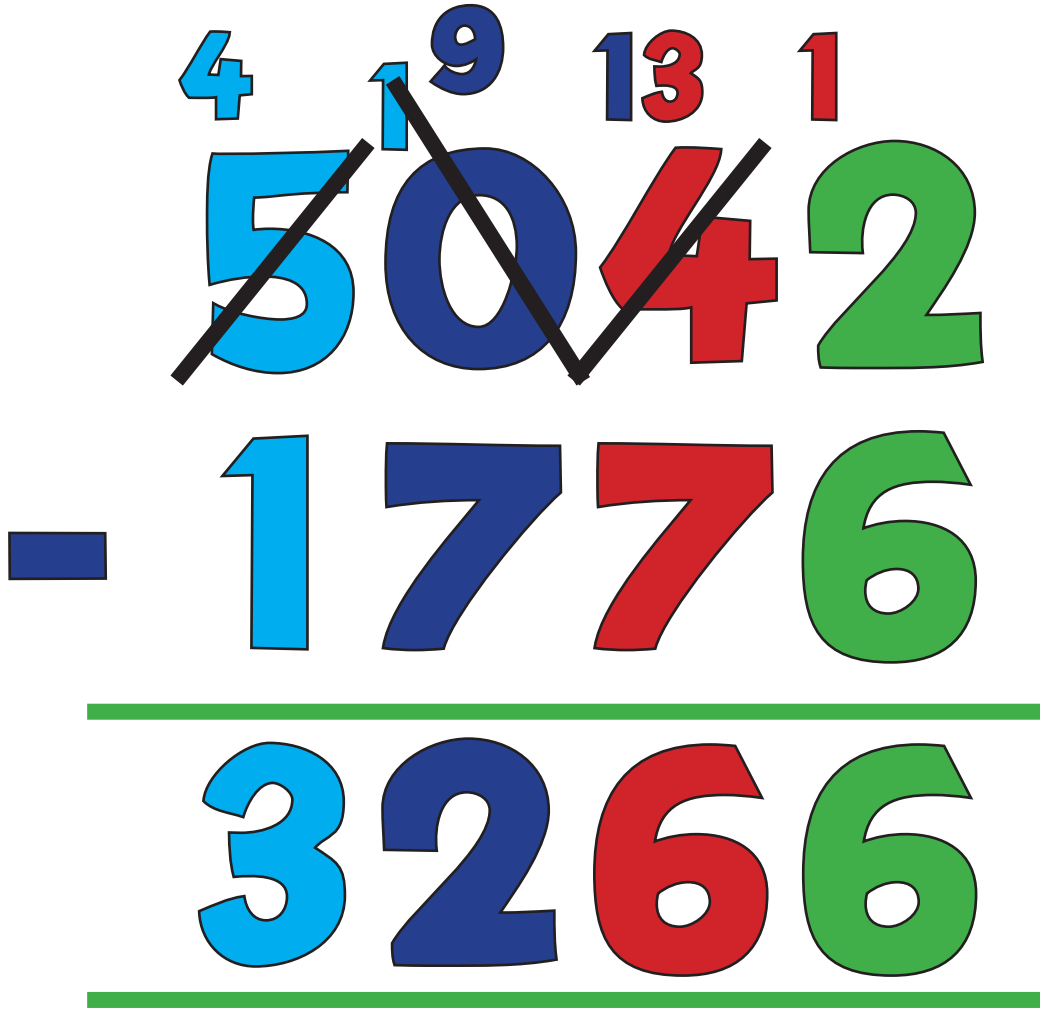
4



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S11g: Column Subtraction

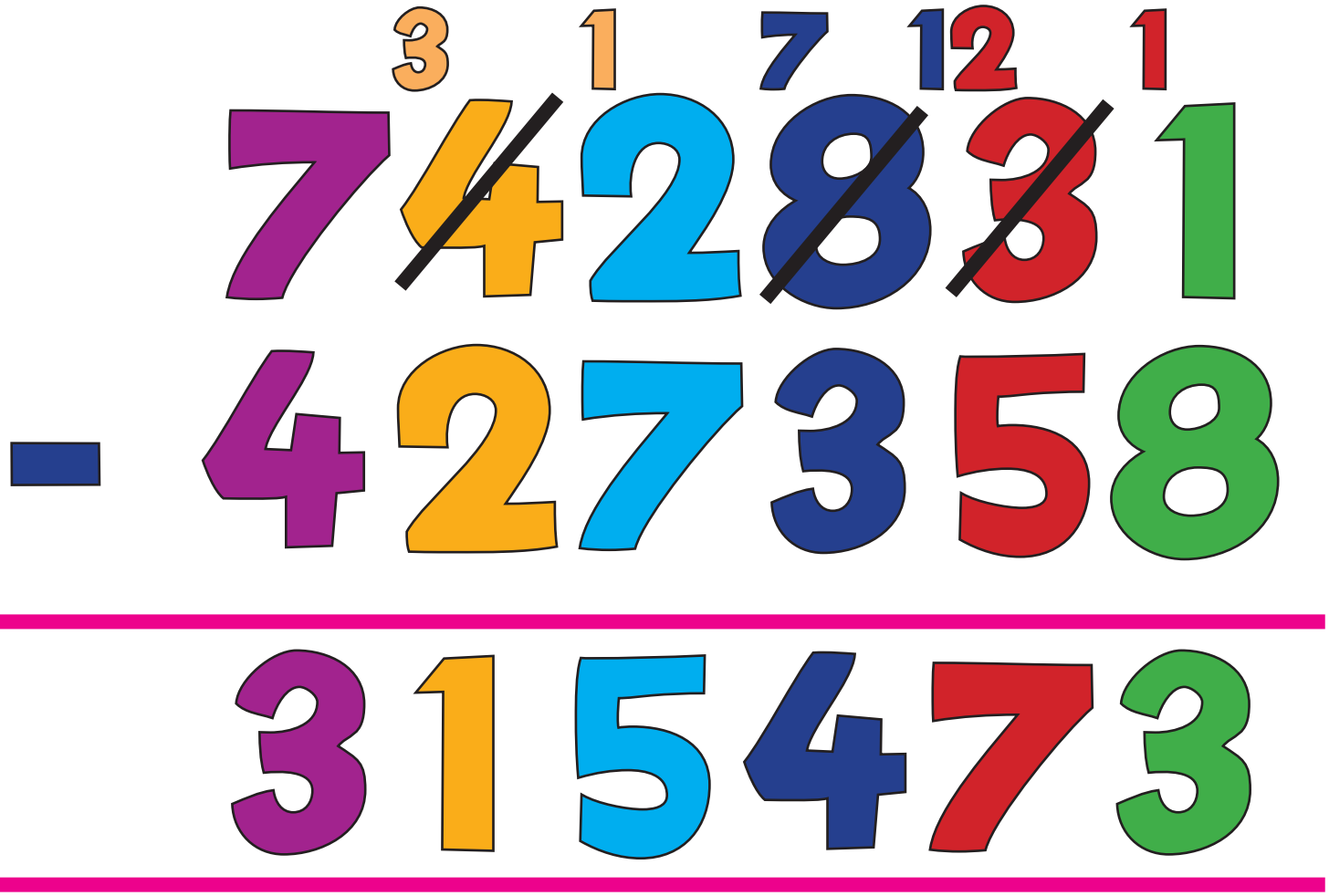
4



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S11h: Column Subtraction

5

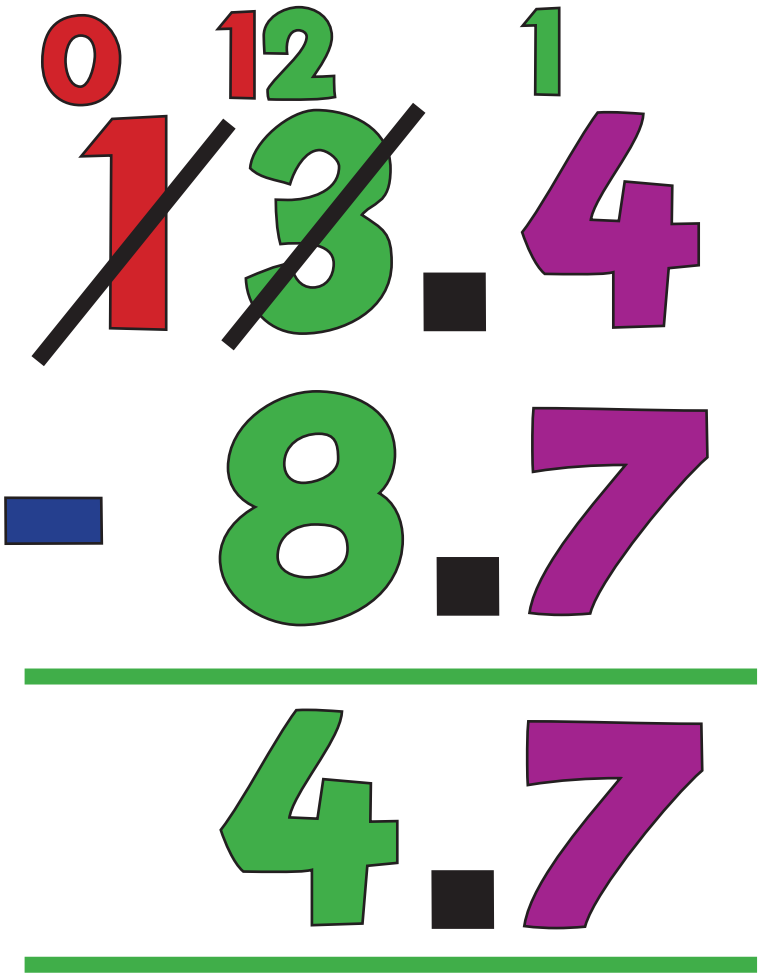


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S11i: Column Subtraction

5

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

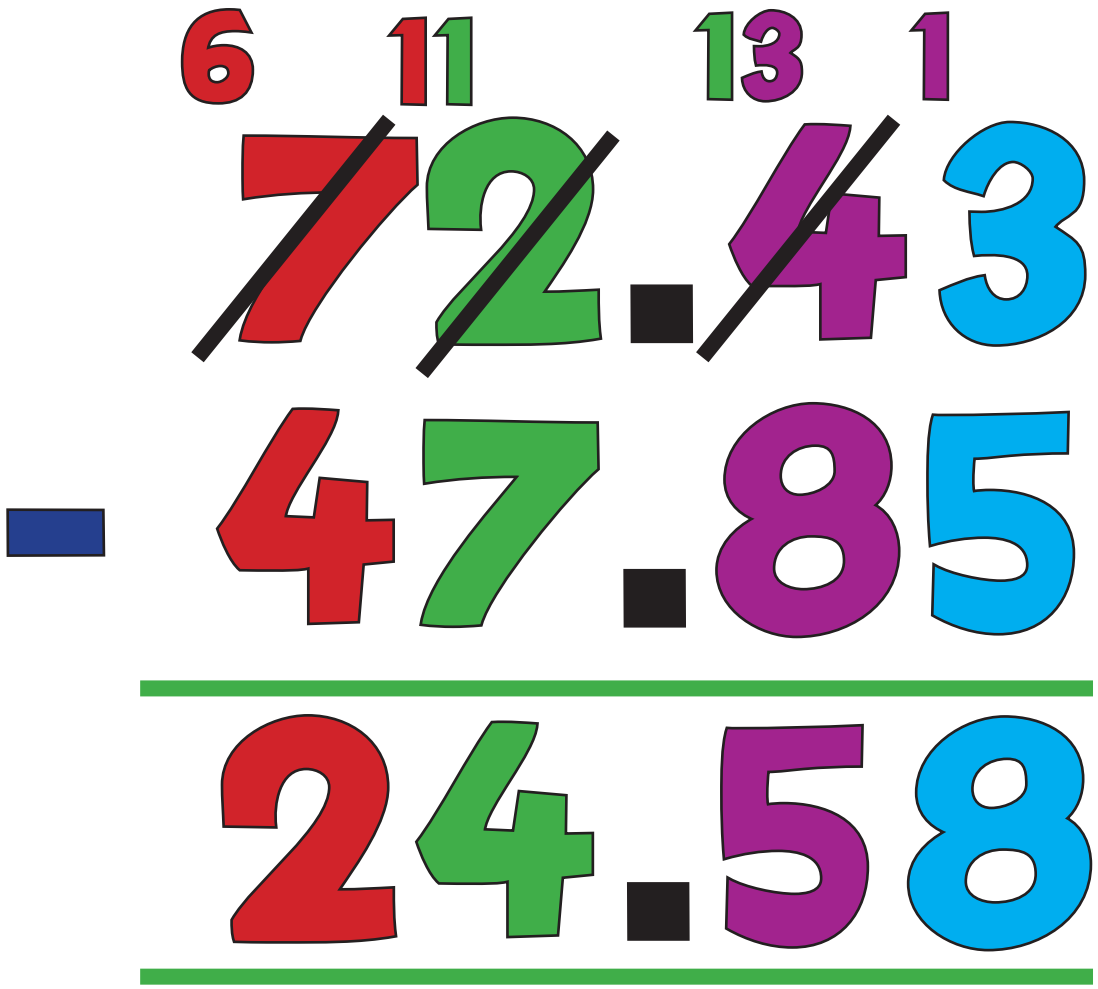


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S11j: Column Subtraction

5

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



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S11k: Column Subtraction

5

With Decimals

$$12.4 - 5.97 = 6.43$$

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

0 11 13 1

~~1~~ ~~2~~.~~4~~0

\- 5.97

6.43

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Multiplication Strategies

171 Calculation & Vocabulary

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179 M3 Arrays

181 M4 Multi Boing!

183 M5 Partitoning

185 M6 Grid Method

188 M7 *Expanded Column

194 M8 Column Multiplication

198 M9 Grid Method (Long Mult.)

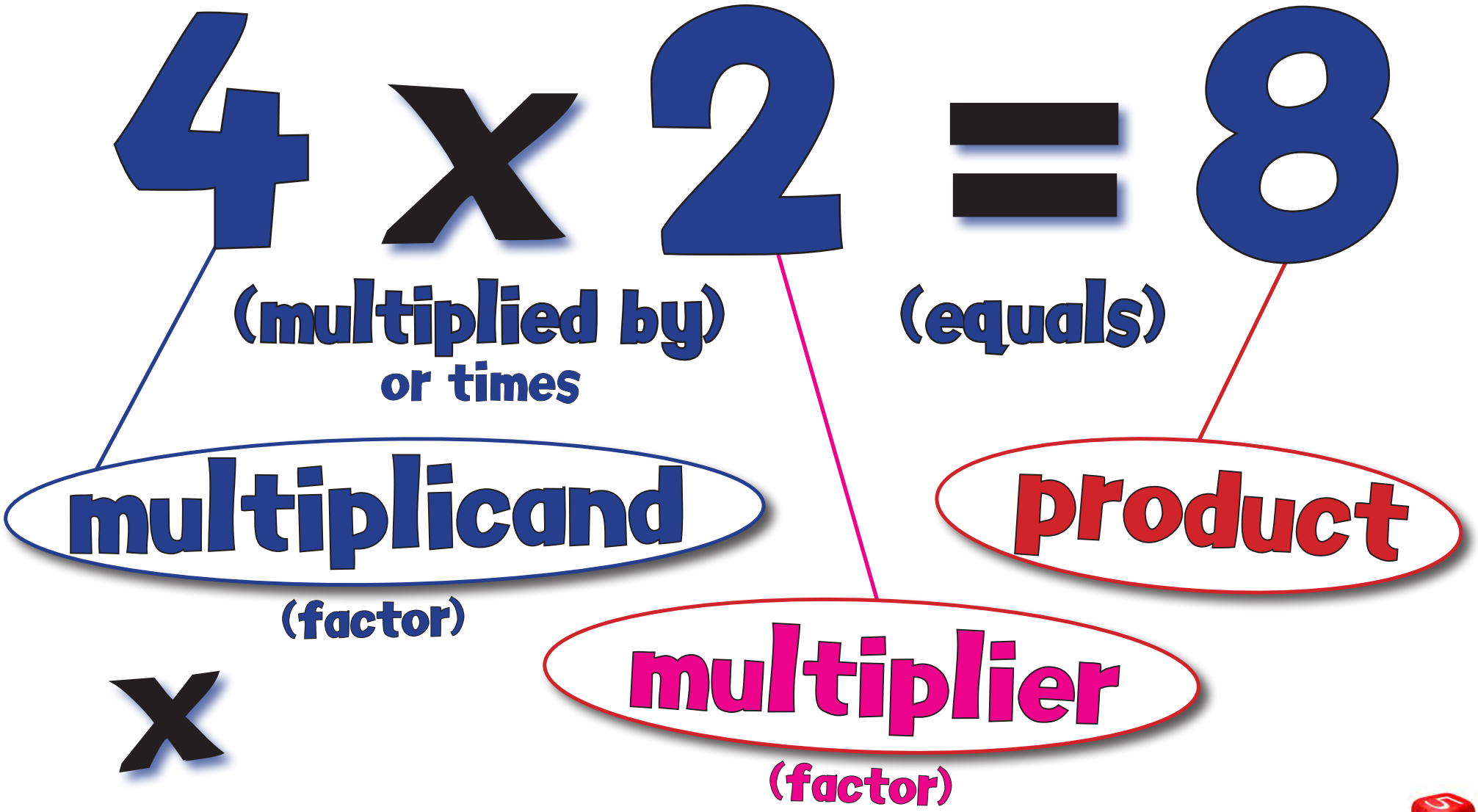
206 M10 *Long Multiplication

* The strategies marked with an asterisk have both 'multiplied by' and 'groups of' posters



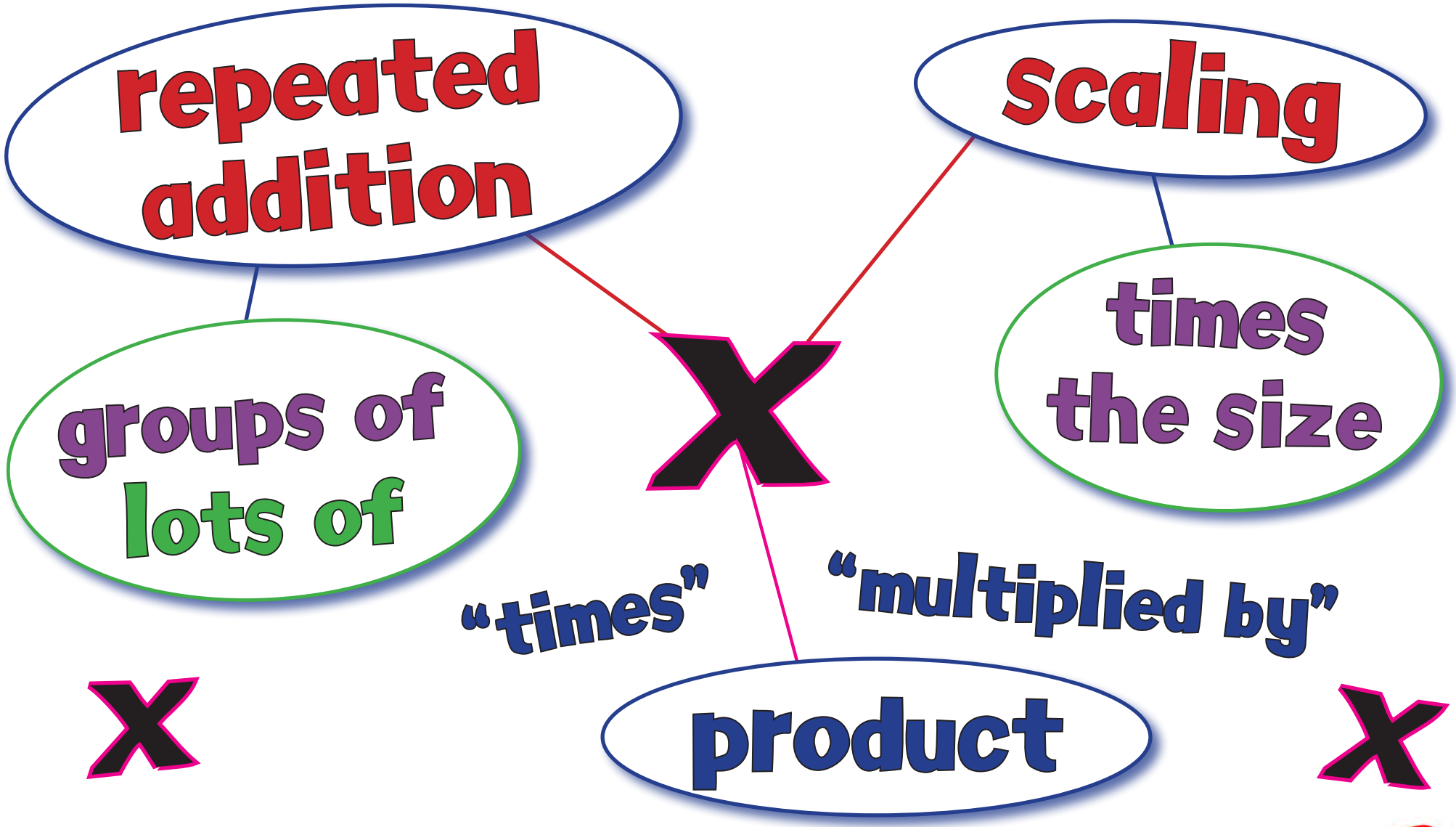
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Multiplication Calculation



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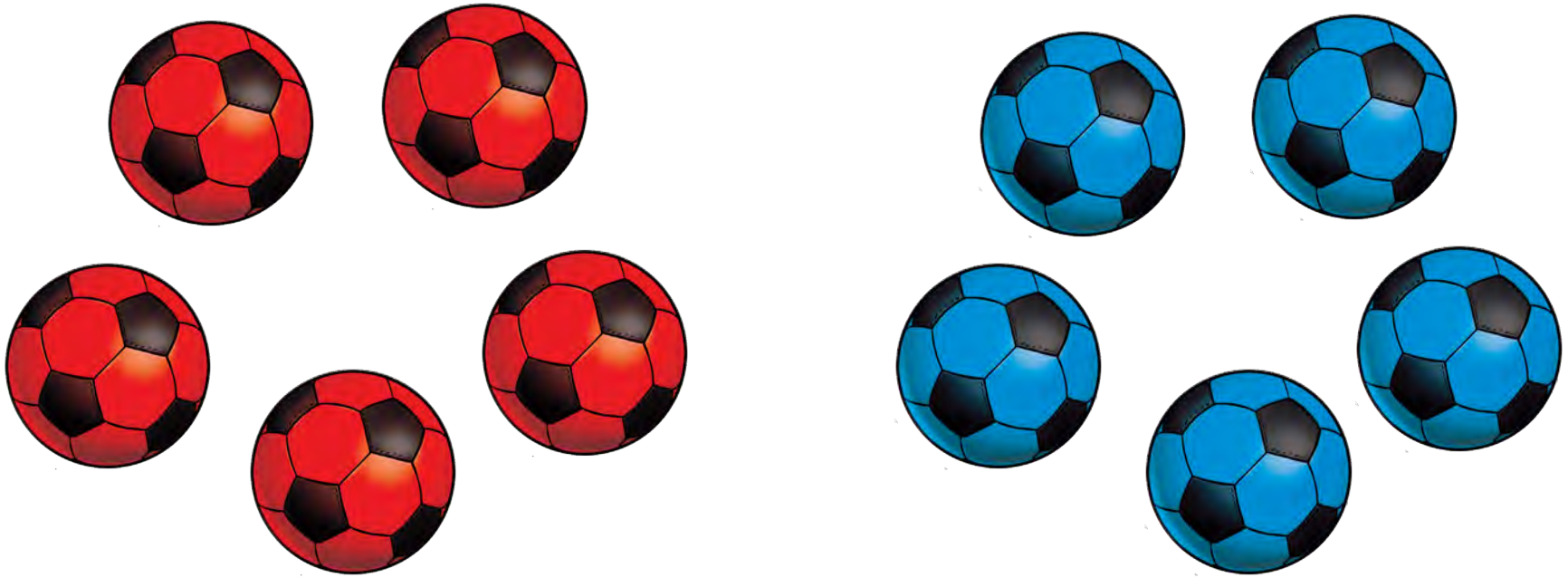
Multiplication Vocabulary



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M1: Objects and Pictures

1



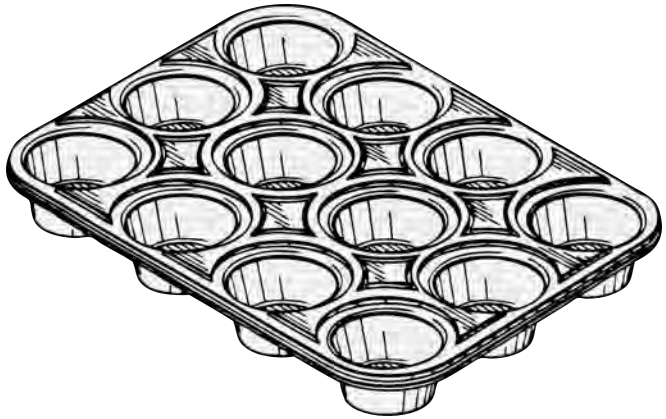
"A bag of 5 red footballs and a bag of 5 blue footballs makes 10 footballs altogether."

