

Sense of Number

Expanded Visual Calculation Policy

Written Strategies Policy

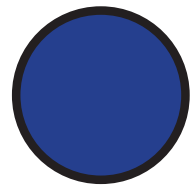
Hawkesley Church Primary Academy
July 2019

Graphic Design by Dave Godfrey
Compiled by the Sense of Number Maths Team

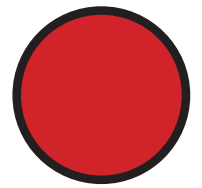
For sole use within Hawkesley Church Primary Academy.

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





Guide to using a



Visual Calculation Policy

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

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

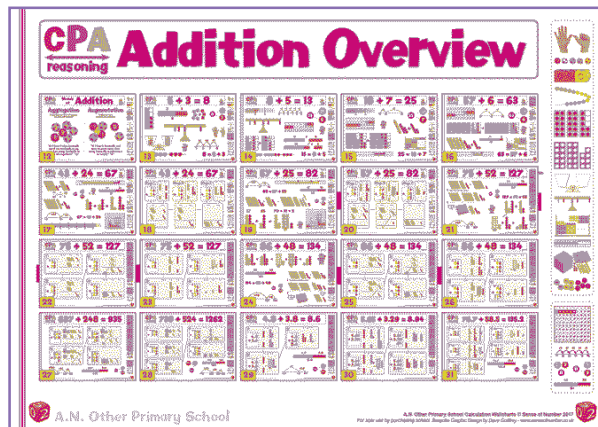
- Classroom:** **The posters are printed out (e.g. A4) and the appropriate slides are displayed for continual reference or on a working wall. Posters are used on the interactive whiteboard.**
- Reference:** **The summary overviews are printed out and inserted in the teacher's planning folder.**
- Parents:**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



Expanded Visual Calculation Policy

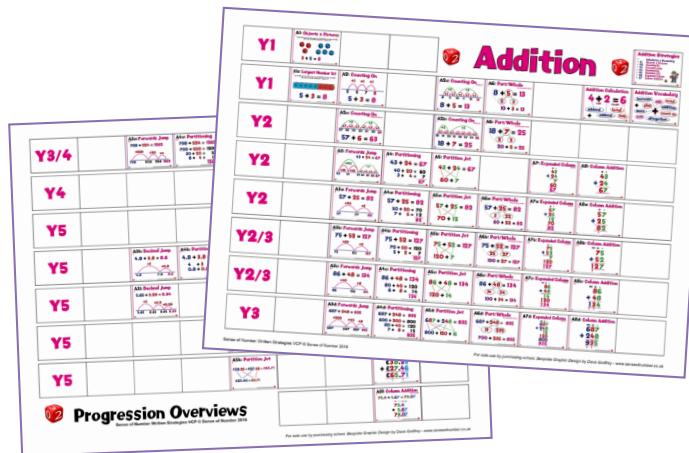
The Expanded Visual Calculation Policy helps children and teaching staff achieve mastery of all aspects of calculation. It contains the following three documents:

Concrete & Pictorial VCP



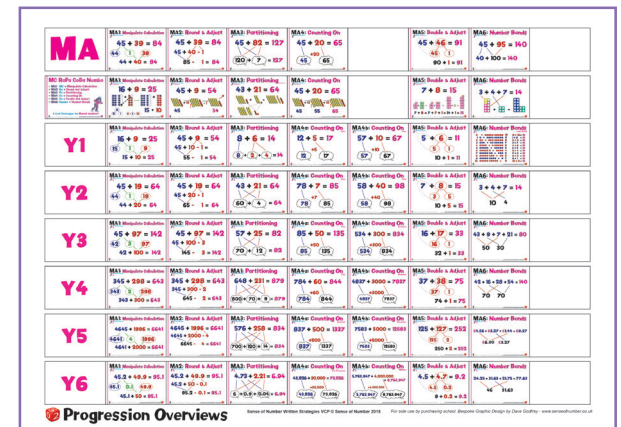
84 A3 wallcharts showing the range of models and images that help children to understand and master calculation strategies.

Written Strategies VCP

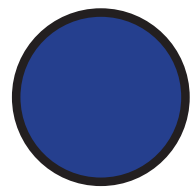


271 A4 posters showing the progression of written strategies (from Y1 to Y6) for all 4 operations in line with the National Curriculum.

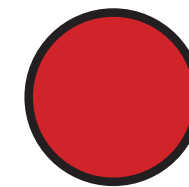
Mental Strategies VCP



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



Poster Guide



Expanded Visual Calc. Policy

Code	Section	Concrete & Pictorial (84 A3 Wallcharts)		Written VCP (271 A4 Posters)		Mental VCP (215 A4 Posters)	
		Number of Wallcharts	Wallchart Numbers	No. of Posters	Poster Numbers	No. of Posters	Poster Numbers
	Policy Introduction Slides	4	1-4	4	1-4	4	1-4
	Introductory Posters	3	5-7	9	5-13		
	Operation Overviews	4	8-11	13	14-26	8	5-12
C	Counting Policy			15	27-41		
A	Addition	20	12-31	54	42-103		
MA	Mental Addition					55	13-67
S	Subtraction	27	32-58	48	104-169		
MS	Mental Subtraction					63	68-130
M	Multiplication	11	59-69	39	170-209		
MM	Mental Multiplication					46	131-176
D	Division	15	70-84	51	210-260		
MD	Mental Division					38	177-215
	Multiplication Tables			11	261-271		
	Alternative layouts (Column & Number Lines)			29	272-302		



Introductory Posters

6 **Calculation Vocabulary**

7 **Key Vocabulary**

8 **Make? Draw? Head? Jotting? Written?**

9 **a) Can I make it?**

10 **b) Can I draw a picture of it?**

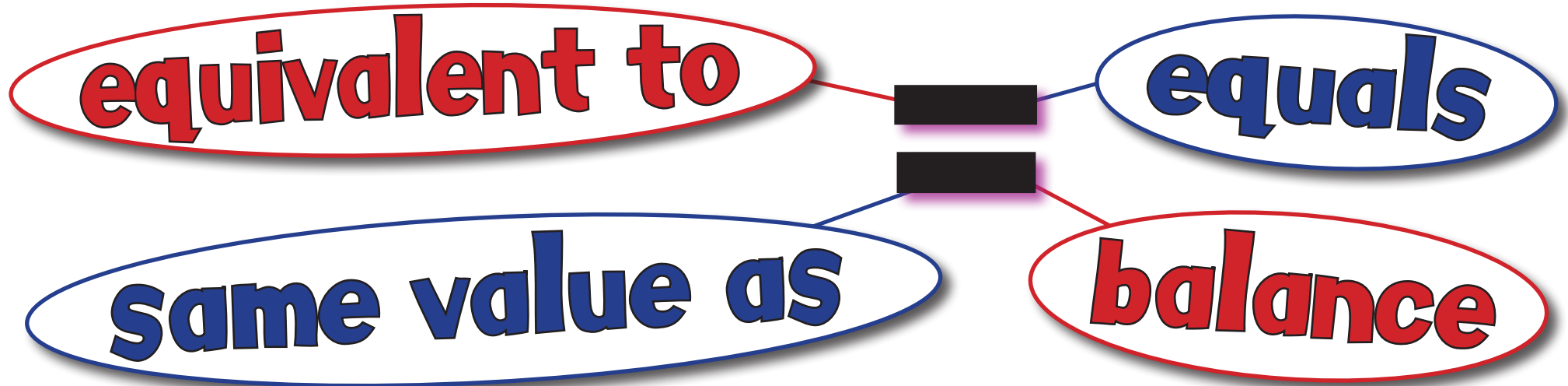
11 **c) Can I do this in my head?**

12 **d) Do I need to do a jotting?**

13 **e) Do I need a written method?**



Calculation Vocabulary



Key Vocabulary!

$$\underset{\text{Addend}}{8} + \underset{\text{Addend}}{2} = \underset{\text{Total Sum}}{10}$$

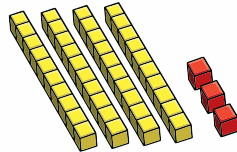
$$\underset{\text{Minuend}}{8} - \underset{\text{Subtrahend}}{2} = \underset{\text{Difference}}{6}$$

$$\underset{\text{Multiplicand}}{8} \times \underset{\text{Multiplier}}{2} = \underset{\text{Product}}{16}$$

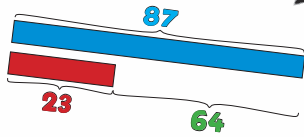
$$\underset{\text{Dividend}}{8} \div \underset{\text{Divisor}}{2} = \underset{\text{Quotient}}{4}$$



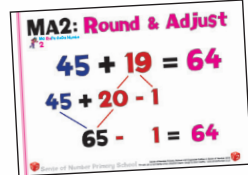
1
Make it?



2
Draw it?

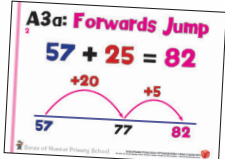


3
In my Head?

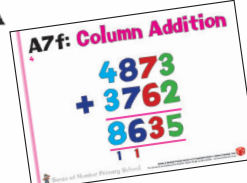


What should I do?

4
Jotting?

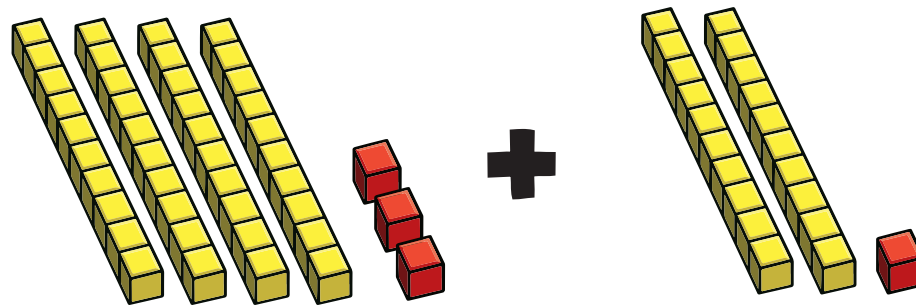



5
Written method?



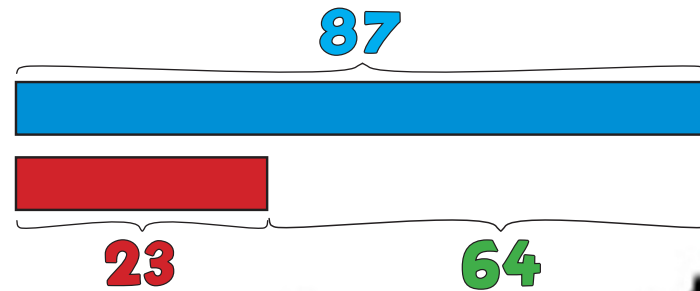

1

Can I make it?



2

Can I draw a picture?



3

Can I do it in
my head?

MA2: Round & Adjust
2

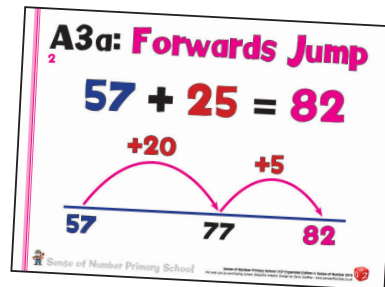
$$45 + 19 = 64$$
$$45 + 20 - 1$$
$$65 - 1 = 64$$

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4

Do I need a
jotting?



5

Do I need a
written method?

A7f: Column Addition

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

Sense of Number Primary School



<p>Sense of Number Visual Calculation Policy</p> <p>Expanded Edition for Sense of Number Primary School January 2017</p> <p>Graphic Design by Dave Godfrey Compiled by the Sense of Number Maths Team</p> <p>For sale on www.senseofnumber.co.uk</p>	<p>Guide to using a Visual Calculation Policy</p> <p>The Sense of Number Visual Calculation Policy provides a visual representation of each of the Written Calculation Policies.</p> <p>Types of VCP</p> <p>The VCPs are published on (i.e. A1) and the appropriate VCPs are displayed on overhead projectors or on the wall in the classroom.</p> <p>Parents: The VCPs are used to communicate to parents the methods being taught and used in school.</p> <p>Notes: Some parts of the VCP are written on a separate sheet (e.g. the CPA Expanded Visual Calculation Policy).</p>	<p>CPA Expanded Visual Calculation Policy</p> <p>The Expanded Visual Calculation Policy includes additional written strategies for all aspects of addition, subtraction and multiplication.</p> <p>Written Strategies VCP</p> <p>Mental Strategies VCP</p> <p>Concrete & Pictorial VCP</p>	<p>Poster Guide Visual Calculation Policies</p> <table border="1"> <thead> <tr> <th>Operation</th> <th>Written</th> <th>Mental</th> <th>Concrete & Pictorial</th> </tr> </thead> <tbody> <tr> <td>1. Addition</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>2. Subtraction</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>3. Multiplication</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>4. Division</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Operation	Written	Mental	Concrete & Pictorial	1. Addition	1	1	1	2. Subtraction	1	1	1	3. Multiplication	1	1	1	4. Division	1	1	1						
Operation	Written	Mental	Concrete & Pictorial																										
1. Addition	1	1	1																										
2. Subtraction	1	1	1																										
3. Multiplication	1	1	1																										
4. Division	1	1	1																										

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<p>Introductory Posters</p> <p>Calculation Vocabulary</p> <p>Make? Draw? Head? Jotting? Written?</p> <ul style="list-style-type: none"> Can I make it? Can I draw a picture of it? Can I do this in my head? Do I need to do a jotting? Do I need a written method? 	<p>Calculation Vocabulary</p> <p>equivalent to = equals</p> <p>same value as = balance</p> <p>+ Addition</p> <p>x Multiplication</p> <p>- Subtraction</p> <p>÷ Division</p>	<p>Key Vocabulary!</p> <p>$8 + 2 = 10$ - Total Sum</p> <p>$8 - 2 = 6$ - Difference</p> <p>$8 \times 2 = 16$ - Product</p> <p>$8 \div 2 = 4$ - Quotient</p>	<p>Make it?</p> <p>Draw it?</p> <p>Do it in my head?</p> <p>Jotting?</p> <p>Written method?</p>	<p>1 Can I make it?</p> <p>$3 + 2 = 5$</p>	<p>2 Can I draw a picture?</p> <p>$3 + 2 = 5$</p>	<p>3 Can I do it in my head?</p> <p>$3 + 2 = 5$</p>	<p>3 Do I need a jotting?</p> <p>$3 + 2 = 5$</p>	<p>5 Do I need a written method?</p> <p>$3 + 2 = 5$</p>
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<p>Counting Policy</p> <ul style="list-style-type: none"> C1a: Number Order C1b: At a Glance C2a: Number Match C2b: Counting Objects C2c: Order Arrangement C3: How Many? C4: Arranging C5: Counting Forwards C6: Counting On C7: Counting Back C8: Counting in Steps 	<p>C1a: Number Order</p> <p>0 1 2 3 4 5</p> <p>The numbers must be said out loud in the correct order.</p>	<p>C1b: At a Glance</p> <p>See at a glance how many are in small collections and attach correct number words to each collection.</p>		<p>C2a: Number Match</p> <p>Each object to be counted must be touched or 'held' exactly once as the numbers are said.</p>	<p>C2b: Counting Objects</p> <p>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.</p>	<p>C2c: Order Arrangement</p> <p>The arrangement of the objects does not affect how many there are.</p>		<p>C3: How Many?</p> <p>The last number said tells 'how many' in the whole collection. It does not include the last object touched.</p>
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<p>C4: Arranging</p> <p>Sets of 5</p> <p>7</p>	<p>C4a: Arranging</p> <p>Sets of 5</p> <p>18</p>	<p>C4b: Arranging</p> <p>Sets of 5 (Non-Linear)</p> <p>18</p>	<p>C4c: Arranging</p> <p>Sets of 5 (Non-Linear)</p> <p>43</p>		<p>C5: Counting Forwards</p> <p>0 1 2 3 4 5</p>	<p>C6: Counting On</p> <p>8 9 10 11 12 13</p>	<p>C7: Counting Back</p> <p>4 5 6 7 8 9</p>	<p>C8: Counting in Steps</p> <p>3 5 7 9 11</p>
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Progression Overviews

Sense of Number Written Strategies VCP © Sense of Number 2017




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



Y1

A1: Objects & Pictures
 "In the PE cupboard there were 3 red footballs and 5 blue footballs. How many footballs altogether?" Answer: 8



$3 + 5 = 8$




Addition



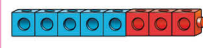
Addition Strategies

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




Y1

A1a: Largest Number 1st
 "In the PE cupboard there were 3 red footballs and 5 blue footballs. How many footballs altogether?" Answer: 8



$5 + 3 = 8$

A2: Counting On



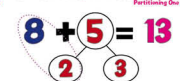
$5 + 3 = 8$

A2a: Counting On




$8 + 5 = 13$

A6: Part/Whole



$8 + 5 = 13$
 $2 + 3 = 10 + 3 = 13$

Addition Calculation



$4 + 2 = 6$
 (add) (equals)
 addend total
 + addend Sum


Addition Vocabulary



increase add total
 + plus addition
 more count on
 sum altogether


Y2

A2c: Counting On



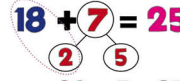
$57 + 6 = 63$

A2b: Counting On



$18 + 7 = 25$

A6: Part/Whole



$18 + 7 = 25$
 $2 + 5 = 20 + 5 = 25$

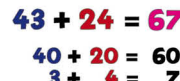
Y2

A3: Forwards Jump




$43 + 24 = 67$

A4: Partitioning




$43 + 24 = 67$
 $40 + 20 = 60$
 $3 + 4 = 7$
 $60 + 7 = 67$

A5: Partition Jot



$43 + 24 = 67$
 $60 + 7 = 67$

A7: Expanded Column



$43 + 24 = 67$

A8: Column Addition



$43 + 24 = 67$

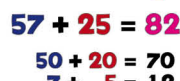
Y2

A3a: Forwards Jump



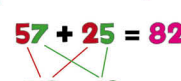
$57 + 25 = 82$

A4a: Partitioning



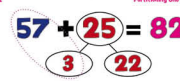
$57 + 25 = 82$
 $50 + 20 = 70$
 $7 + 5 = 12$
 $70 + 12 = 82$

A5a: Partition Jot




$57 + 25 = 82$
 $70 + 12 = 82$

A6a: Part/Whole




$57 + 25 = 82$
 $3 + 22 = 60 + 22 = 82$

A7a: Expanded Column



$57 + 25 = 82$

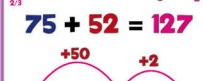
A8a: Column Addition



$57 + 25 = 82$


Y2/3

A3b: Forwards Jump




$75 + 52 = 127$

A4b: Partitioning



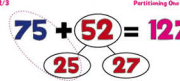
$75 + 52 = 127$
 $70 + 50 = 120$
 $5 + 2 = 7$
 $120 + 7 = 127$

A5b: Partition Jot




$75 + 52 = 127$
 $120 + 7 = 127$

A6b: Part/Whole




$75 + 52 = 127$
 $25 + 27 = 100 + 27 = 127$

A7b: Expanded Column



$75 + 52 = 127$

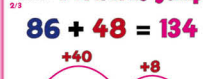
A8b: Column Addition



$75 + 52 = 127$

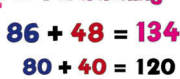
Y2/3

A3c: Forwards Jump



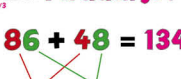
$86 + 48 = 134$

A4c: Partitioning



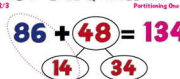
$86 + 48 = 134$
 $80 + 40 = 120$
 $6 + 8 = 14$
 $120 + 14 = 134$

A5c: Partition Jot



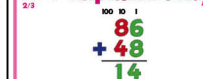
$86 + 48 = 134$
 $120 + 14 = 134$

A6c: Part/Whole




$86 + 48 = 134$
 $14 + 34 = 100 + 34 = 134$

A7c: Expanded Column



$86 + 48 = 134$

A8c: Column Addition



$86 + 48 = 134$


Y3

A3d: Forwards Jump



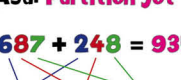
$687 + 248 = 935$

A4d: Partitioning



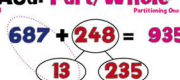
$687 + 248 = 935$
 $600 + 200 = 800$
 $80 + 40 = 120$
 $7 + 8 = 15$
 $800 + 120 + 15 = 935$

A5d: Partition Jot




$687 + 248 = 935$
 $800 + 120 + 15 = 935$

A6d: Part/Whole




$687 + 248 = 935$
 $13 + 235 = 700 + 235 = 935$

A7d: Expanded Column


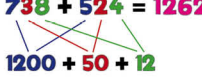
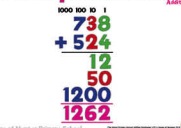
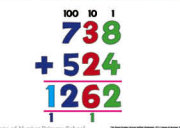
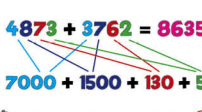


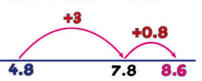
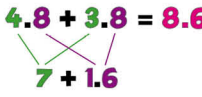
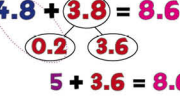

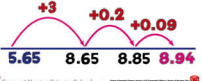
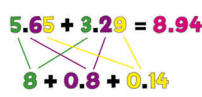

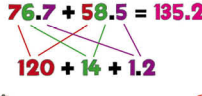
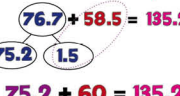

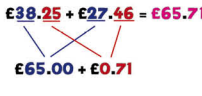



$687 + 248 = 935$

A8d: Column Addition



$687 + 248 = 935$

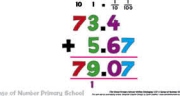
Y3/4		A3e: Forwards Jump $738 + 524 = 1262$ 	A4e: Partitioning $738 + 524 = 1262$ $700 + 500 = 1200$ $30 + 20 = 50$ $8 + 4 = 12$ 1262	A5e: Partition Jot $738 + 524 = 1262$ 		A7e: Expanded Column $738 + 524 = 1262$ 	A8e: Column Addition $738 + 524 = 1262$ 	
Y4				A5f: Partition Jot $4873 + 3762 = 8635$ 			A8f: Column Addition $4873 + 3762 = 8635$ 	
Y5							A8g: Column Addition $787567 + 446278 = 1233845$ 	
Y5		A3h: Decimal Jump $4.8 + 3.8 = 8.6$ 	A4h: Partitioning $4.8 + 3.8 = 8.6$ $4 + 3 = 7$ $0.8 + 0.8 = 1.6$ 8.6	A5h: Partition Jot $4.8 + 3.8 = 8.6$ 	A6h: Part/Whole $4.8 + 3.8 = 8.6$ 		A8h: Column Addition $4.8 + 3.8 = 8.6$ 	
Y5		A3i: Decimal Jump $5.65 + 3.29 = 8.94$ 		A5i: Partition Jot $5.65 + 3.29 = 8.94$ 			A8i: Column Addition $5.65 + 3.29 = 8.94$ 	
Y5				A5j: Partition Jot $76.7 + 58.5 = 135.2$ 	A6j: Part/Whole $76.7 + 58.5 = 135.2$ 		A8j: Column Addition $76.7 + 58.5 = 135.2$ 	
Y5				A5k: Partition Jot $£38.25 + £27.46 = £65.71$ 			A8k: Column Addition $£38.25 + £27.46 = £65.71$ 	



Progression Overviews

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		A8l: Column Addition $73.4 + 5.67 = 79.07$ 	
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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



Y1

S1: Objects & Pictures
 Removing from (Taking Away)
 "There were 7 footballs in the PE cupboard. 3 of them were taken out. How many were left in the cupboard? Answer!"
 $7 - 3 = 4$

S1a: Objects and Pictures
 Concrete level
 $7 - 5 = 2$
 "There were 7 blue footballs and 5 red footballs! How many more blue footballs were there than red? What is the difference?"

S1b: Objects and Pictures
 Part/Whole Model
 $12 - 9 = 3$
 "There were 12 footballs in the PE cupboard. 9 footballs were blue. How many were red?"

Subtraction

Subtraction Strategies

- S1 Calculation & Vocabulary
- S2 Objects and Pictures
- S3 Counting Back
- S4 Counting On
- S5 Backwards Bounce
- S6 Backwards Jump
- S7 10s Jump, 1s Jump
- S8 Triple Jump
- S9 Part/Whole (Minuend)
- S10 Part/Whole (Subtrahend)
- S11 Expanded Column
- S12 Column Subtraction

Y1

S2: Counting Back
 $12 - 3 = 9$
 "What do I get if I take 3 away from 12? Answer!"

S3: Counting On
 $12 - 9 = 3$
 "How many more is 12 than 9? What is the difference?"

Subtraction Calculation
 $6 - 2 = 4$
 (subtract) (equals)
 minuend difference subtrahend

Subtraction Vocabulary

- count back
- decrease
- minus
- subtract
- count on
- take away
- difference between
- less
- fewer

Y2

S2a: Counting Back
 Big Steps
 $75 - 7 = 68$

S3a: Counting On
 $83 - 78 = 5$
 "How many more is 83 than 78? What is the difference?"

Y2

S4: Backwards Bounce
 $87 - 23 = 64$

S5: Backwards Jump
 $87 - 23 = 64$

S6: 10s Jump, 1s Jump!
 $87 - 23 = 64$

S7: Triple Jump!
 $87 - 23 = 64$

S8: Part/Whole (\$)
 $87 - 23 = 64$
 $87 - 20 = 67$ | $67 - 3 = 64$

S10: Expanded Column
 $87 - 23 = 64$

S11: Column Subtraction
 $87 - 23 = 64$

Y2

S4a: Backwards Bounce
 $75 - 37 = 38$

S5a: Backwards Jump
 $75 - 37 = 38$

S6a: 10s Jump, 1s Jump!
 $75 - 37 = 38$

S7a: Triple Jump!
 $75 - 37 = 38$

S8a: Part/Whole (\$)
 $75 - 37 = 38$
 $75 - 35 = 40$ | $40 - 2 = 38$

S9a: Part/Whole (M)
 $75 - 37 = 38$
 $3 + 35 = 38$

S10a: Expanded Column
 $75 - 37 = 38$

S11a: Column Subtraction
 $75 - 37 = 38$

Y3

S6b: 10s Jump, 1s Jump!
 $127 - 74 = 53$

S7b: Quad Jump!
 $127 - 74 = 53$

S8b: Part/Whole (\$)
 $127 - 74 = 53$
 $127 - 67 = 60$ | $60 - 7 = 53$

S9b: Part/Whole (M)
 $127 - 74 = 53$
 $6 + 47 = 53$

S10b: Expanded Column
 $127 - 74 = 53$

S11b: Column Subtraction
 $127 - 74 = 53$

Y3

S6c: 10s Jump, 1s Jump!
 $132 - 56 = 76$

S7c: Quad Jump!
 $132 - 56 = 76$

S8c: Part/Whole (\$)
 $132 - 56 = 76$
 $132 - 32 = 100$ | $100 - 24 = 76$

S9c: Part/Whole (M)
 $132 - 56 = 76$
 $6 + 70 = 76$

S10c: Expanded Column
 $132 - 56 = 76$

S11c: Column Subtraction
 $132 - 56 = 76$

Y3

S6d: 100s, 10s, 1s Jump
 $736 - 462 = 274$

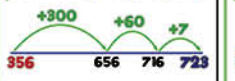

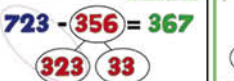








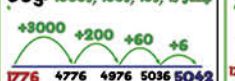
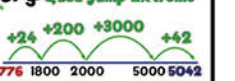



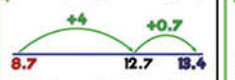










S7d: Big Jump!
 $736 - 462 = 274$

S8d: Part/Whole (\$)
 $736 - 462 = 274$
 $736 - 436 = 300$ | $300 - 26 = 274$

S9d: Part/Whole (M)
 $736 - 462 = 274$
 $38 + 236 = 274$

S10d: Expanded Column
 $736 - 462 = 274$

S11d: Column Subtraction
 $736 - 462 = 274$

Y3			S6e: 100s, 10s, 1s Jump  $723 - 356 = 367$	S7e: Big Jump!  $723 - 356 = 367$	S8e: Part/Whole (\$)  $723 - 356 = 367$ $723 - 323 = 400$ $400 - 33 = 367$	S9e: Part/Whole (M)  $723 - 356 = 367$ $400 - 356 = 44$ $44 + 323 = 367$	S10e: Expanded Column $723 - 356 = 367$ 	S1e: Column Subtraction 
Y4			S6f: 100s, 10s, 1s Jump  $1375 - 538 = 837$	S7f: Quad Jump Extreme  $1375 - 538 = 837$	S8f: Part/Whole (\$)  $1375 - 538 = 837$ $1375 - 525 = 850$ $850 - 13 = 837$	S9f: Part/Whole (M)  $1375 - 538 = 837$ $800 - 538 = 262$ $262 + 575 = 837$		S1f: Column Subtraction 
Y4			S6g: 1000s, 100s, 10s, 1s Jump  $5042 - 1776 = 3266$	S7g: Quad Jump Extreme  $5042 - 1776 = 3266$		S9g: Part/Whole (M)  $5042 - 1776 = 3266$ $2000 - 1776 = 224$ $224 + 3042 = 3266$		S1g: Column Subtraction 
Y5								S1h: 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 (\$)  $13.4 - 8.7 = 4.7$ $13.4 - 8.4 = 5$ $5 - 0.3 = 4.7$	S9h: Part/Whole (M)  $13.4 - 8.7 = 4.7$ $9 - 8.7 = 0.3$ $0.3 + 4.4 = 4.7$		S1i: Column Subtraction 
Y5			S1j: Column Subtraction 		S1j: Column Subtraction 			S1j: Column Subtraction 
Y5			S1k: Column Subtraction $12.4 - 5.97 = 6.43$ 		S1k: Column Subtraction $12.4 - 5.97 = 6.43$ 			S1k: Column Subtraction $12.4 - 5.97 = 6.43$ 



Progression Overviews

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Multiplication Strategies

171		Calculation & Vocabulary
173	M1	Objects and Pictures
175	M2	Repeated Addition
177	M3	Arrays
179	M4	Multi Boing!
181	M5	Partitoning
183	M6	Grid Method
186	M7	Expanded Column
189	M8	Column Multiplication
193	M9	Grid Method (Long Mult.)
201	M10	Long 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



Multiplication Strategies

- 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)
- M10 Long Multiplication

Y2

M2: Repeated Addition



$$5 \times 3 = 5 + 5 + 5 = 15$$

M2a: Repeated Addition



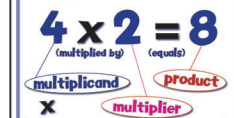
$$5 \times 3 = 5 + 5 + 5 = 15$$

M3: Arrays



$$3 \times 5 = 15 \text{ or } 5 \times 3 = 15$$

Multiplication Calculation



Multiplication Vocabulary



Y2

MF: 2x Table Facts

$$\begin{array}{ll} 2 \times 1 = 2 & 2 \times 7 = 14 \\ 2 \times 2 = 4 & 2 \times 8 = 16 \\ 2 \times 3 = 6 & 2 \times 9 = 18 \\ 2 \times 4 = 8 & 2 \times 10 = 20 \\ 2 \times 5 = 10 & 2 \times 11 = 22 \\ 2 \times 6 = 12 & 2 \times 12 = 24 \end{array}$$

MF: 5x Table Facts

$$\begin{array}{ll} 5 \times 1 = 5 & 5 \times 7 = 35 \\ 5 \times 2 = 10 & 5 \times 8 = 40 \\ 5 \times 3 = 15 & 5 \times 9 = 45 \\ 5 \times 4 = 20 & 5 \times 10 = 50 \\ 5 \times 5 = 25 & 5 \times 11 = 55 \\ 5 \times 6 = 30 & 5 \times 12 = 60 \end{array}$$

MF: 10x Table Facts

$$\begin{array}{ll} 10 \times 1 = 10 & 10 \times 7 = 70 \\ 10 \times 2 = 20 & 10 \times 8 = 80 \\ 10 \times 3 = 30 & 10 \times 9 = 90 \\ 10 \times 4 = 40 & 10 \times 10 = 100 \\ 10 \times 5 = 50 & 10 \times 11 = 110 \\ 10 \times 6 = 60 & 10 \times 12 = 120 \end{array}$$

Y3

MF: 3x Table Facts

$$\begin{array}{ll} 3 \times 1 = 3 & 3 \times 7 = 21 \\ 3 \times 2 = 6 & 3 \times 8 = 24 \\ 3 \times 3 = 9 & 3 \times 9 = 27 \\ 3 \times 4 = 12 & 3 \times 10 = 30 \\ 3 \times 5 = 15 & 3 \times 11 = 33 \\ 3 \times 6 = 18 & 3 \times 12 = 36 \end{array}$$

MF: 4x Table Facts

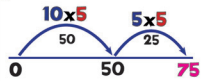
$$\begin{array}{ll} 4 \times 1 = 4 & 4 \times 7 = 28 \\ 4 \times 2 = 8 & 4 \times 8 = 32 \\ 4 \times 3 = 12 & 4 \times 9 = 36 \\ 4 \times 4 = 16 & 4 \times 10 = 40 \\ 4 \times 5 = 20 & 4 \times 11 = 44 \\ 4 \times 6 = 24 & 4 \times 12 = 48 \end{array}$$

MF: 8x Table Facts

$$\begin{array}{ll} 8 \times 1 = 8 & 8 \times 7 = 56 \\ 8 \times 2 = 16 & 8 \times 8 = 64 \\ 8 \times 3 = 24 & 8 \times 9 = 72 \\ 8 \times 4 = 32 & 8 \times 10 = 80 \\ 8 \times 5 = 40 & 8 \times 11 = 88 \\ 8 \times 6 = 48 & 8 \times 12 = 96 \end{array}$$

Y3

M4: Multi Boing!

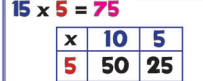


$$15 \times 5 = 75$$

M5: Partitioning



M6: Grid Method



(M7: Expanded Column)



(M8: Column Multiplication)



Y4

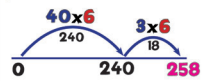
MF: 6x Table Facts

$$\begin{array}{ll} 6 \times 1 = 6 & 6 \times 7 = 42 \\ 6 \times 2 = 12 & 6 \times 8 = 48 \\ 6 \times 3 = 18 & 6 \times 9 = 54 \\ 6 \times 4 = 24 & 6 \times 10 = 60 \\ 6 \times 5 = 30 & 6 \times 11 = 66 \\ 6 \times 6 = 36 & 6 \times 12 = 72 \end{array}$$

MF: 7x Table Facts

$$\begin{array}{ll} 7 \times 1 = 7 & 7 \times 7 = 49 \\ 7 \times 2 = 14 & 7 \times 8 = 56 \\ 7 \times 3 = 21 & 7 \times 9 = 63 \\ 7 \times 4 = 28 & 7 \times 10 = 70 \\ 7 \times 5 = 35 & 7 \times 11 = 77 \\ 7 \times 6 = 42 & 7 \times 12 = 84 \end{array}$$

M4a: Multi Boing!

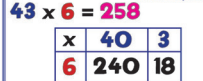


$$43 \times 6 = 258$$

M5a: Partitioning



M6a: Grid Method



(M7: Expanded Column)



(M8: Column Multiplication)



Y4

MF: 9x Table Facts

$$\begin{array}{ll} 9 \times 1 = 9 & 9 \times 7 = 63 \\ 9 \times 2 = 18 & 9 \times 8 = 72 \\ 9 \times 3 = 27 & 9 \times 9 = 81 \\ 9 \times 4 = 36 & 9 \times 10 = 90 \\ 9 \times 5 = 45 & 9 \times 11 = 99 \\ 9 \times 6 = 54 & 9 \times 12 = 108 \end{array}$$

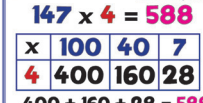
MF: 11x Table Facts

$$\begin{array}{ll} 11 \times 1 = 11 & 11 \times 7 = 77 \\ 11 \times 2 = 22 & 11 \times 8 = 88 \\ 11 \times 3 = 33 & 11 \times 9 = 99 \\ 11 \times 4 = 44 & 11 \times 10 = 110 \\ 11 \times 5 = 55 & 11 \times 11 = 121 \\ 11 \times 6 = 66 & 11 \times 12 = 132 \end{array}$$

MF: 12x Table Facts

$$\begin{array}{ll} 12 \times 1 = 12 & 12 \times 7 = 84 \\ 12 \times 2 = 24 & 12 \times 8 = 96 \\ 12 \times 3 = 36 & 12 \times 9 = 108 \\ 12 \times 4 = 48 & 12 \times 10 = 120 \\ 12 \times 5 = 60 & 12 \times 11 = 132 \\ 12 \times 6 = 72 & 12 \times 12 = 144 \end{array}$$

M6b: Grid Method



M7: Expanded Column



M8: Column Multiplication

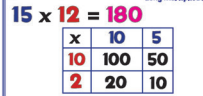


M8a: Column Multiplication

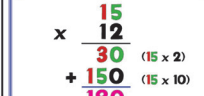


Y5

M9: Grid Method



M10: Long Multiplication



Y5

M9a: Grid Method
Long Multiplication

$$43 \times 65 = 2795$$

x	40	3
60	2400	180
5	200	15

$$2400 + 180 + 200 + 15 = 2795$$

M10a: Long Multiplication

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

Y5

M9b: Grid Method
Long Multiplication

$$243 \times 68 = 16,524$$

x	200	40	3
60	12000	2400	180
8	1600	320	24

$$14580 + 1944 = 16,524$$

M10b: Long Multiplication

$$\begin{array}{r} 243 \\ \times 68 \\ \hline 1944 \quad (243 \times 8) \\ + 14580 \quad (243 \times 60) \\ \hline 16524 \end{array}$$

Y5

M9c: Grid Method
Long Multiplication

$$203 \times 68 = 13,804$$

x	200	0	3
60	12000	0	180
8	1600	0	24

$$12180 + 1624 = 13,804$$

M10c: Long Multiplication

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

Y5

M9d: Decimal Grid
Short Multiplication

$$3.6 \times 4 = 14.4$$

x	3	0.6
4	12	2.4

$$12 + 2.4 = 14.4$$

M10d: Column Multiplication

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

Y6

M9e: Decimal Grid
Short Multiplication

$$47.2 \times 3 = 141.6$$

x	40	7	0.2
3	120	21	0.6

$$120 + 21 + 0.6 = 141.6$$

M10e: Column Multiplication

$$\begin{array}{r} 47.2 \\ \times 3 \\ \hline 141.6 \\ 2 \end{array}$$

Y6

M9f: Grid Method
Short Multiplication

$$7.38 \times 6 = 44.28$$

x	7	0.3	0.08
6	42	1.8	0.48

$$42 + 1.8 + 0.48 = 44.28$$

M10f: Column Multiplication

$$\begin{array}{r} 7.38 \\ \times 6 \\ \hline 44.28 \\ 4 \quad 2 \quad 4 \end{array}$$

Y6

M9g: Grid Method
Long Multiplication

$$24.3 \times 2.5 = 60.75$$

x	20	4	0.3
2	408	0.6	48.6
0.5	10	2	0.15

$$48.6 + 12.15 = 60.75$$

M10g: Long Multiplication

$$\begin{array}{r} 24.3 \\ \times 2.5 \\ \hline 12.15 \quad (24.3 \times 0.5) \\ + 48.60 \quad (24.3 \times 2) \\ \hline 60.75 \end{array}$$



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M10h: Long Multiplication

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

Division Strategies

211		Calculation & Vocabulary
213	D1	Objects and Pictures (Sharing)
214	D2	Objects and Pictures (Grouping)
215	D3	Sharing
216	D4	Grouping
217	D5	Grouping on a Number Line
220	D6	Grouping Grid
221	D7	Chunking Jump
223	D8	Find the Hunk
225	D9	Mega Hunk
235	D10	Short Division
245	D11	Chunking
257	D12	Long Division (Short Division Method)
258	D13	Long Division (Chunking Method)
260	D14	Long Division (Traditional Method)



Y1

D1: Objects and Pictures
Sharing
"If I share 6 footballs fairly into 3 bags, how many footballs in each bag?" Answer: 2

D2: Objects and Pictures
Grouping
"If a child can carry 2 footballs, how many children do I need to carry 6 footballs?" Answer: 3



Division



Division Strategies

- 100 Calculation & Vocabulary
- 101 Sharing
- 102 Grouping
- 103 Grouping on a Number Line
- 104 Grouping Grid
- 105 Chunking Jump
- 106 Find the Hunk!
- 107 Mega Hunk!
- 108 Short Division
- 109 Chunking
- 110 Long Division (Using Hunk)
- 111 Long Division (Using Grid)
- 112 Long Division (Using Number Line)
- 113 Long Division (Using Hunk)

Y2

D3: Division as Sharing
 $12 \div 2 = 6$
"If I share 12 into 2 equal groups, how many in each group?" Answer: 6

D4: Division as Grouping
 $12 \div 2 = 6$
"How many groups of 2 are there?" Answer: 6

D5: Grouping on a Number Line
 $20 \div 5 = 4$
"How many 5s in 20?" Answer: 4

D5a: Grouping on a Number Line
 $23 \div 5 = 4r3$
"How many 5s in 23?" Answer: 4 remainder 3

Division Calculation
 $8 \div 2 = 4$
dividend, divisor, quotient, equals, divided by

Division Vocabulary
remainder, group, share, divisor, quotient, factor, equal groups of, divide

Y3

D5b: Grouping on a Number Line
 $48 \div 8 = 6$
"How many 8s in 48?" Answer: 6

D6: Grouping Grid
 $27 \div 4 = 6r3$
"How many 4s are there in 27?" Answer: 6 remainder 3

D7: Chunking Jump
 $72 \div 4 = 18$
"How many 4s in 72?" Answer: 18

D8: Find the Hunk!
 $72 \div 4 = 18$
The Hunk! 40, Chunk 32, 10 + 8 = 18

(D10: Short Division)
 $72 \div 4 = 18$

(D11: Chunking)
 $72 \div 4 = 18$

Y3

D7a: Chunking Jump
 $65 \div 4 = 16r1$
"How many 4s in 65?" Answer: 16 remainder 1

D8a: Find the Hunk!
 $65 \div 4 = 16r1$
The Hunk! 40, Chunk 25, 10 + 6r1 = 16r1

(D10: Short Division)
 $65 \div 4 = 16r1$

(D11: Chunking)
 $65 \div 4 = 16r1$

(D11a: Chunking)
 $65 \div 4 = 16r1$

(D11b: Chunking)
 $65 \div 4 = 16r1$

Y3

D9: Mega Hunk!
 $136 \div 4 = 34$
The Hunk! 120, Chunk 16, 30 + 4 = 34

D10b: Short Division
 $136 \div 4 = 34$

D11a: Chunking
 $136 \div 4 = 34$

D11b: Chunking
 $136 \div 4 = 34$

D11c: Chunking
 $145 \div 6 = 24r1$

D11d: Chunking
 $145 \div 6 = 24r1$

Y4

D9c: Mega Hunk!
 $145 \div 6 = 24r1$
Mega Hunk! 120, Chunk 25, 20 + 4r1 = 24r1

D10c: Short Division
 $145 \div 6 = 24r1$

D11c: Chunking
 $145 \div 6 = 24r1$

D11d: Chunking
 $145 \div 6 = 24r1$

D11e: Chunking
 $394 \div 6 = 65r4$

D11f: Chunking
 $394 \div 6 = 65r4$

Y4

D9d: Mega Hunk!
 $394 \div 6 = 65r4$
Mega Hunk! 360, Chunk 34, 60 + 5r4 = 65r4

D10d: Short Division
 $394 \div 6 = 65r4$

D11e: Chunking
 $394 \div 6 = 65r4$

D11f: Chunking
 $394 \div 6 = 65r4$

D11g: Chunking
 $394 \div 6 = 65r4$

D11h: Chunking
 $394 \div 6 = 65r4$

Y5

D9d: Mega Hunk!
 $394 \div 6 = 65r4$
Mega Hunk! 360, Chunk 34, 60 + 5r4 = 65r4

D10d: Short Division
 $394 \div 6 = 65r4$

D11e: Chunking
 $394 \div 6 = 65r4$

D11f: Chunking
 $394 \div 6 = 65r4$

D11g: Chunking
 $394 \div 6 = 65r4$

D11h: Chunking
 $394 \div 6 = 65r4$

Y5				D9e: Mega Hunk! $536 \div 4 = 134$ $100 + 30 + 4 = 134$	D10e: Short Division $536 \div 4 = 134$ $4 \overline{)536}$	D11e: Chunking <small>Mega Chunk</small> $536 \div 4 = 134$ $536 \div 4 = 134$		
Y5				D9f: Mega Hunk! $1278 \div 6 = 213$ $200 + 10 + 3 = 213$	D10f: Short Division $1278 \div 6 = 213$ $6 \overline{)1278}$	D11f: Chunking <small>Mega Chunk</small> $1278 \div 6 = 213$ $1278 \div 6 = 213$		
Y5				D9g: Mega Hunk! $5978 \div 7 = 854$ $800 + 50 + 4 = 854$	D10g: Short Division $5978 \div 7 = 854$ $7 \overline{)5978}$	D11g: Chunking <small>Mega Chunk</small> $5978 \div 7 = 854$ $5978 \div 7 = 854$		
Y5				D9h: Mega Hunk! $846 \div 5 = 169 \text{ r}1$ $100 + 60 + 9 \text{ r}1 = 169 \text{ r}1$	D10h: Short Division <small>Different Remainders</small> $846 \div 5 = 169 \text{ r}1$ $5 \overline{)846}$	D11h: Chunking <small>Mega Chunk</small> $846 \div 5 = 169 \text{ r}1$ $846 \div 5 = 169 \text{ r}1$	D11g2: Chunking <small>Long Division</small> $480 \div 15 = 32$ $480 \div 15 = 32$	
Y6				D9i: Mega Hunk! <small>Simple Long Division</small> $480 \div 15 = 32$ $30 + 2 = 32$		D11iA: Chunking <small>Long Division</small> $480 \div 15 = 32$ $480 \div 15 = 32$	D11iB: Chunking <small>Long Division</small> $480 \div 15 = 32$ $480 \div 15 = 32$	
Y6				D9j: Decimal Hunk! $18 \div 1.5 = 12$ $10 + 2 = 12$				
Y6				D9k: Decimal Hunk! $87.5 \div 7 = 12.5$ $10 + 2 + 0.5 = 12.5$	D10k: Short Division $87.5 \div 7 = 12.5$ $7 \overline{)87.5}$			