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M1a: Objects and Pictures

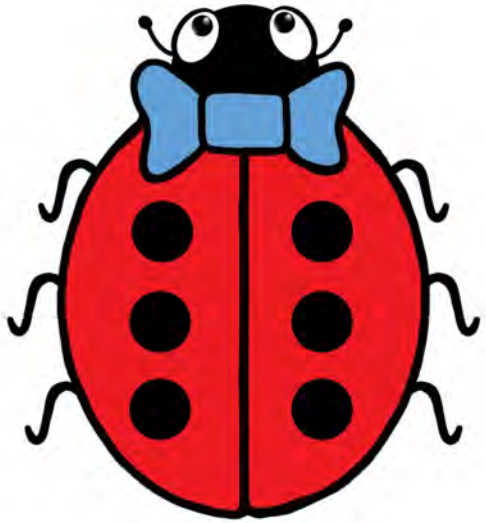
1









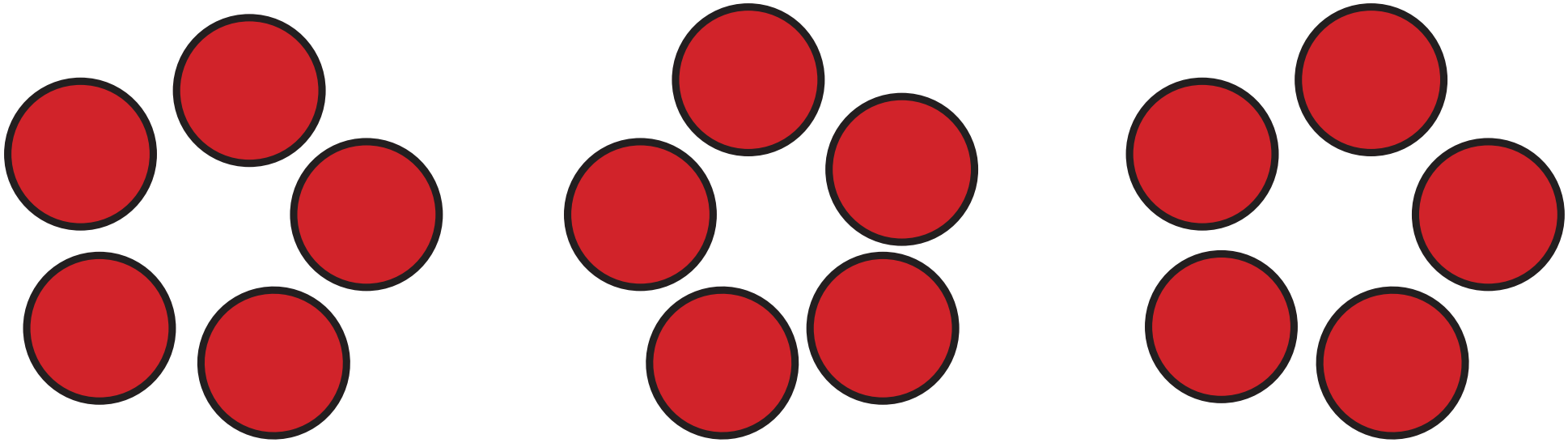




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M2: Repeated Addition

2 (Multiplied by)



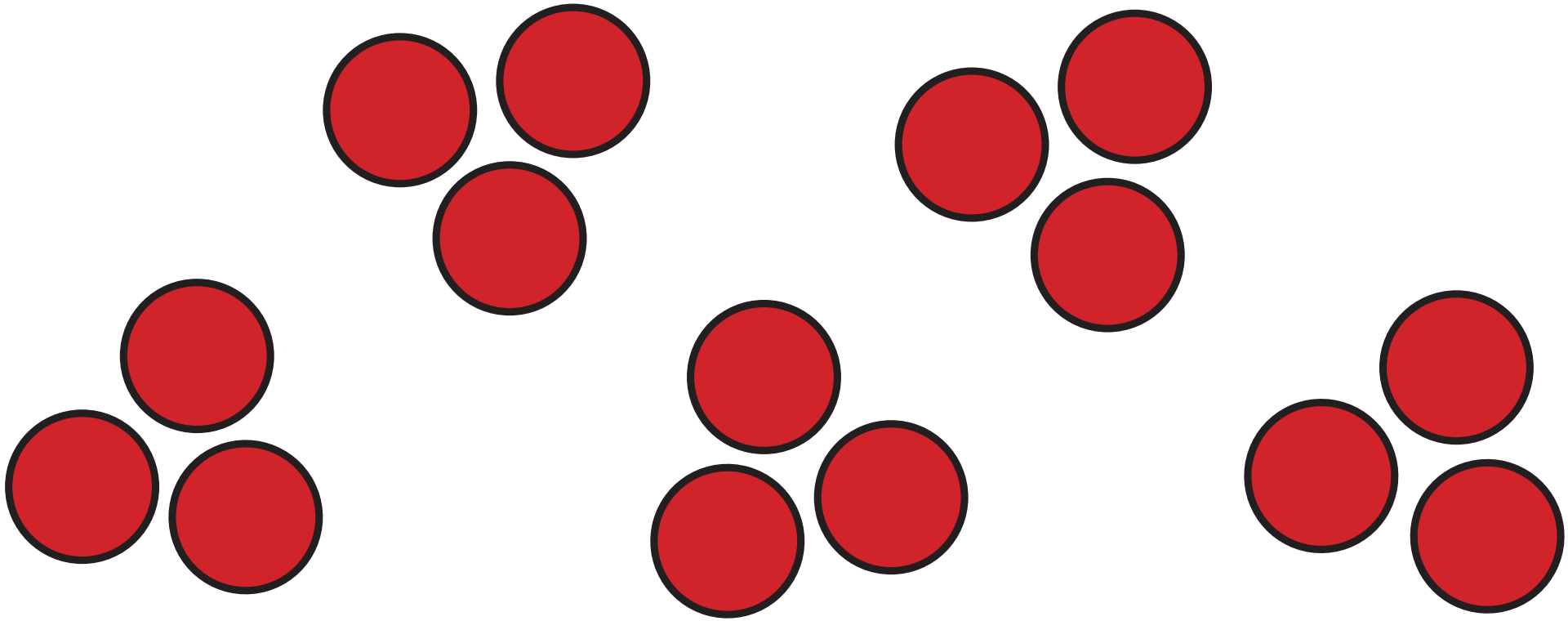
5 x 3 = 5 + 5 + 5 = 15

"5 multiplied by 3" means "5, 3 times", which gives "3 lots of 5"!

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M2: Repeated Addition

2 (Groups of)



5 x 3 = 3 + 3 + 3 + 3 + 3 = 15

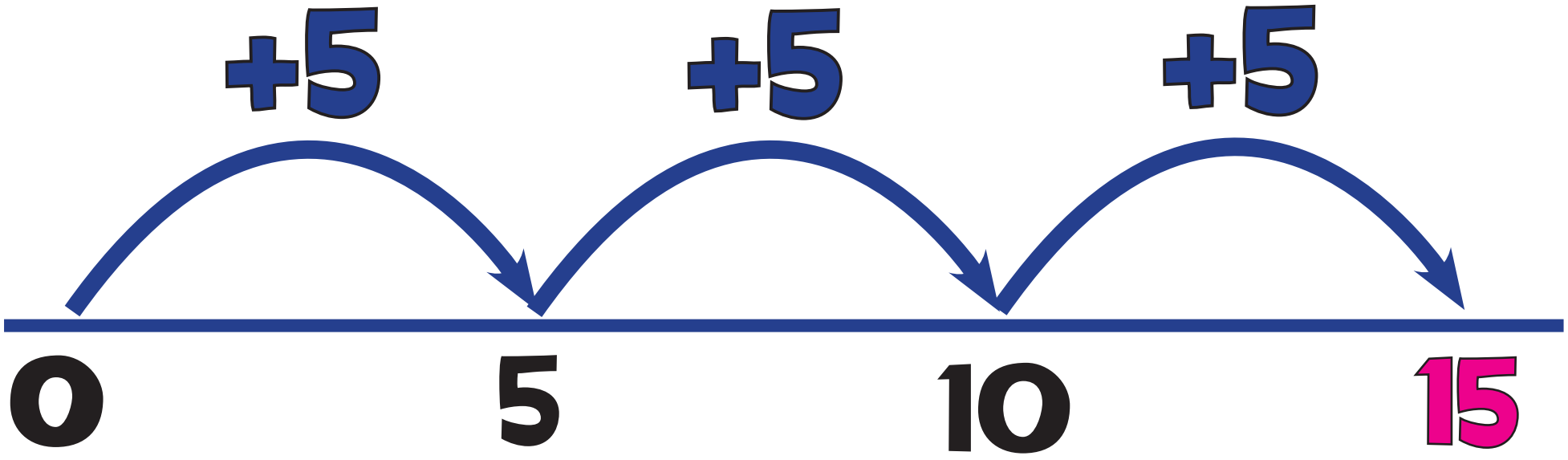
"5 times 3" means "5 groups of 3"

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M2a: Repeated Addition

2

(Number Line - Multiplied By)



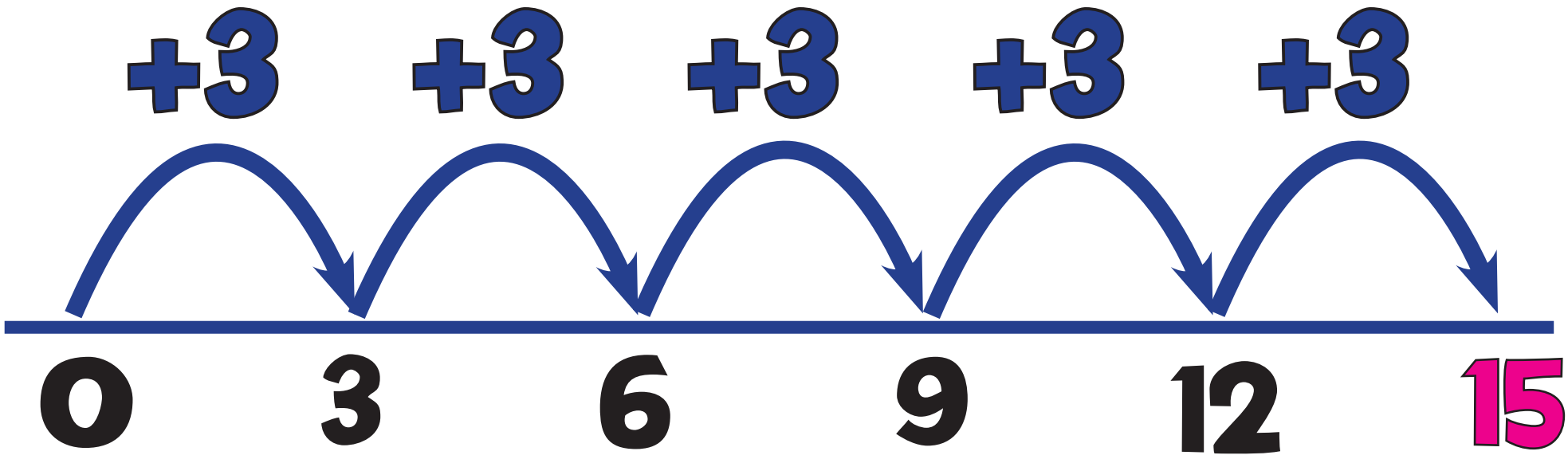
5 x 3 = 5 + 5 + 5 = 15

"5 multiplied by 3" means "5, 3 times", which gives "3 lots of 5"!

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M2a: Repeated Addition

2 (Number Line - Groups of)



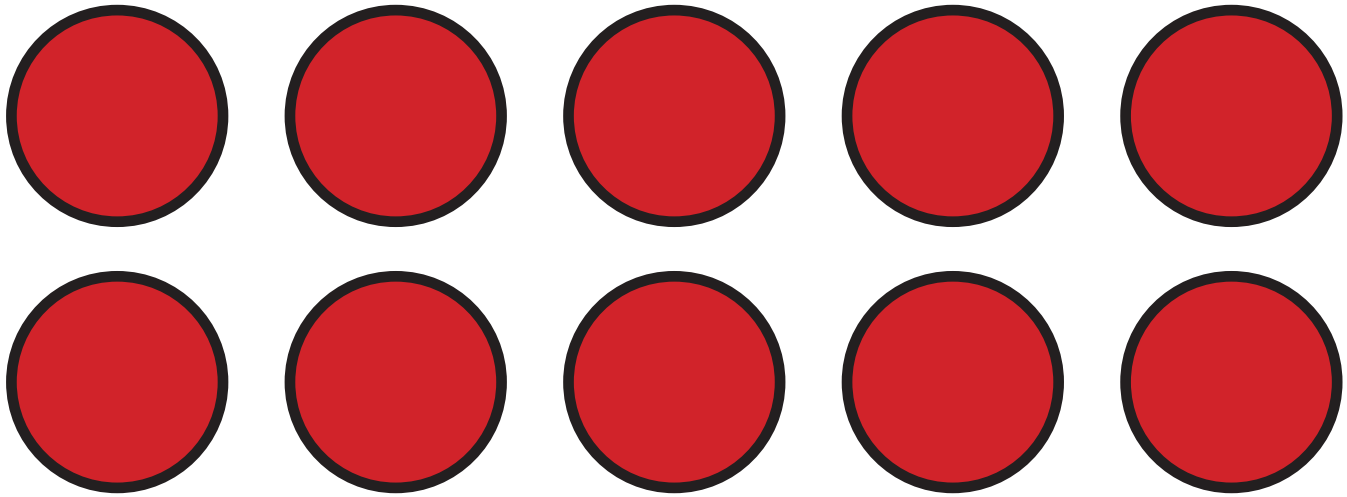
5 x 3 = 3 + 3 + 3 + 3 + 3 = 15

"5 times 3" means "5 groups of 3"

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M3: Arrays

1

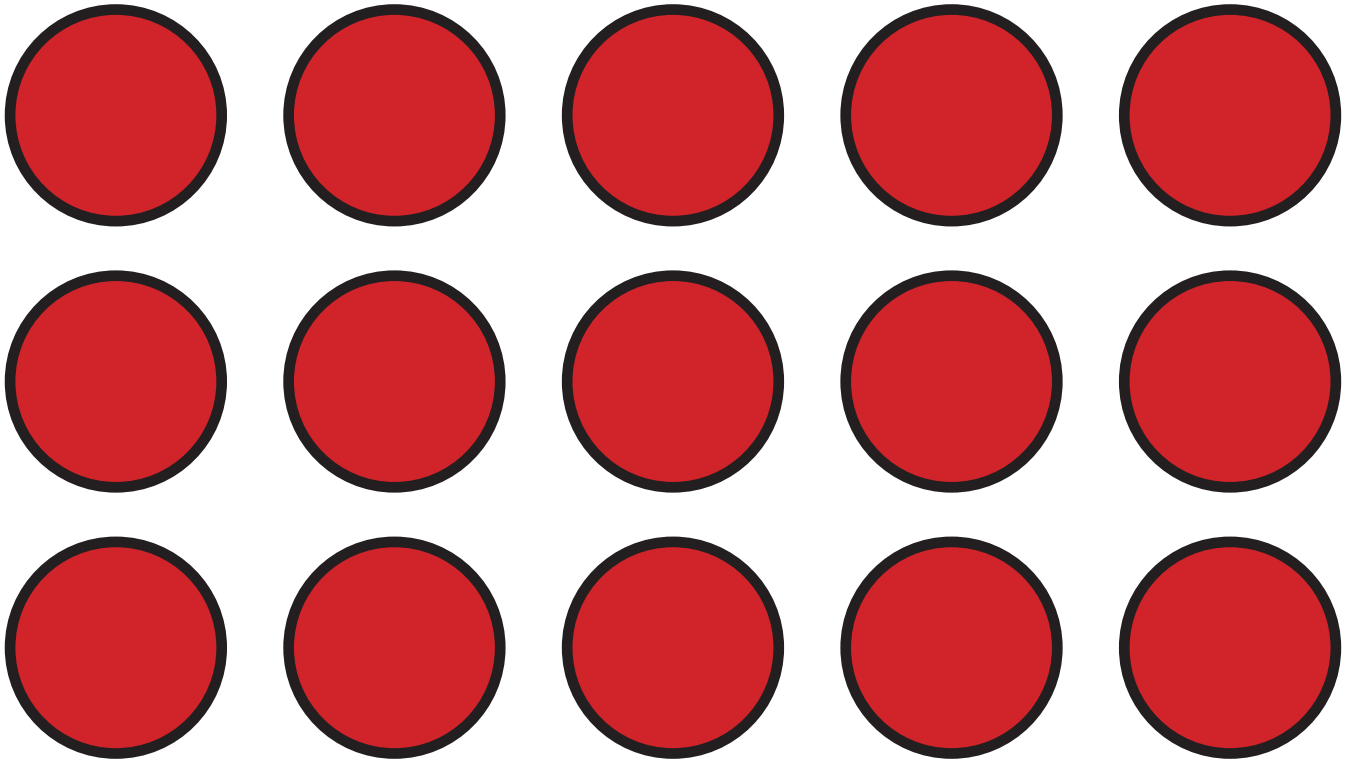


"2 groups of 5 counters" or "5 groups of 2 counters" - "10 counters altogether"

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M3: Arrays

2

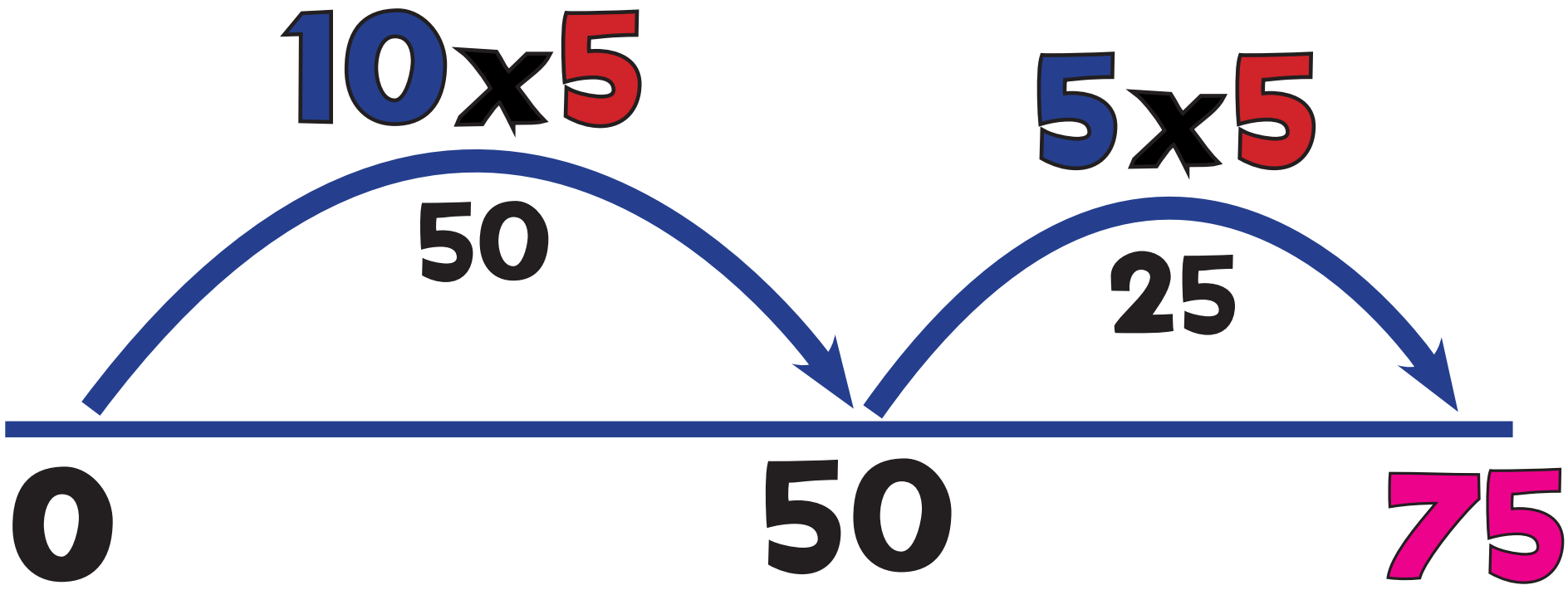


$3 \times 5 = 15$ or $5 \times 3 = 15$

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M4: Multi Boing!

3



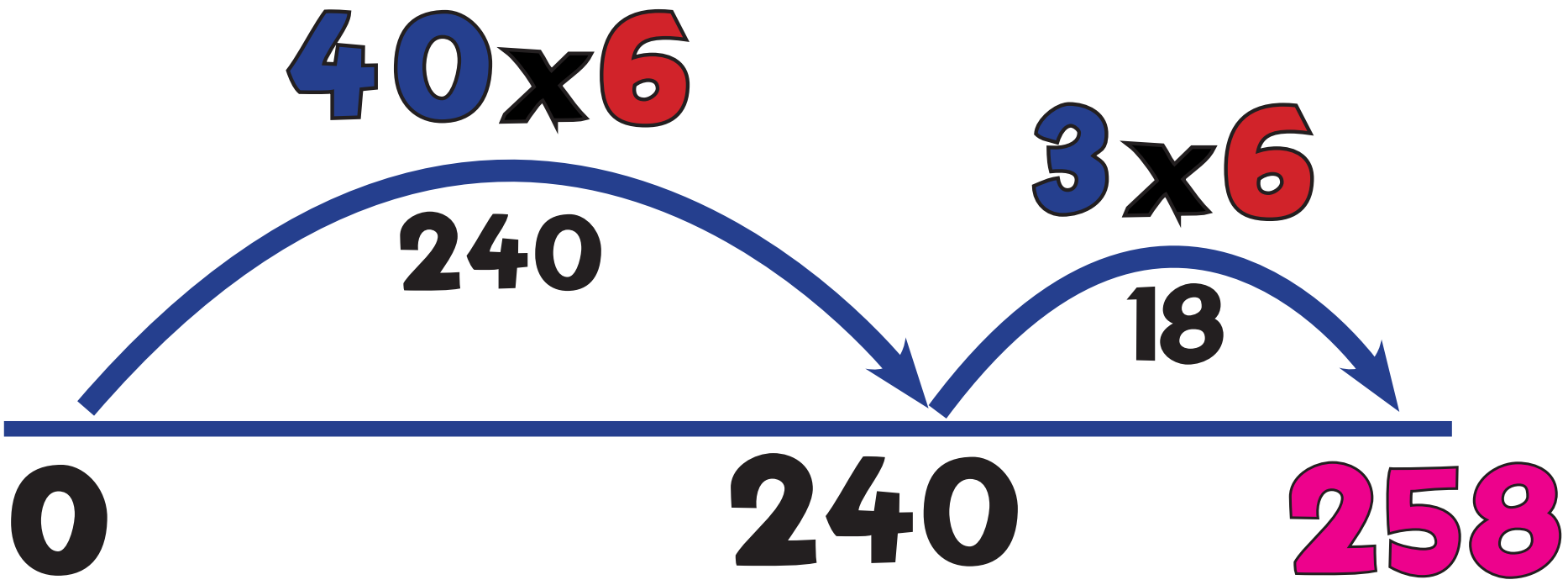
15 x 5 = 75

5 x 15 = 75

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M4a: Multi Boing!

4



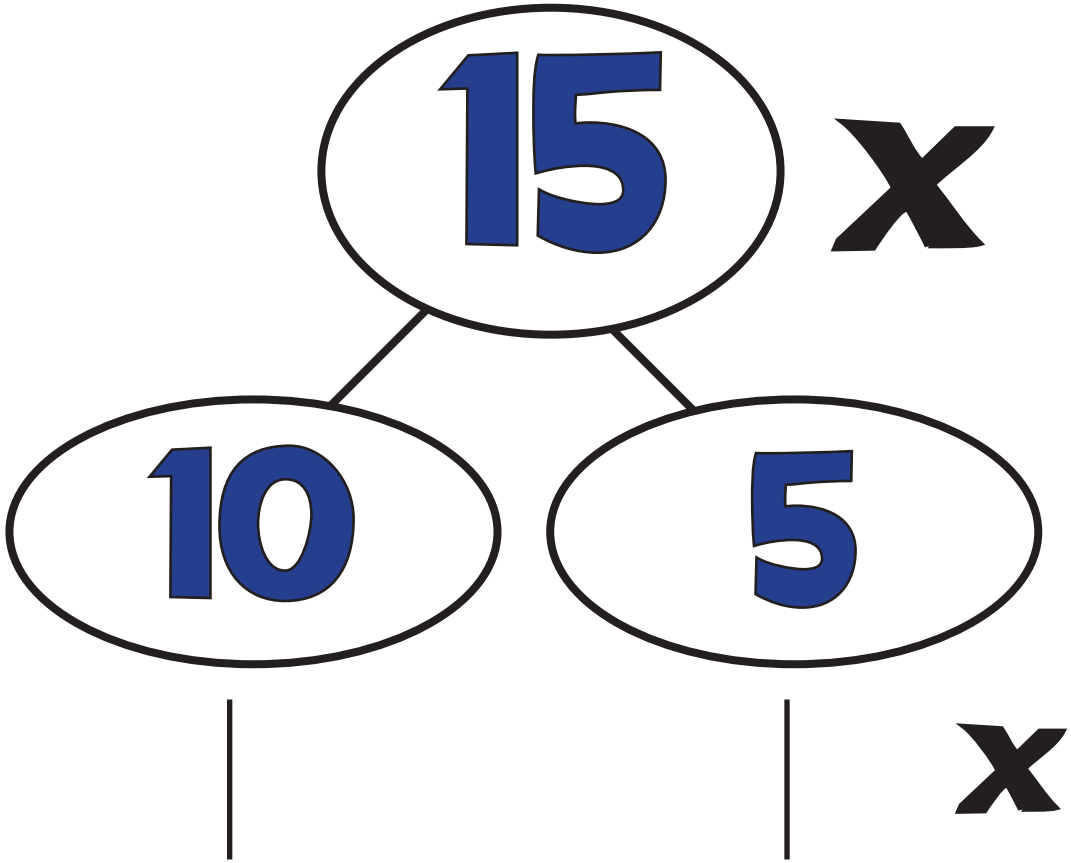
43 x 6 = 258

6 x 43 = 258

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M5: Partitioning

3



15 x 5 = 75

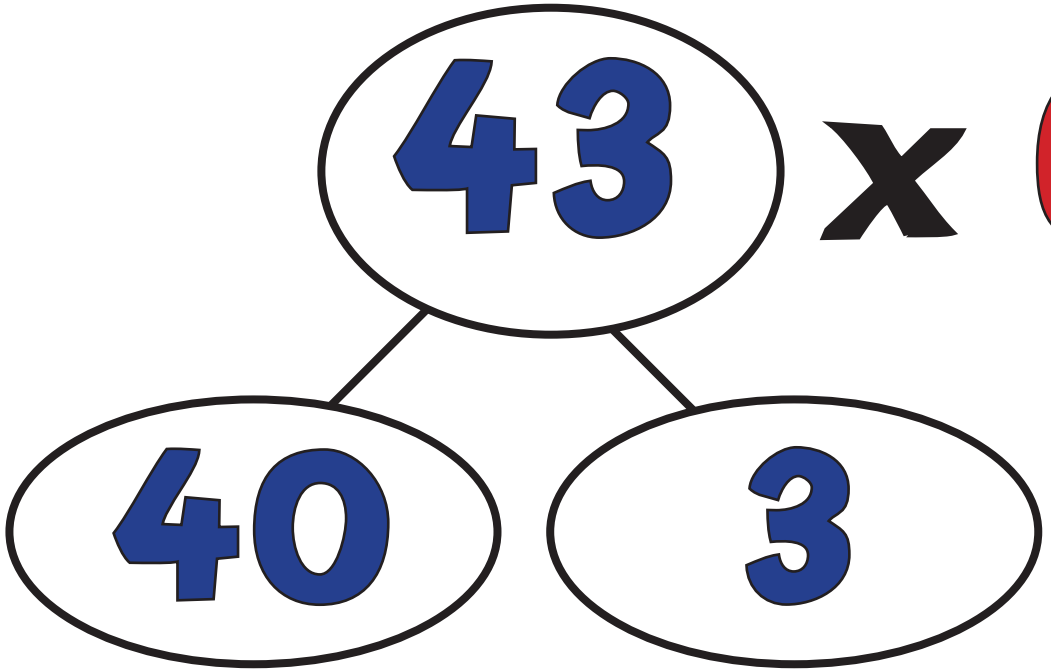
x 5

50 + 25 = 75

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M5a: Partitioning

4



43 x 6 = 258

x 6

240 + 18 = 258

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M6: Grid Method

3

Short Multiplication

15 x 5 = 75

15 x 5 = 75

x	10	5
5	50	25

50 + 25 = 75

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M6a: Grid Method

4

Short Multiplication

6 x 43 = 258

43 x 6 = 258

x	40	3
6	240	18

240 + 18 = 258

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M6b: Grid Method

4

Short Multiplication

4 x 147 = 588

147 x 4 = 588

x	100	40	7
4	400	160	28

400 + 160 + 28 = 588

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M7: Expanded Column

3 (Multiplied by)

	10	1	
	1	5	
x		5	
	2	5	(5 x 5)
	5	0	(10 x 5)
	7	5	

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M7: Expanded Column

3 (Groups of)

	10	1	
	1	5	
x		5	
	2	5	(5 x 5)
	5	0	(5 x 10)
	7	5	

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M7a: Expanded Column

4 (Multiplied by)

100	10	1
	4	3
x		6
	1	8
2	4	0
2	5	8

(3 x 6)