Progression Overviews

Sense of Number Written Strategies VCP © Sense of Number 2018



Hawkesley Church Primary Academy

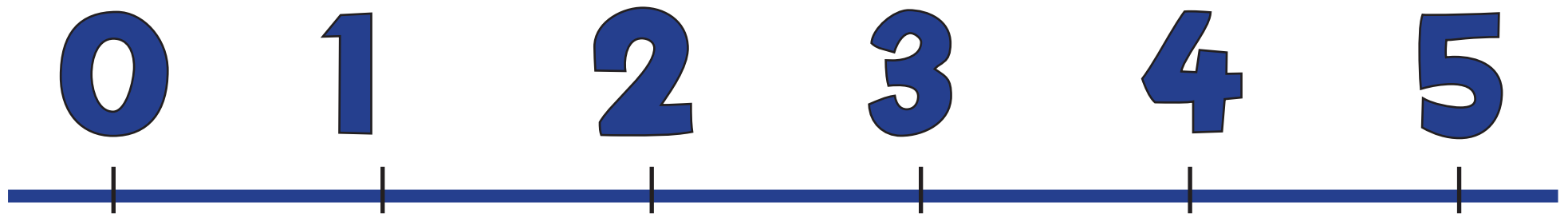
D12: Long Division <small>Short Division Method</small> $983 \div 37 = 26 \text{ r}21$ $37 \overline{)983}$	D13A: Long Division <small>Chunking Method</small> $983 \div 37 = 26 \text{ r}21$ $983 \div 37 = 26 \text{ r}21$	D13B: Long Division <small>Chunking Method</small> $983 \div 37 = 26 \text{ r}21$ $983 \div 37 = 26 \text{ r}21$	D14: Long Division <small>Traditional Method</small> $983 \div 37 = 26 \text{ r}21$ $37 \overline{)983}$
--	---	---	---

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**
- 39 **C6** **Counting On**
- 40 **C7** **Counting Back**
- 41 **C8** **Counting in Steps**



C1a: Number Order

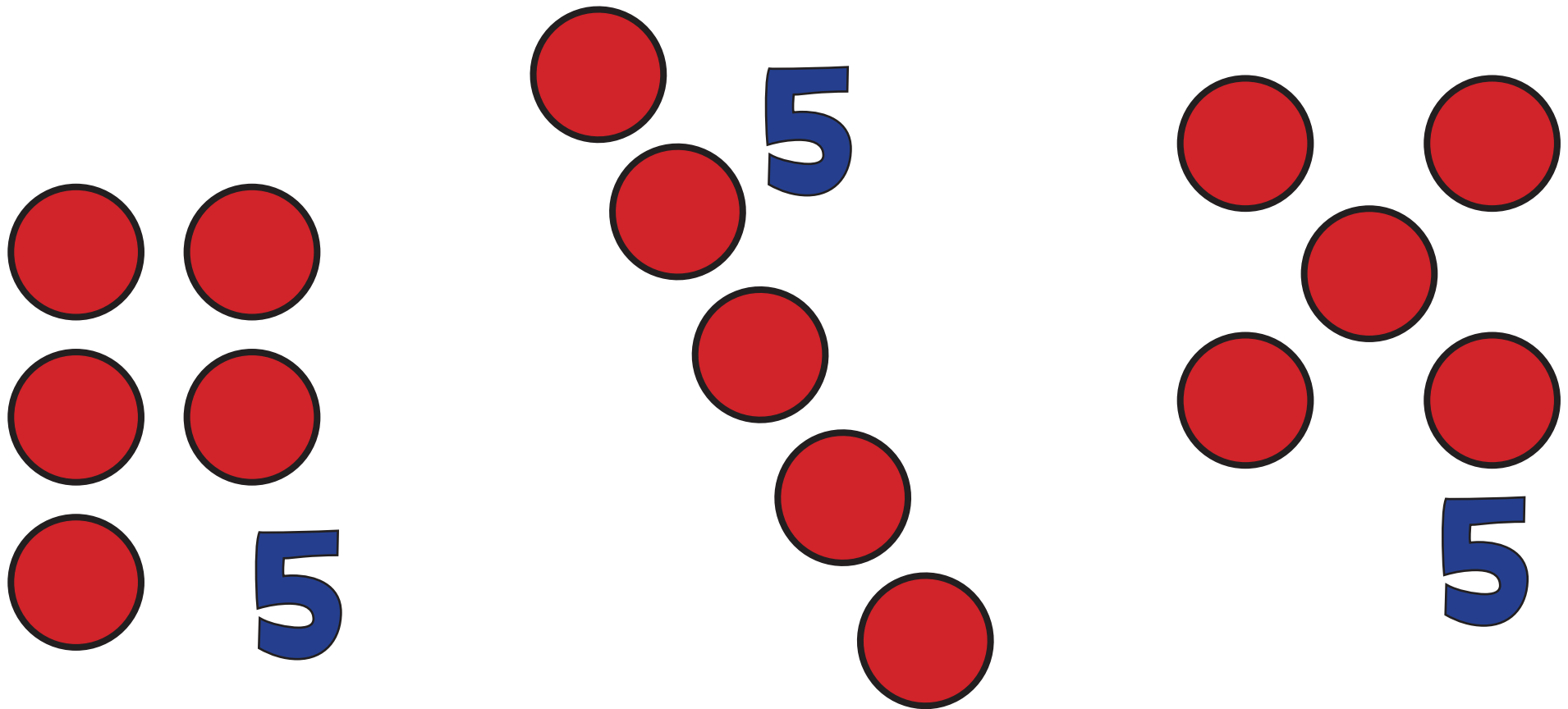


The Numbers must be said once and always in the conventional order.



C1b: At a Glance

Subitising

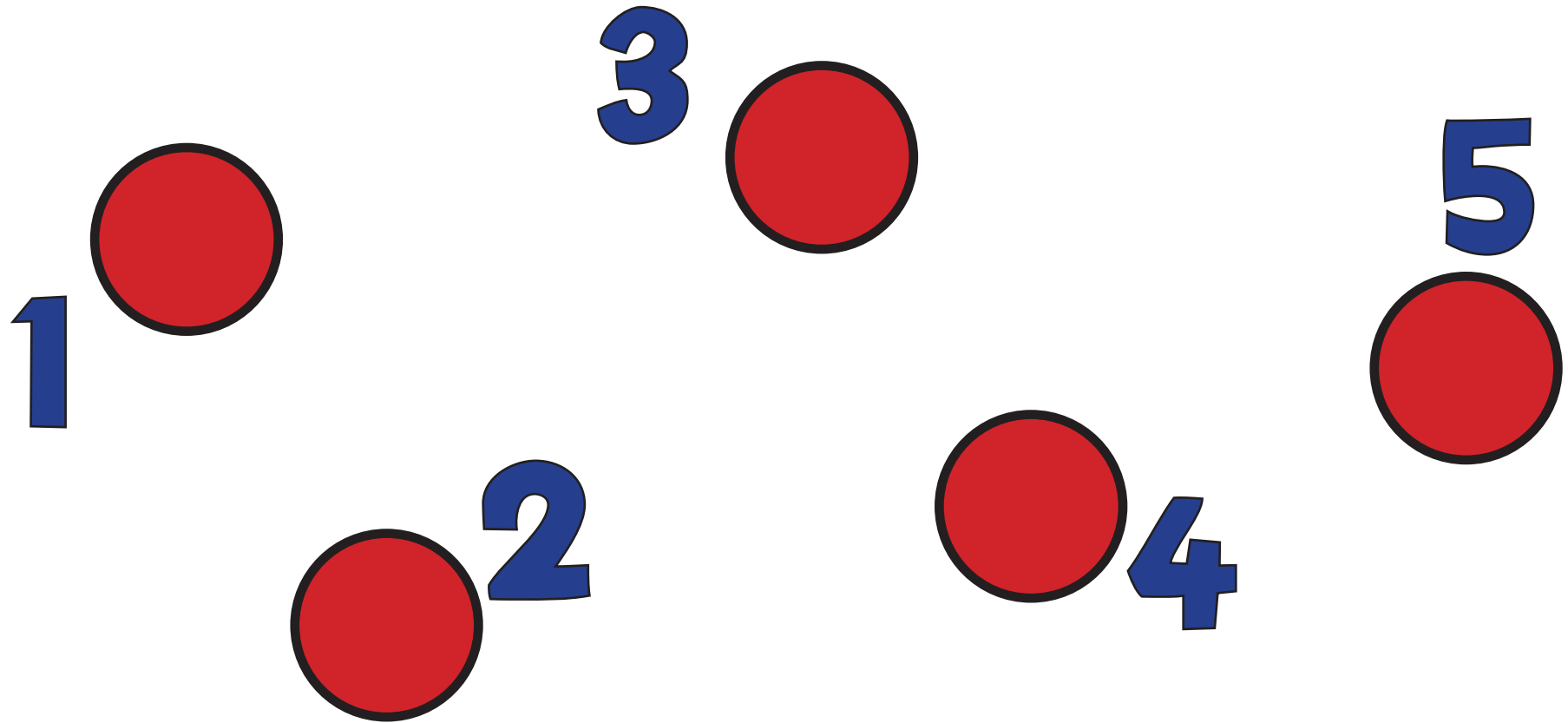


See at a glance how many are in small collections and attach correct number names to such collections.



C2a: Number Match

One to One Correspondence

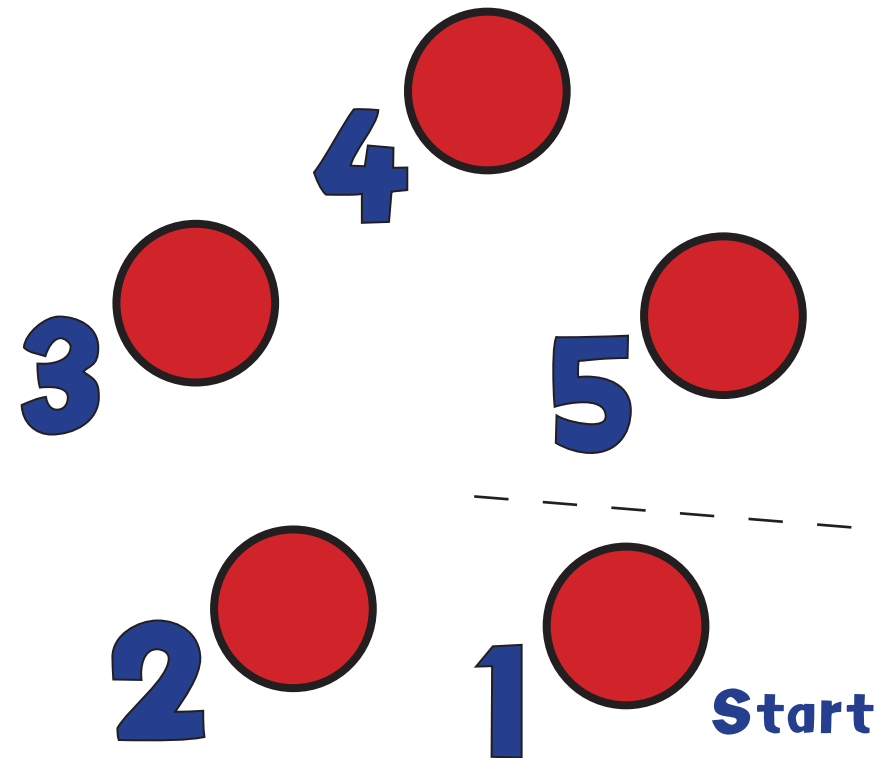
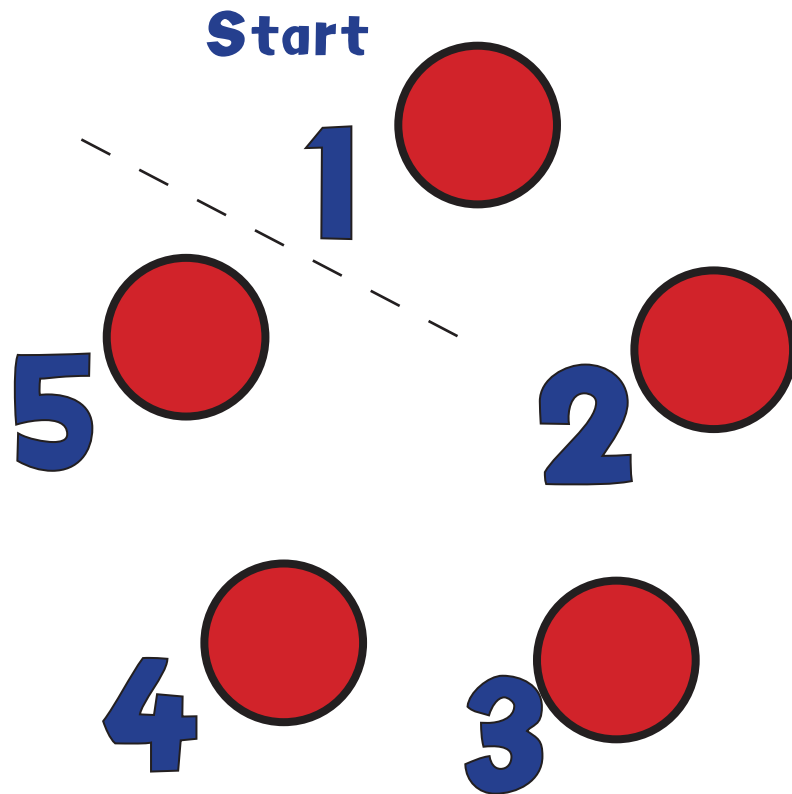


Each object to be counted must be touched or 'included' exactly once as the numbers are said.



C2b: Counting Objects

Starting Point and Order Irrelevance

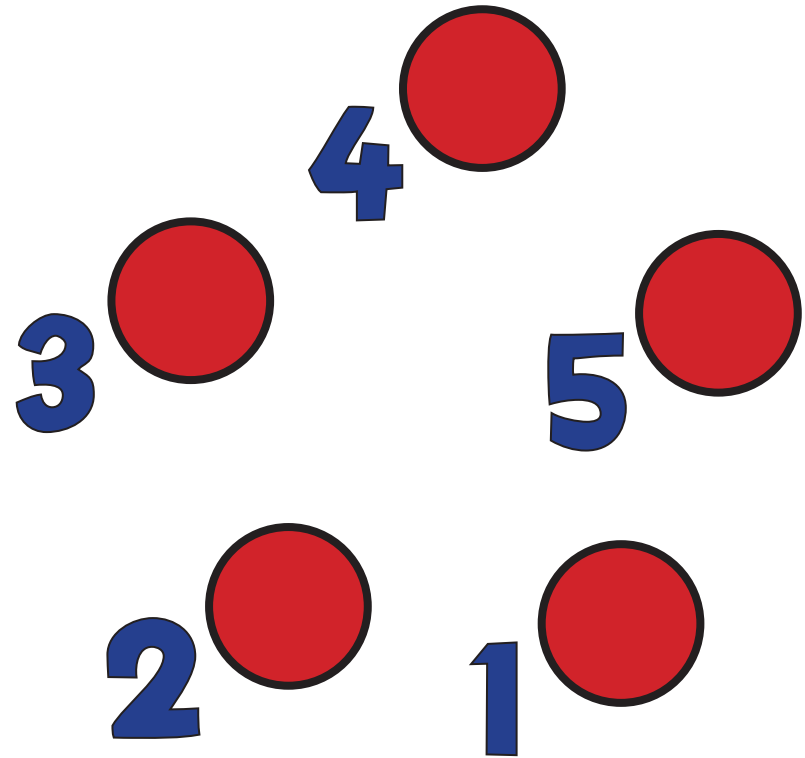
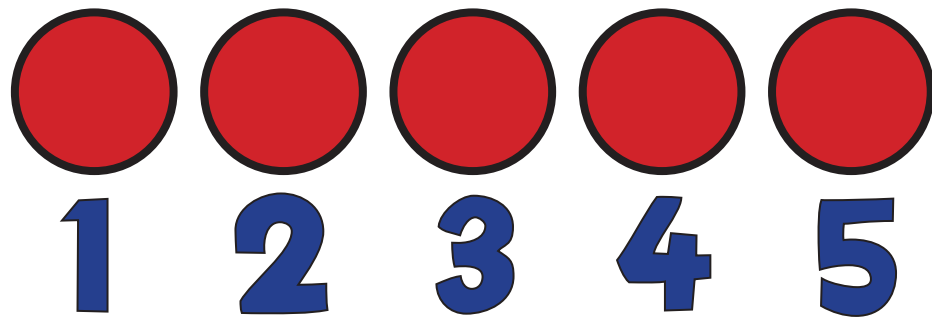


The objects can be touched in any order. The starting point and order in which the objects are counted does not affect how many there are.



C2c: Order Arrangement

Arrangement Irrelevance

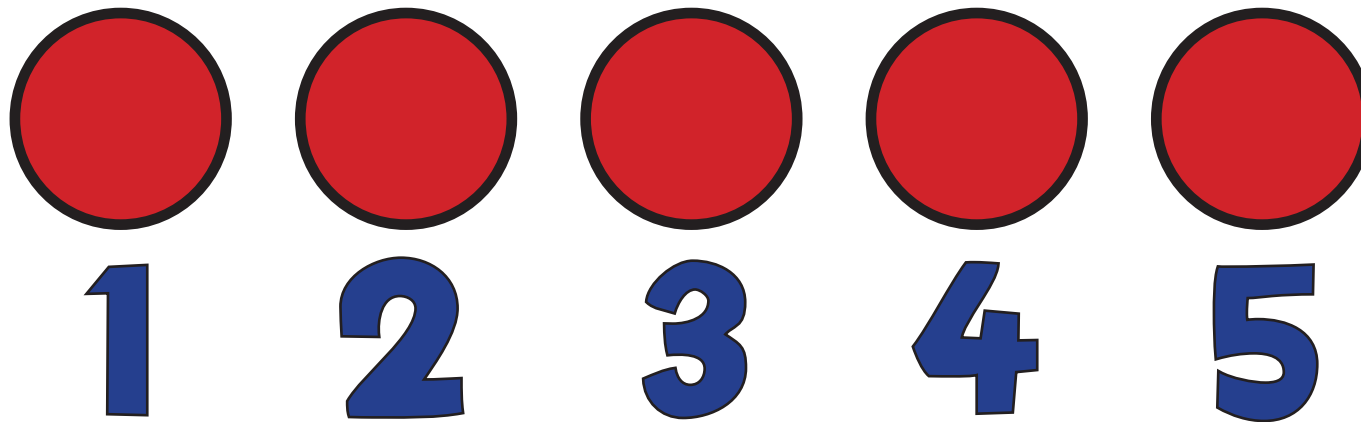


The arrangement of the objects does not affect how many there are.



C3: How Many?

Final number is the total

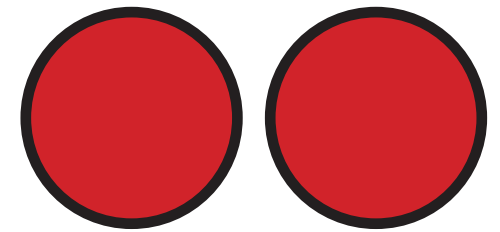
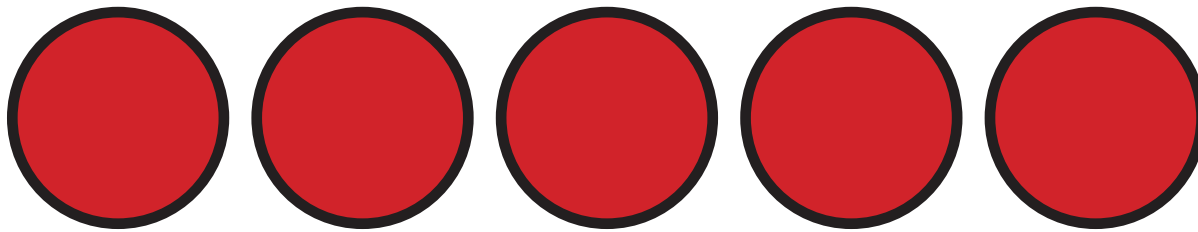


**The last number said tells 'how many' in the whole collection.
It does not describe the last object touched.**



C4: Arranging

Sets of 5

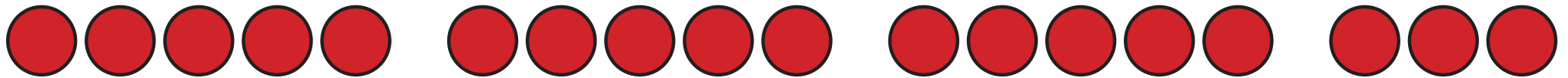


7



C4a: Arranging

Sets of 5

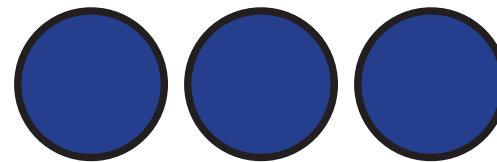
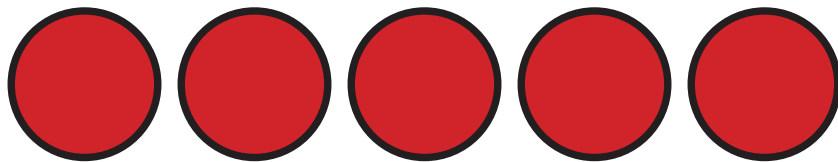
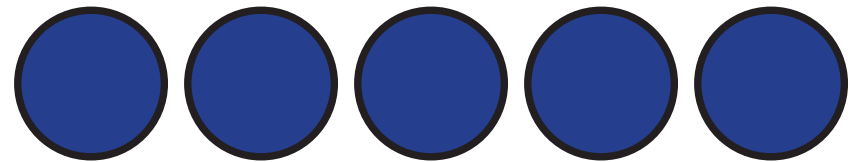
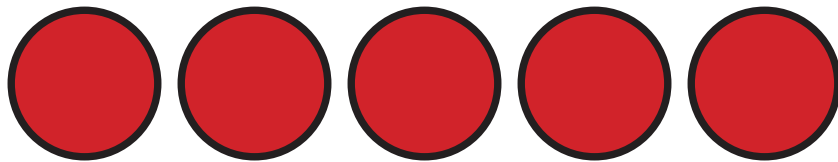


18



C4b: Arranging

Sets of 5
(Non Linear)

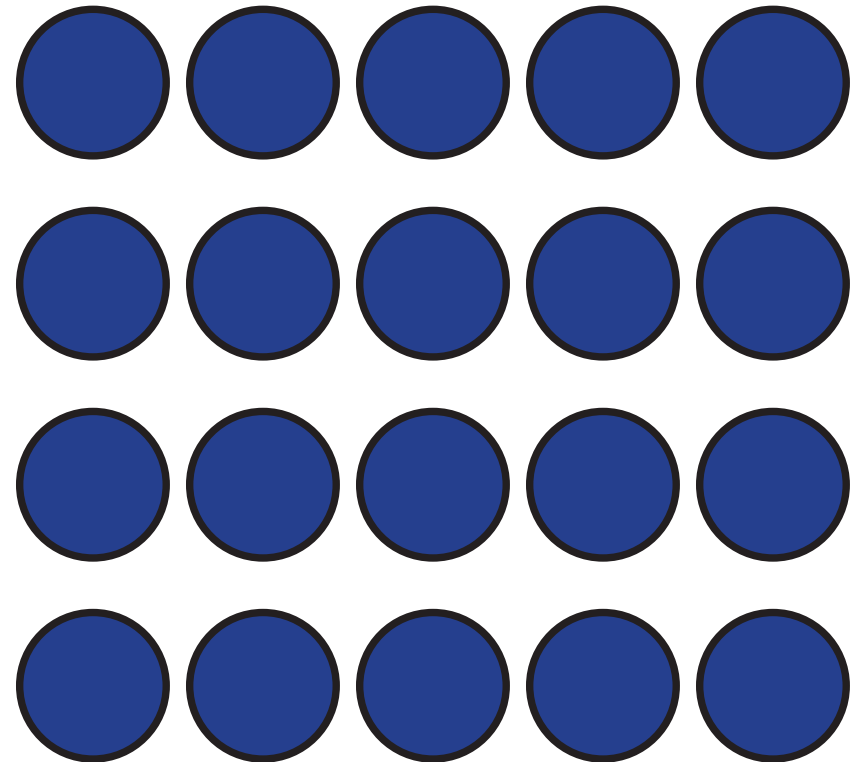
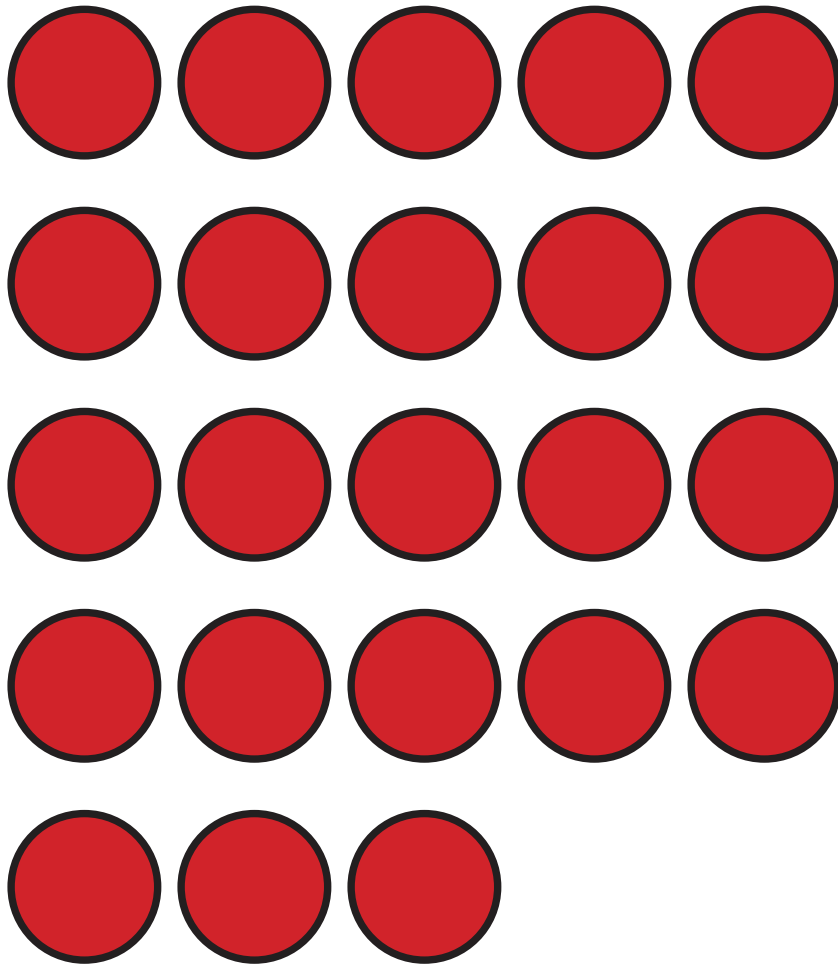


18



C4c: Arranging

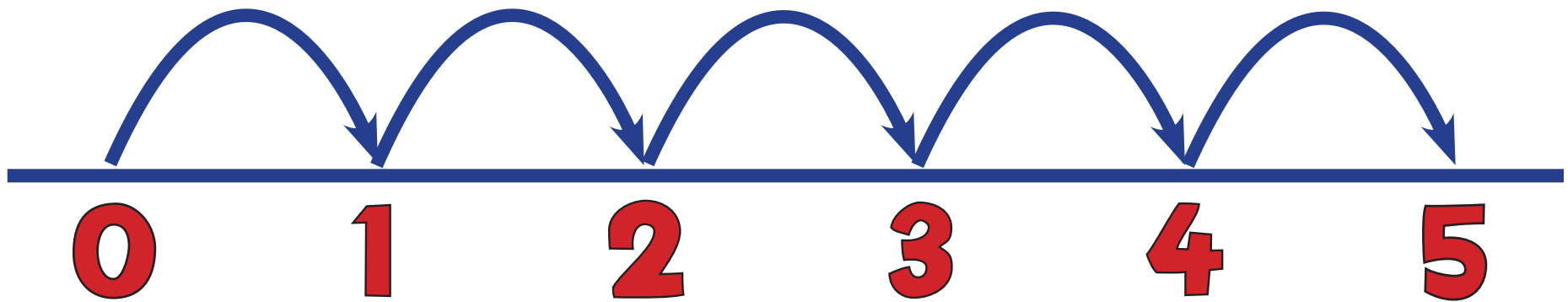
Sets of 5
(Non Linear)



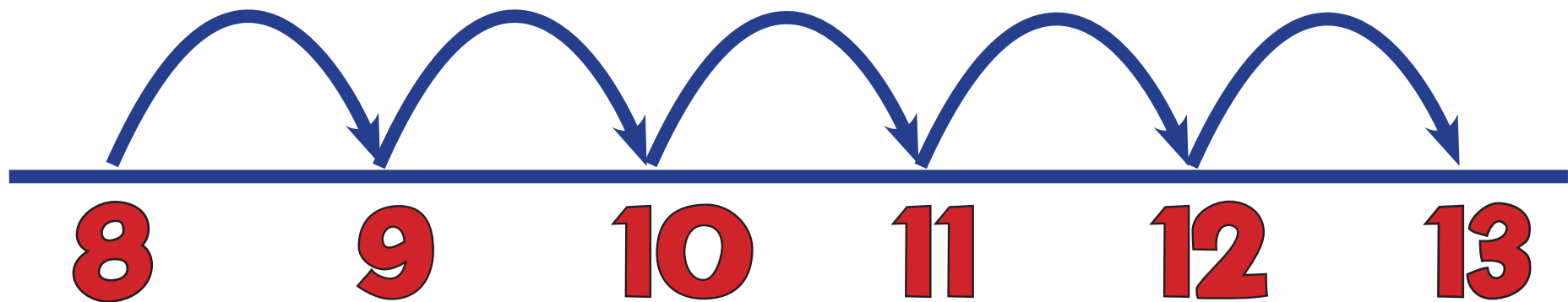
43



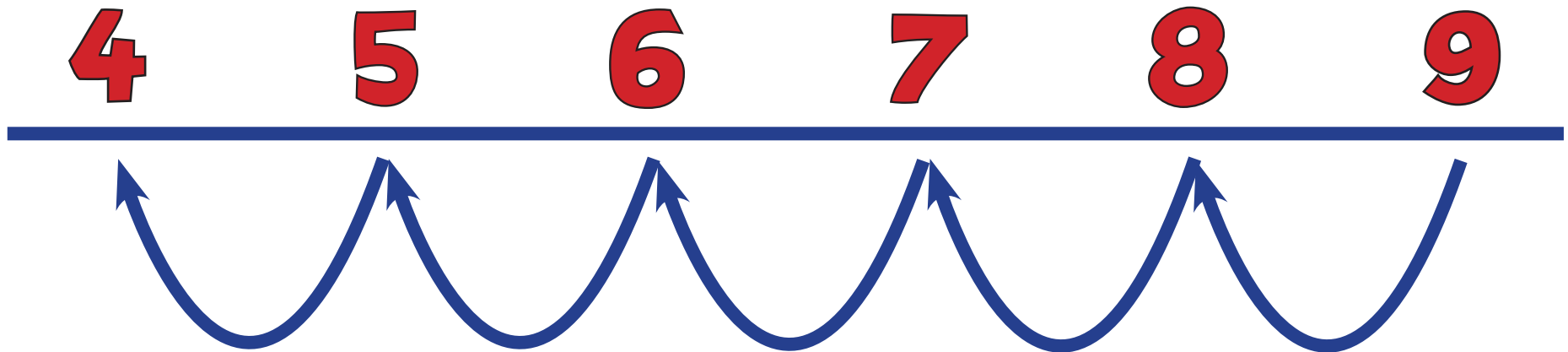
C5: Counting Forwards



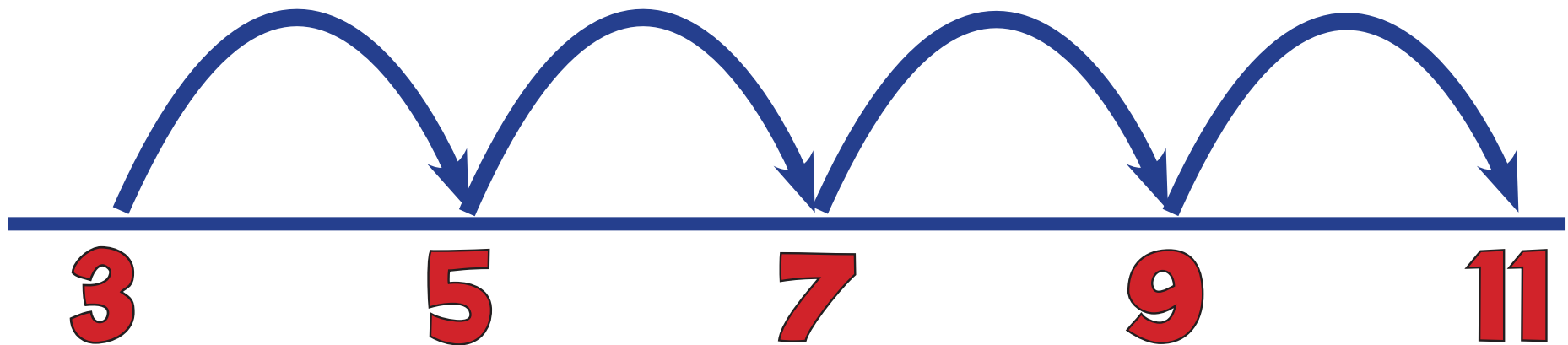
C6: Counting On



C7: Counting Back



C8: Counting in Steps



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



Addition Calculation

$$4 + 2 = 6$$

(add) (equals)