(40 x 6)

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M7a: Expanded Column

4 (Groups of)

100	10	1
	4	3
x		6

18	(6 x 3)
240	(6 x 40)
258	

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M7b: Expanded Column

4 (Multiplied by)

100	10	1	
1	4	7	
x		4	
	2	8	(7 x 4)
1	6	0	(40 x 4)
4	0	0	(100 x 4)
5	8	8	

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M7b: Expanded Column

4 (Groups of)

100	10	1	
1	4	7	
x		4	
	2	8	(4 x 7)
1	6	0	(4 x 40)
4	0	0	(4 x 100)
5	8	8	

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M8: Column Multiplication

3

	10	1
	1	5
x		5
	7	5
	2	

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M8a: Column Multiplication

4

100	10	1
	4	3
x		6
2	5	8
	1	

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M8b: Column Multiplication

4

100	10	1
1	4	7
x		4
5	8	8
1	2	

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M8c: Column Multiplication

4

3647

x 4

14588

2 1 2

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M9: Grid Method

5

Long Multiplication

12 x 15 = 180

15 x 12 = 180

x	10	5
10	100	50
2	20	10

100 + 50 + 20 + 10 = 180

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M9a: Grid Method

5

Long Multiplication

65 x 43 = 2795

43 x 65 = 2795

x	40	3
60	2400	180
5	200	15

2400 + 180 + 200 + 15 = 2795

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M9b: Grid Method

5

Long Multiplication

243 x 68 = 16,524

x	200	40	3	
60	12000	2400	180	= 14,580
8	1600	320	24	= 1,944

14580 + 1944 = 16,524

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M9c: Grid Method

5

Long Multiplication

203 x 68 = 13,804

x	200	0	3	
60	12000	0	180	= 12,180
8	1600	0	24	= 1,624

12180 + 1624 = 13,804

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M9d: Decimal Grid

5

Short Multiplication

$3.6 \times 4 = 14.4$

x	3	0.6
4	12	2.4

$12 + 2.4 = 14.4$

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M9e: Decimal Grid

6

Short Multiplication

47.2 x 3 = 141.6

x	40	7	0.2
3	120	21	0.6

120 + 21 + 0.6 = 141.6

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M9f: Grid Method

6

Short Multiplication

$$7.38 \times 6 = 44.28$$

x	7	0.3	0.08
6	42	1.8	0.48

$$42 + 1.8 + 0.48 = 44.28$$

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M9g: Grid Method

6

Long Multiplication

24.3 x 2.5 = 60.75

x	20	4	0.3	
2	40	8	0.6	= 48.6
0.5	10	2	0.15	= 12.15

48.6 + 12.15 = 60.75

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M10: Long Multiplication

5

Column

$$
\begin{array}{rr}
 & 15 \\
\times & 12 \\
\hline
 & 30 \quad (15 \times 2) \\
+ & 150 \quad (15 \times 10) \\
\hline
 & 180 \\
\hline
\end{array}
$$

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M10: Long Multiplication

5

Column

$$
\begin{array}{rr}
 & 15 \\
\times & 12 \\
\hline
 & 30 \quad (2 \times 15) \\
+ & 150 \quad (10 \times 15) \\
\hline
 & 180 \\
\hline
\end{array}
$$

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M10a: Long Multiplication

6

Column

$$
\begin{array}{rr}
 & 43 \\
\times & 65 \\
\hline
 & 215 \quad (43 \times 5) \\
+ & 2580 \quad (43 \times 60) \\
\hline
 & 2795 \\
\hline
\end{array}
$$

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M10a: Long Multiplication

6

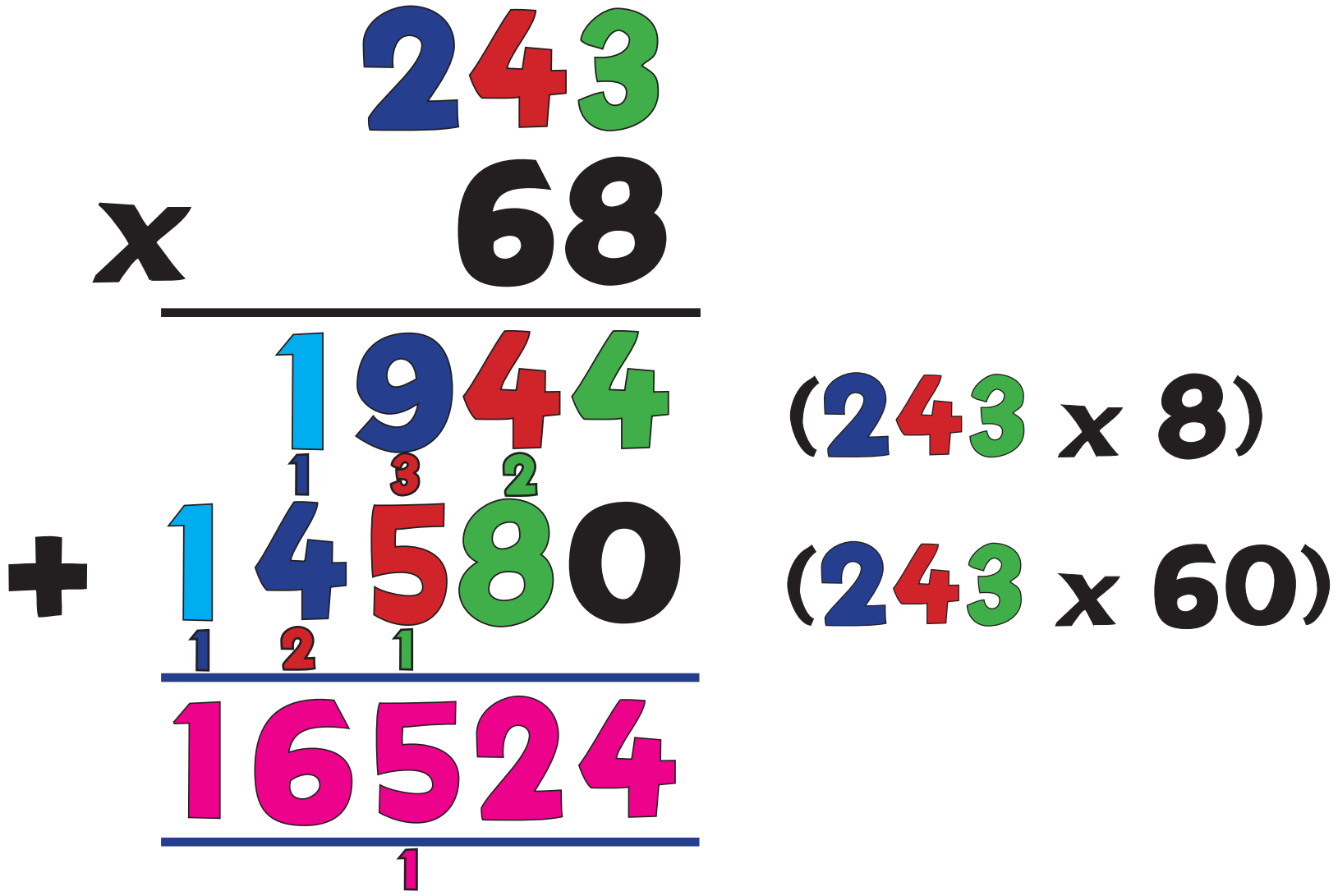
Column

$$
\begin{array}{rr}
 & 43 \\
\times & 65 \\
\hline
 & 215 \quad (5 \times 43) \\
+ & 2580 \quad (60 \times 43) \\
\hline
 & 2795
\end{array}
$$

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M10b: Long Multiplication

6 Column



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M10b: Long Multiplication

6 Column

$$
\begin{array}{r}
243 \\
\times \quad 68 \\
\hline
1944 \\
+\ 14580 \\
\hline
16524 \\
\hline
\end{array}
$$

(8 x 243)

(60 x 243)

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M10c: Long Multiplication

6 Column

$$
\begin{array}{rr}
 & 203 \\
\times & 68 \\
\hline
 & 1624 \quad (203 \times 8) \\
+ & 12180 \quad (203 \times 60) \\
\hline
 & 13804 \\
\hline
\end{array}
$$

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M10c: Long Multiplication

6 Column

$$
\begin{array}{rr}
 & 203 \\
\times & 68 \\
\hline
 & 1624 \quad (8 \times 203) \\
+ & 12180 \quad (60 \times 203) \\
\hline
 & 13804 \\
\hline
\end{array}
$$

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M10d: Column Multiplication

5

10 1 ▪ $\frac{1}{10}$

$$\begin{array}{r} 3.6 \\ \times \quad 4 \\ \hline 14.4 \\ \hline 2 \end{array}$$

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M10e: Column Multiplication

6

100	10	1	.	$\frac{1}{10}$
	4	7	.	2
x		3		
1	4	1	.	6
		2		

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M10f: Column Multiplication

6

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	7	.	3	8
x	6			
4	4	.	2	8
4	2		4	

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M10g: Long Multiplication

Column Decimals

6

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	24	.	3	
x			2.5	
	12	.	1	5
	1		2	1
+	48	.	60	
	60	.	75	
	1			

(24.3 x 0.5)

(24.3 x 2)

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M10g: Long Multiplication

Column Decimals

6

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	24	.	3	
x			2.5	
	12	.	1	5
	1		2	1
+	48	.	60	
	60	.	75	
	1			

(0.5 x 24.3)

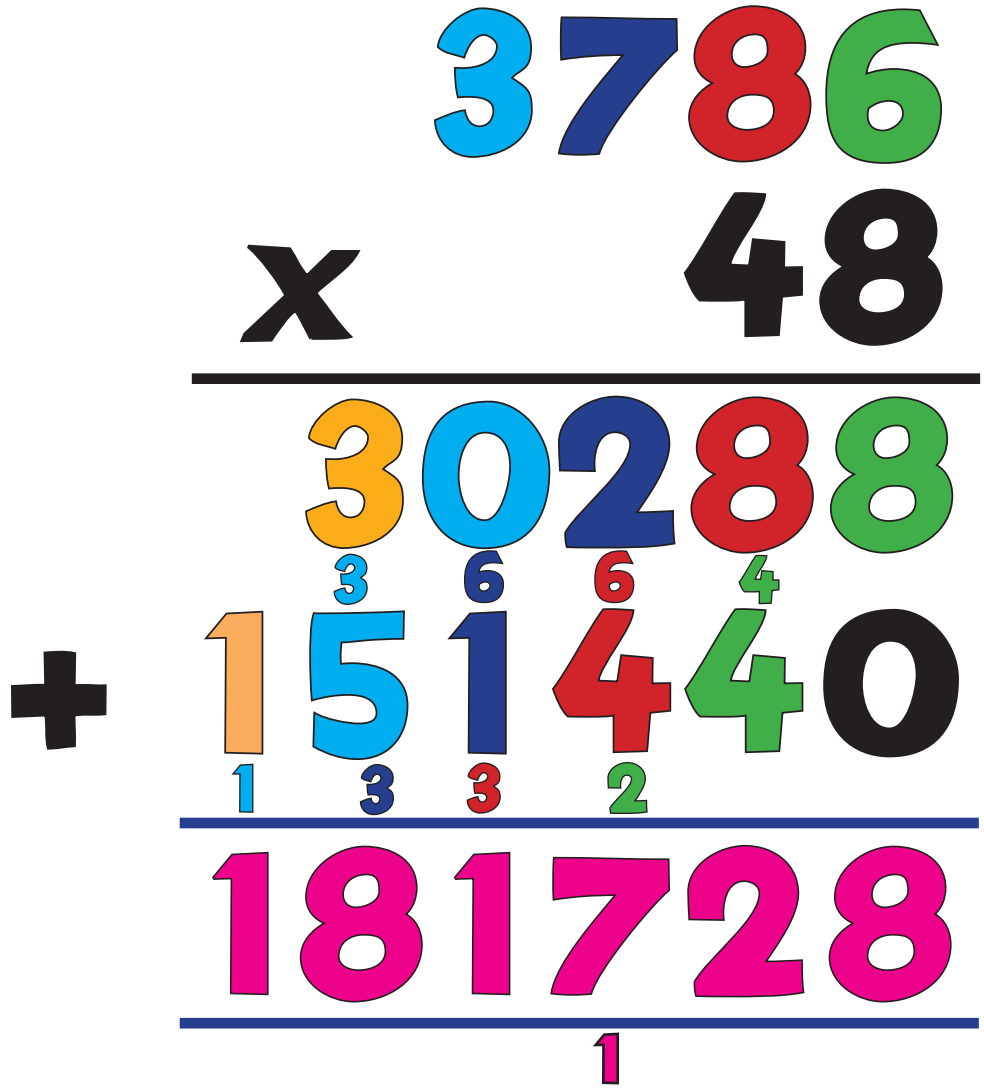
(2 x 24.3)

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M10h: Long Multiplication

6

Column



(3786 x 8)

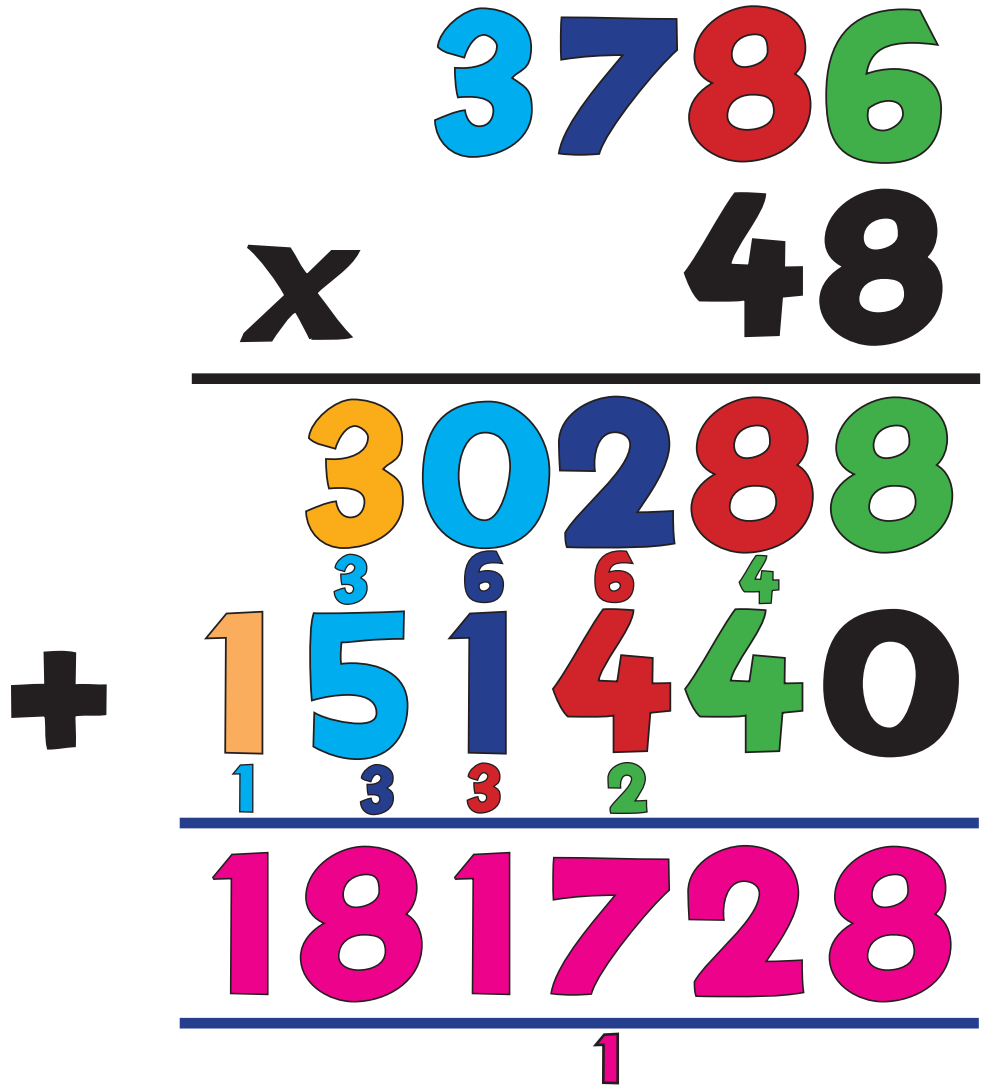
(3786 x 40)

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M10h: Long Multiplication

6

Column



(8 x 3786)

(40 x 3786)

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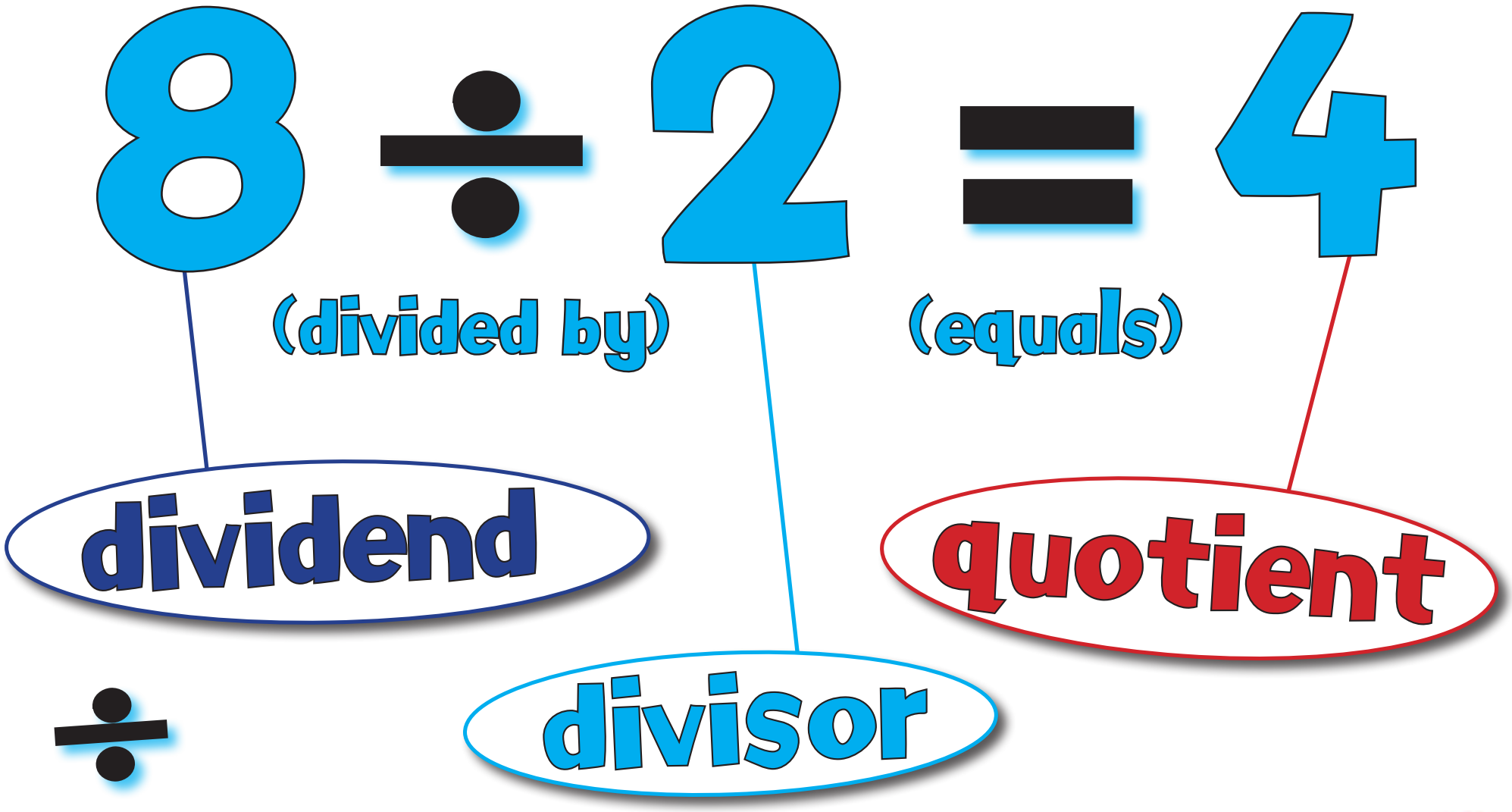
Division Strategies

221		Calculation & Vocabulary
223	D1	Objects and Pictures (Sharing)
224	D2	Objects and Pictures (Grouping)
225	D3	Sharing
226	D4	Grouping
227	D5	Grouping on a Number Line
230	D6	Grouping Grid
231	D7	Chunking Jump
233	D8	Find the Hunk
235	D9	Mega Hunk
245	D10	Short Division
255	D11	Chunking
267	D12	Long Division (Short Division Method)
268	D13	Long Division (Chunking Method)
270	D14	Long Division (Traditional Method)



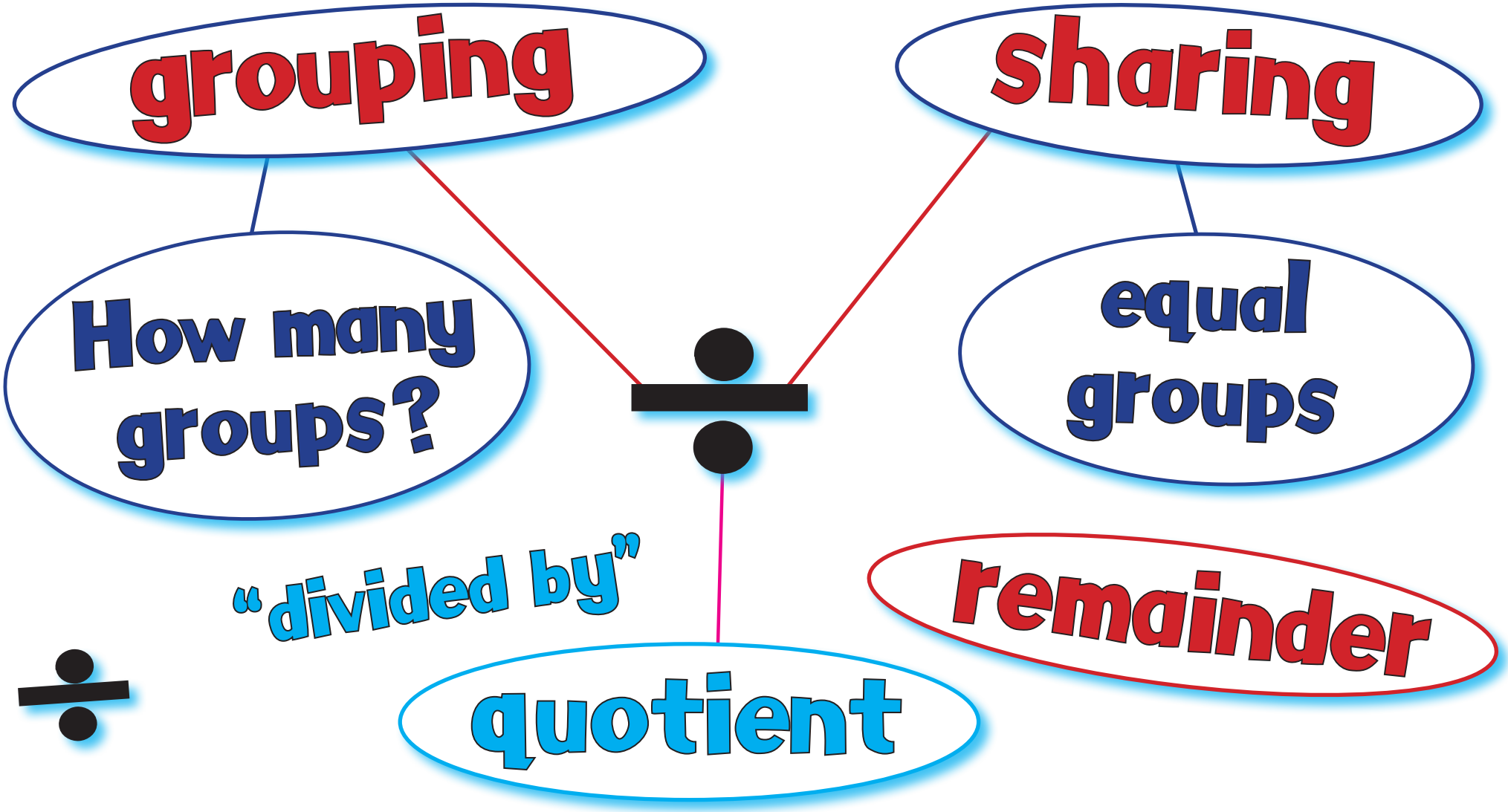
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Division Calculation