augend

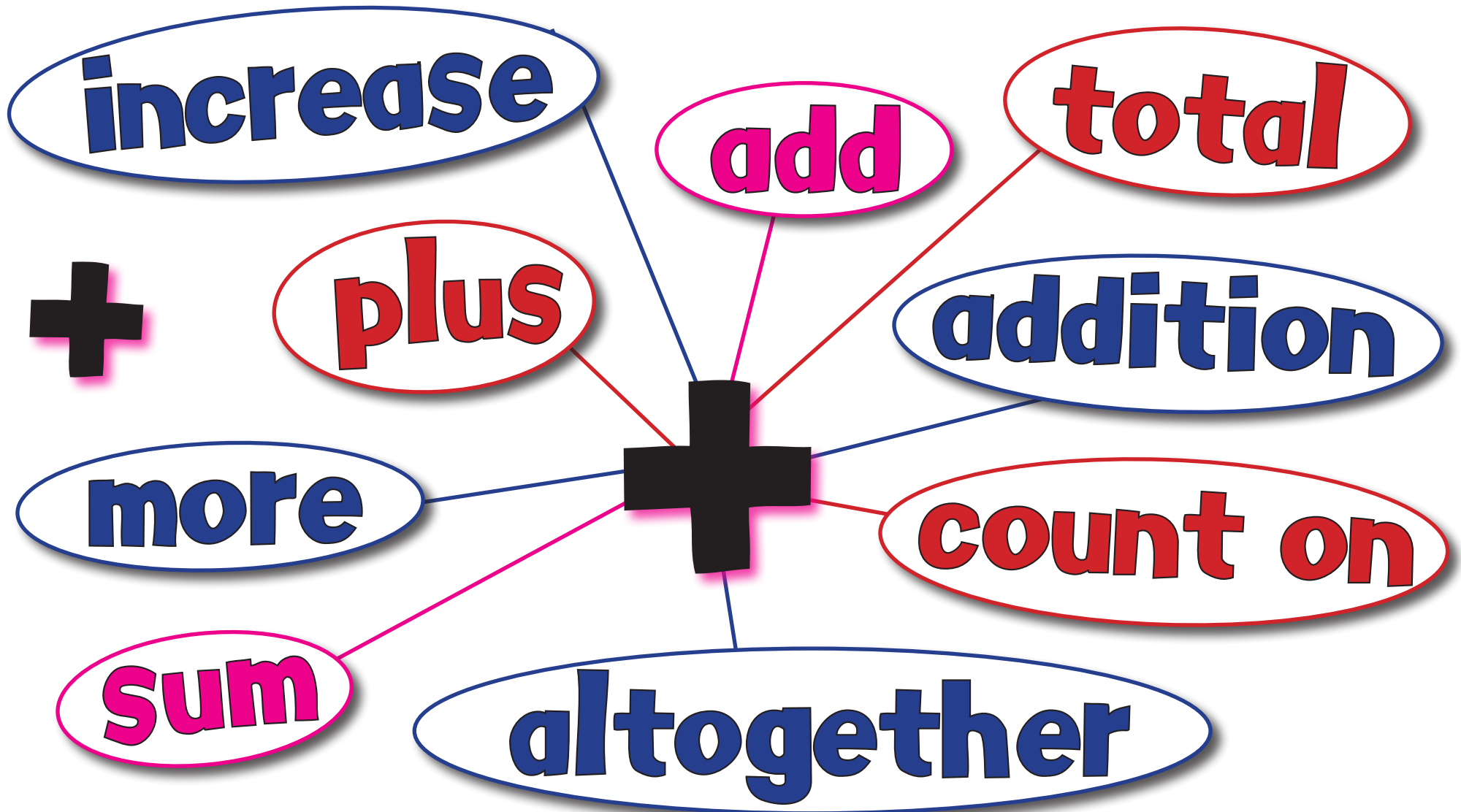
total

addend

sum



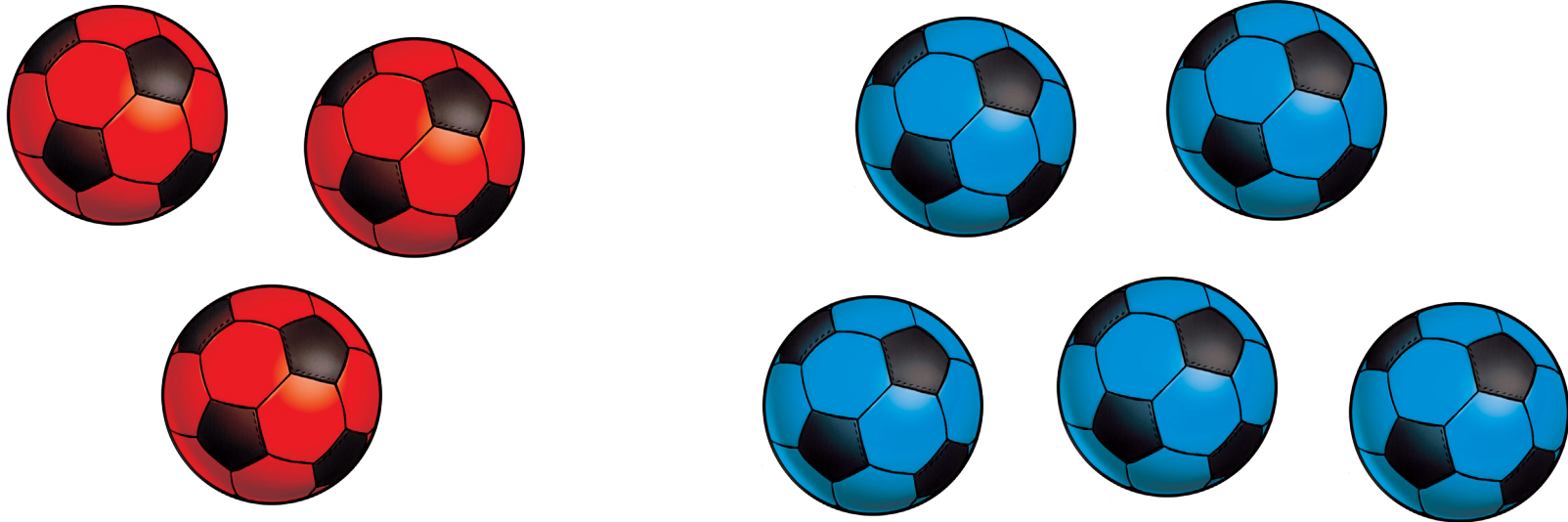
Addition Vocabulary



A1: Objects & Pictures

1

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



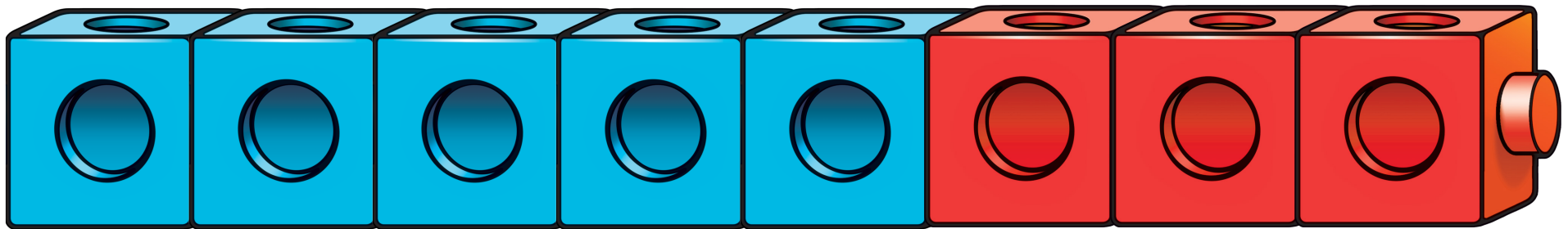
$$3 + 5 = 8$$



A1a: Largest Number 1st

1

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



$$5 + 3 = 8$$



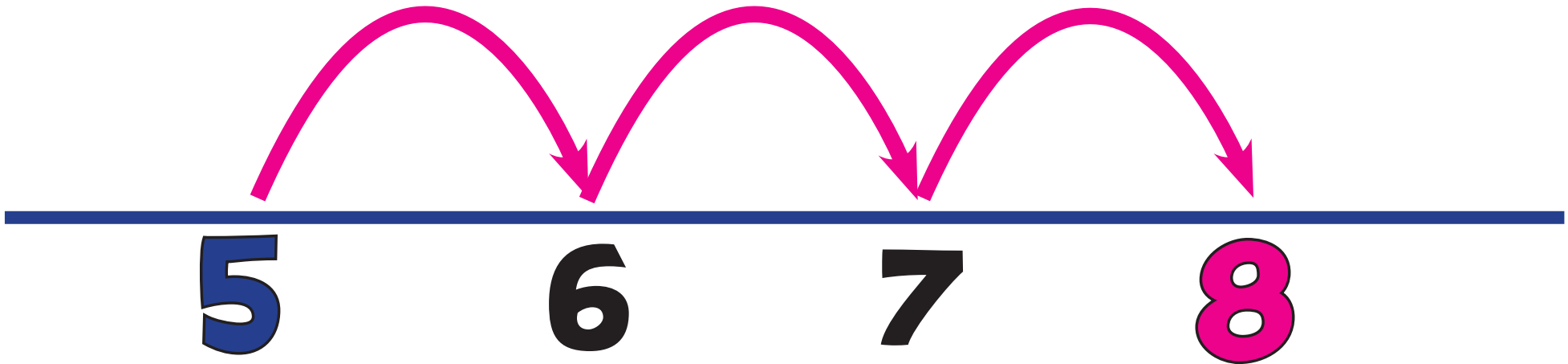
A2: Counting On

1

+1

+1

+1



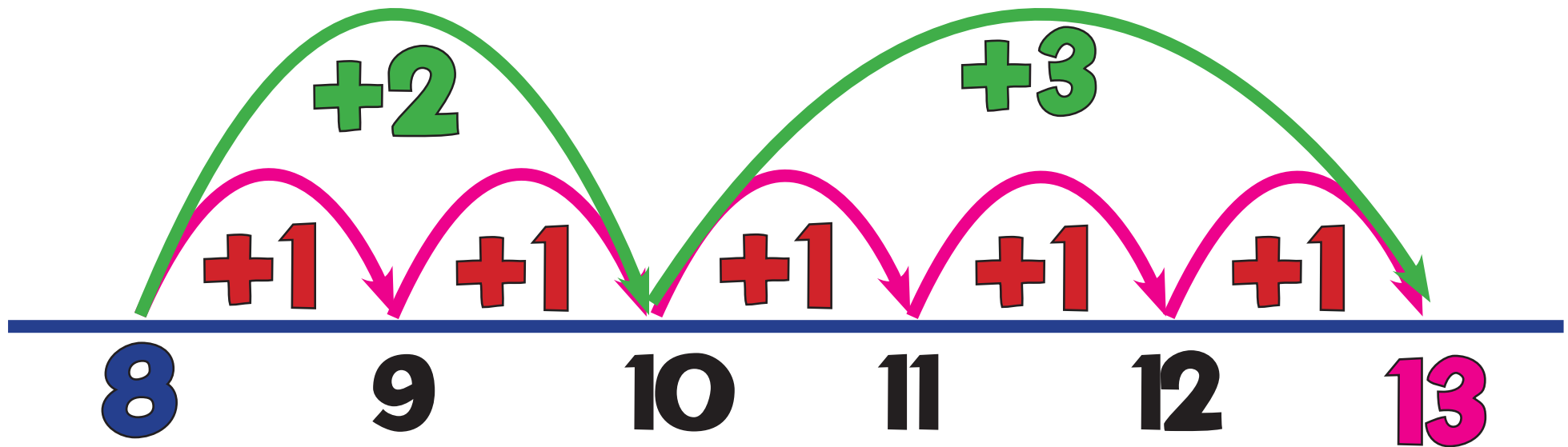
$$5 + 3 = 8$$



A2a: Counting On

Bridging 10

1



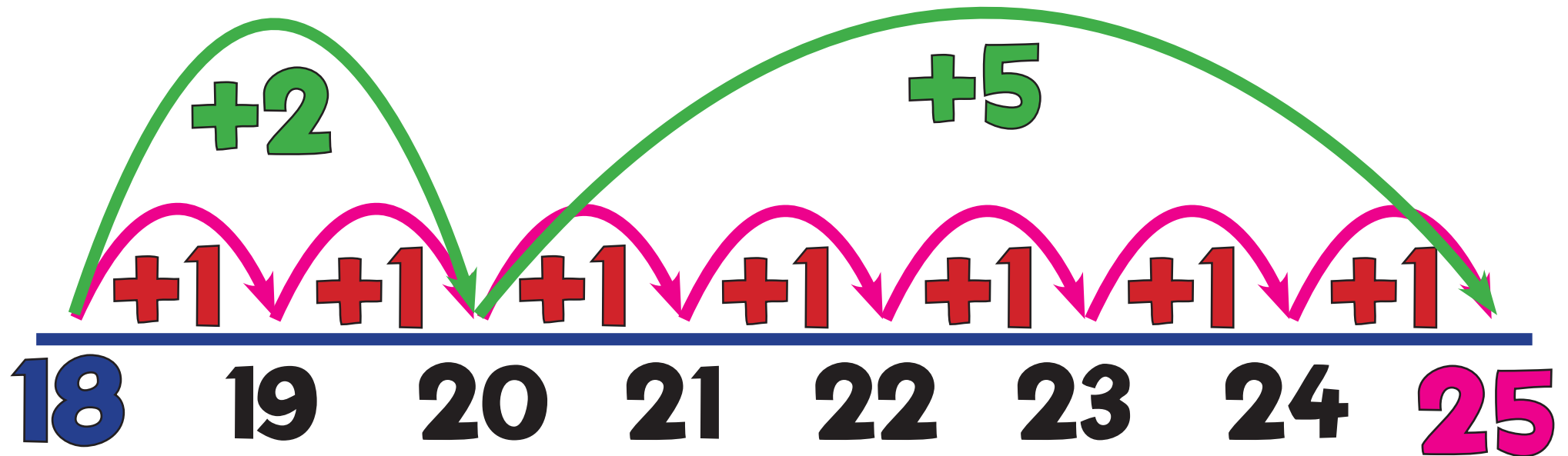
$$8 + 5 = 13$$



A2b: Counting On

Bridging 10

1



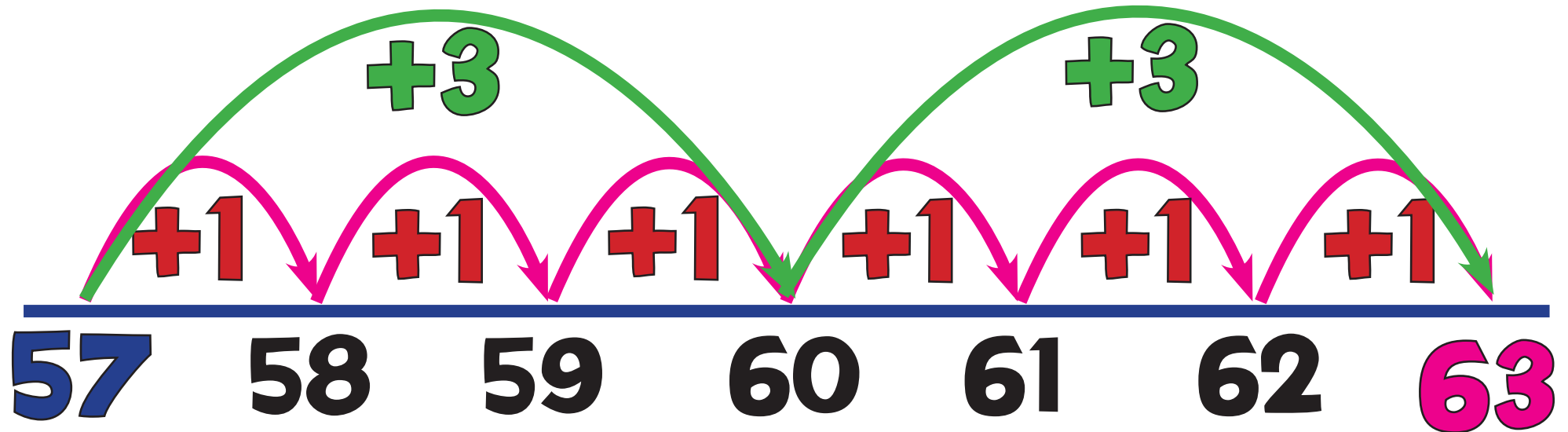
$$18 + 7 = 25$$



A2c: Counting On

2

Bridging 10s Number



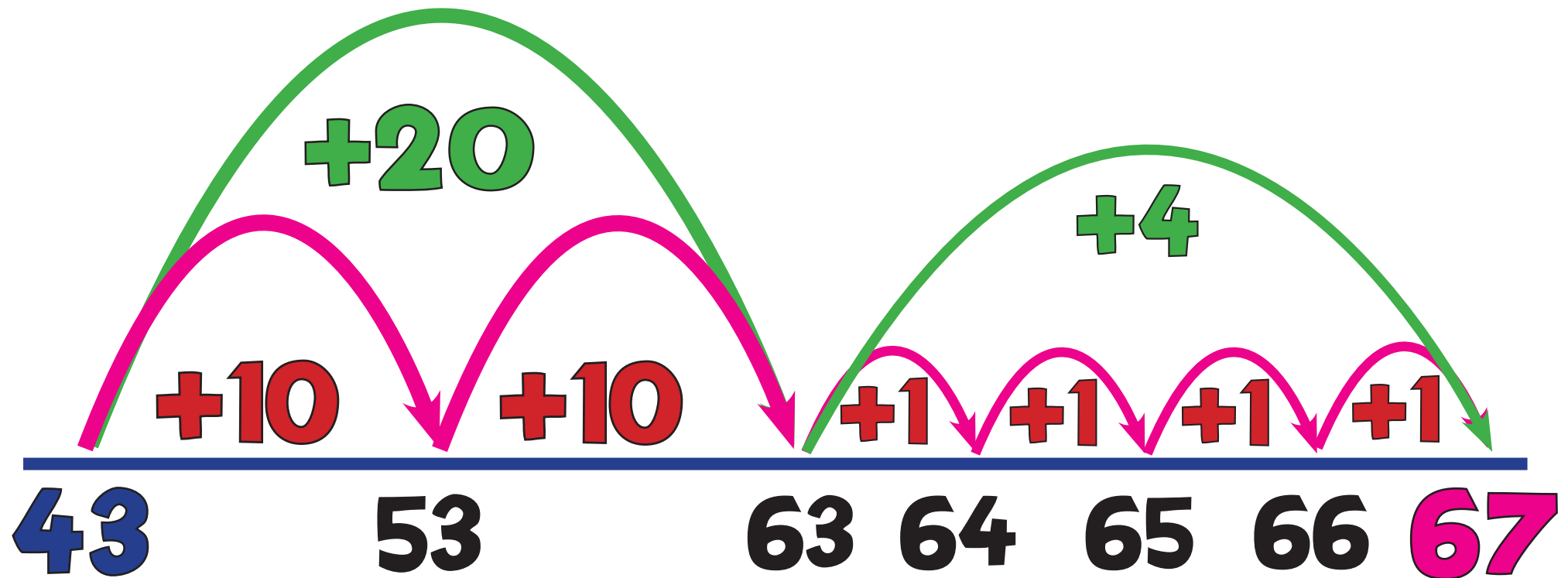
$$57 + 6 = 63$$



A3: Forwards Jump

2

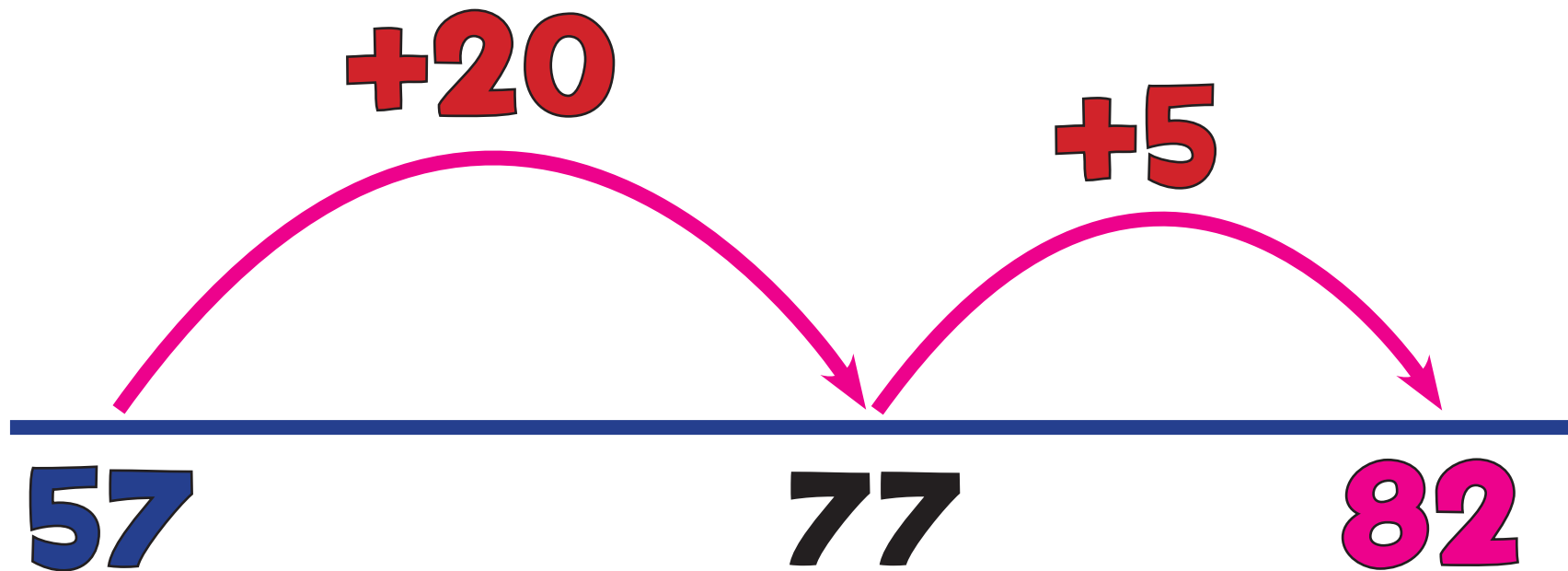
$$43 + 24 = 67$$



A3a: Forwards Jump

2

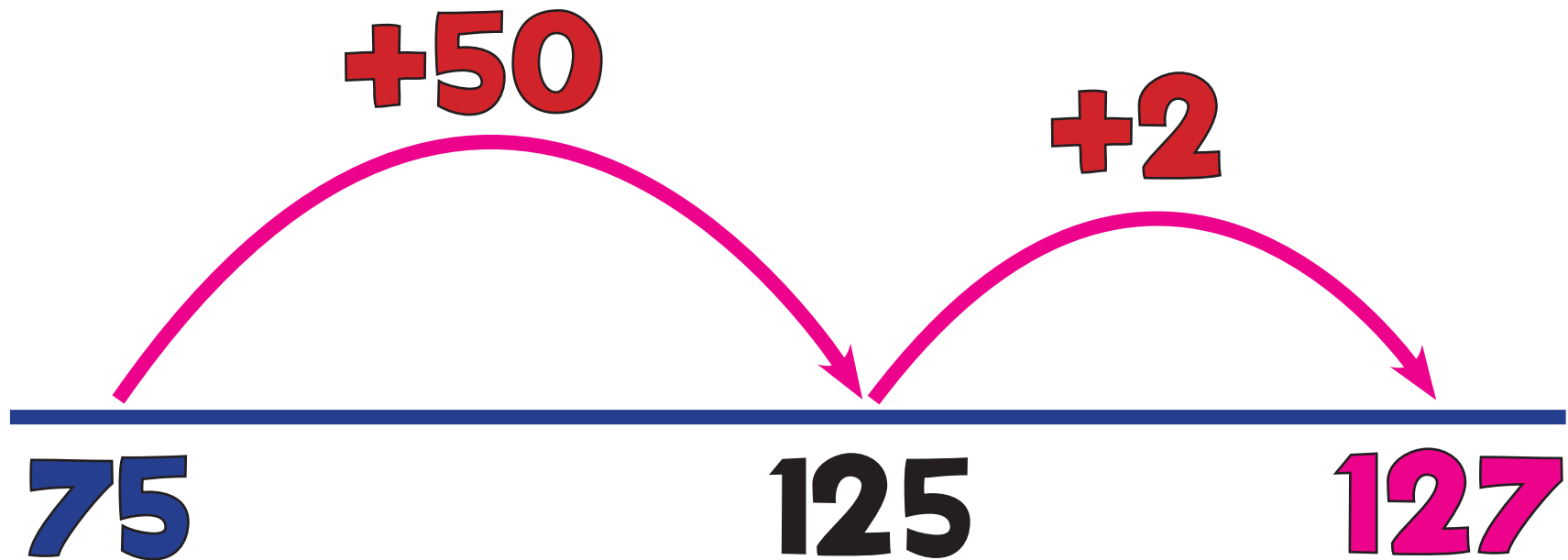
$$57 + 25 = 82$$



A3b: Forwards Jump

2/3

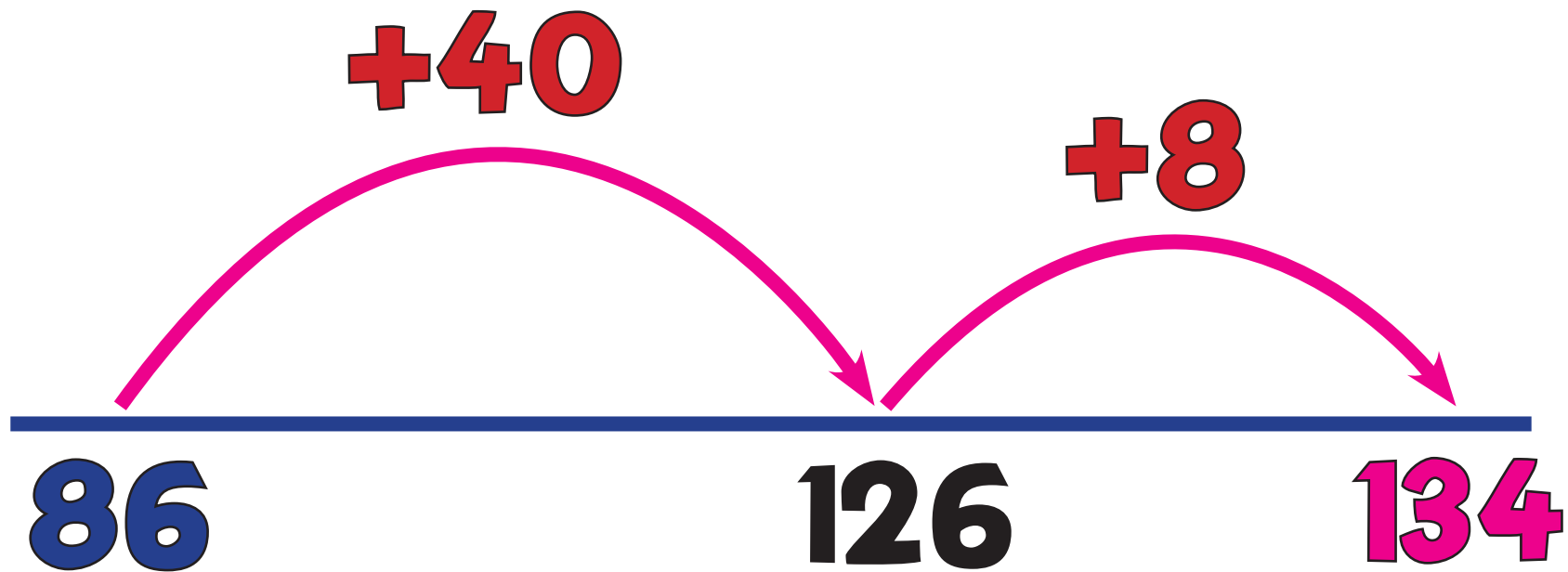
$$75 + 52 = 127$$



A3c: Forwards Jump

2/3

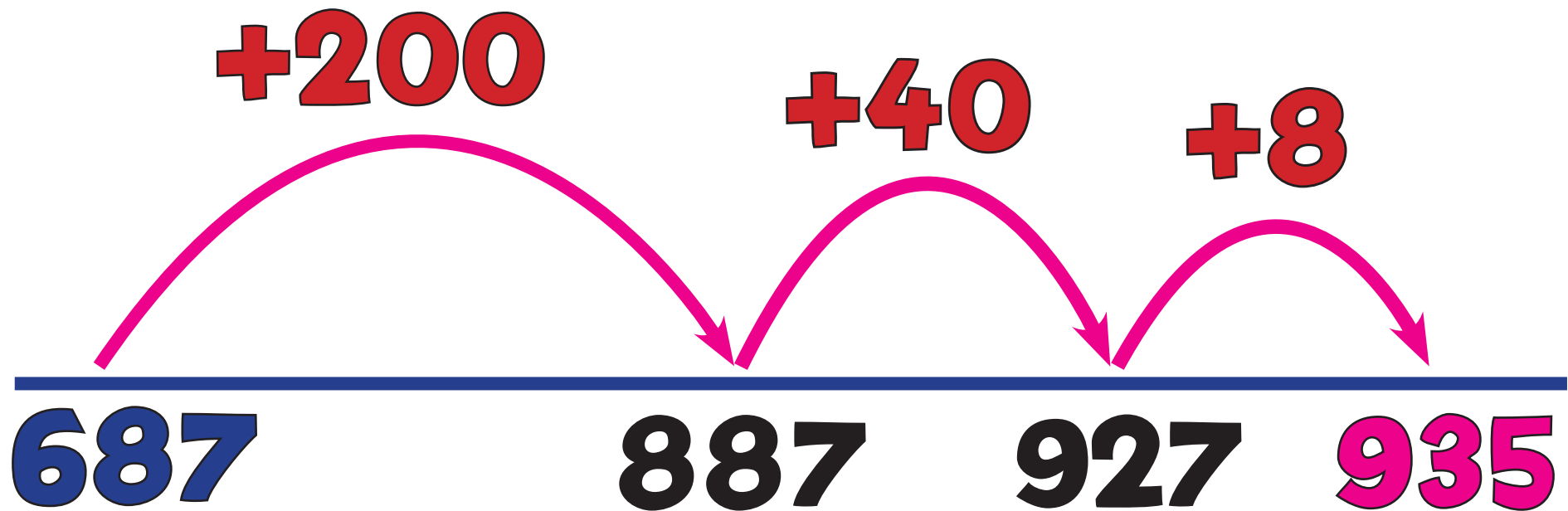
$$86 + 48 = 134$$



A3d: Forwards Jump

3

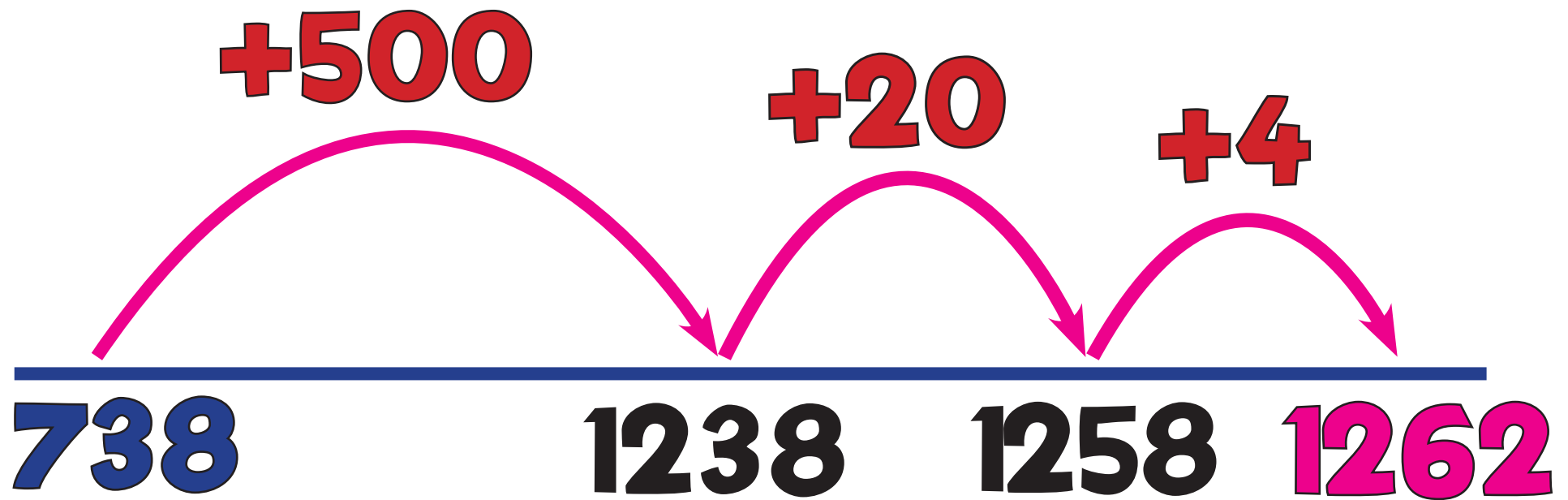
$$687 + 248 = 935$$



A3e: Forwards Jump

3/4

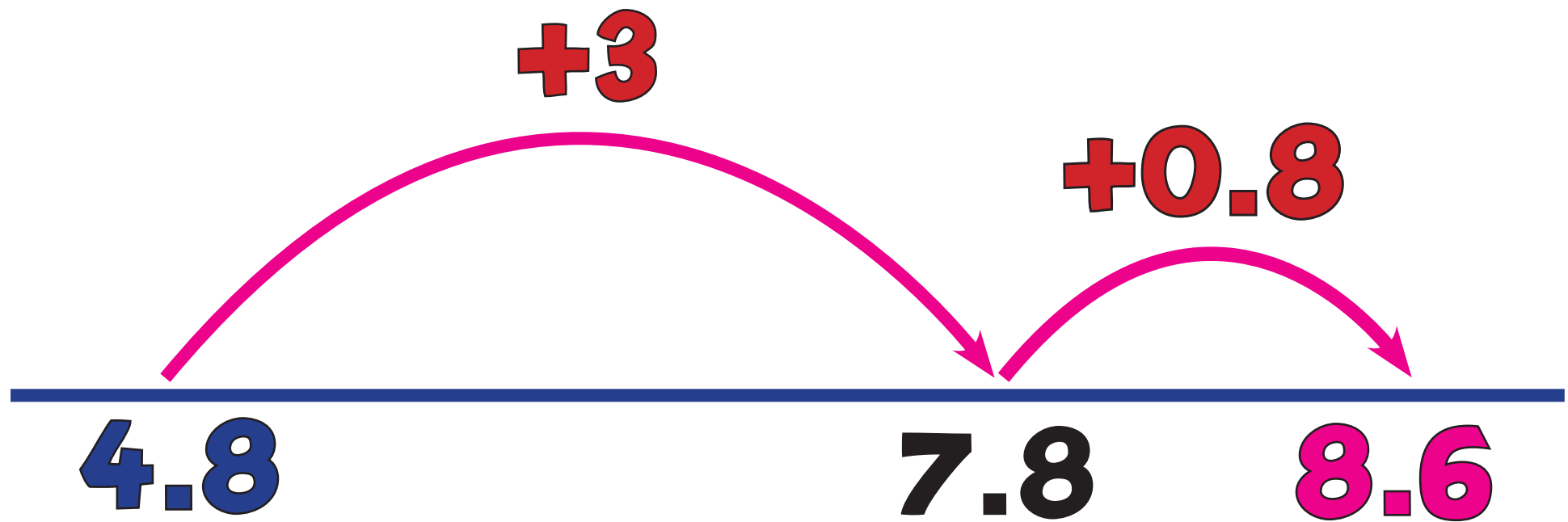
$$738 + 524 = 1262$$



A3h: Decimal Jump

5

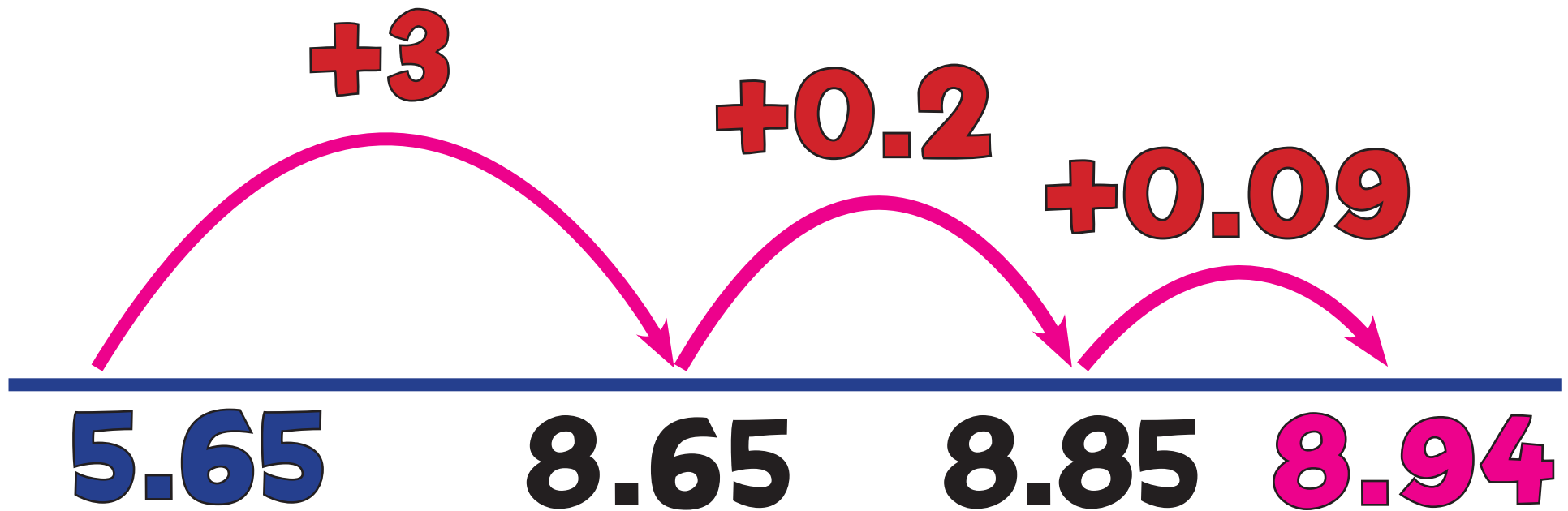
$$4.8 + 3.8 = 8.6$$



A3i: Decimal Jump

5

$$5.65 + 3.29 = 8.94$$



A4: Partitioning

2

$$43 + 24 = 67$$

$$40 + 20 = 60$$

$$3 + 4 = 7$$

$$67$$



A4a: Partitioning

2

$$57 + 25 = 82$$

$$50 + 20 = 70$$

$$7 + 5 = 12$$

$$82$$



A4b: Partitioning

2/3

$$75 + 52 = 127$$

$$70 + 50 = 120$$

$$5 + 2 = 7$$

$$127$$



A4c: Partitioning

2/3

$$86 + 48 = 134$$

$$80 + 40 = 120$$

$$6 + 8 = 14$$

$$134$$



A4d: Partitioning

3

$$687 + 248 = 935$$

$$600 + 200 = 800$$

$$80 + 40 = 120$$

$$7 + 8 = 15$$