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Division Vocabulary



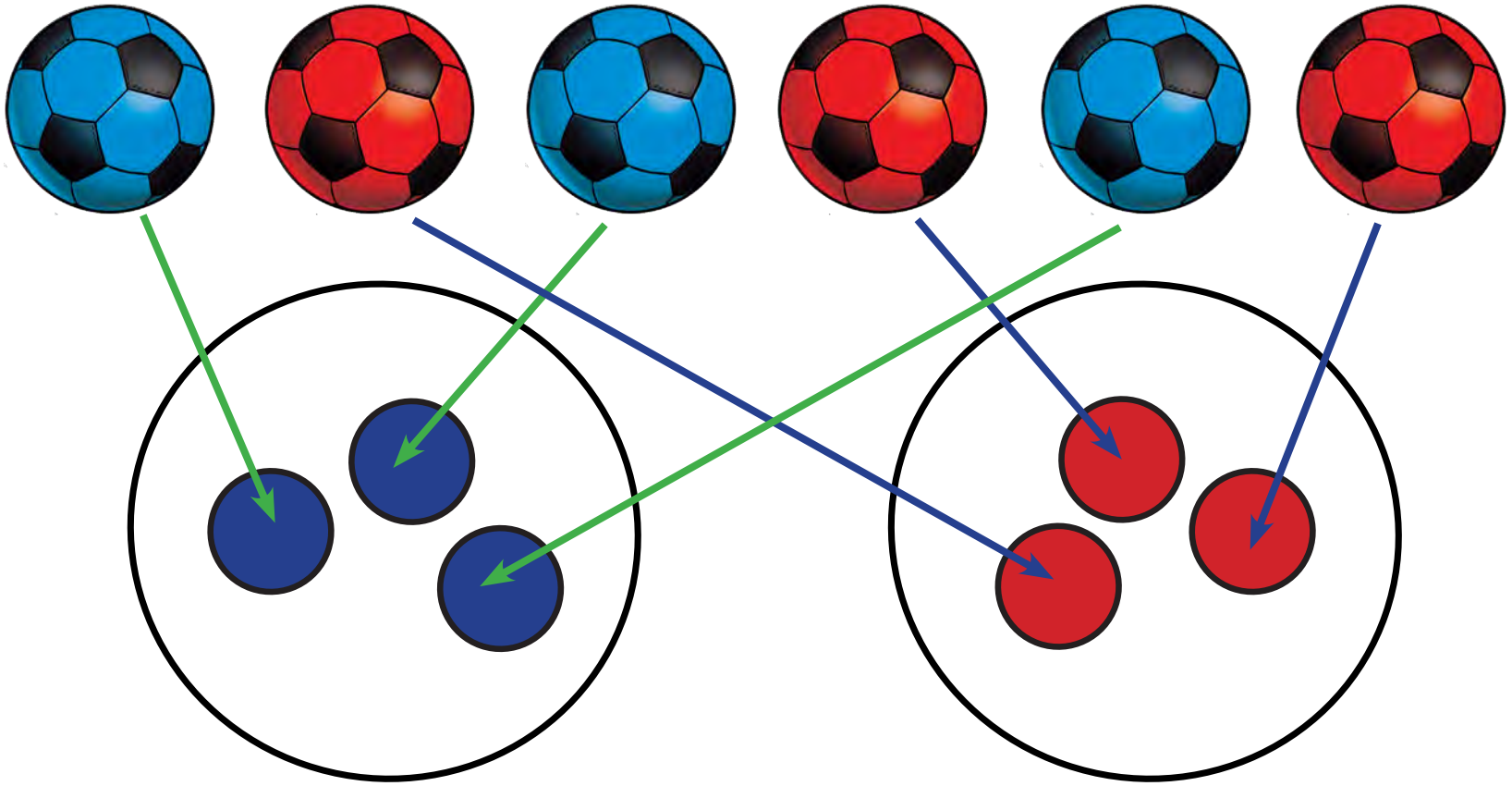
÷

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D1: Objects and Pictures

1

Sharing



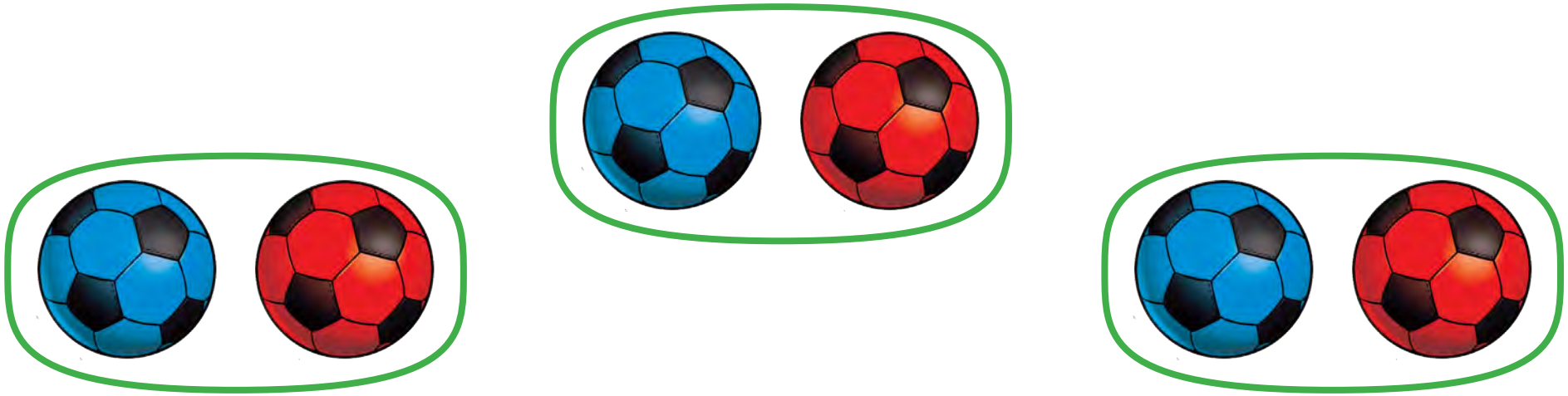
"If I share 6 footballs fairly into 2 bags, how many footballs in each bag?" Answer: 3

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D2: Objects and Pictures

1

Grouping



"If a child can carry 2 footballs, how many children do I need to carry 6 footballs? Answer: 3

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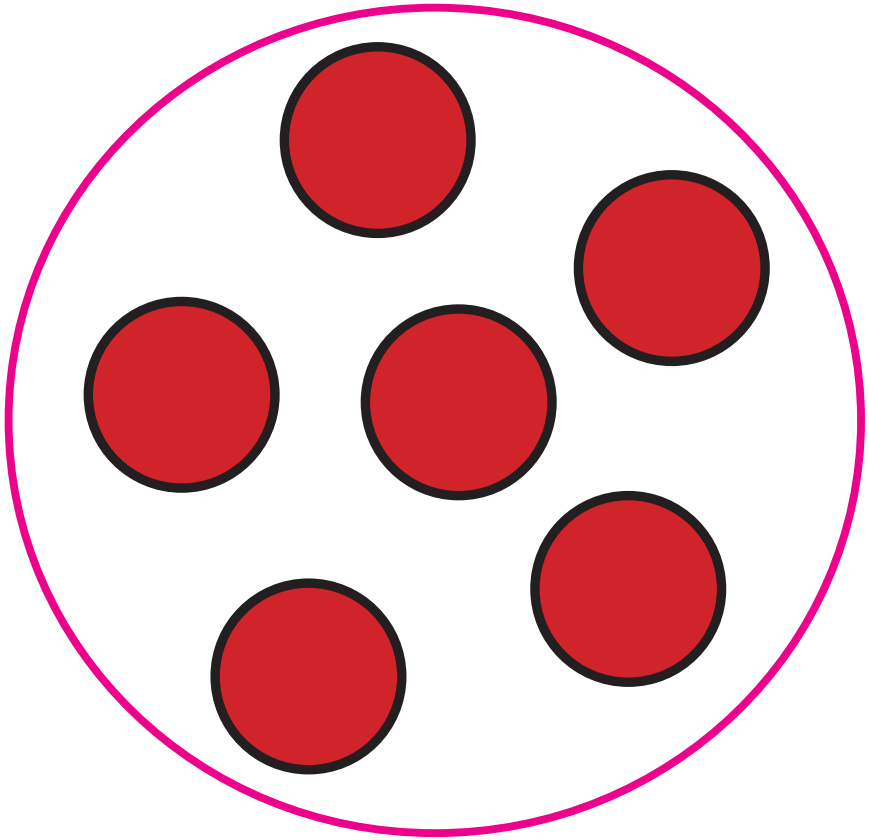
D3: Division as Sharing

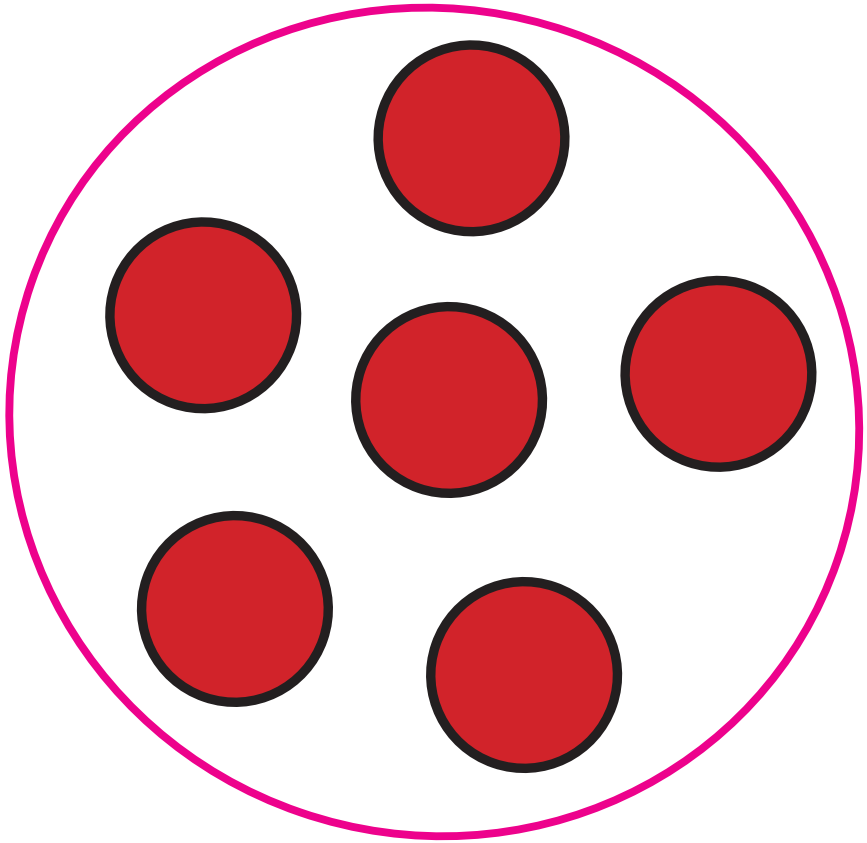
2

(Partitive Division)

12 ÷ 2 = 6

"If I share 12 into 2 equal amounts, how many in each group?" Answer: 6





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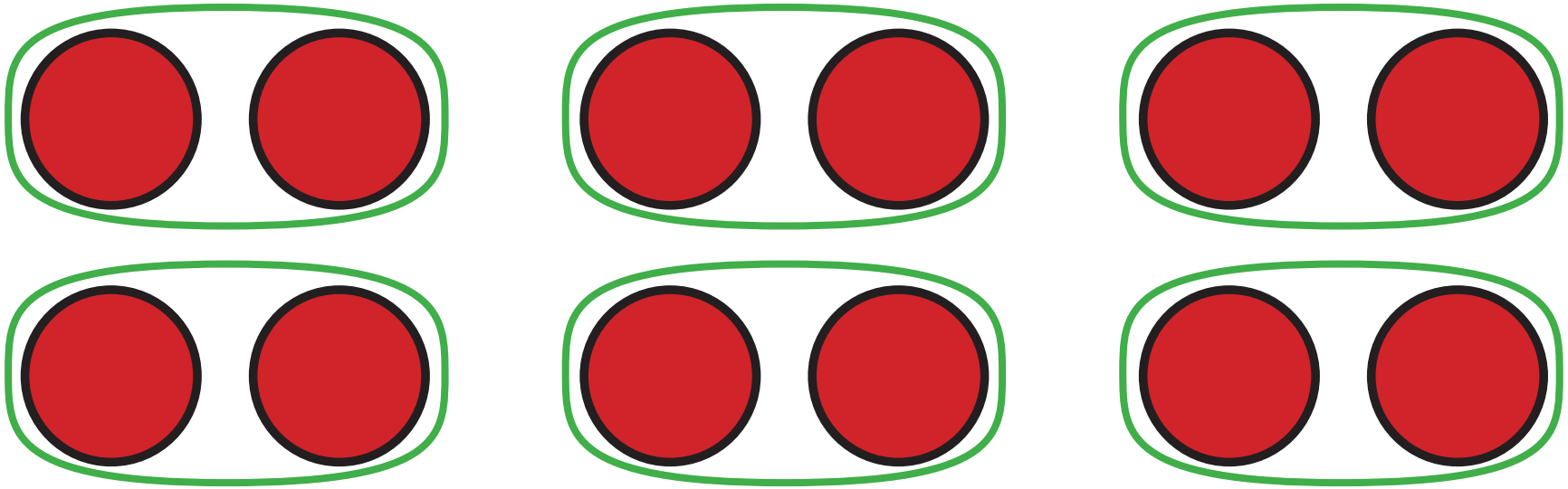
D4: Division as Grouping

2

(Quotitive Division)

12 ÷ 2 = 6

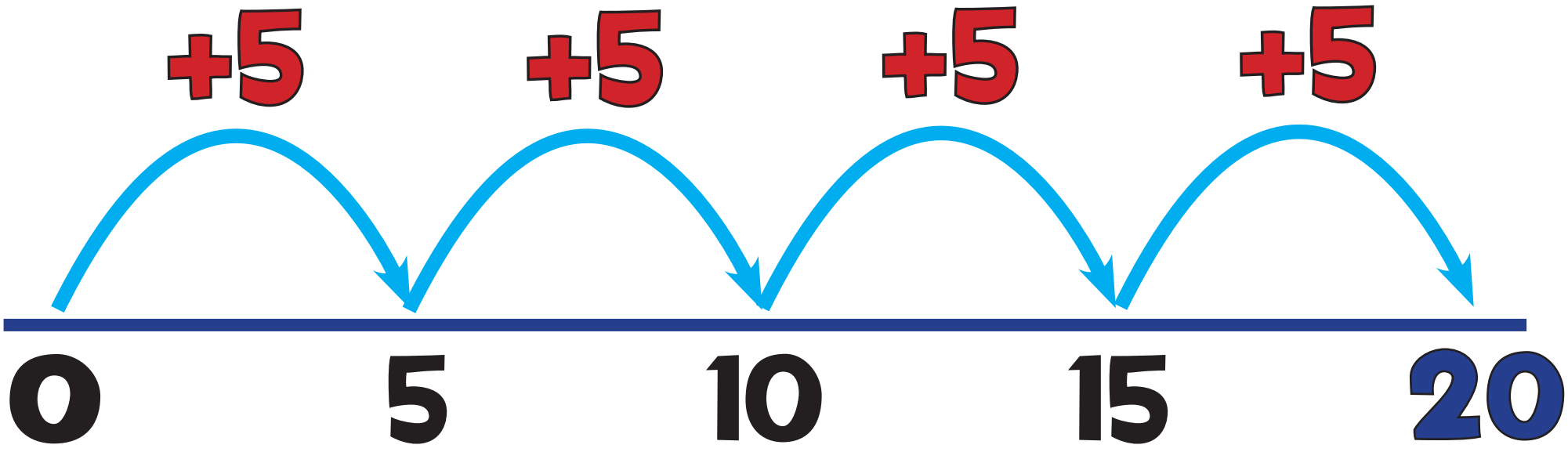
"How many groups of 2 can I fit into 12?"
Answer: 6



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D5: Grouping on a Number Line

2



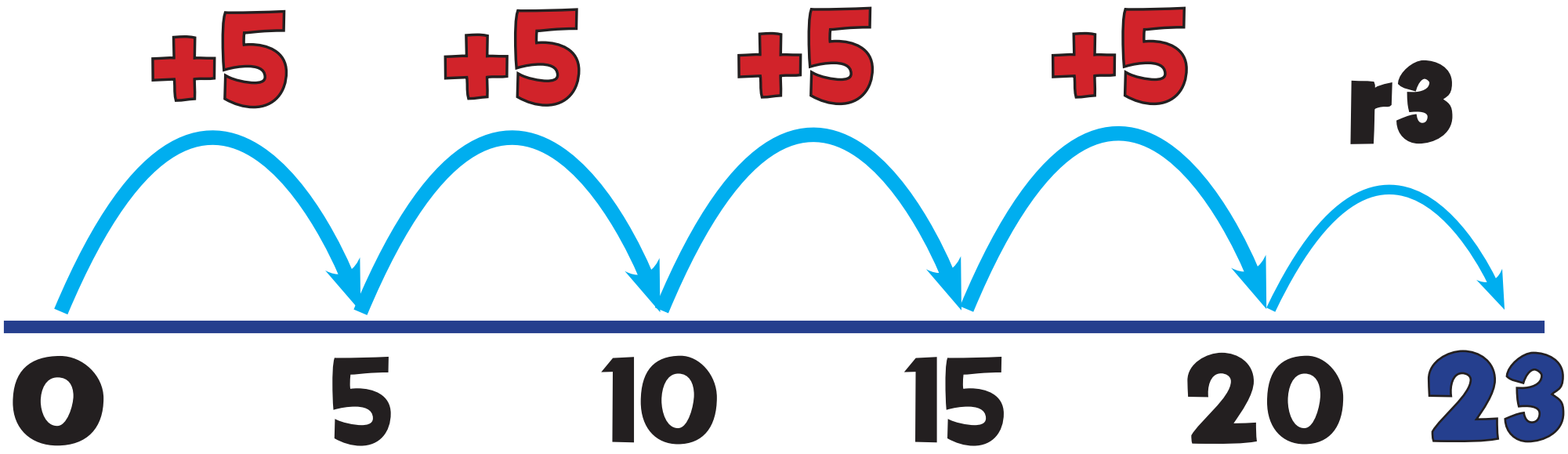
"How many 5s in 20?"
Answer: 4

$$20 \div 5 = 4$$

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D5a: Grouping on a Number Line

2



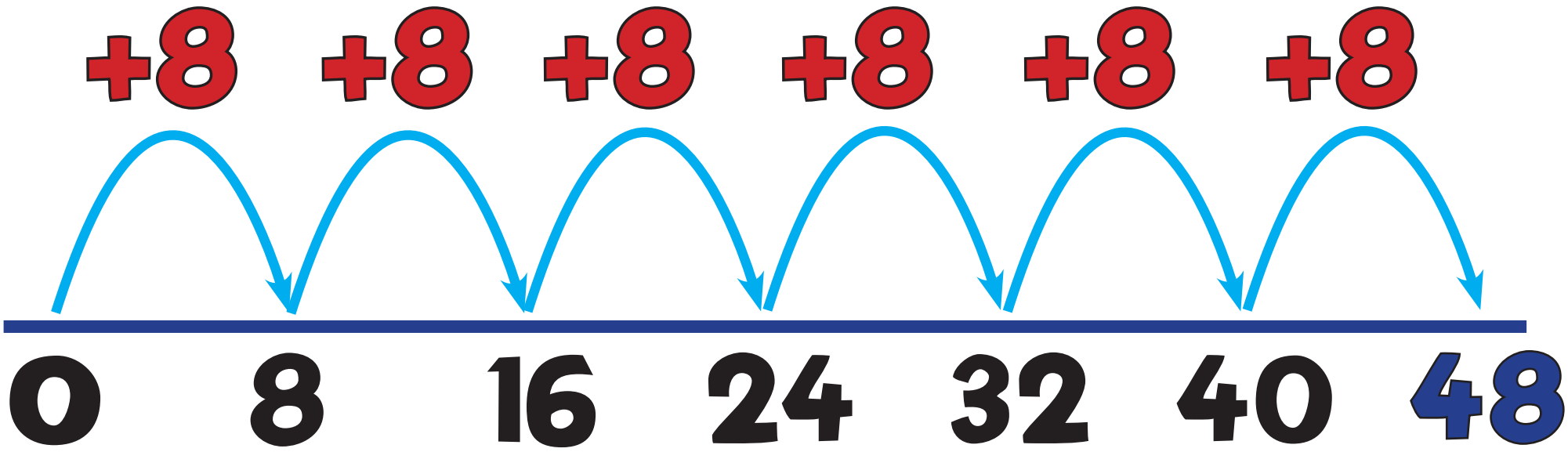
"How many 5s in 23?"
Answer: 4 remainder 3

$$23 \div 5 = 4r3$$

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D5b: Grouping on a Number Line

3



"How many 8s in 48?"
Answer: 6

48 ÷ 8 = 6

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D6: Grouping Grid

3

4	4	4	4	4
4				3

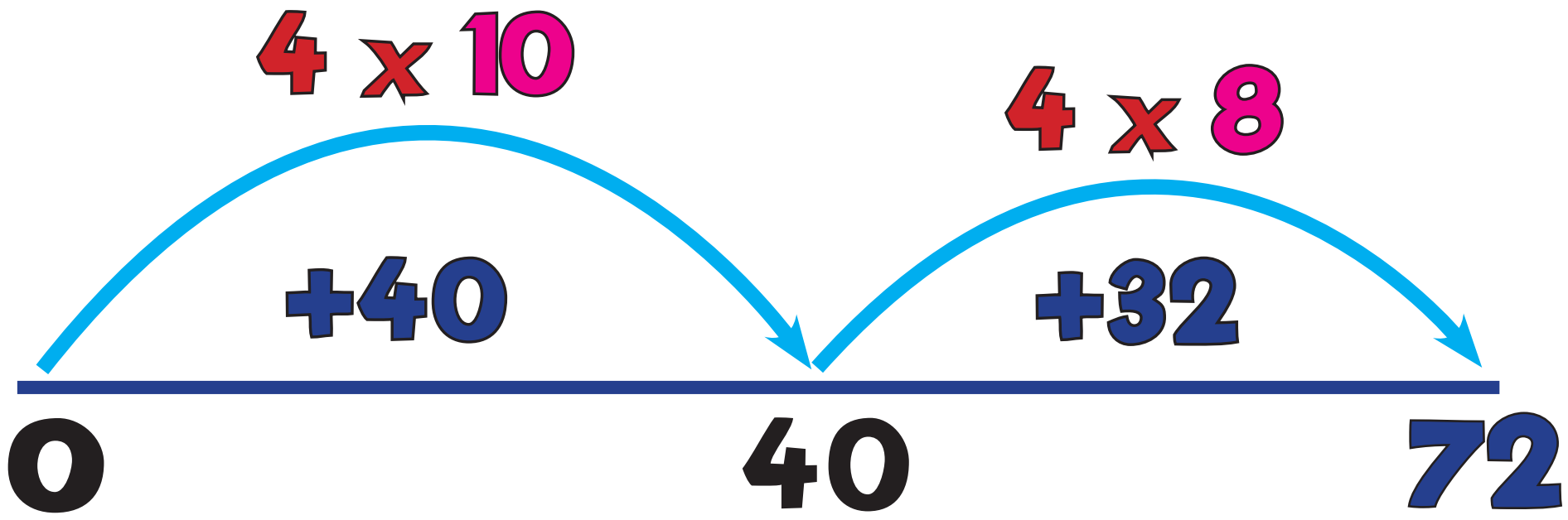
"How many times can I fit (groups of) 4 into 27?"
Answer: 6r3

$$27 \div 4 = 6r3$$

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D7: Chunking Jump

3



"How many 4s in 72?"
Answer: 18

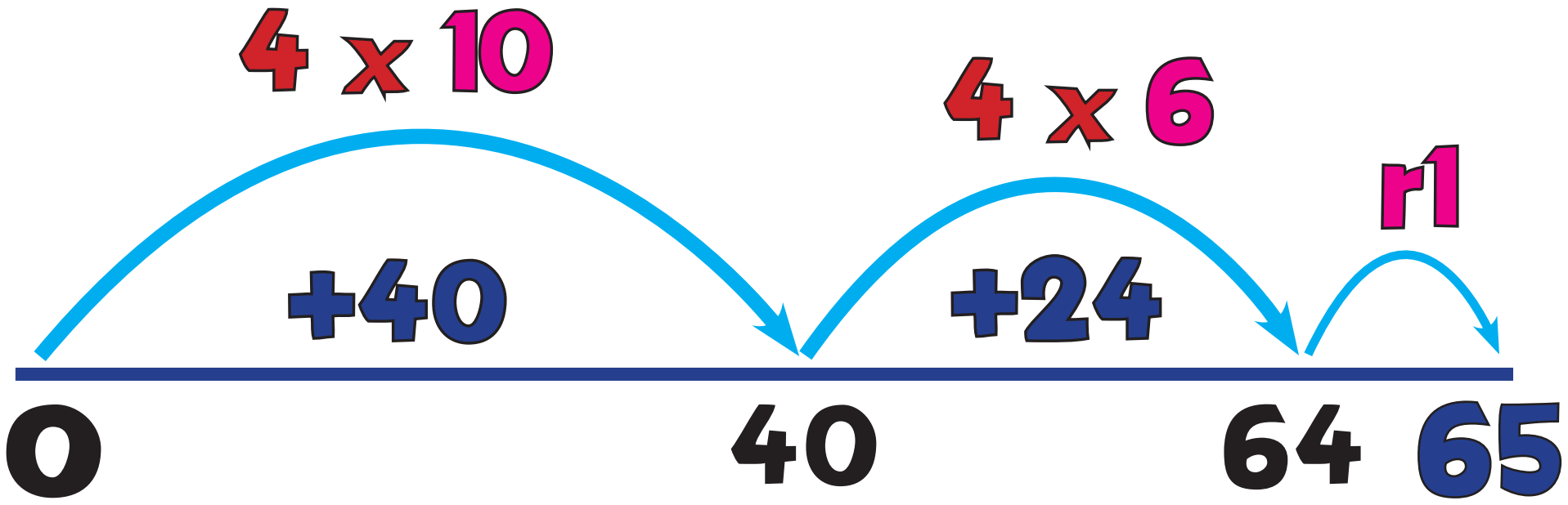
$$72 \div 4 = 18$$

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D7a: Chunking Jump

3

Remainders



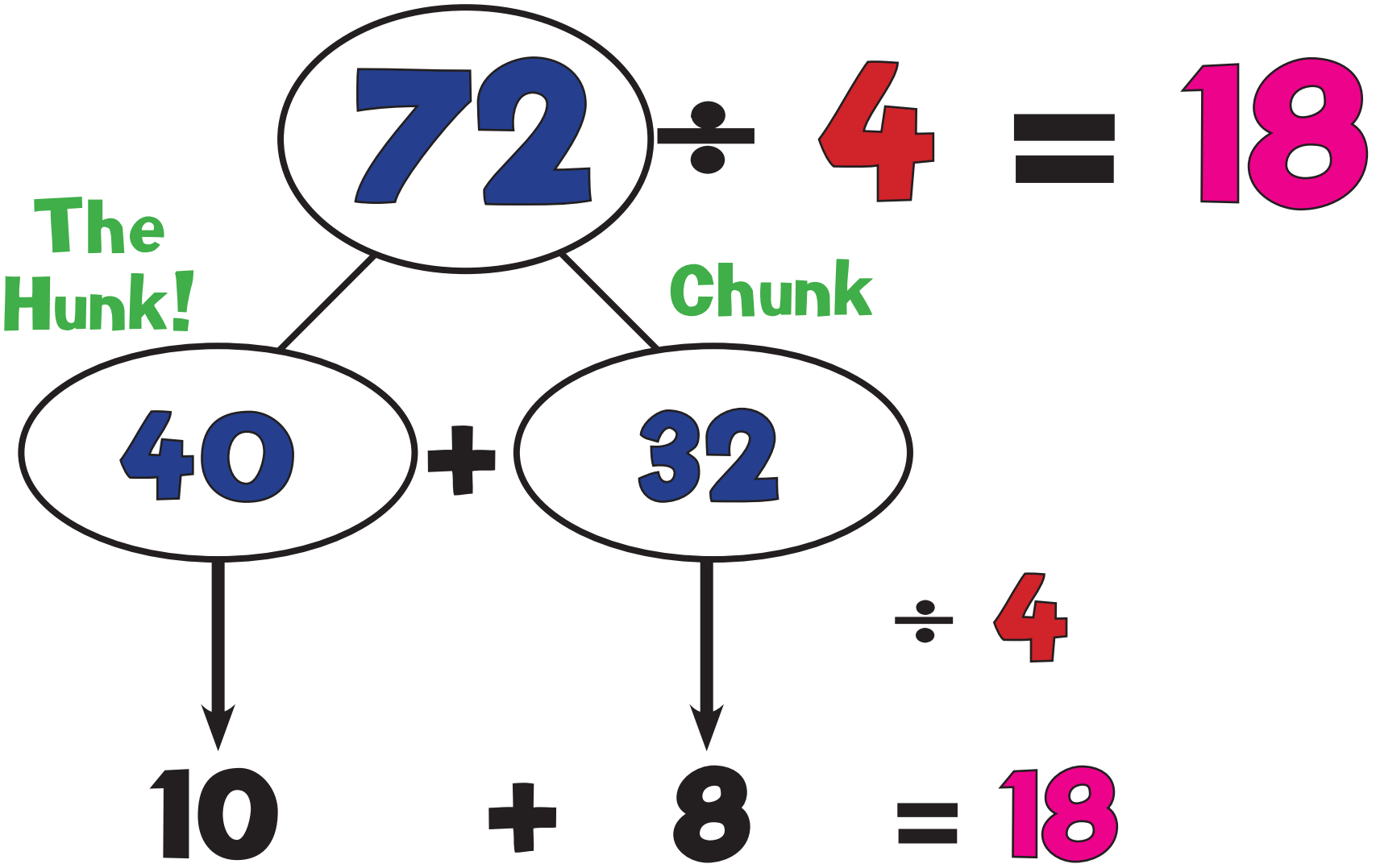
"How many 4s in 65?"
Answer: 16r1

$$65 \div 4 = 16r1$$

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D8: Find the Hunk!