$$935$$



A4e: Partitioning

3/4

$$738 + 524 = 1262$$

$$700 + 500 = 1200$$

$$30 + 20 = 50$$

$$8 + 4 = 12$$

$$1262$$



A4h: Partitioning

5

$$4.8 + 3.8 = 8.6$$

$$4 + 3 = 7$$

$$0.8 + 0.8 = 1.6$$

$$8.6$$



A5: Partition Jot

2

$$43 + 24 = 67$$

Diagram illustrating the partitioning of the addition $43 + 24 = 67$. The number 43 is split into 40 (red) and 3 (green). The number 24 is split into 20 (red) and 4 (green). The 40 and 20 are combined to form 60 (red), and the 3 and 4 are combined to form 7 (green). The final sum is 67 (pink).



A5a: Partition Jot

2

$$57 + 25 = 82$$

A diagram illustrating the partitioning of the numbers 57 and 25 into 70 and 12. Red lines connect the '5' in 57 to the '70' and the '2' in 25 to the '12'. Green lines connect the '7' in 57 to the '12' and the '5' in 25 to the '70'.

$$70 + 12$$



A5b: Partition Jot

2/3

$$75 + 52 = 127$$

A diagram illustrating the partitioning of the numbers 75 and 52. Red lines connect the '7' in 75 to the '1' in 120 and the '5' in 52 to the '2' in 120. Green lines connect the '5' in 75 to the '7' in 7 and the '2' in 52 to the '0' in 120. This shows that 75 is split into 70 and 5, and 52 is split into 50 and 2, which are then combined to form 120 and 7.

$$120 + 7$$



A5c: Partition Jot

2/3

$$86 + 48 = 134$$

$$120 + 14$$



A5d: Partition Jot

3

$$687 + 248 = 935$$

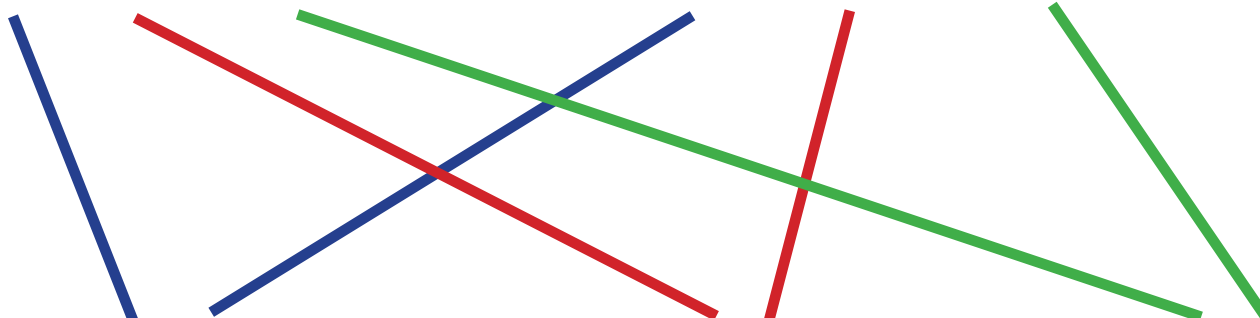
$$800 + 120 + 15$$



A5e: Partition Jot

3/4

$$738 + 524 = 1262$$


$$1200 + 50 + 12$$



A5f: Partition Jot

4

$$4873 + 3762 = 8635$$

$$7000 + 1500 + 130 + 5$$



A5h: Partition Jot

5

$$4.8 + 3.8 = 8.6$$

$$7 + 1.6$$



A5i: Partition Jot

5

$$5.65 + 3.29 = 8.94$$

$$8 + 0.8 + 0.14$$



A5j: Partition Jot

5

$$76.7 + 58.5 = 135.2$$

$$120 + 14 + 1.2$$



A5k: Partition Jot

5

$$\underline{\text{€}38}.\underline{25} + \underline{\text{€}27}.\underline{46} = \text{€}65.71$$