3

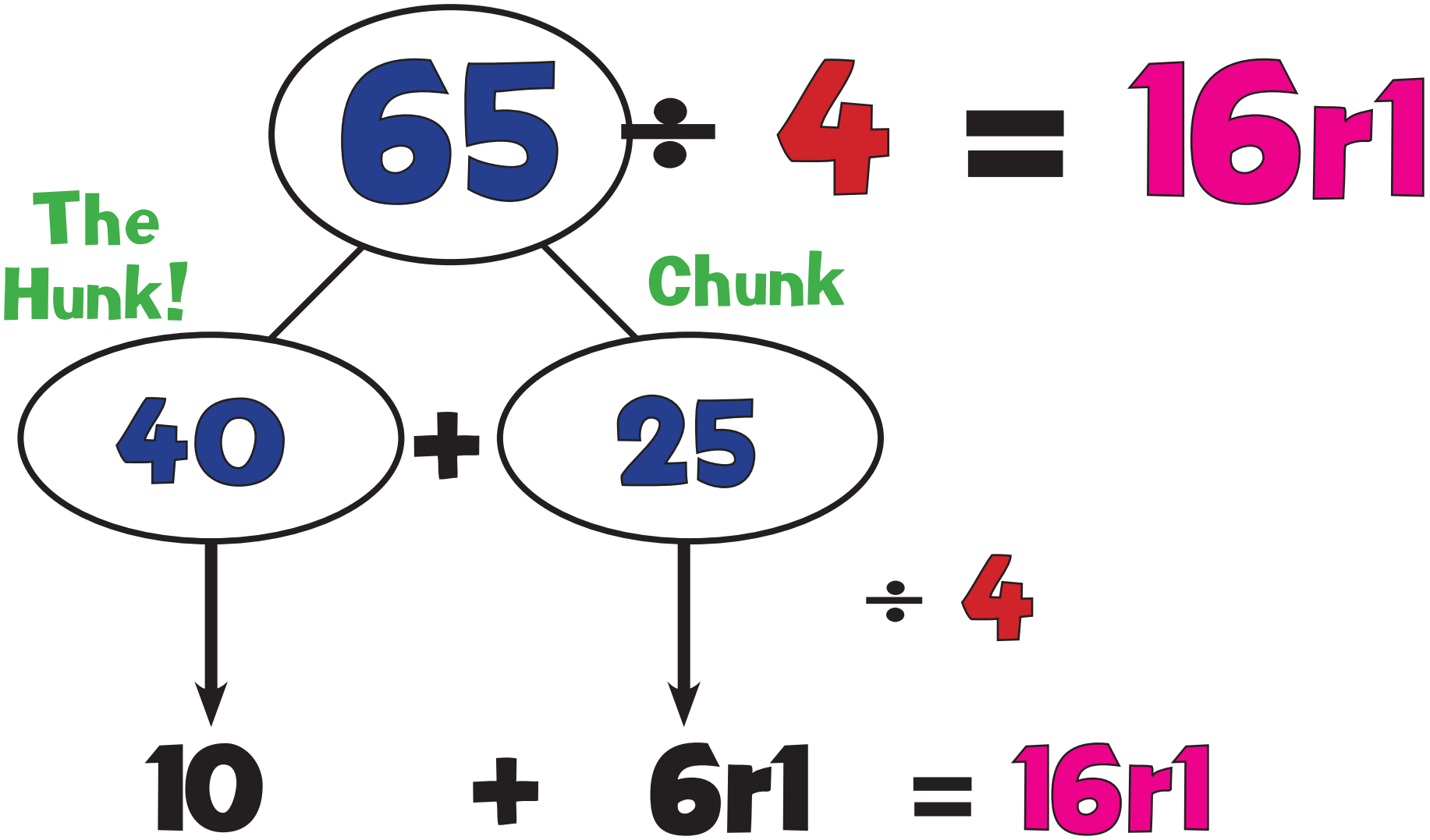


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D8a: Find the Hunk!

3

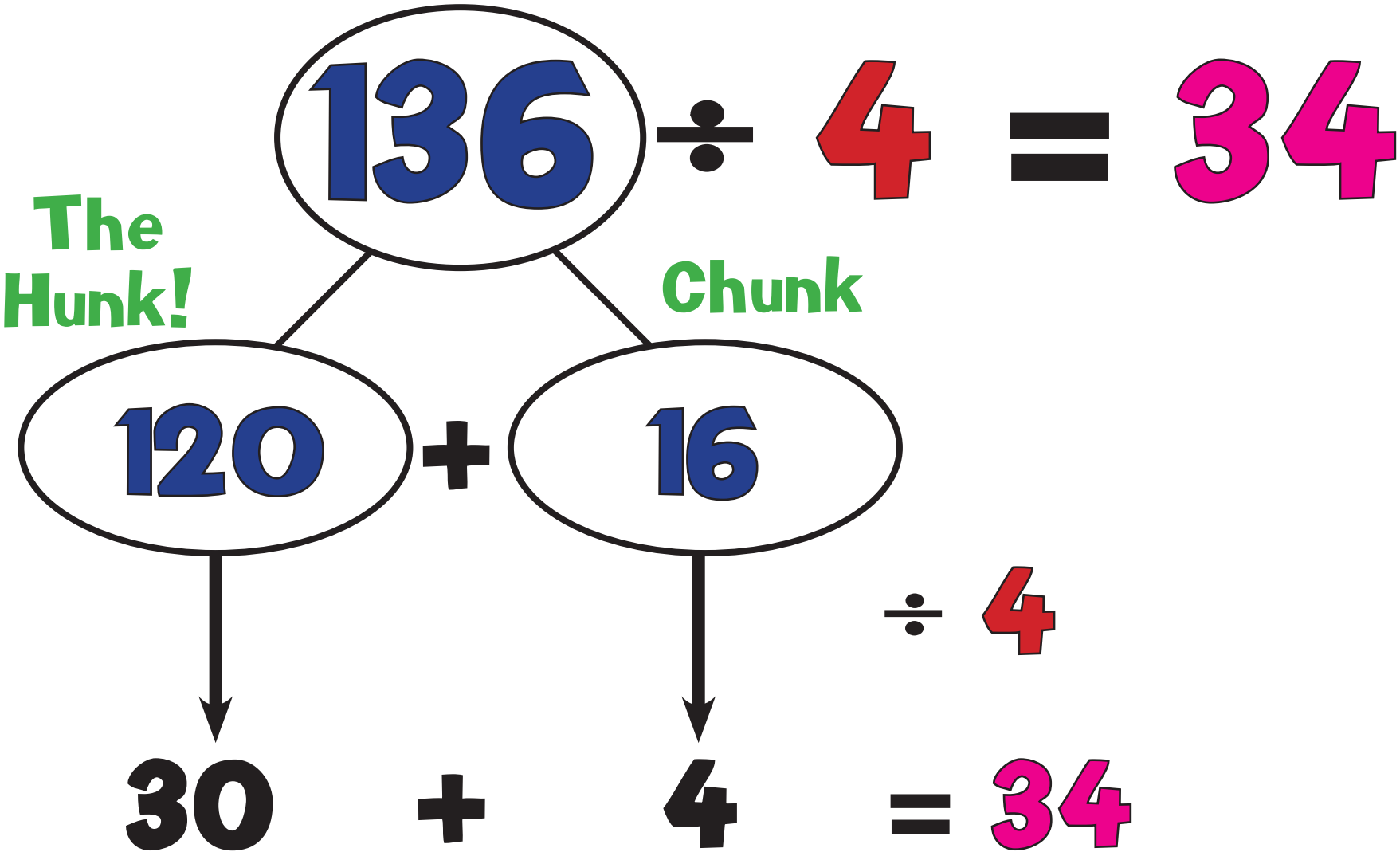
Remainders



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D9: Mega Hunk!

4



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D9c: Mega Hunk!

4

Remainders

145 ÷ 6 = 24r1

Mega Hunk!

Chunk

120 + 25

÷ 6

20 + 4r1 = 24r1

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D9d: Mega Hunk!

5

Remainders

394 ÷ 6 = 65r4

Mega Hunk!

Chunk

360 + 34

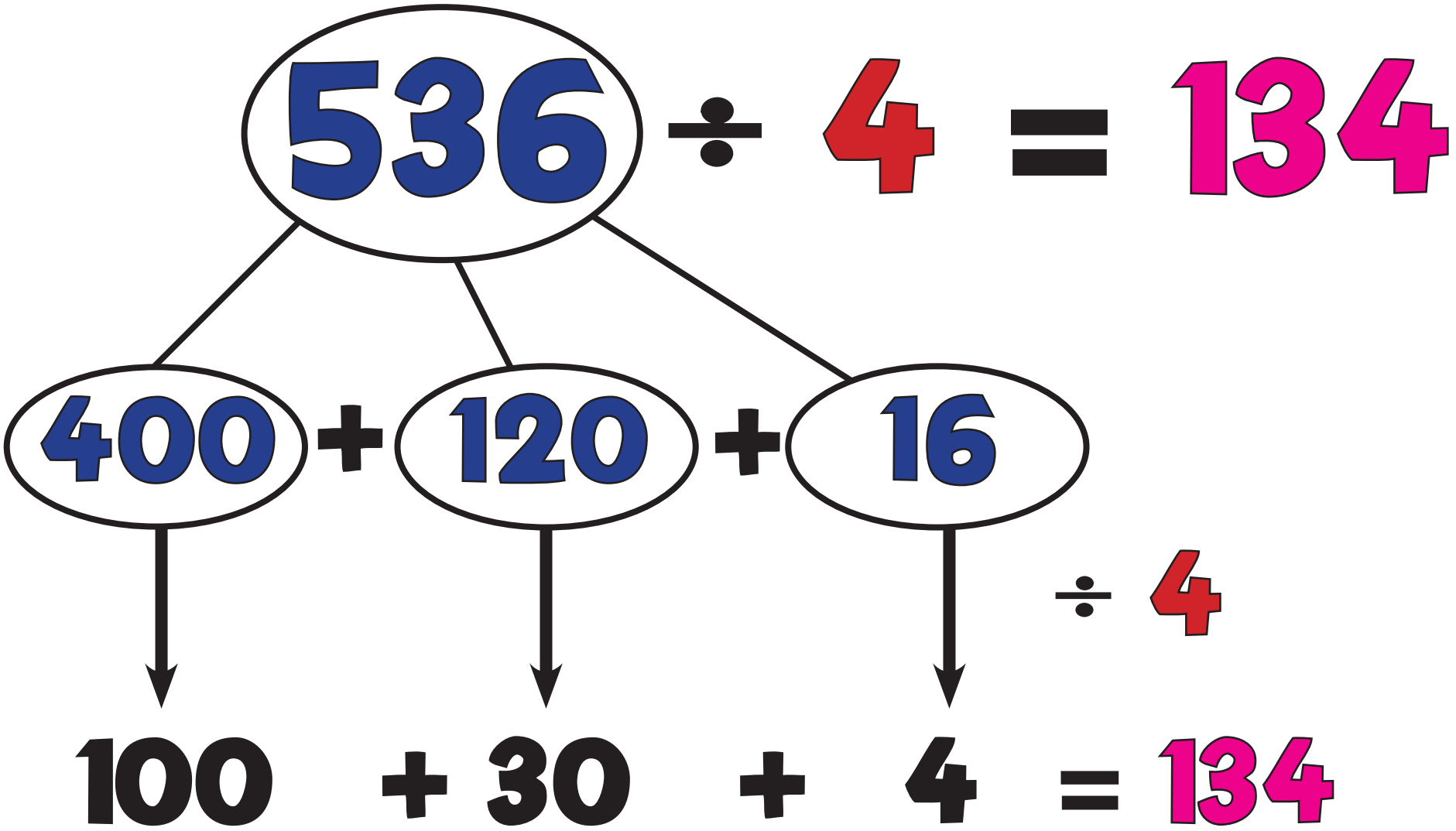
÷ 6

60 + 5r4 = 65r4

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D9e: Mega Hunk!

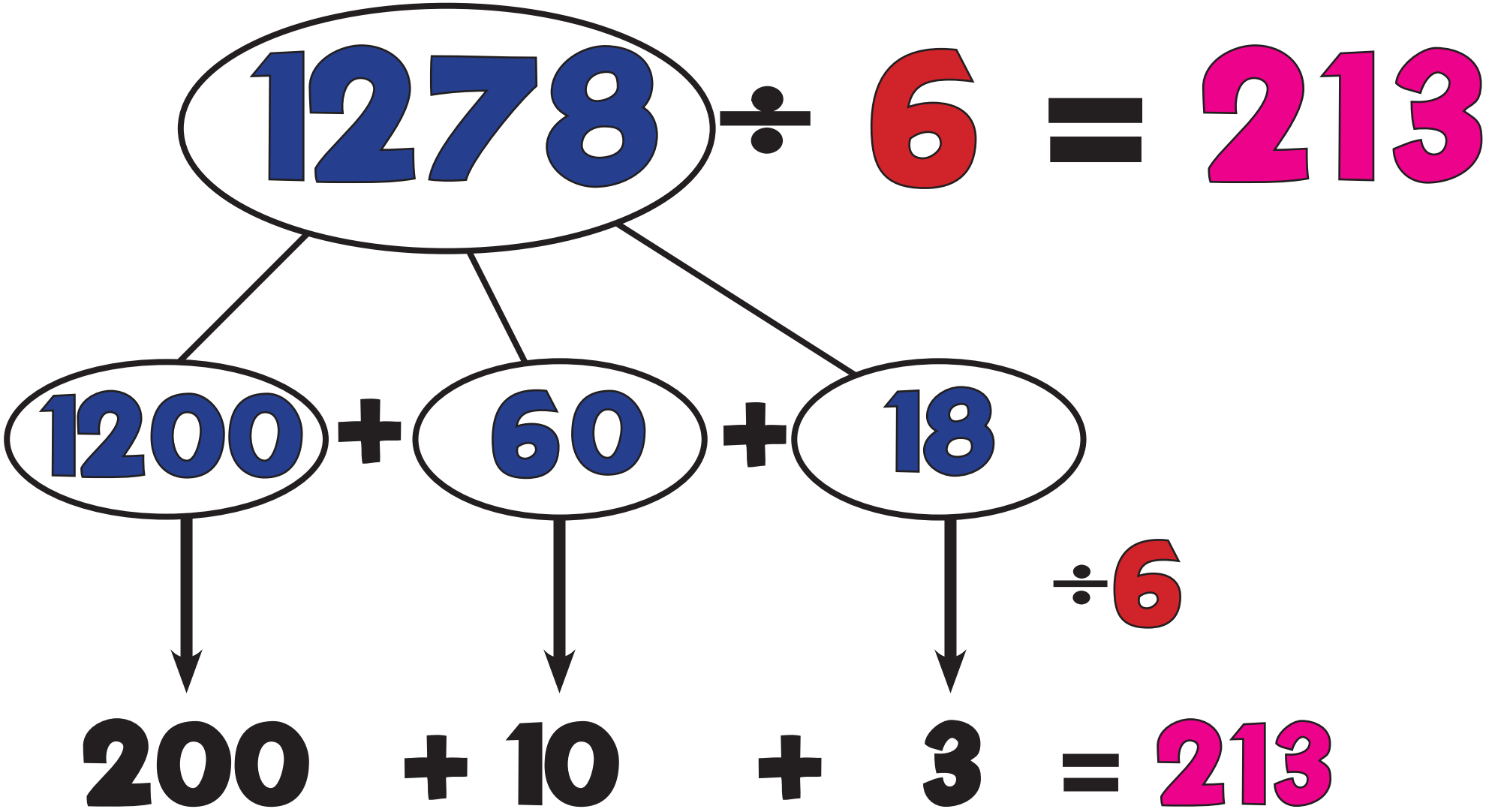
5



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D9f: Mega Hunk!

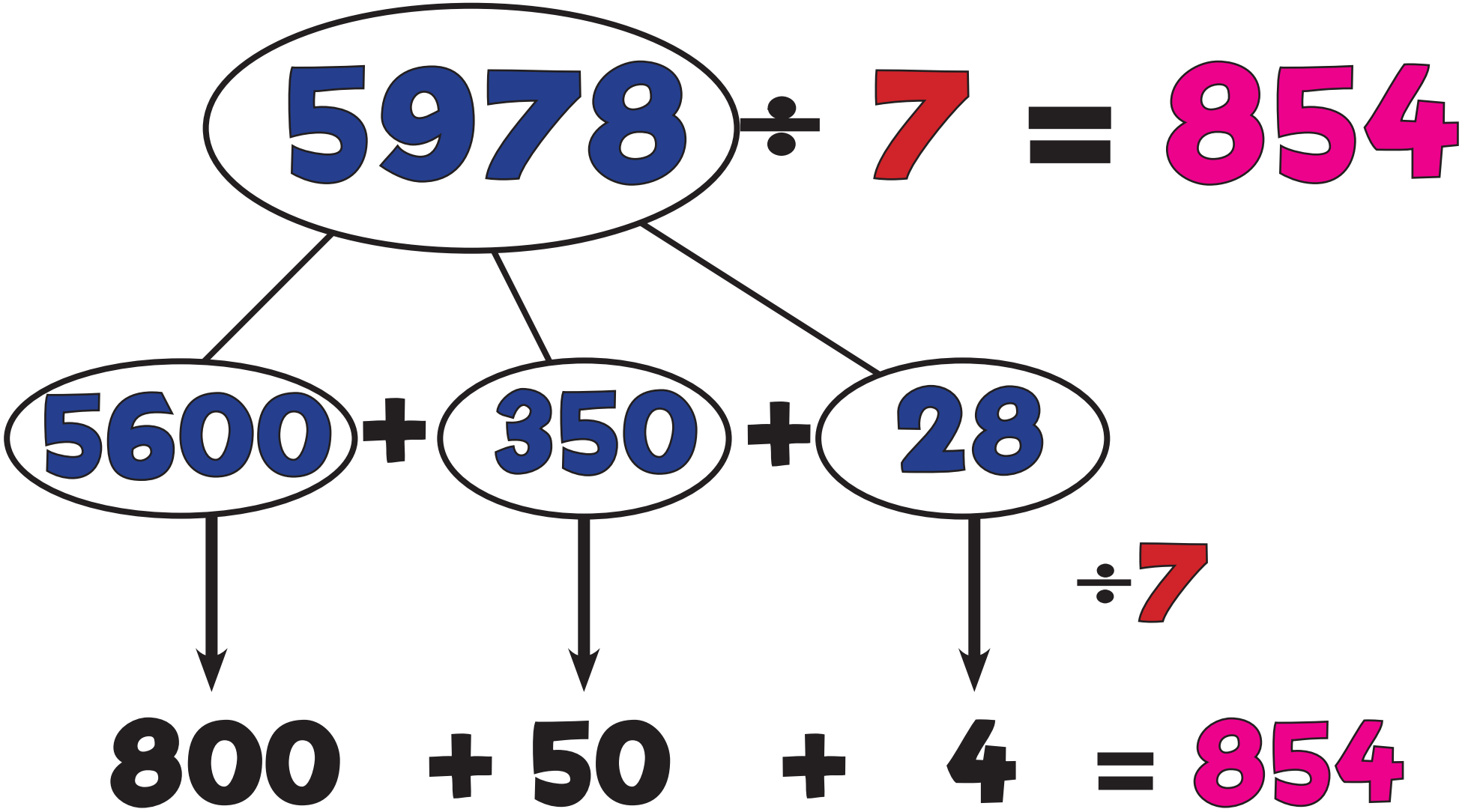
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D9g: Mega Hunk!

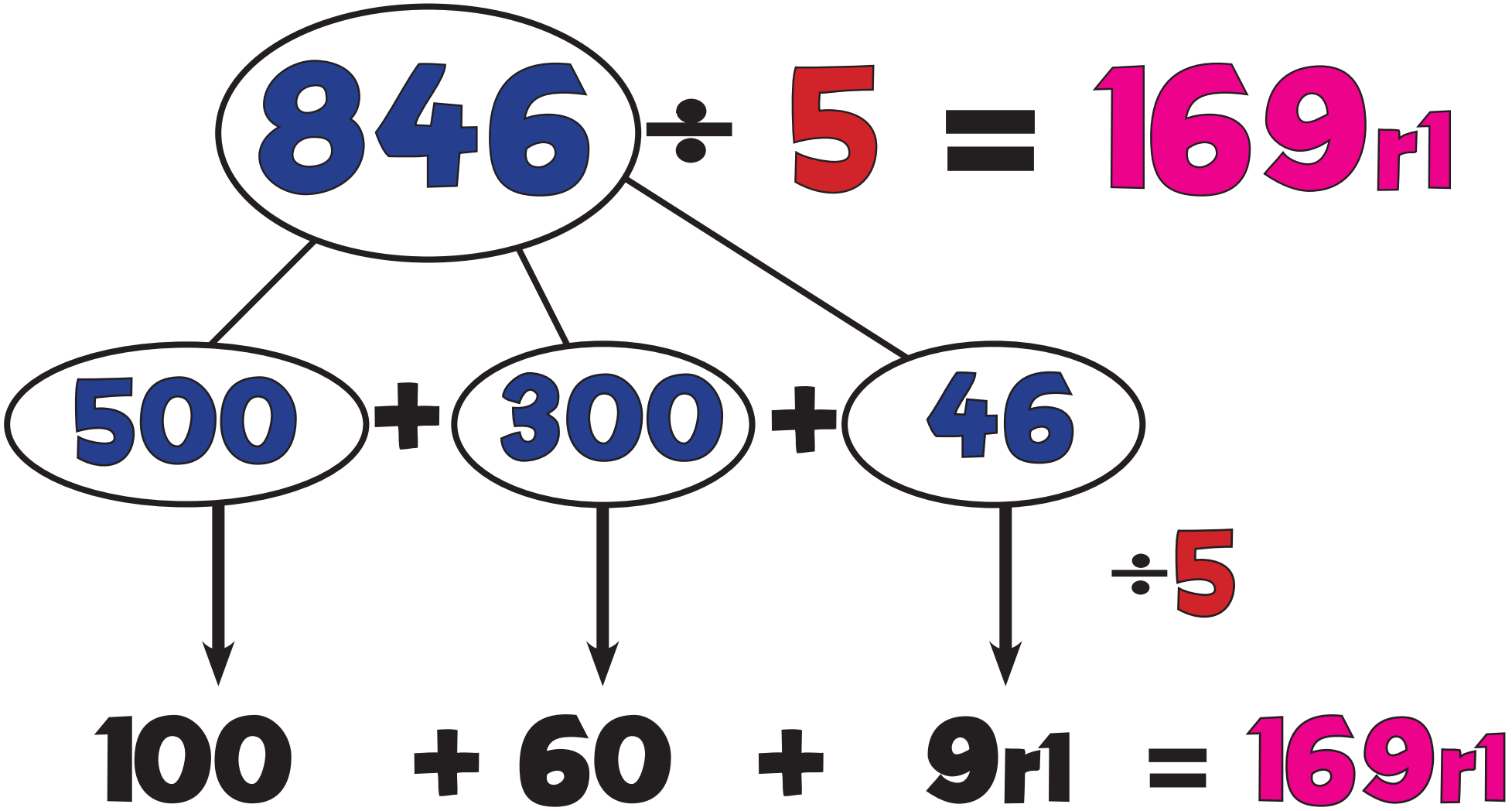
5



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D9h: Mega Hunk!

5

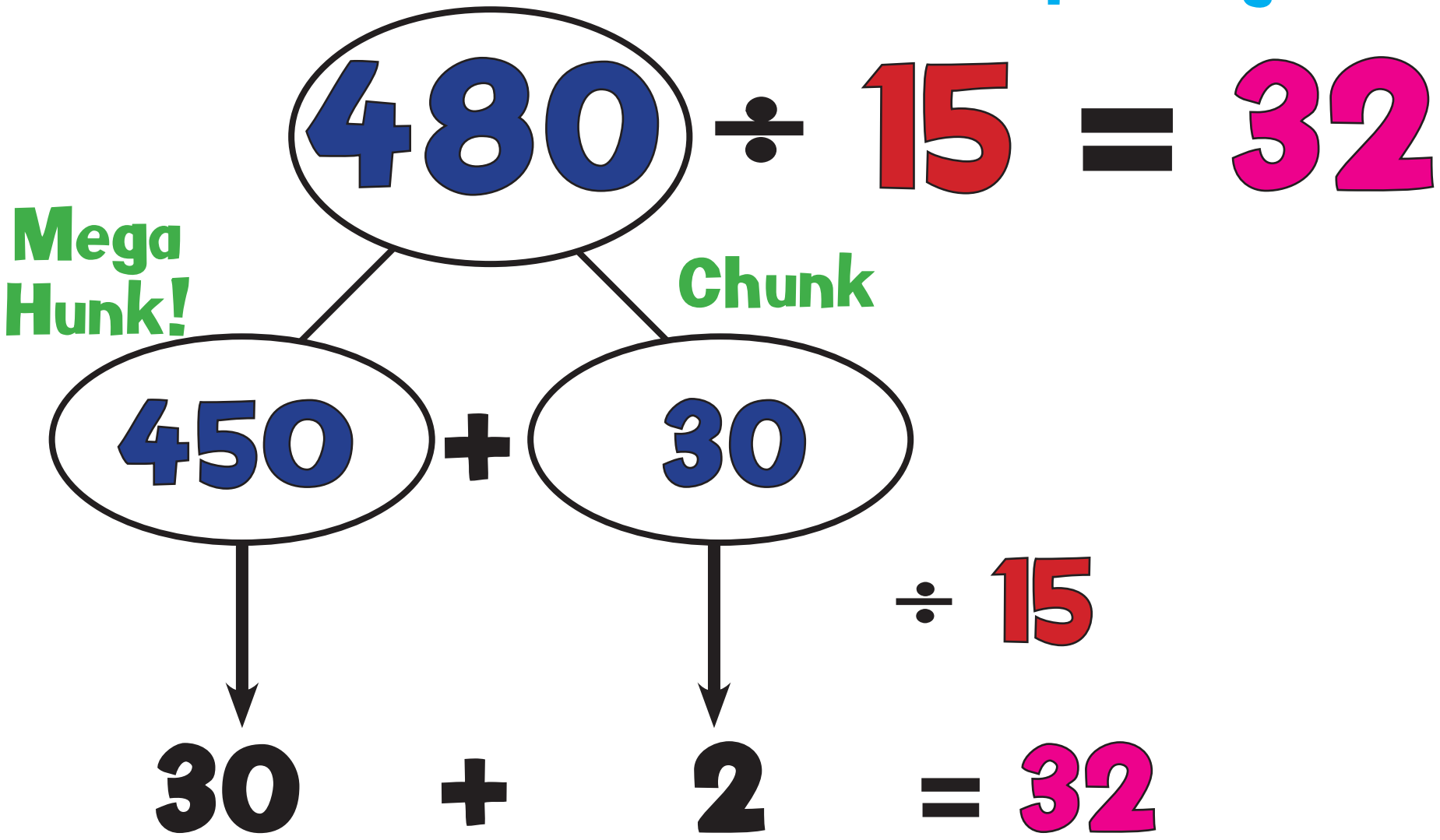


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D9i: Mega Hunk!