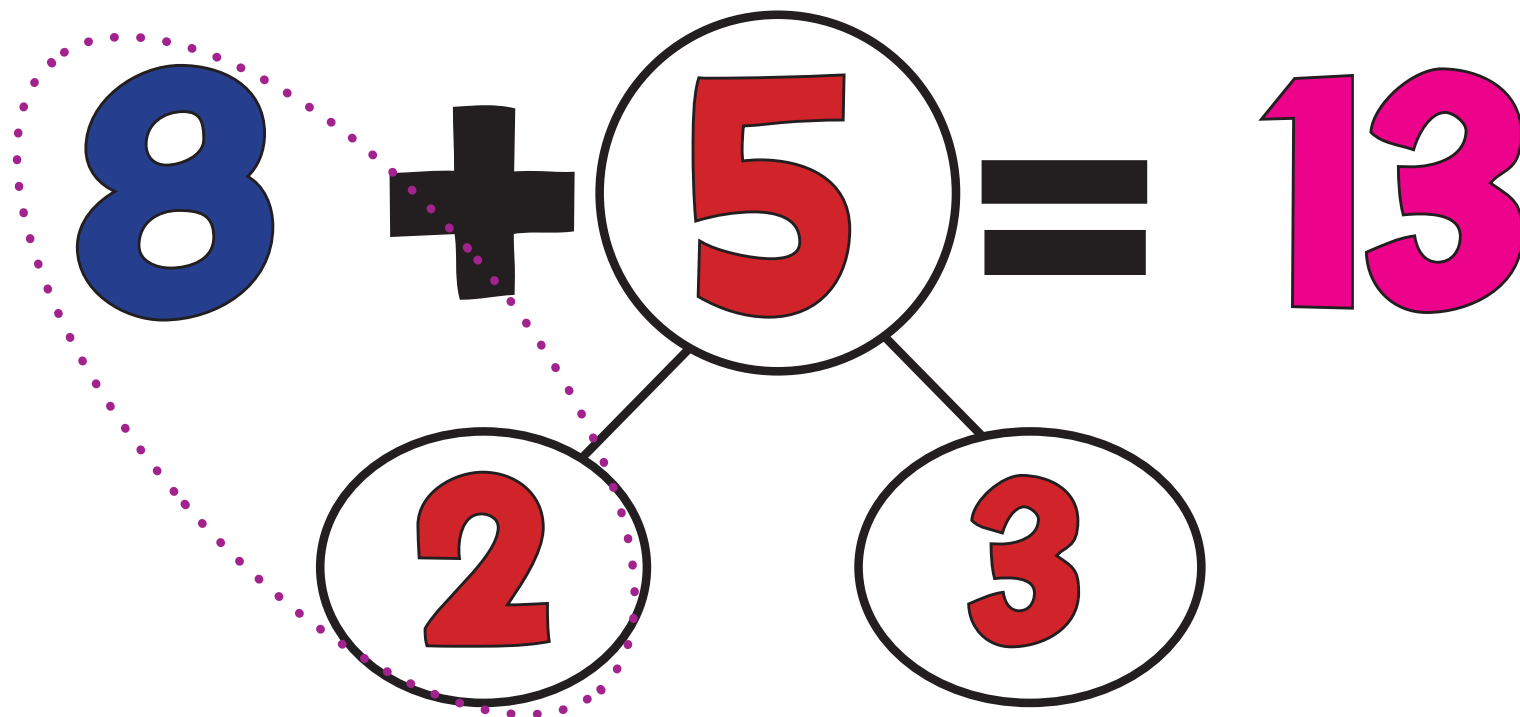
$$\text{€}65.00 + \text{€}0.71$$



A6: Part/Whole

1

Partitioning One Addend



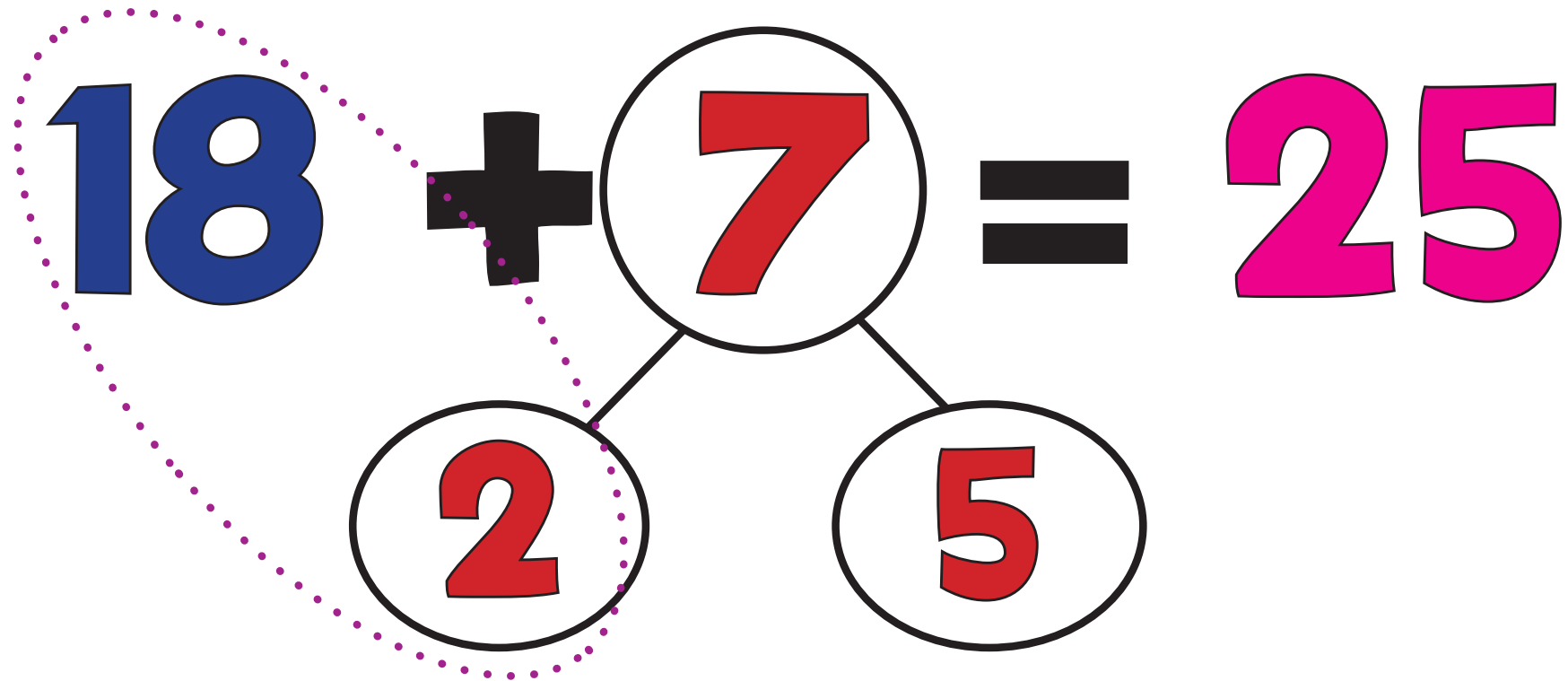
$$10 + 3 = 13$$



A6: Part/Whole

1

Partitioning One Addend



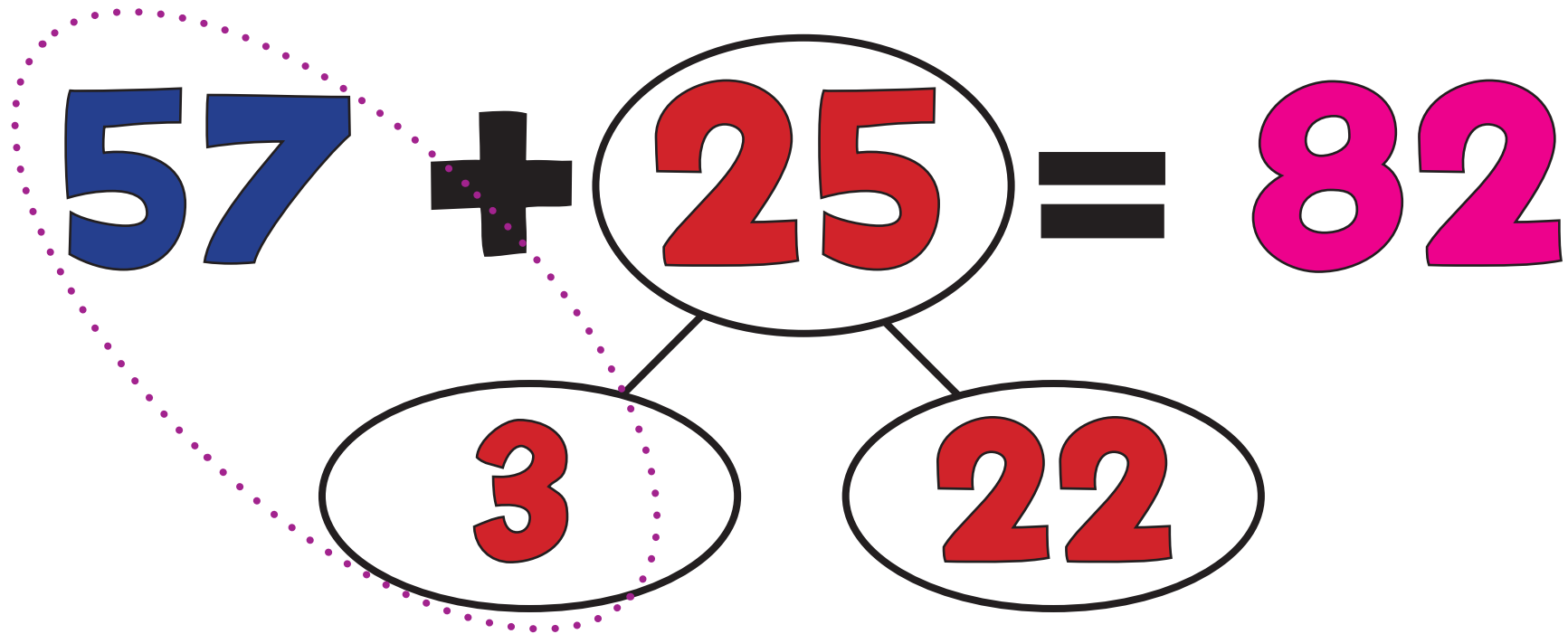
$$20 + 5 = 25$$



A6a: Part/Whole

2

Partitioning One Addend



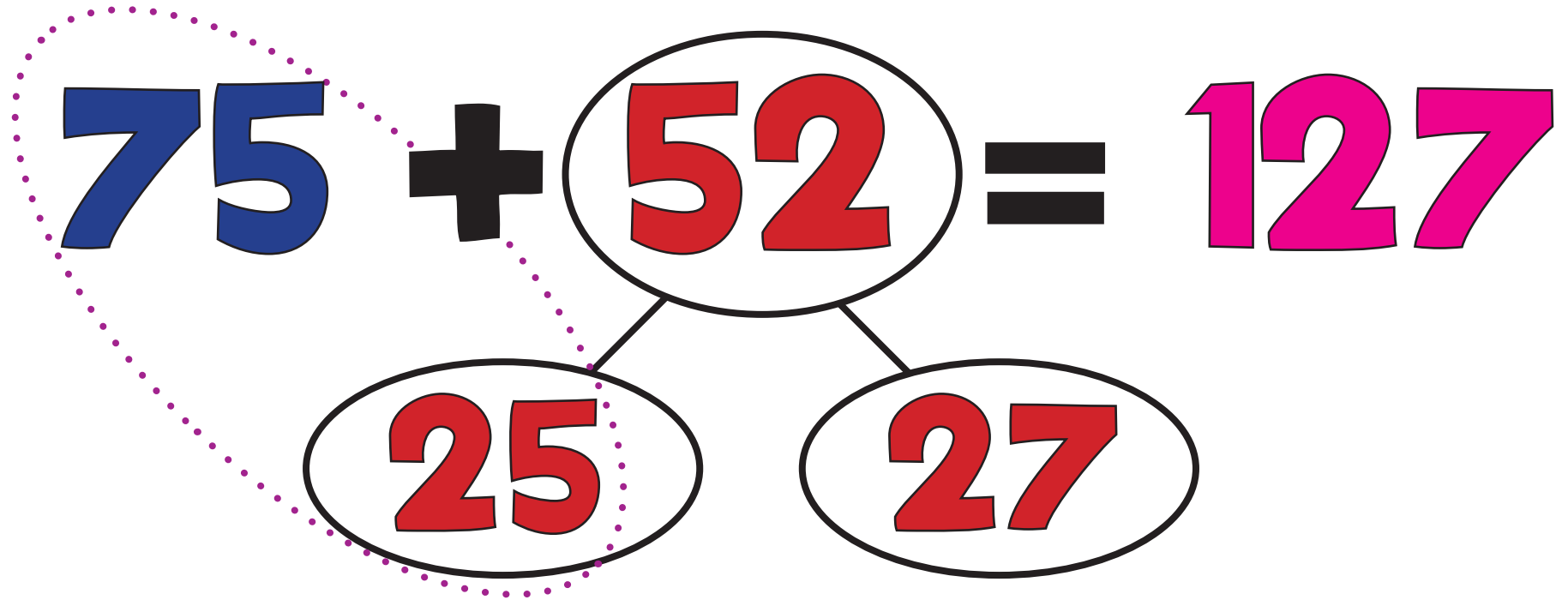
$$60 + 22 = 82$$



A6b: Part/Whole

2/3

Partitioning One Addend



$$100 + 27 = 127$$

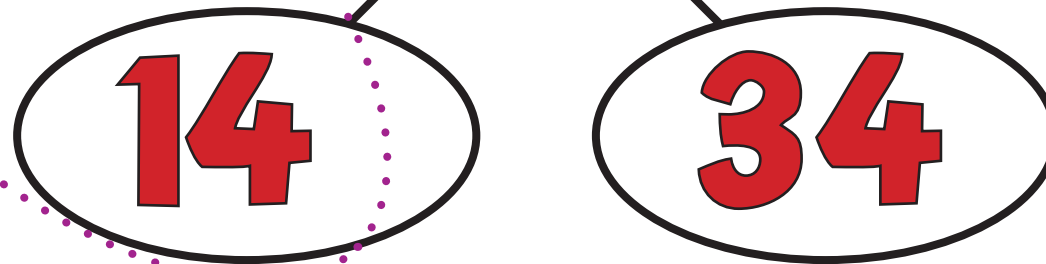


A6c: Part/Whole

2/3

Partitioning One Addend

$$86 + 48 = 134$$



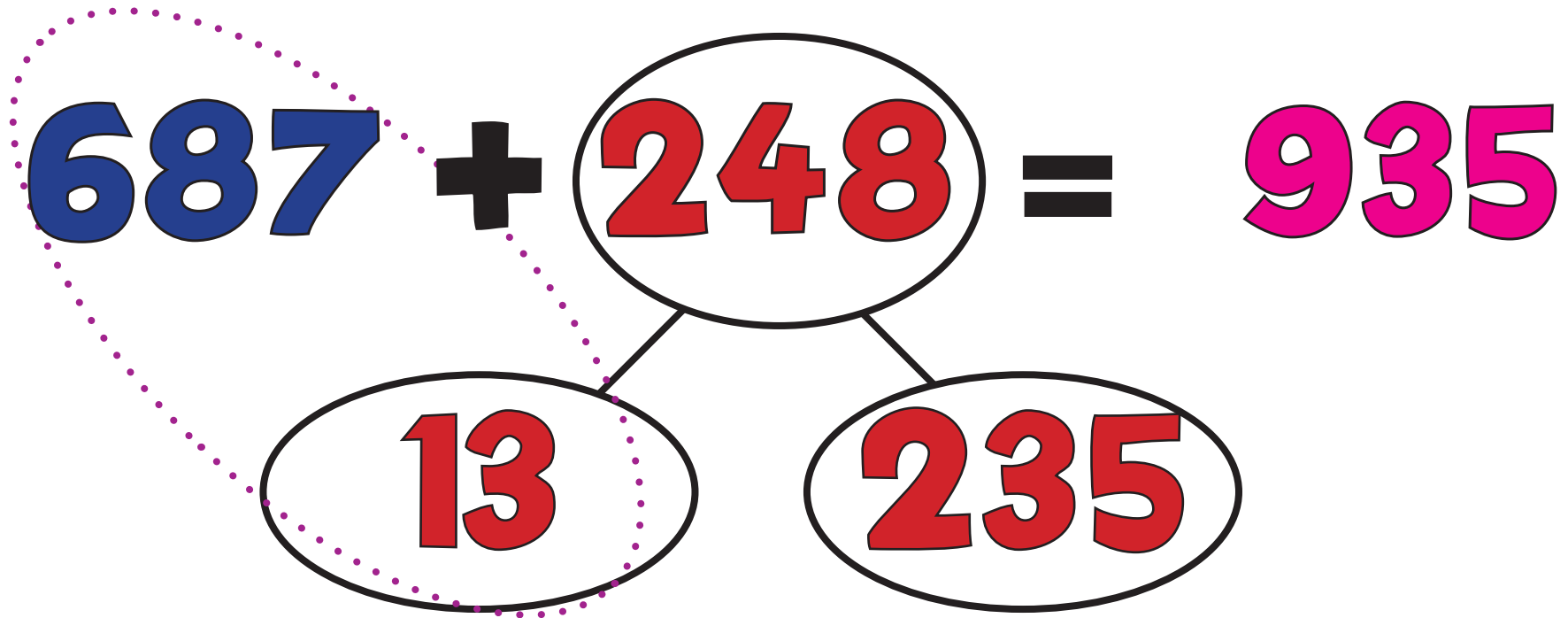
$$100 + 34 = 134$$



A6d: Part/Whole

3

Partitioning One Addend



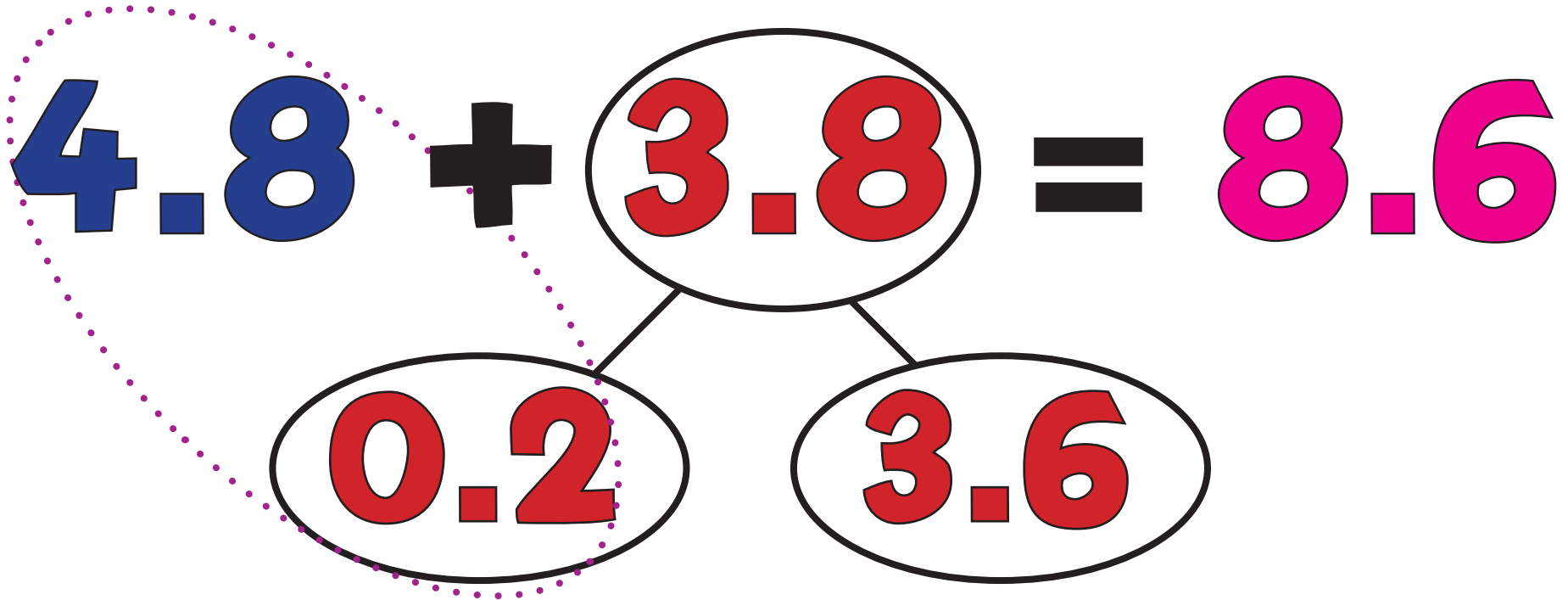
$$700 + 235 = 935$$



A6h: Part/Whole

5

Partitioning One Addend



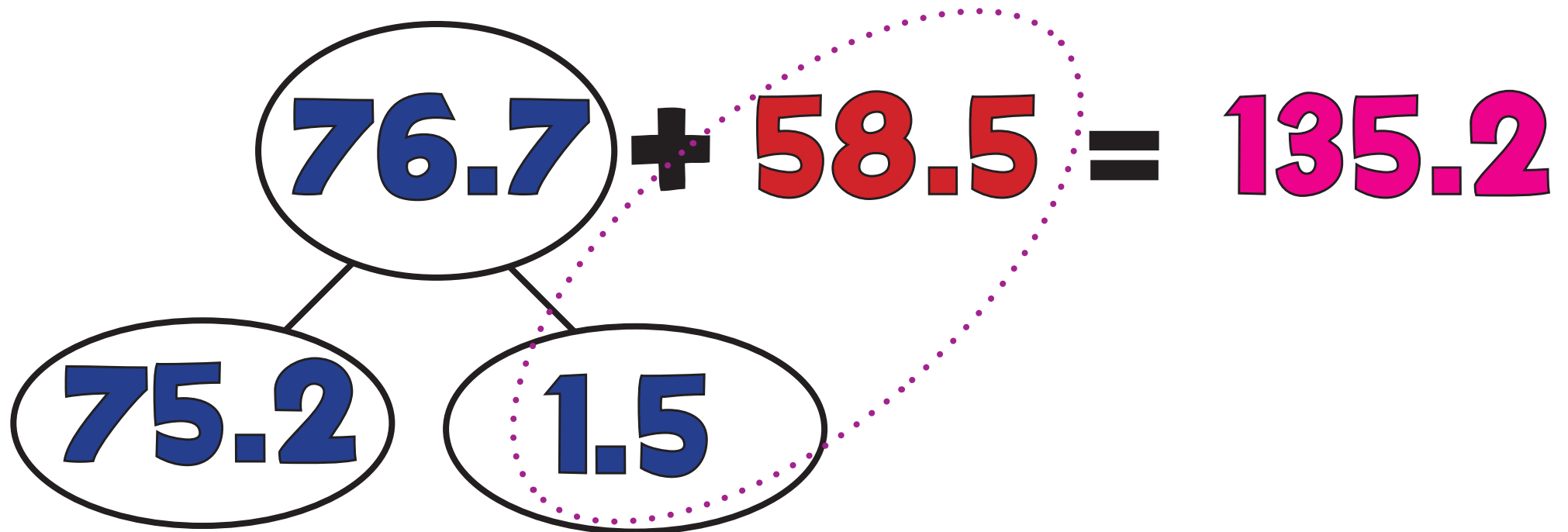
$$5 + 3.6 = 8.6$$



A6j: Part/Whole

5

Partitioning One Addend



$$75.2 + 60 = 135.2$$



A7: Expanded Column

2

Addition

$$\begin{array}{r} \text{10} \quad \text{1} \\ 43 \\ + 24 \\ \hline 7 \\ 60 \\ \hline 67 \end{array}$$



A7a: Expanded Column

2

Addition

$$\begin{array}{r} \text{10} \quad \text{1} \\ 57 \\ + 25 \\ \hline 12 \\ 70 \\ \hline 82 \end{array}$$



A7b: Expanded Column

2/3

Addition

$$\begin{array}{r} \text{10} \quad \text{1} \\ 75 \\ + 52 \\ \hline 7 \\ 120 \\ \hline 127 \end{array}$$



A7c: Expanded Column

2/3

Addition

	100	10	1
		8	6
+	4	8	
<hr/>			
		14	
	1	2	0
<hr/>			
	1	3	4
<hr/>			



A7d: Expanded Column

Addition

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ 687 \\ + 248 \\ \hline 15 \\ 120 \\ 800 \\ \hline 935 \end{array}$$



A7e: Expanded Column

Addition

3

	1000	100	10	1
	7	3	8	
+	5	2	4	
<hr/>				
		12		
		50		
	1200			
<hr/>				
	1262			



A8: Column Addition

2

$$\begin{array}{r} \text{10} \quad \text{1} \\ 43 \\ + 24 \\ \hline 67 \end{array}$$



A8a: Column Addition

2

$$\begin{array}{r} \text{10} \quad \text{1} \\ 57 \\ + 25 \\ \hline 82 \\ \hline 1 \end{array}$$



A8b: Column Addition

2/3

	100	10	1
		7	5
+	5	2	
<hr/>			
	1	2	7
<hr/>			
	1		



A8c: Column Addition

2/3

	100	10	1
		8	6
+	4	8	
<hr/>			
	1	3	4
<hr/>			
	1	1	



A8d: Column Addition

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ 687 \\ + 248 \\ \hline 935 \\ \hline \text{1} \quad \text{1} \end{array}$$



A8e: Column Addition

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ 738 \\ + 524 \\ \hline 1262 \\ \hline \text{1} \quad \text{1} \end{array}$$



A8f: Column Addition

4

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



A8g: Column Addition

5

$$\begin{array}{rcccccc} 7 & 8 & 7 & 5 & 6 & 7 \\ + & 4 & 4 & 6 & 2 & 7 & 8 \\ \hline 1 & 2 & 3 & 3 & 8 & 4 & 5 \\ \hline 1 & 1 & 1 & & 1 & 1 & \end{array}$$



A8h: Column Addition

5

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



A8i: Column Addition

5

$$\begin{array}{r} \begin{array}{c} 1 \quad \cdot \quad \frac{1}{10} \quad \frac{1}{100} \\ 5.65 \\ + 3.29 \\ \hline 8.94 \\ \hline 1 \end{array} \end{array}$$



A8j: Column Addition

5

$$\begin{array}{r} \text{10} \quad \text{1} \quad \text{.} \quad \frac{\text{1}}{\text{10}} \\ 76.7 \\ + 58.5 \\ \hline 135.2 \\ \hline \text{1} \quad \text{1} \quad \text{1} \end{array}$$



A8k: Column Addition

5

With Money

$$\begin{array}{r} \text{€}38.25 \\ + \text{€}27.46 \\ \hline \text{€}65.71 \end{array}$$

1 1



A81: Column Addition

5

With Decimals

$$73.4 + 5.67 = 79.07$$

$$\begin{array}{r} \begin{array}{cccc} 10 & 1 & \cdot & \frac{1}{10} & \frac{1}{100} \\ 73.4 & & & & \\ + & 5.67 & & & \\ \hline 79.07 & & & & \\ \hline & 1 & & & \end{array} \end{array}$$

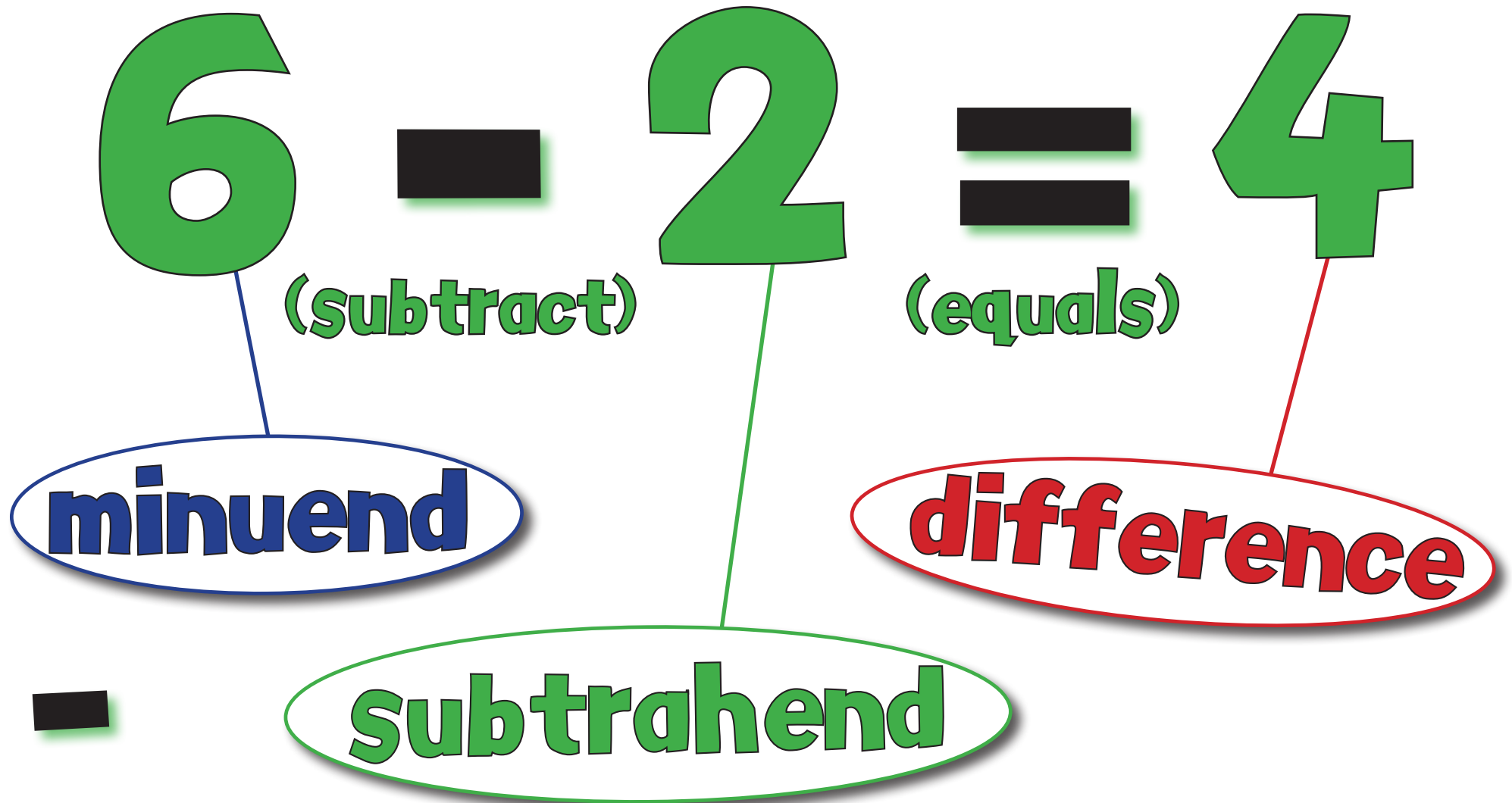


Subtraction Strategies

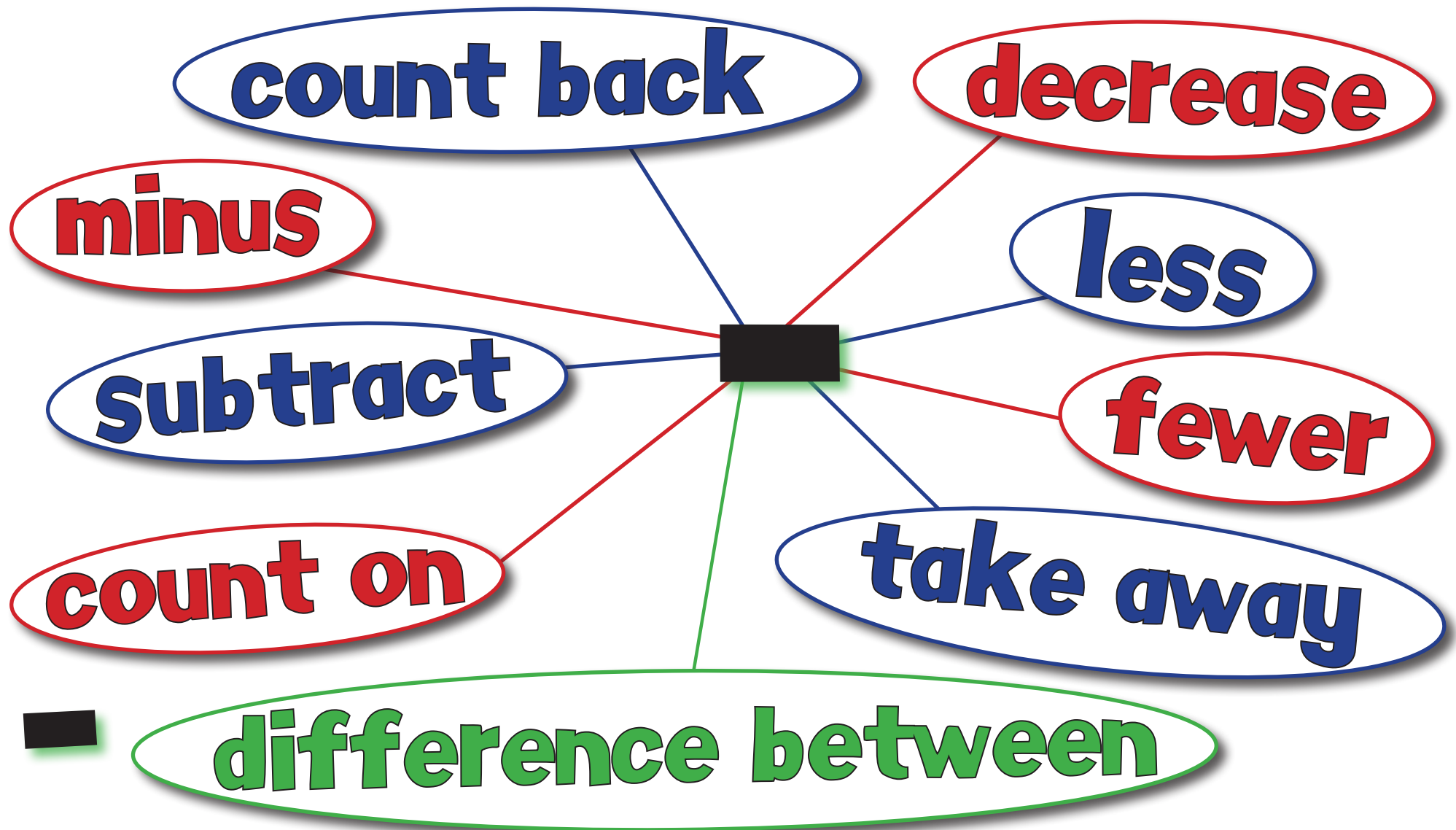
105		Calculation & Vocabulary
107	S1	Objects and Pictures
110	S2	Counting Back
112	S3	Counting On
114	S4	Backwards Bounce
116	S5	Backwards Jump
118	S6	10s Jump, 1s Jump
127	S7	Triple Jump
136	S8	Part/Whole (Minuend)
144	S9	Part/Whole (Subtrahend)
152	S10	Expanded Column
158	S11	Column Subtraction