6

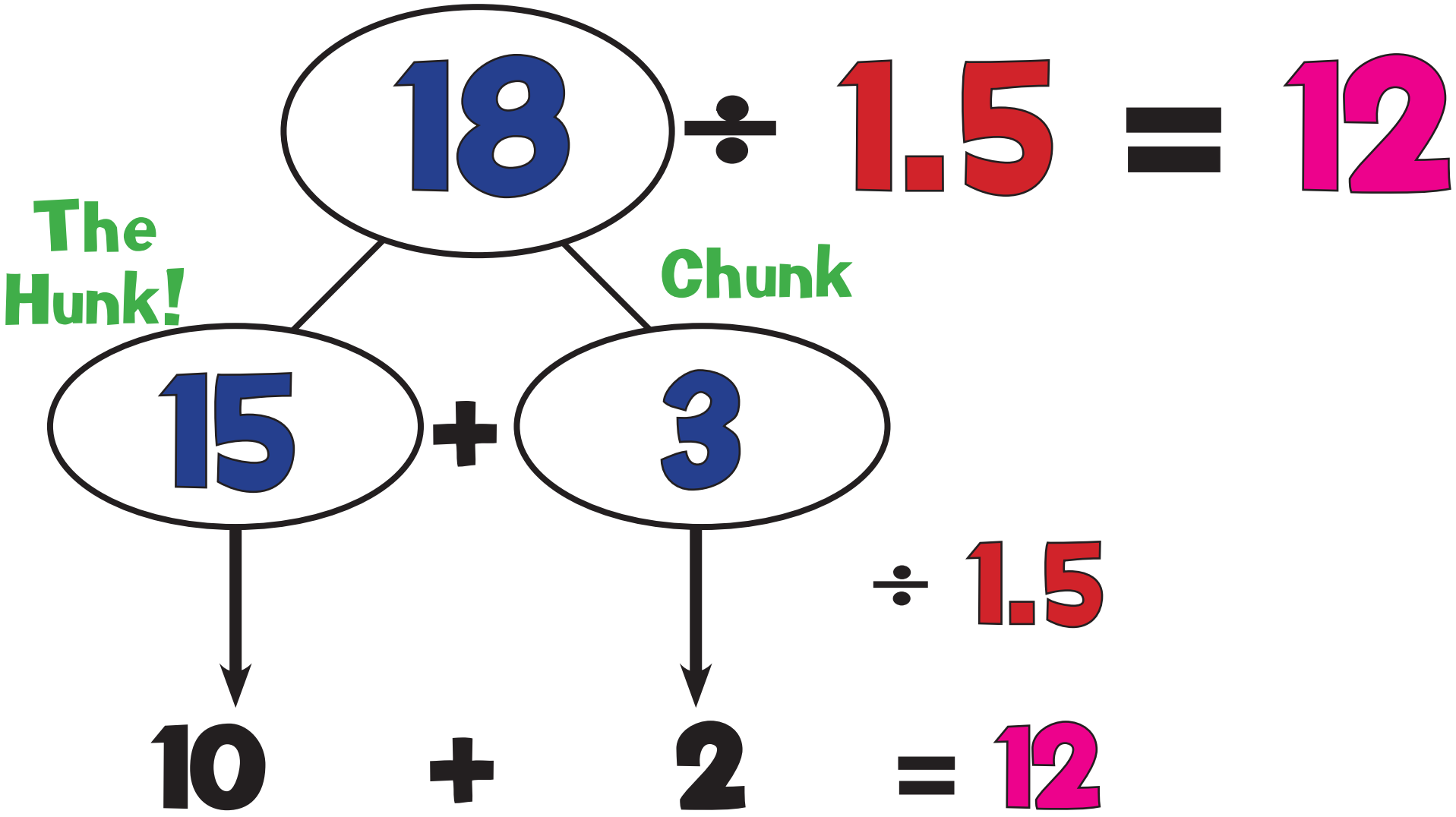
Simple Long Division



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D9 j: Decimal Hunk!

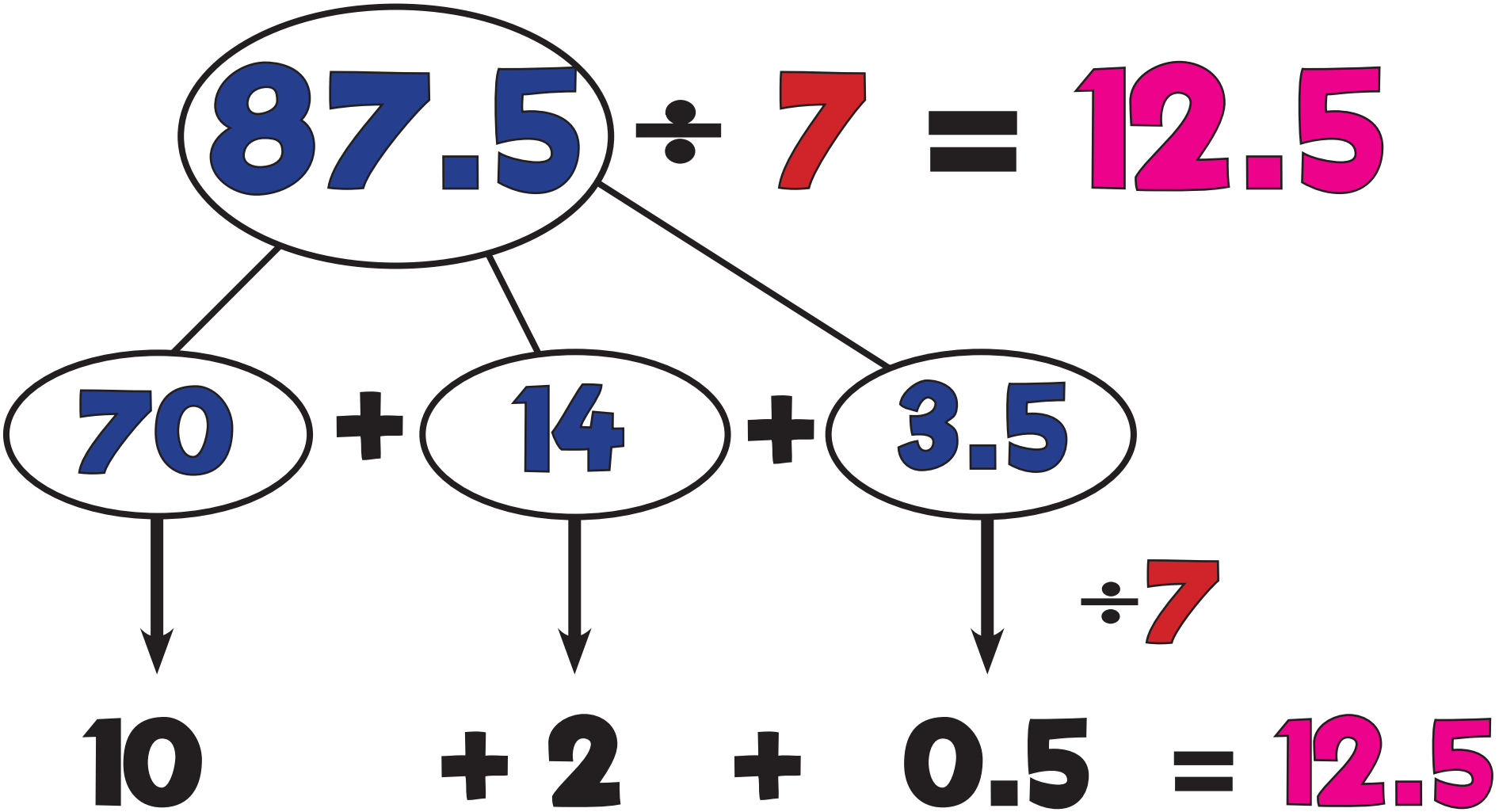
6



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D9k: Decimal Hunk!

6



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D10: Short Division

3

$$72 \div 4 = 18$$

$$4\overline{)\,7^{3}2}\quad 18$$

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D10a: Short Division

3

$$65 \div 4 = 16\text{r}1$$

$$4\overline{)\,6^{2}5}\qquad 16\text{r}1$$

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D10b: Short Division

4

$$136 \div 4 = 34$$

$$4\overline{)136} = 34$$

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D10c: Short Division

4

$$145 \div 6 = 24\text{r}1$$

$$6\overline{)1^{1}4^{2}5} \quad 24\text{r}1$$

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D10d: Short Division

5

$394 \div 6 = 65r4$

$$6\overline{)394} = 65r4$$

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D10e: Short Division

5

536 ÷ 4 = 134

$$
\begin{array}{r}
134 \\
4\overline{)\,5^{1}3^{1}6}
\end{array}
$$

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D10f: Short Division

5

1278 ÷ 6 = 213

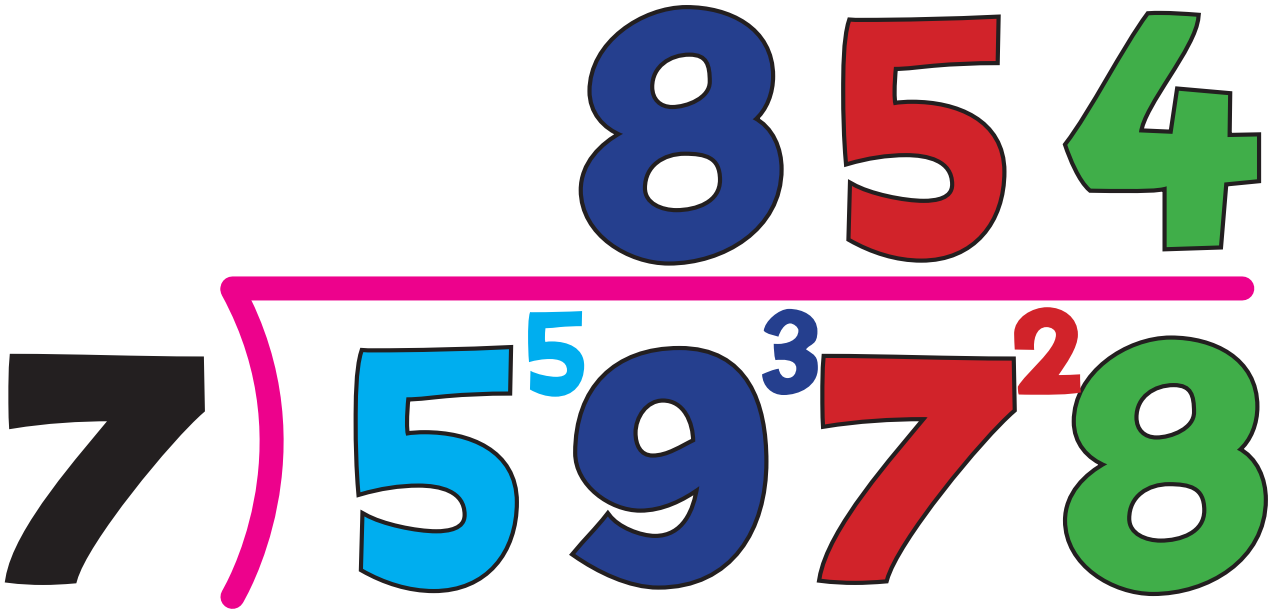
$$
\begin{array}{r}
213 \\
6\overline{)1^{1}278^{1}}
\end{array}
$$

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D10g: Short Division

5

5978 ÷ 7 = 854



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D10h: Short Division

5

Different Remainders

$$\begin{array}{r} 169.2 \\ 5\overline{)\,8^{3}4^{4}6.^{1}0} \end{array}$$

$$846 \div 5$$

$$\begin{array}{r} 169\text{r}1 \\ 5\overline{)\,8^{3}4^{4}6} \end{array}$$

$$\begin{array}{r} 169\frac{1}{5} \\ 5\overline{)\,8^{3}4^{4}6} \end{array}$$

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D10k: Short Division

6

$$87.5 \div 7 = 12.5$$

$$7\overline{)87.5} = 12.5$$

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D11: Chunking

3

$$
\begin{array}{r}
18 \\
4\overline{)72} \\
-\ 40 \quad (4 \times 10) \\
\hline
32 \\
-\ 32 \quad (4 \times 8) \\
\hline
0
\end{array}
$$

$72 \div 4 = 18$

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D11: Chunking

3

$$
\begin{array}{r}
18 \\
4 \overline{)\,72} \\
-\ 40 \quad (10 \times 4) \\
\hline
32 \\
-\ 32 \quad (8 \times 4) \\
\hline
0
\end{array}
$$

$72 \div 4 = 18$

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D11: Chunking

3

$$
\begin{array}{r}
16\text{r}1 \\
4\overline{)\,65} \\
-\,40 \quad (4 \times 10) \\
\hline
25 \\
-\,24 \quad (4 \times 6) \\
\hline
1
\end{array}
$$

$65 \div 4 = 16\text{r}1$

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D11: Chunking

3

$$
\begin{array}{r}
16\text{r}1 \\
4\overline{)\,65} \\
-\ 40 \quad (10 \times 4) \\
\hline
25 \\
-\ 24 \quad (6 \times 4) \\
\hline
1
\end{array}
$$

$65 \div 4 = 16\text{r}1$

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D11bA: Chunking

4

```
      34
   ┌─────
4  │ 136
   -120   (4 x 30)
   ─────
     16
   - 16   (4 x 4)
   ─────
      0
```

136 ÷ 4 = 34

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D11bA: Chunking

4

```
      34
   ┌─────
4  │ 136
   -120   (30 x 4)
   ────
     16
   - 16   (4 x 4)
   ────
      0
```

136 ÷ 4 = 34

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D11bB: Chunking

4

```
      34
   ┌────
4  │ 136
   - 40   (4 x 10)
   ────
     96
   - 40   (4 x 10)
   ────
     56
   - 40   (4 x 10)
   ────
     16
   - 16   (4 x 4)
   ────
      0
```

136 ÷ 4 = 34

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D11bB: Chunking

4

```
      34
   ┌────
4  │ 136
   - 40   (10 x 4)
   ────
     96
   - 40   (10 x 4)
   ────
     56
   - 40   (10 x 4)
   ────
     16
   - 16   (4 x 4)
   ────
      0
```

136 ÷ 4 = 34

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D11c: Chunking

4

Remainders

24 r1

6 ⟌ 145

-120 (6 x 20)

25

- 24 (6 x 4)

1

145 ÷ 4 = 24r1

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D11c: Chunking

4

Remainders

$$
\begin{array}{r}
24\ \text{r}1 \\
6\overline{)145} \\
-120 \quad (20 \times 6) \\
\hline
25 \\
-\ 24 \quad (4 \times 6) \\
\hline
1
\end{array}
$$

145 ÷ 4 = 24r1

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D11d: Chunking

5

Remainders

65r4

6) 394

- 360 (6 x 60)

34

- 30 (6 x 5)

4

394 ÷ 6 = 65r4

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D11d: Chunking

5

Remainders

65r4

6 ⟌ 394

- 360 (60 x 6)

34

- 30 (5 x 6)

4

394 ÷ 6 = 65r4

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D11e: Chunking

5

Mega Chunk

```
      134
   ┌─────
4  │ 536
   - 400   (4 x 100)
   ─────
     136
   - 120   (4 x 30)
   ─────
      16
   -  16   (4 x 4)
   ─────
       0
```

536 ÷ 4 = 134

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D11e: Chunking

5

Mega Chunk

```
      134
   ┌─────
4  │ 536
   - 400   (100 x 4)
   ─────
     136
   - 120   (30 x 4)
   ─────
      16
   -  16   (4 x 4)
   ─────
       0
```

536 ÷ 4 = 134

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D11f: Chunking

5

Mega Chunk

```
      213
   ┌──────
6  │ 1278
   - 1200   (6 x 200)
   ------
     78
   -  60    (6 x 10)
   ------
     18
   -  18    (6 x 3)
   ------
      0
```

1278 ÷ 6 = 213

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D11f: Chunking

5

Mega Chunk

```
      213
   ┌──────
6  │ 1278
   - 1200   (200 x 6)
   ──────
     78
   -  60    (10 x 6)
   ──────
     18
   -  18    (3 x 6)
   ──────
      0
```

1278 ÷ 6 = 213

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D11g: Chunking

5

Mega Chunk

```
      854
   ┌─────
7  │ 5978
   - 5600   (7 x 800)
   ──────
     378
   - 350    (7 x 50)
   ──────
      28
   - 28     (7 x 4)
   ──────
       0
```

5978 ÷ 7 = 854

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D11g: Chunking

5

Mega Chunk

```
      854
   ┌─────
7  │5978
   - 5600   (800 x 7)
   ──────
     378
   - 350    (50 x 7)
   ──────
      28
   - 28     (4 x 7)
   ──────
       0
```

5978 ÷ 7 = 854

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D11h: Chunking

5

Mega Chunk

$$
\begin{array}{r}
169\text{r}1 \\
5\overline{)\,846} \\
-\ 500 \quad (5 \times 100) \\
\hline
346 \\
-\ 300 \quad (5 \times 60) \\
\hline
46 \\
-\ 45 \quad (5 \times 9) \\
\hline
1
\end{array}
$$

$$846 \div 5 = 169\text{r}1$$

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D11h: Chunking

5

Mega Chunk

$$
\begin{array}{r}
169\text{r}1 \\
5\overline{)\,846} \\
-\ 500 \quad (100 \times 5) \\
\hline
346 \\
-\ 300 \quad (60 \times 5) \\
\hline
46 \\
-\ 45 \quad (9 \times 5) \\
\hline
1
\end{array}
$$

$$846 \div 5 = 169\text{r}1$$

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D11iA: Chunking

6

Long Division

$$
\begin{array}{r}
32 \\
15 \overline{)\,480} \\
-\ 450 \quad (15 \times 30) \\
\hline
30 \\
-\ 30 \quad (15 \times 2) \\
\hline
0
\end{array}
$$

480 ÷ 15 = 32

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D11iA: Chunking

6

Long Division

$$
\begin{array}{r}
32 \\
15 \overline{)\,480} \\
-\ 450 \quad (30 \times 15) \\
\hline
30 \\
-\ 30 \quad (2 \times 15) \\
\hline
0
\end{array}
$$

480 ÷ 15 = 32

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D11iB: Chunking

6

Long Division

$$
\begin{array}{r}
32 \\
15 \overline{)\,480} \\
-\ 150 \quad (15 \times 10) \\
\hline
330 \\
-\ 150 \quad (15 \times 10) \\
\hline
180 \\
-\ 150 \quad (15 \times 10) \\
\hline
30 \\
-\ 30 \quad (15 \times 2) \\
\hline
0
\end{array}
$$

$480 \div 15 = 32$

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D11iB: Chunking

6

Long Division

$$
\begin{array}{r}
32 \\
15 \overline{)\,480} \\
-\ 150 \quad (10 \times 15) \\
\hline
330 \\
-\ 150 \quad (10 \times 15) \\
\hline
180 \\
-\ 150 \quad (10 \times 15) \\
\hline
30 \\
-\ 30 \quad (2 \times 15) \\
\hline
0
\end{array}
$$

$480 \div 15 = 32$

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D12: Long Division

6

Short Division Method

$$\begin{array}{r} 26 \text{ r } 21 \\ 37 \overline{)\,983} \\ \end{array}$$

9 24

D12b: Long Division

6

Short Division Method

$$59 \overline{)\,2\,2^{2}\,4^{22}\,2^{47}}$$

$$38$$

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D13a1: Long Division

6

Chunking Method

$$
\begin{array}{r}
26 \text{ r } 21 \\
37 \overline{)\,983} \\
-\ 740 \quad (37 \times 20) \\
\hline
243 \\
-\ 222 \quad (37 \times 6) \\
\hline
21
\end{array}
$$

$983 \div 37 = 26 \text{ r } 21$

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D13a1: Long Division

6

Chunking Method

$$
\begin{array}{r}
26 \text{ r } 21 \\
37 \overline{)\,983} \\
-\ 740 \quad (20 \times 37) \\
\hline
243 \\
-\ 222 \quad (6 \times 37) \\
\hline
21
\end{array}
$$

$983 \div 37 = 26 \text{ r } 21$

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D13a2: Long Division

6

Chunking Method

$$
\begin{array}{r}
26 \text{ r } 21 \\
37 \overline{)\,983} \\
-\,370 \quad (37 \times 10) \\
\hline
613 \\
-\,370 \quad (37 \times 10) \\
\hline
243 \\
-\,222 \quad (37 \times 6) \\
\hline
21
\end{array}
$$

$$983 \div 37 = 26 \text{ r } 21$$

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D13a2: Long Division

6

Chunking Method

$$
\begin{array}{r}
26 \text{ r } 21 \\
37 \overline{)\,983} \\
-\,370 \quad (10 \times 37) \\
\hline
613 \\
-\,370 \quad (10 \times 37) \\
\hline
243 \\
-\,222 \quad (6 \times 37) \\
\hline
21
\end{array}
$$

$$983 \div 37 = 26 \text{ r } 21$$

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D13b1: Long Division

6

Chunking Method

$$
\begin{array}{r}
38 \\
59 \overline{)\,2242} \\
-\,1770 \quad (59 \times 30) \\
\hline
472 \\
-\,472 \quad (59 \times 8) \\
\hline
0
\end{array}
$$

$$2242 \div 59 = 38$$

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D13b1: Long Division

6

Chunking Method

$$
\begin{array}{r}
38 \\
59 \overline{)\,2242} \\
-\,1770 \quad (30 \times 59) \\
\hline
472 \\
-\,472 \quad (8 \times 59) \\
\hline
0
\end{array}
$$

$2242 \div 59 = 38$

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D13b2: Long Division

6

Chunking Method

```
      39
   ┌─────
59 │ 2242
   - 590   (59 x 10)
   ────
    1652
   - 590   (59 x 10)
   ────
    1062
   - 590   (59 x 10)
   ────
     472
   - 472   (59 x 8)
   ────
       0
```

2242 ÷ 59 = 38

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D13b2: Long Division

6

Chunking Method

```
      39
59 ) 2242
   - 590   (10 x 59)
    1652
   - 590   (10 x 59)
    1062
   - 590   (10 x 59)
     472
   - 472   (8 x 59)
       0
```

2242 ÷ 59 = 38

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D14: Long Division

6

Traditional Method

$$
\begin{array}{r}
26 \text{ r } 21 \\
37 \overline{)\,983} \\
-\,74 \\
\hline
243 \\
-\,222 \\
\hline
21
\end{array}
$$

$983 \div 37 = 26 \text{ r } 21$

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D14b: Long Division

6

Traditional Method

$$
\begin{array}{r}
38 \\
59 \overline{)\,2242} \\
-\,177 \\
\hline
472 \\
-\,472 \\
\hline
0
\end{array}
$$

$2242 \div 59 = 38$

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MF: 2x Table Facts

2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20
2 x 11 = 22
2 x 12 = 24

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MF: 2x Table Facts

1 x 2 = 2	7 x 2 = 14
2 x 2 = 4	8 x 2 = 16
3 x 2 = 6	9 x 2 = 18
4 x 2 = 8	10 x 2 = 20
5 x 2 = 10	11 x 2 = 22
6 x 2 = 12	12 x 2 = 24

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MF: 3x Table Facts

3 x 1 = 3	3 x 7 = 21
3 x 2 = 6	3 x 8 = 24
3 x 3 = 9	3 x 9 = 27
3 x 4 = 12	3 x 10 = 30
3 x 5 = 15	3 x 11 = 33
3 x 6 = 18	3 x 12 = 36

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MF: 3x Table Facts

1 x 3 = 3
2 x 3 = 6
3 x 3 = 9
4 x 3 = 12
5 x 3 = 15
6 x 3 = 18
7 x 3 = 21
8 x 3 = 24
9 x 3 = 27
10 x 3 = 30
11 x 3 = 33
12 x 3 = 36

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MF: 4x Table Facts

4 x 1 = 4
4 x 2 = 8
4 x 3 = 12
4 x 4 = 16
4 x 5 = 20
4 x 6 = 24
4 x 7 = 28
4 x 8 = 32
4 x 9 = 36
4 x 10 = 40
4 x 11 = 44
4 x 12 = 48

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MF: 4x Table Facts

1 x 4 = 4	7 x 4 = 28
2 x 4 = 8	8 x 4 = 32
3 x 4 = 12	9 x 4 = 36
4 x 4 = 16	10 x 4 = 40
5 x 4 = 20	11 x 4 = 44
6 x 4 = 24	12 x 4 = 48

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MF: 5x Table Facts

5 x 1 = 5	5 x 7 = 35
5 x 2 = 10	5 x 8 = 40
5 x 3 = 15	5 x 9 = 45
5 x 4 = 20	5 x 10 = 50
5 x 5 = 25	5 x 11 = 55
5 x 6 = 30	5 x 12 = 60

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MF: 5x Table Facts

1 x 5 = 5
2 x 5 = 10
3 x 5 = 15
4 x 5 = 20
5 x 5 = 25
6 x 5 = 30
7 x 5 = 35
8 x 5 = 40
9 x 5 = 45
10 x 5 = 50
11 x 5 = 55
12 x 5 = 60

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MF: 6x Table Facts

6 x 1 = 6
6 x 2 = 12
6 x 3 = 18
6 x 4 = 24
6 x 5 = 30
6 x 6 = 36
6 x 7 = 42
6 x 8 = 48
6 x 9 = 54
6 x 10 = 60
6 x 11 = 66
6 x 12 = 72

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MF: 6x Table Facts

1 x 6 = 6

2 x 6 = 12

3 x 6 = 18

4 x 6 = 24

5 x 6 = 30

6 x 6 = 36

7 x 6 = 42

8 x 6 = 48

9 x 6 = 54

10 x 6 = 60

11 x 6 = 66

12 x 6 = 72

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MF: 7x Table Facts

7 x 1 = 7	7 x 7 = 49
7 x 2 = 14	7 x 8 = 56
7 x 3 = 21	7 x 9 = 63
7 x 4 = 28	7 x 10 = 70
7 x 5 = 35	7 x 11 = 77
7 x 6 = 42	7 x 12 = 84

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MF: 7x Table Facts

1 x 7 = 7	7 x 7 = 49
2 x 7 = 14	8 x 7 = 56
3 x 7 = 21	9 x 7 = 63
4 x 7 = 28	10 x 7 = 70
5 x 7 = 35	11 x 7 = 77
6 x 7 = 42	12 x 7 = 84

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MF: 8x Table Facts

8 x 1 = 8	8 x 7 = 56
8 x 2 = 16	8 x 8 = 64
8 x 3 = 24	8 x 9 = 72
8 x 4 = 32	8 x 10 = 80
8 x 5 = 40	8 x 11 = 88
8 x 6 = 48	8 x 12 = 96

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MF: 8x Table Facts

1 x 8 = 8

2 x 8 = 16

3 x 8 = 24

4 x 8 = 32

5 x 8 = 40

6 x 8 = 48

7 x 8 = 56

8 x 8 = 64

9 x 8 = 72

10 x 8 = 80

11 x 8 = 88

12 x 8 = 96

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MF: 9x Table Facts

9 x 1 = 9
9 x 2 = 18
9 x 3 = 27
9 x 4 = 36
9 x 5 = 45
9 x 6 = 54
9 x 7 = 63
9 x 8 = 72
9 x 9 = 81
9 x 10 = 90
9 x 11 = 99
9 x 12 = 108

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MF: 9x Table Facts

1 x 9 = 9	7 x 9 = 63
2 x 9 = 18	8 x 9 = 72
3 x 9 = 27	9 x 9 = 81
4 x 9 = 36	10 x 9 = 90
5 x 9 = 45	11 x 9 = 99
6 x 9 = 54	12 x 9 = 108

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MF: 10x Table Facts

10 x 1 = 10
10 x 2 = 20
10 x 3 = 30
10 x 4 = 40
10 x 5 = 50
10 x 6 = 60
10 x 7 = 70
10 x 8 = 80
10 x 9 = 90
10 x 10 = 100
10 x 11 = 110
10 x 12 = 120

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MF: 10x Table Facts

1 x 10 = 10	7 x 10 = 70
2 x 10 = 20	8 x 10 = 80
3 x 10 = 30	9 x 10 = 90
4 x 10 = 40	10 x 10 = 100
5 x 10 = 50	11 x 10 = 110
6 x 10 = 60	12 x 10 = 120

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MF: 11x Table Facts

11 x 1 = 11
11 x 2 = 22
11 x 3 = 33
11 x 4 = 44
11 x 5 = 55
11 x 6 = 66
11 x 7 = 77
11 x 8 = 88
11 x 9 = 99
11 x 10 = 110
11 x 11 = 121
11 x 12 = 132

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MF: 11x Table Facts

1 x 11 = 11

2 x 11 = 22

3 x 11 = 33

4 x 11 = 44

5 x 11 = 55

6 x 11 = 66

7 x 11 = 77

8 x 11 = 88

9 x 11 = 99

10 x 11 = 110

11 x 11 = 121

12 x 11 = 132

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MF: 12x Table Facts

1 x 12 = 12	7 x 12 = 84
2 x 12 = 24	8 x 12 = 96
3 x 12 = 36	9 x 12 = 108
4 x 12 = 48	10 x 12 = 120
5 x 12 = 60	11 x 12 = 132
6 x 12 = 72	12 x 12 = 144

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MF: 12x Table Facts

12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60
12 x 6 = 72
12 x 7 = 84
12 x 8 = 96
12 x 9 = 108
12 x 10 = 120
12 x 11 = 132
12 x 12 = 144

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Sense of Number

Standard Alternative Slides

Alternative Layout Slides

by Dave Godfrey

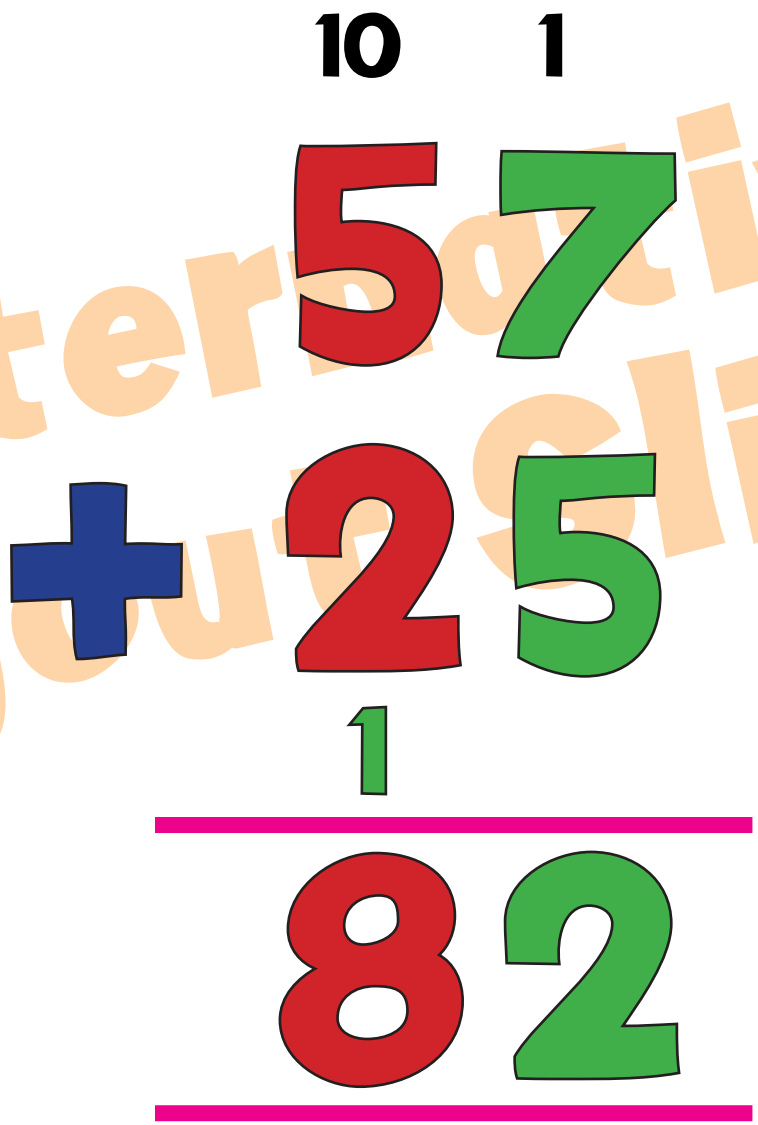
dave@senseofnumber.co.uk Tel: 01904 778848

The following slides the standard alternative slide configurations to the main set of slides.

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(A7a: Column Addition)

2 Additional:a



Alternative Layout Slides

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A7b: Column Addition

2/3

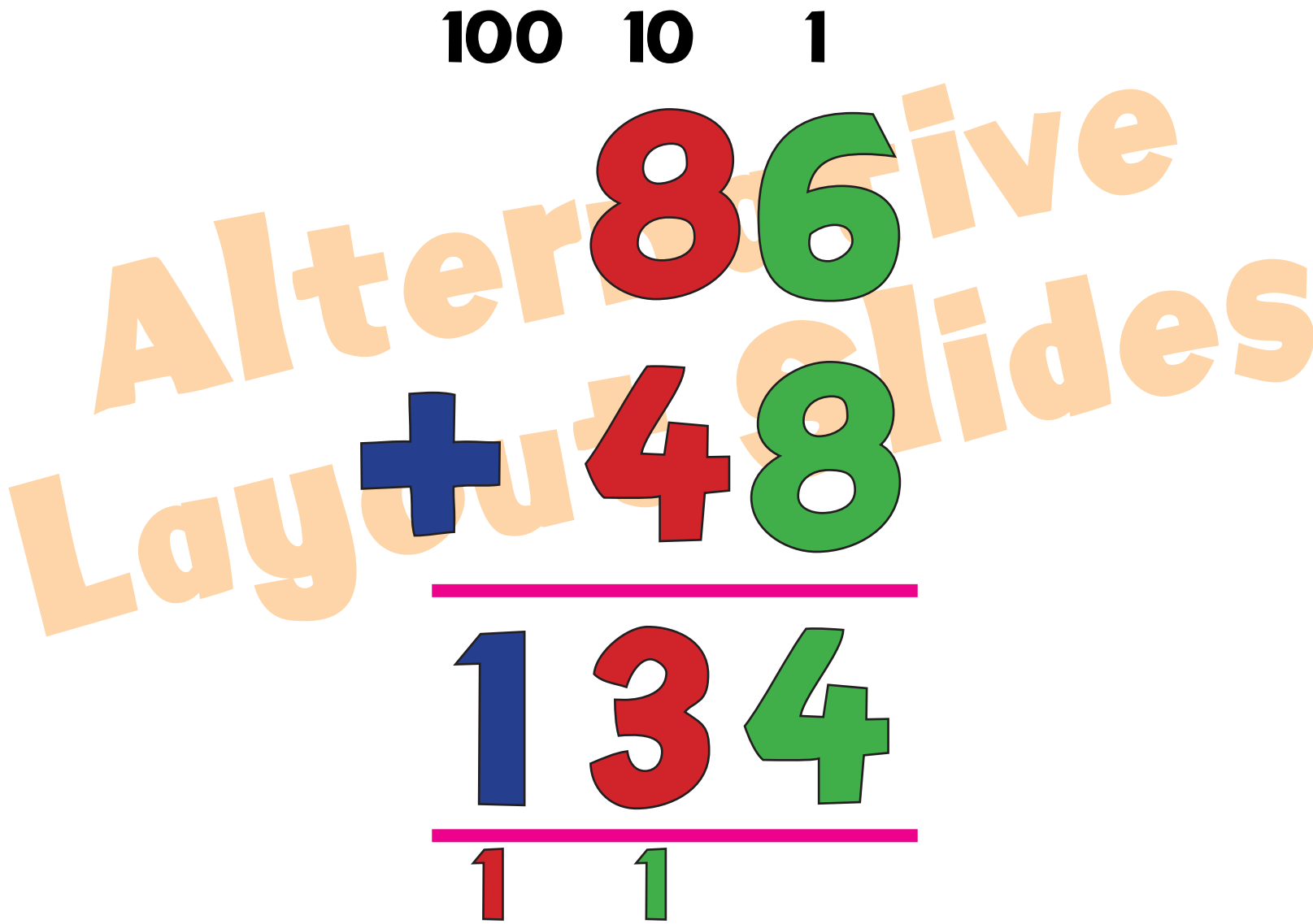
100	10	1
	7	5
+	5	2
1	2	7
1		

Alternative Layout Slides

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A7c: Column Addition

2/3 Additional:b



Alternative Layout Slides

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A7d: Column Addition

3

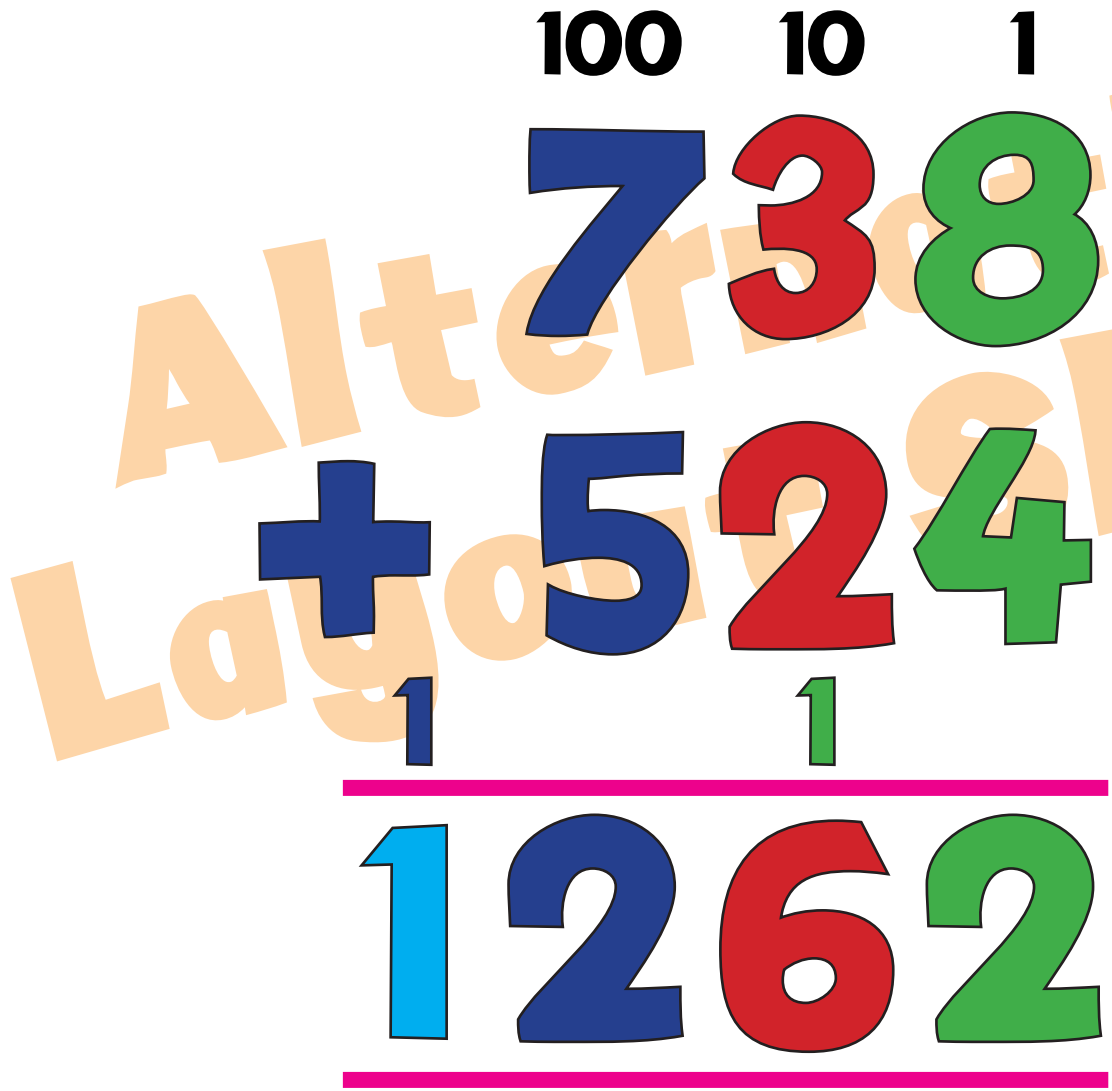
100	10	1
6	8	7
+ 2	4	8
1	1	
9	3	5

Alternative Layout Slides

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A7e: Column Addition

3

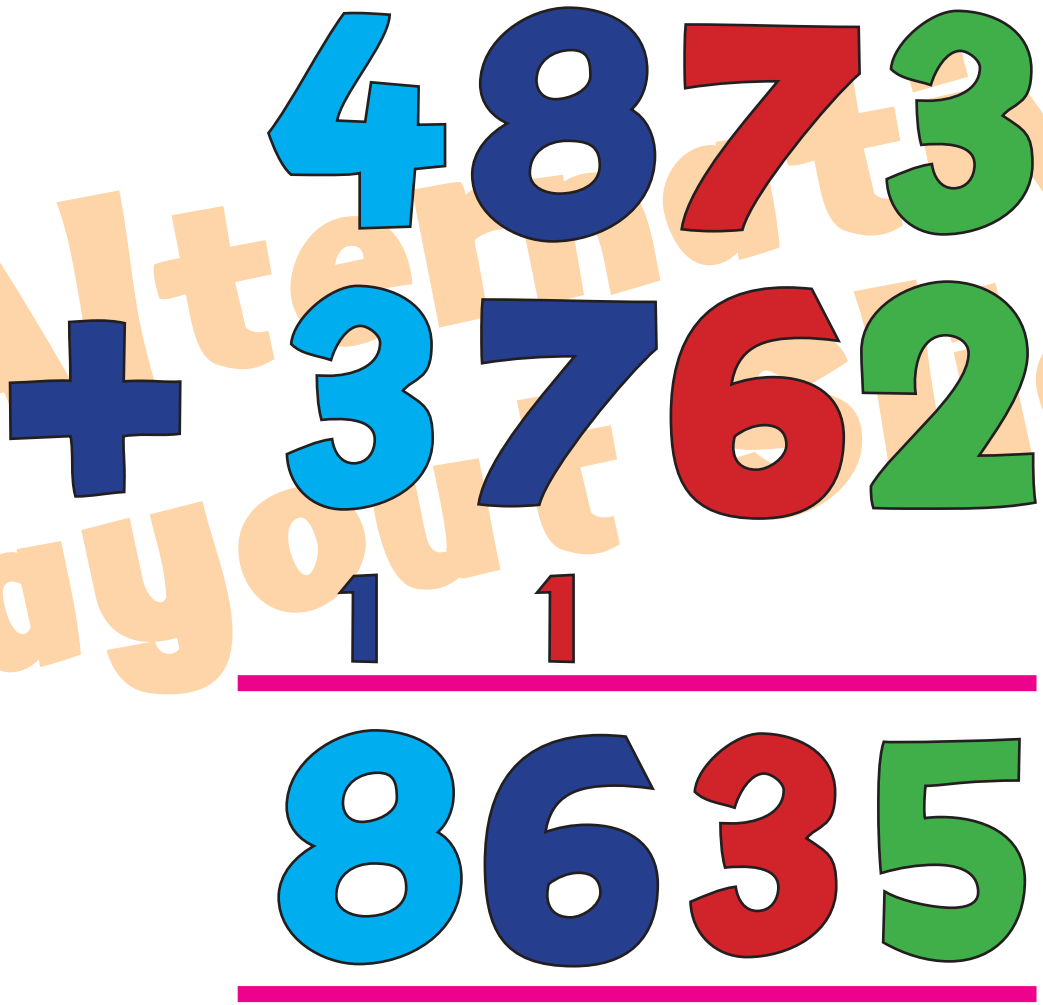


Alternative Lagoon slides

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A7f: Column Addition

4

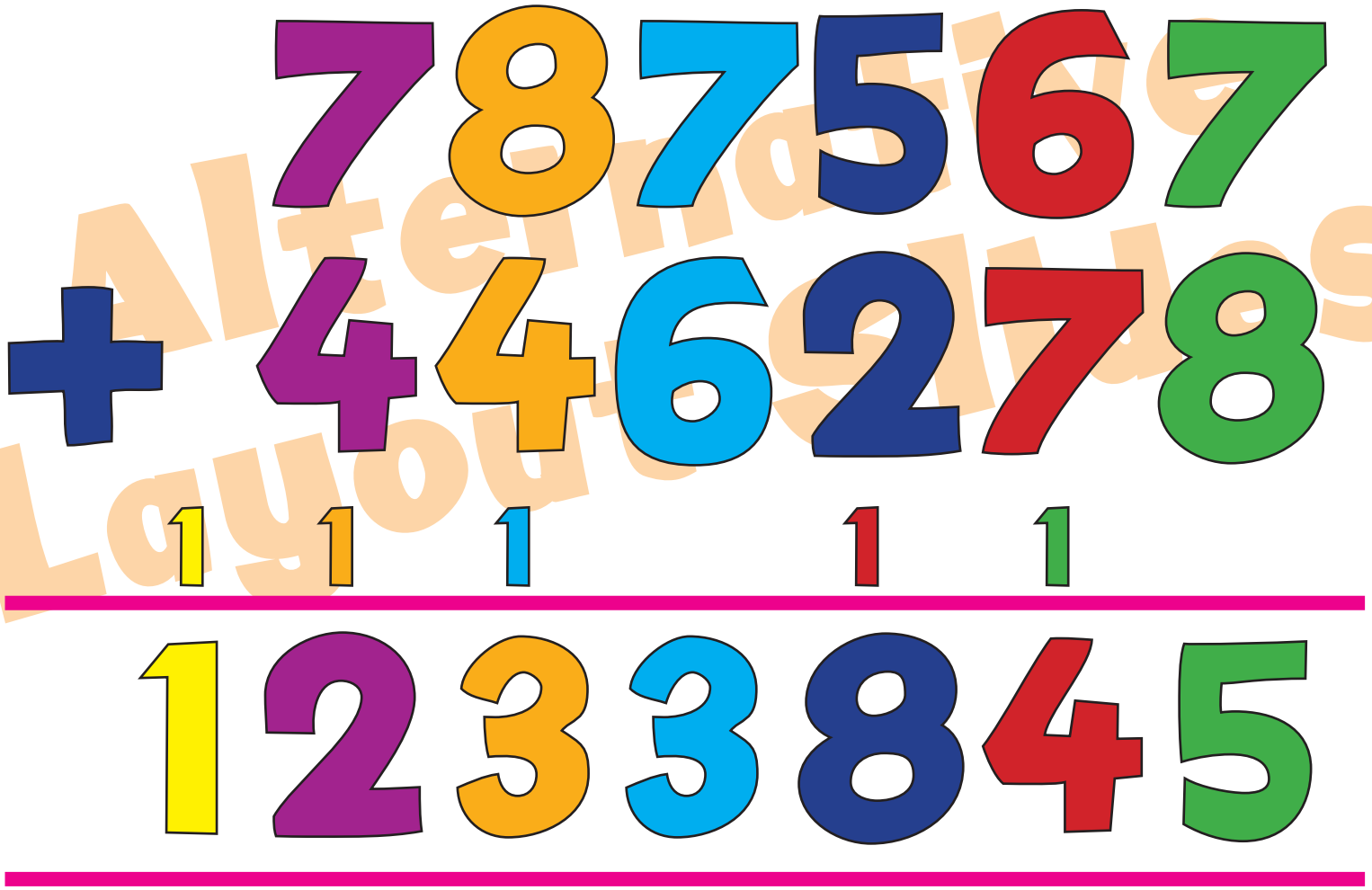


Alternative Layout Slides

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A7g: Column Addition

5

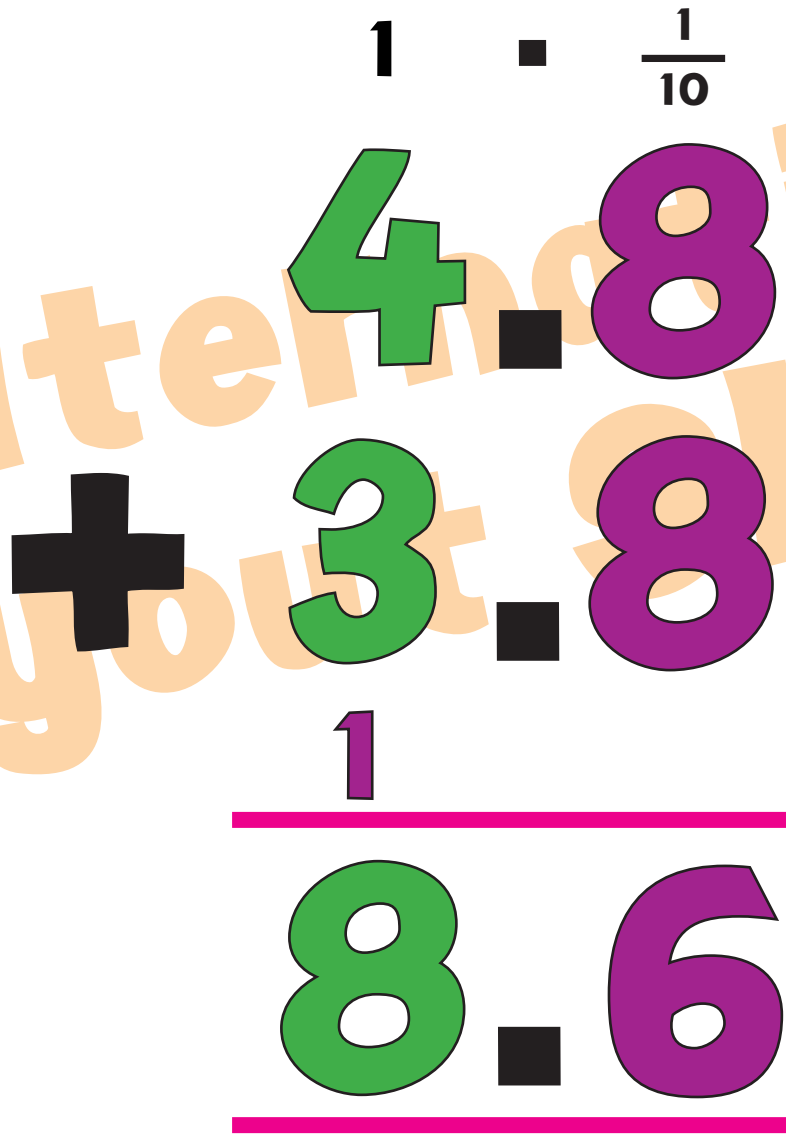


Alternative Layout Styles

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A7h: Column Addition

5



Alternative Layout Slides

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A7i: Column Addition

5

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

5.65

+ 3.29

1

8.94

Alternative Layout Slides

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A7 j: Column Addition

5

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

76.7

+ 58.5

1 1 1

135.2

Alternative Layout Slides

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A7k: Column Addition

5

With Money

Alternative Layout slides

	£	3	8.25
+	£	2	7.46
		1	1
	£	6	5.71

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A7l: Column Addition

5

With Decimals

$$73.4 + 5.67 = 79.07$$

Alternative Layout Slides

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

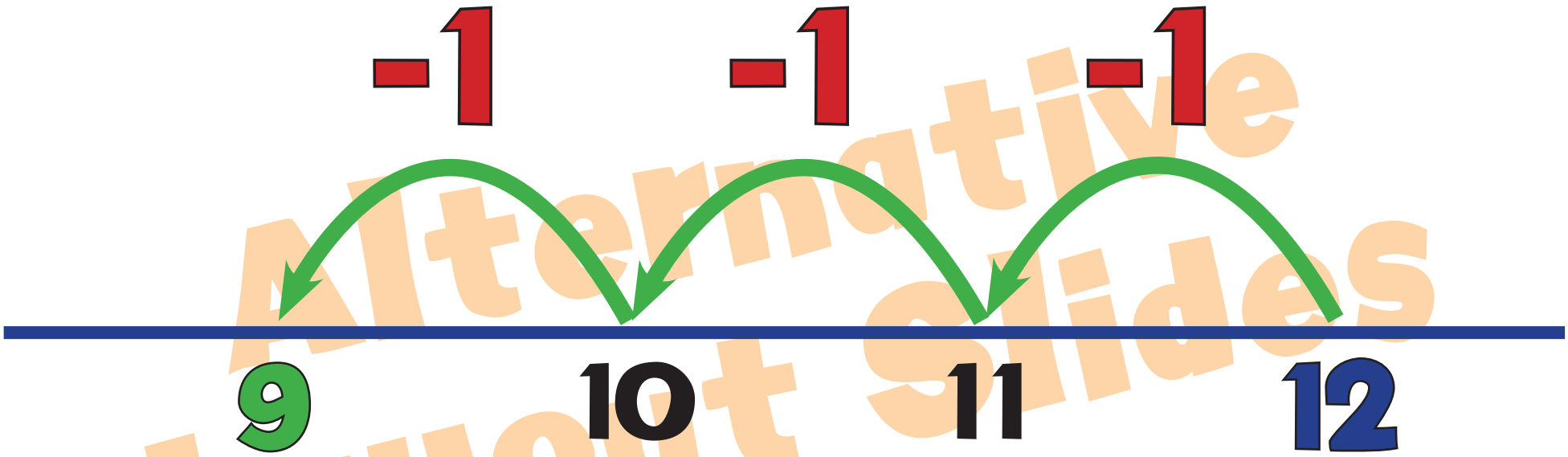
$$\begin{array}{r} 73.4 \\ +\ 5.67 \\ \hline 79.07 \end{array}$$

1

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S2: Counting Back

1



Alternative Layout Slides

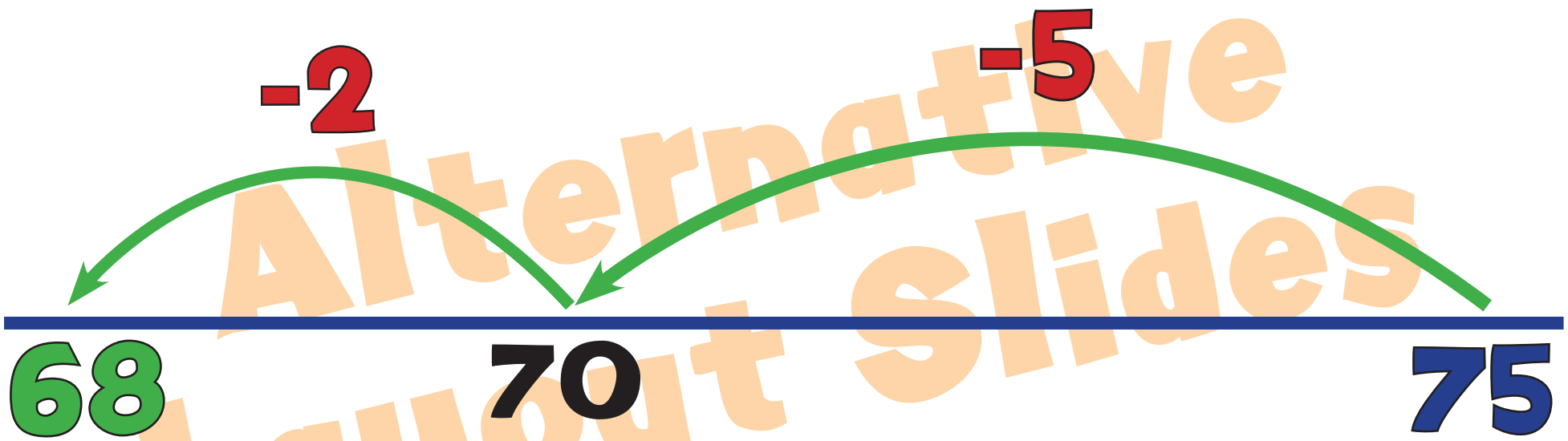
12 - 3 = 9

"What do I get if I take 3 away from 12? Answer: 9"

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S2a: Backwards Boing

2



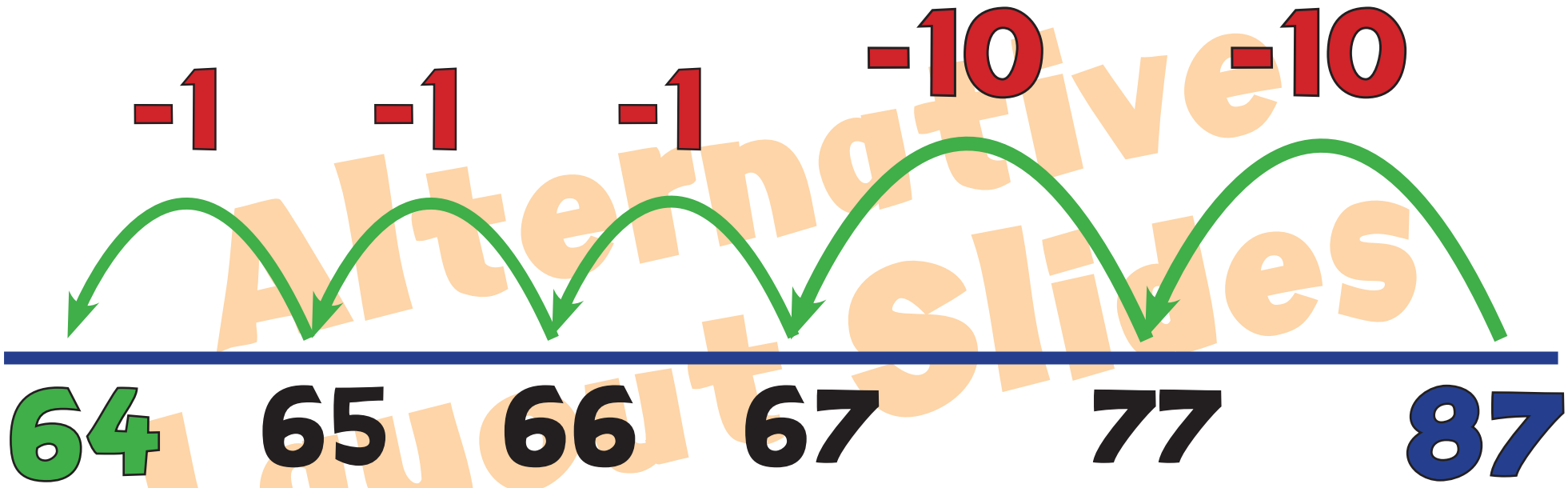
Alternative Layout Slides

75 - 7 = 68

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S4: Backwards Bounce

2



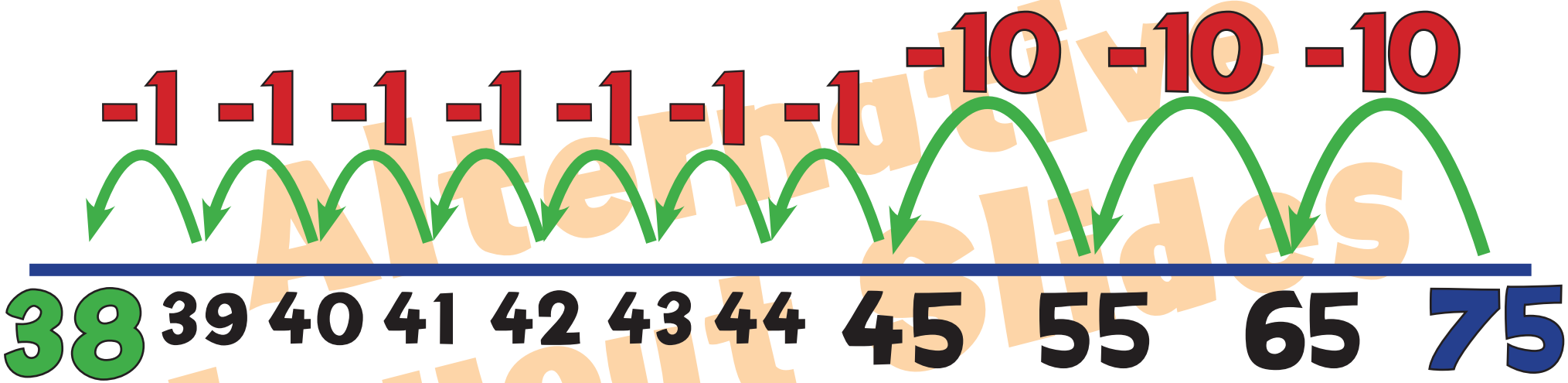
Alternative Layout Slides

87 - 23 = 64

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S4a: Backwards Bounce

2



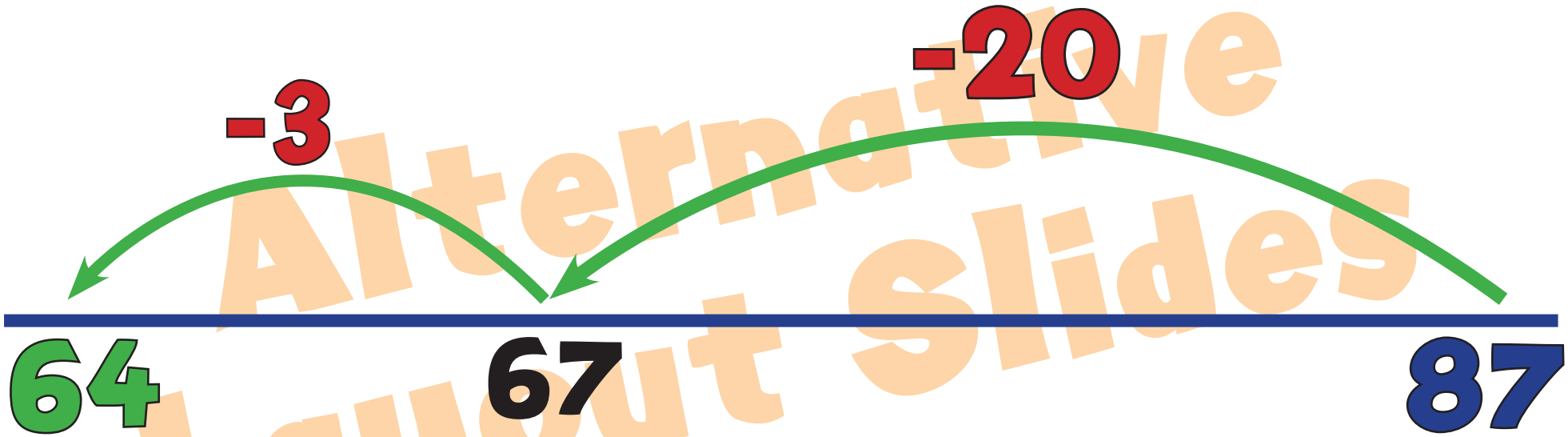
Alternative Layout Slides

75 - 37 = 38

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S5: Backwards Jump

2



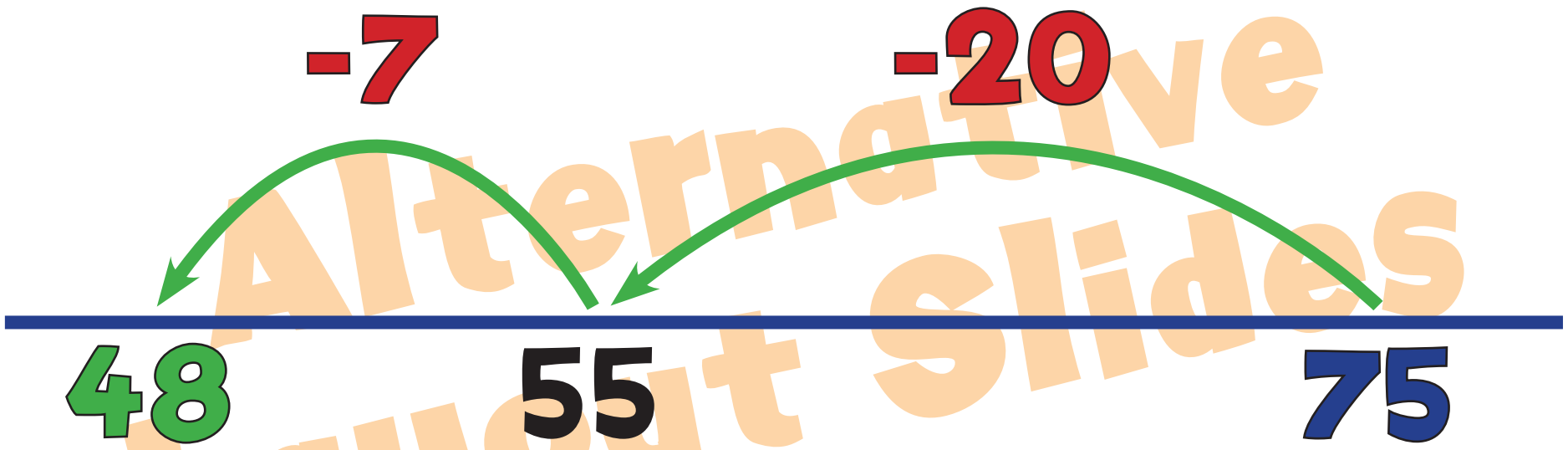
Alternative Layout Slides

87 - 23 = 64

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S5a: Backwards Jump

2



Alternative Layout slides

75 - 27 = 48

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(M8: Column Multiplication)

3 Additional



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(M8: Column Multiplication)

4 Additional:a

100	10	1
	4	3
×		6
	24	
	1	
2	5	8

Alternative Layout Slides

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M8: Column Multiplication

4

100	10	1
1	4	7
		× 4
1	2	
5	8	8

Alternative Layout Slides

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M8a: Column Multiplication

4



Alternative Layout Slides

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M10a: Long Multiplication

5

Column

Alternative Layout Slides

$$
\begin{array}{r}
43 \\
\times\ 65 \\
\hline
^{2}\,^{1}215 \quad (43 \times 5) \\
+\ ^{2}\,^{1}2580 \quad (43 \times 60) \\
\hline
2795
\end{array}
$$

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M10a: Long Multiplication

5

Column

Alternative Layout Slides

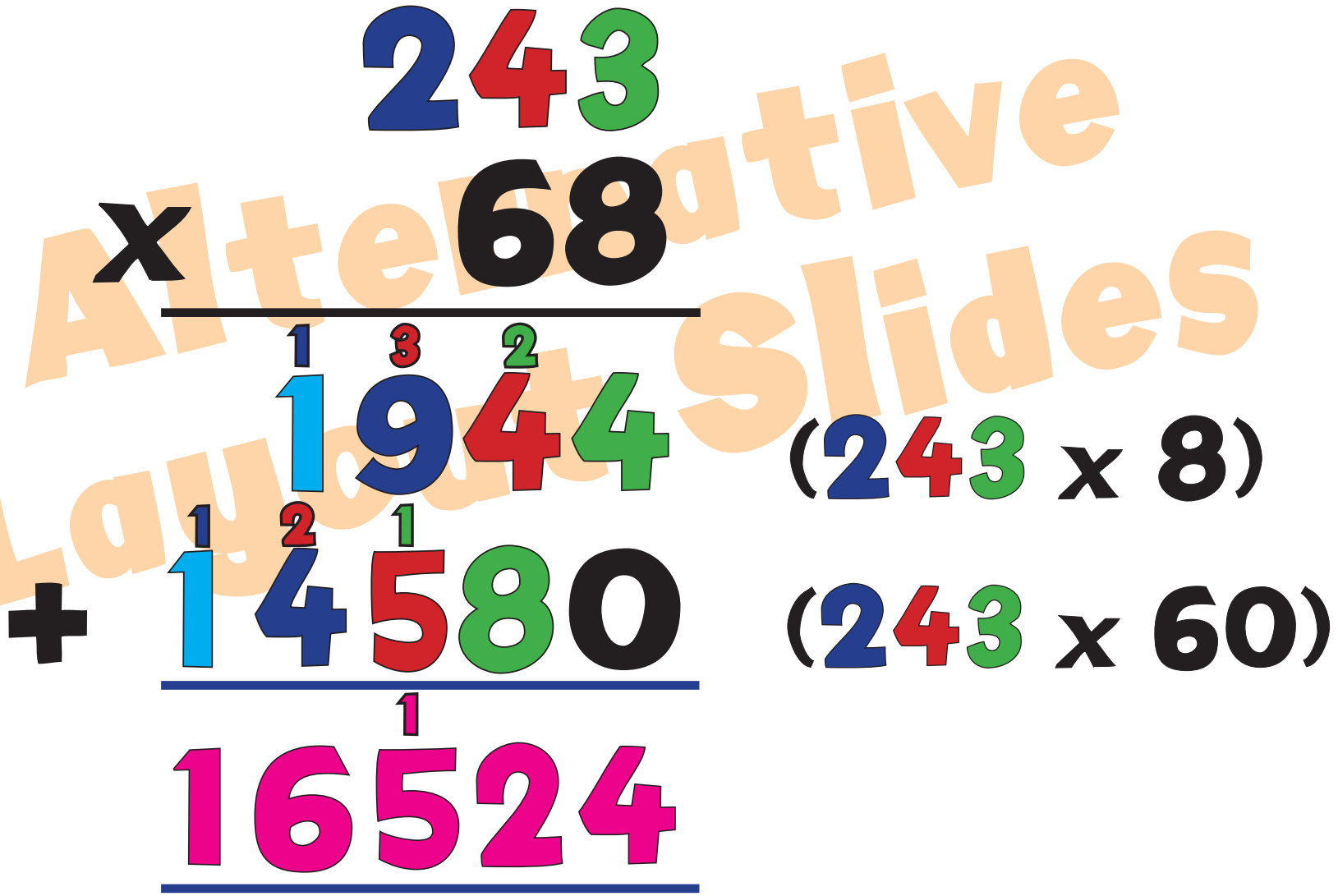
$$
\begin{array}{r}
43 \\
\times\ 65 \\
\hline
^{2}\,^{1}215 \quad (5 \times 43) \\
+\ ^{2}\,^{1}2580 \quad (60 \times 43) \\
\hline
2795
\end{array}
$$

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M10b: Long Multiplication

5

Column



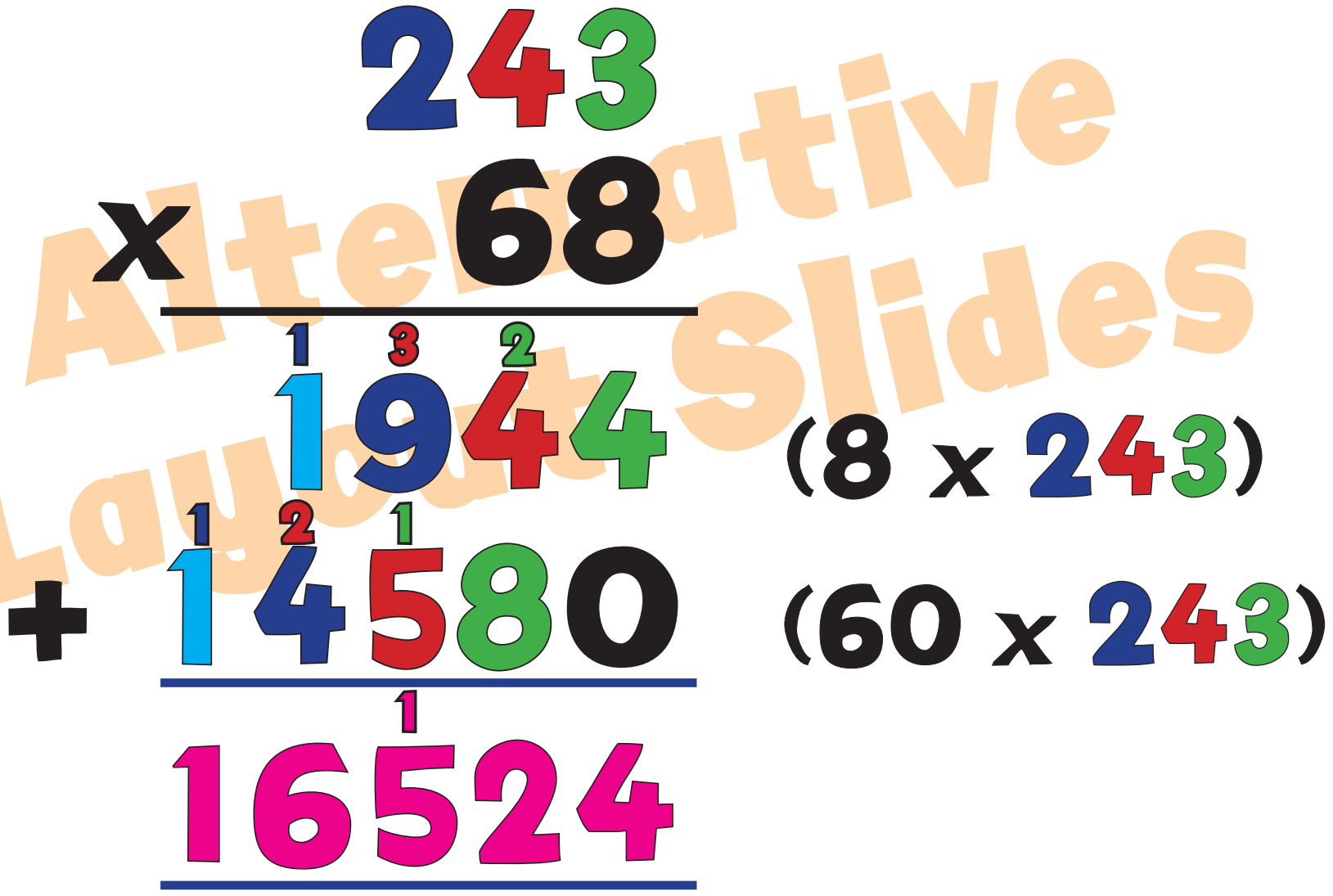
Alternative Layout Slides

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M10b: Long Multiplication

5

Column



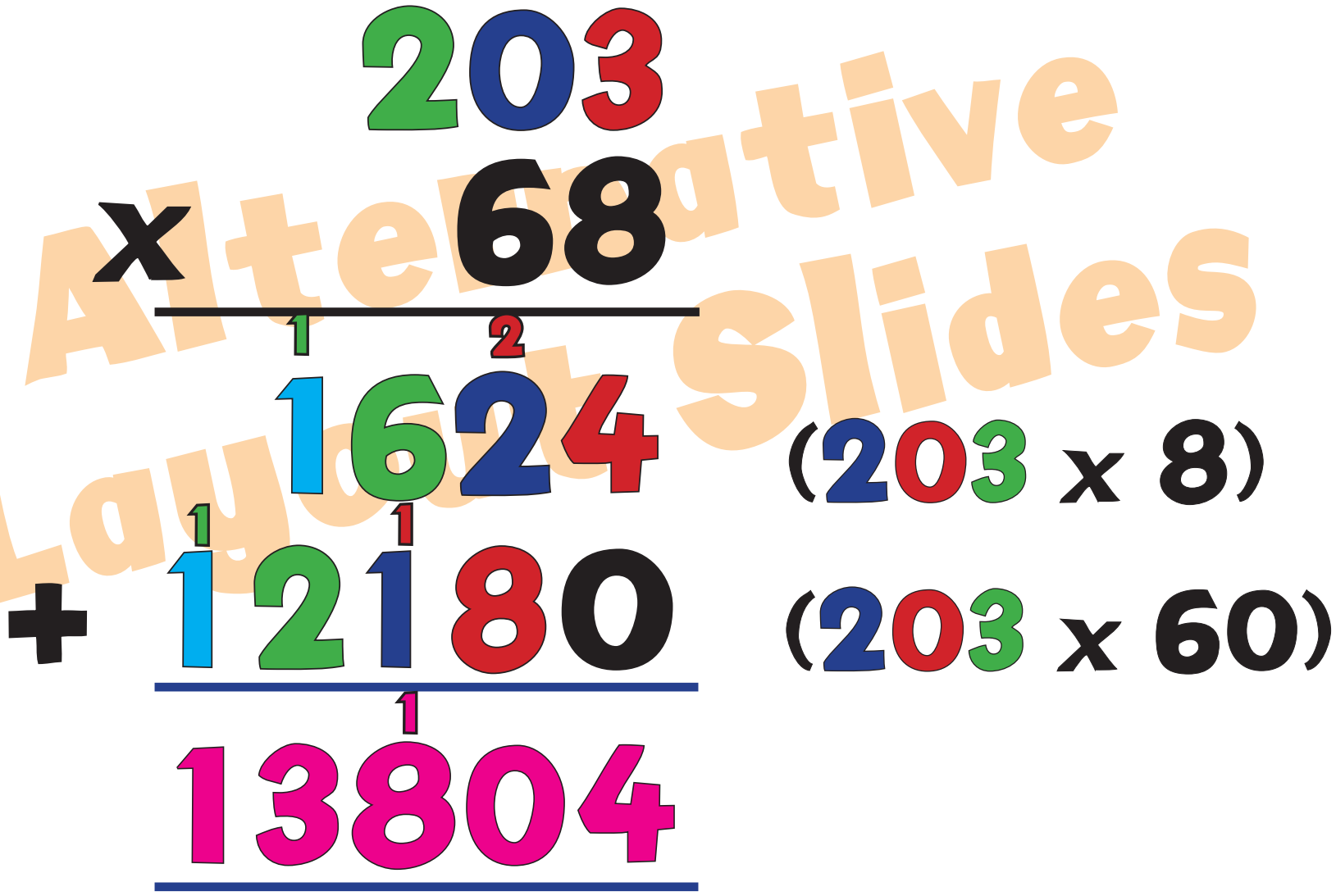
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M10c: Long Multiplication

5

Column



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M10d: Column Multiplication

5

10 1 ▪ $\frac{1}{10}$

Alternative Layout Slides

$$\begin{array}{r} 3.6 \\ \times\ 4 \\ \hline 2 \\ \hline 14.4 \\ \hline \end{array}$$

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M10e: Column Multiplication

6

100	10	1	.	$\frac{1}{10}$
4	7	2	.	
		× 3		
		2		
1	4	1	.	6

Alternative Layout Slides

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M10f: Column Multiplication

6

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	7	.	3	8
×			6	
	4		2	4
4	4	.	2	8

Alternative Layout Slides

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M10g: Long Multiplication

Column Decimals

6

Alternative Layouts Slides

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	24	.	3	
x	2	.	5	
	12	.	15	(24.3 x 0.5)
+	48	.	60	(24.3 x 2)
	60	.	75	

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M10g: Long Multiplication

Column Decimals

6

Alternative Layouts Slides

10	1	.	$\frac{1}{10}$	$\frac{1}{100}$
	2	4	.	3
x		2	.	5
	1	2	.	1	5	(0.5 x 24.3)
+	4	8	.	6	0	(2 x 24.3)
	1					
	6	0	.	7	5	

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M10h: Long Multiplication

6 Column

Alternative Layout Slides

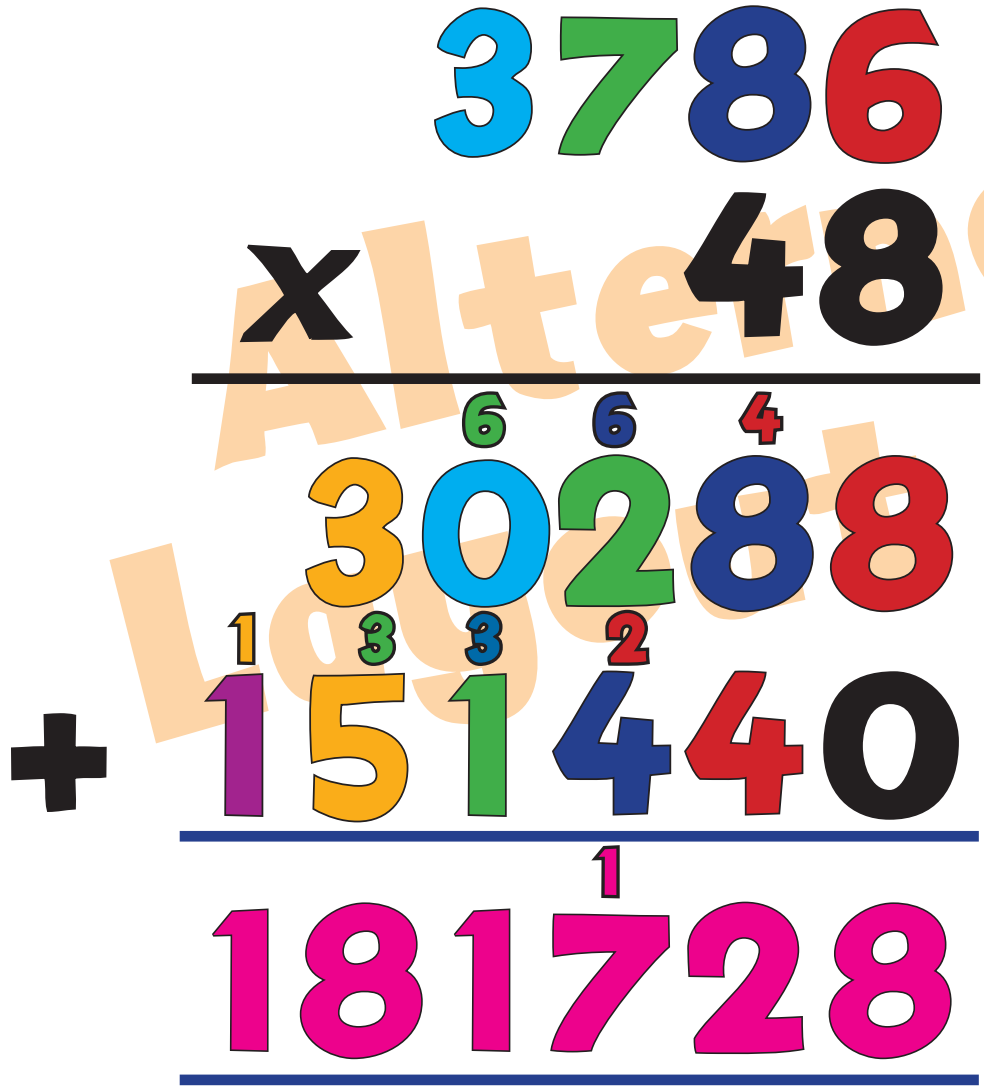
$$
\begin{array}{r}
3786 \\
\times \quad 48 \\
\hline
30288 \quad (3786 \times 8) \\
+\ 151440 \quad (3786 \times 40) \\
\hline
181728 \\
\hline
\end{array}
$$

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M10h: Long Multiplication

6

Column



(8 x 3786)

(40 x 3786)

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