Subtraction Calculation



Subtraction Vocabulary

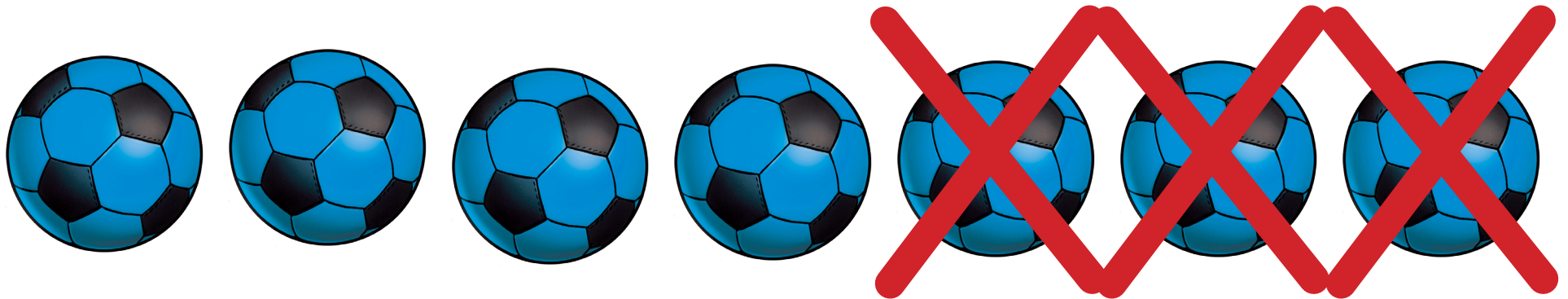


S1: Objects & Pictures

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”



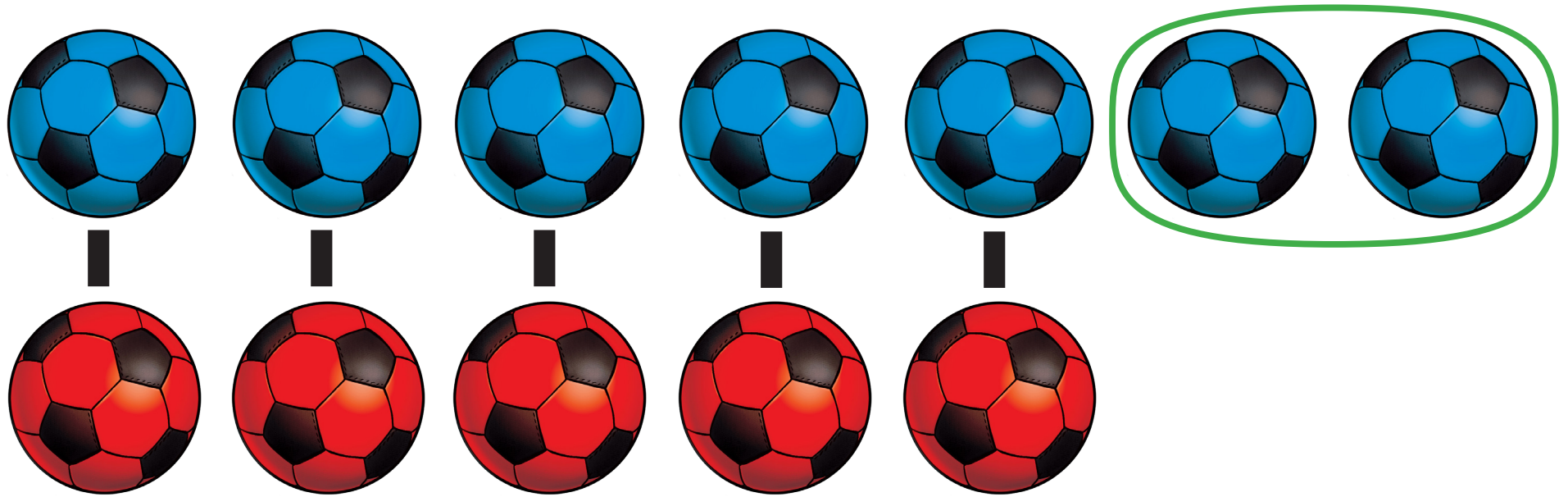
$$7 - 3 = 4$$



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?)

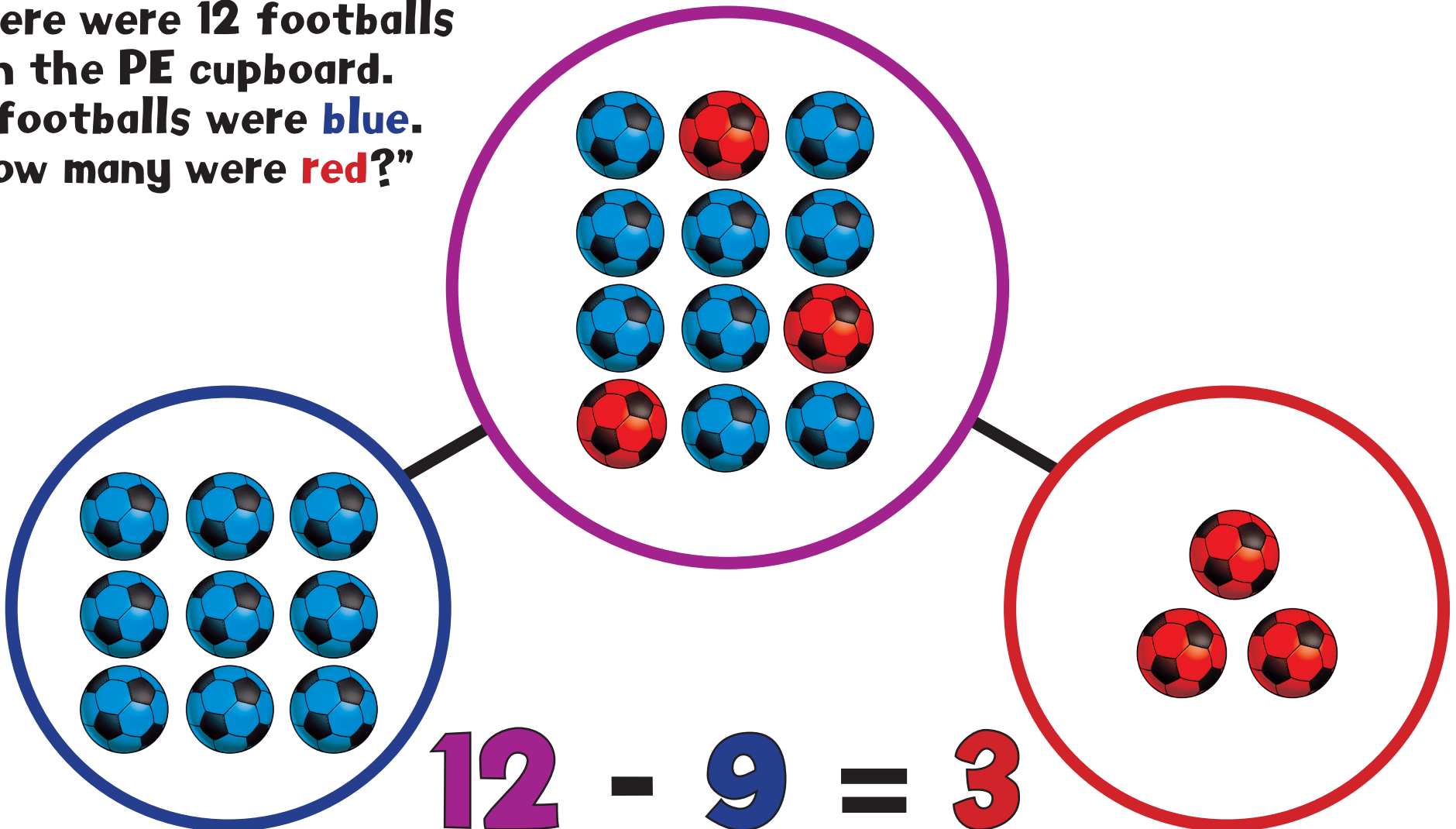


S1b: Objects and Pictures

Part/Whole Model

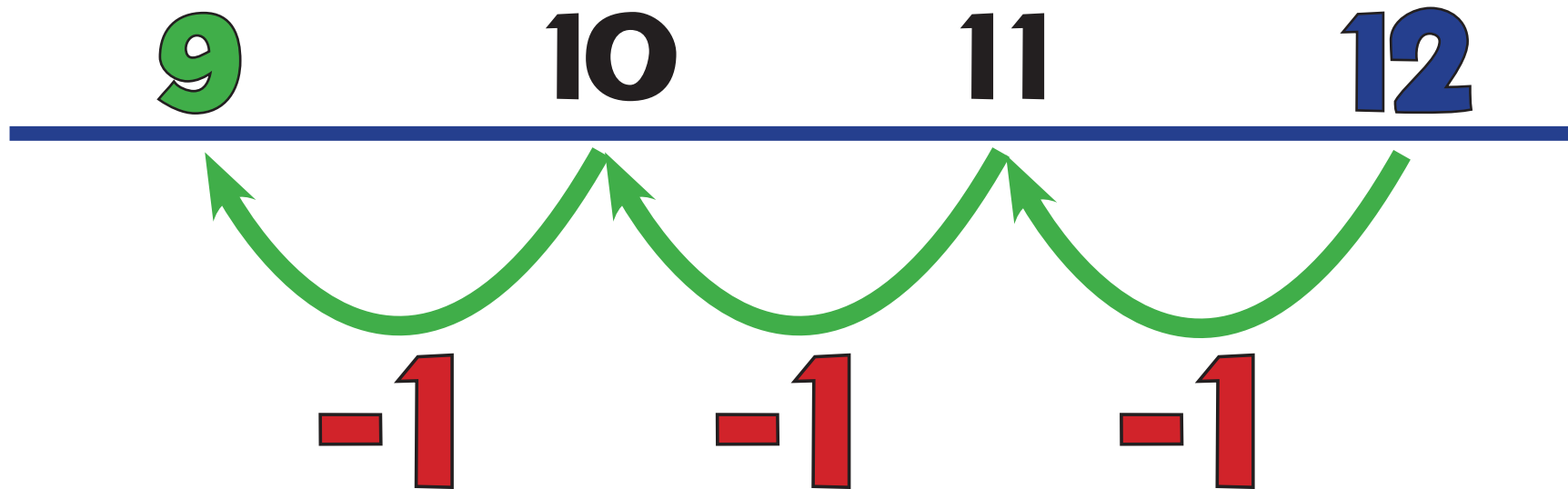
1

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



S2: Counting Back

1



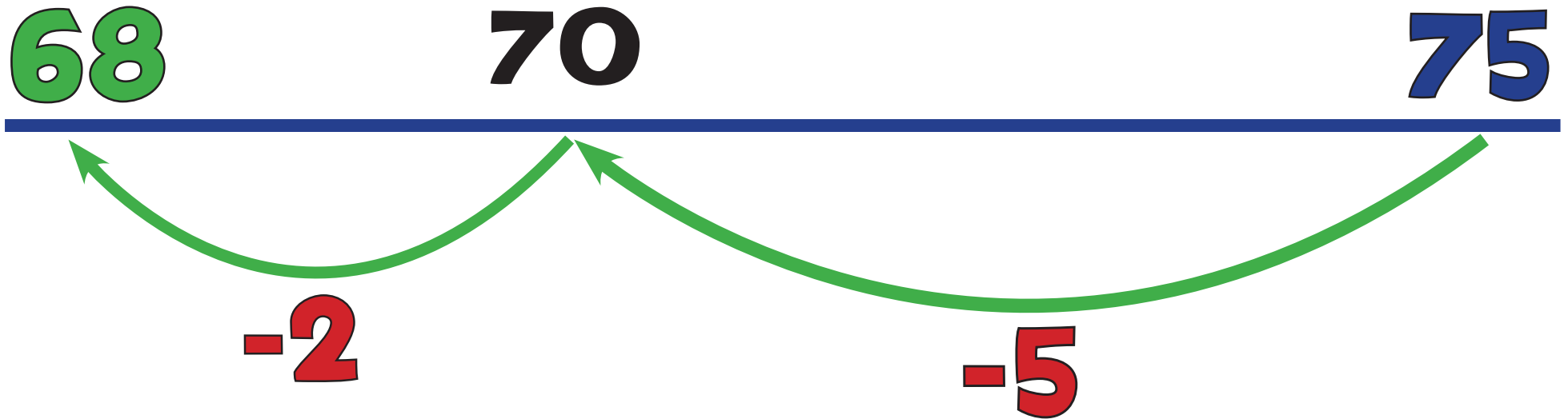
$$12 - 3 = 9$$

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



S2a: Counting Back

2 Big Steps

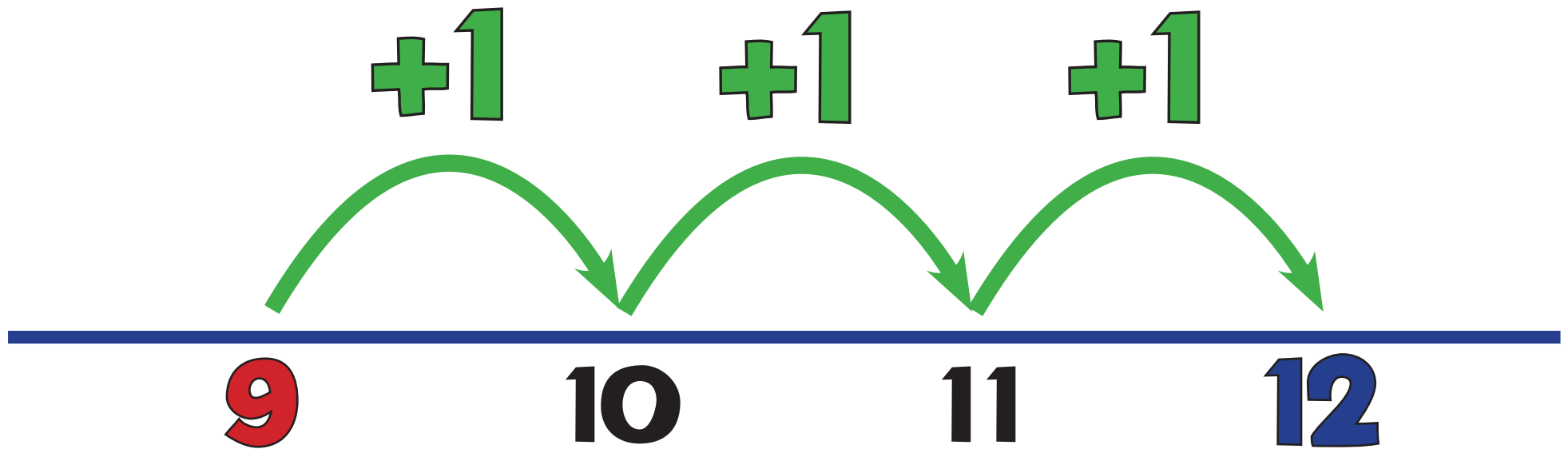


$$75 - 7 = 68$$



S3: Counting On

1



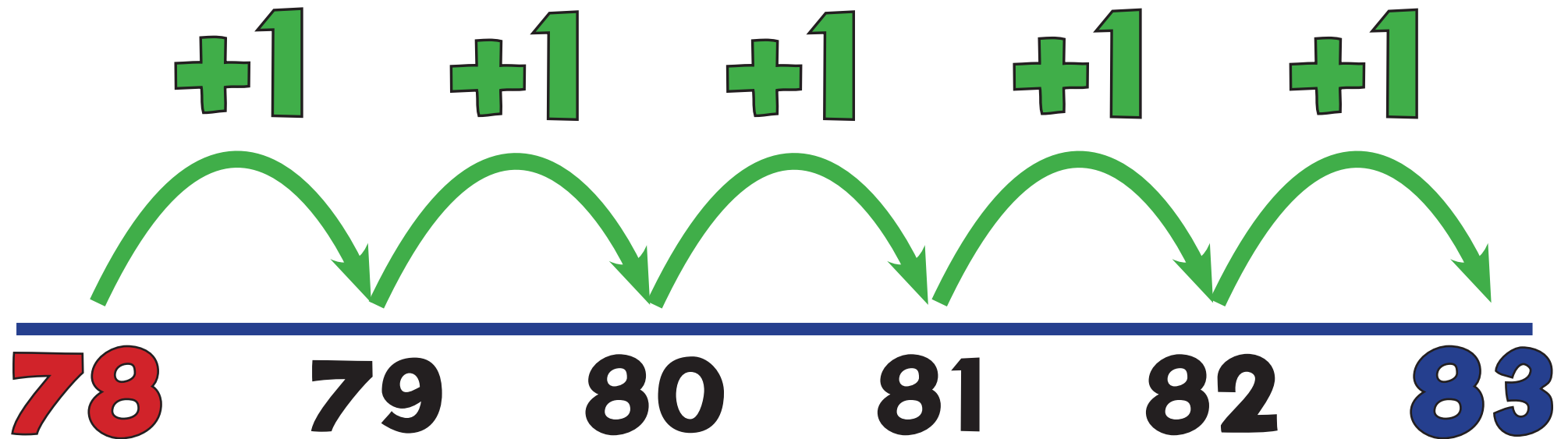
$$12 - 9 = 3$$

“How many more is 12 than 9? What is the difference?”



S3a: Counting On

2



$$83 - 78 = 5$$

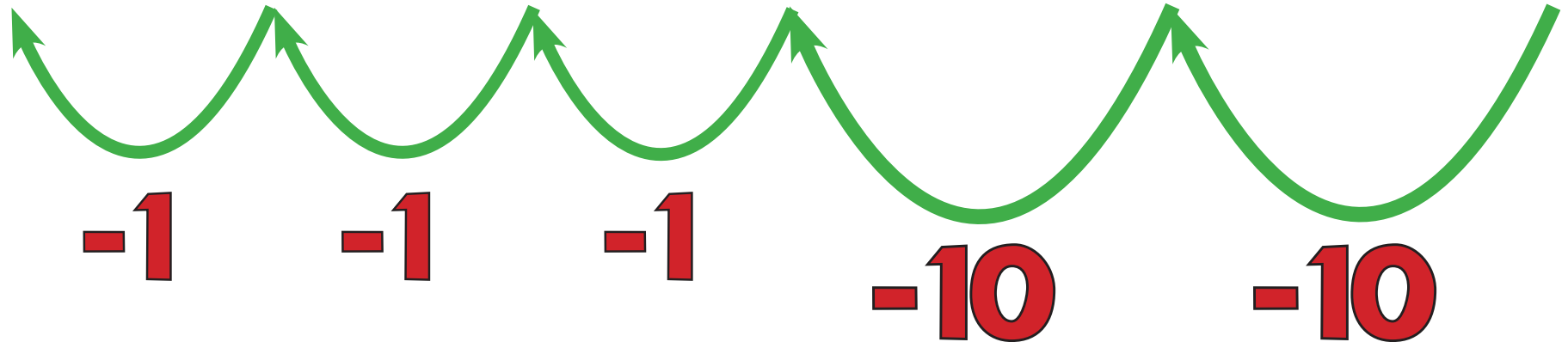
“How many more is 83 than 78? What is the difference?”



S4: Backwards Bounce

2

64 65 66 67 77 87




$$87 - 23 = 64$$



S4a: Backwards Bounce

2

38 39 40 41 42 43 44 45 55 65 75


-1 -1 -1 -1 -1 -1 -1 -10 -10 -10

$$75 - 37 = 38$$



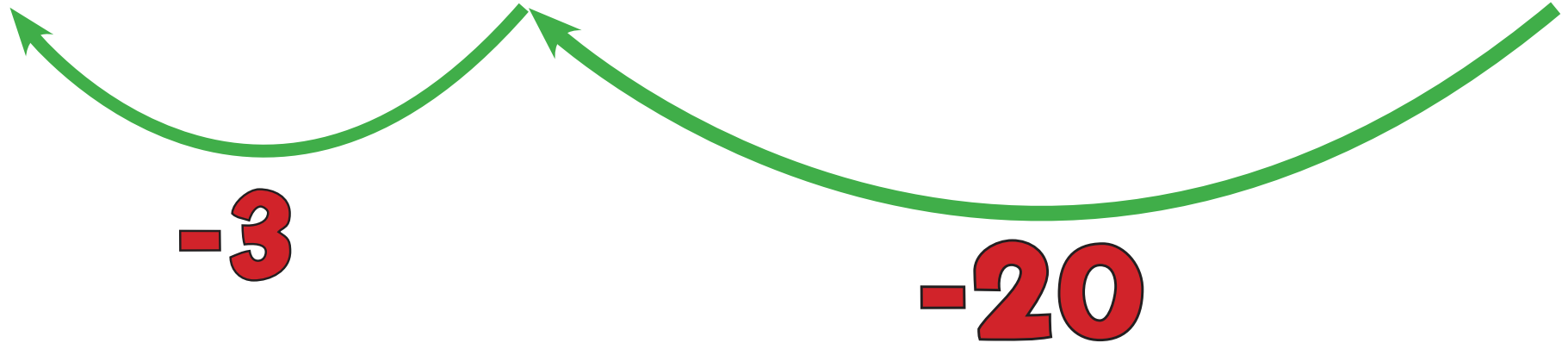
S5: Backwards Jump

2

64

67

87

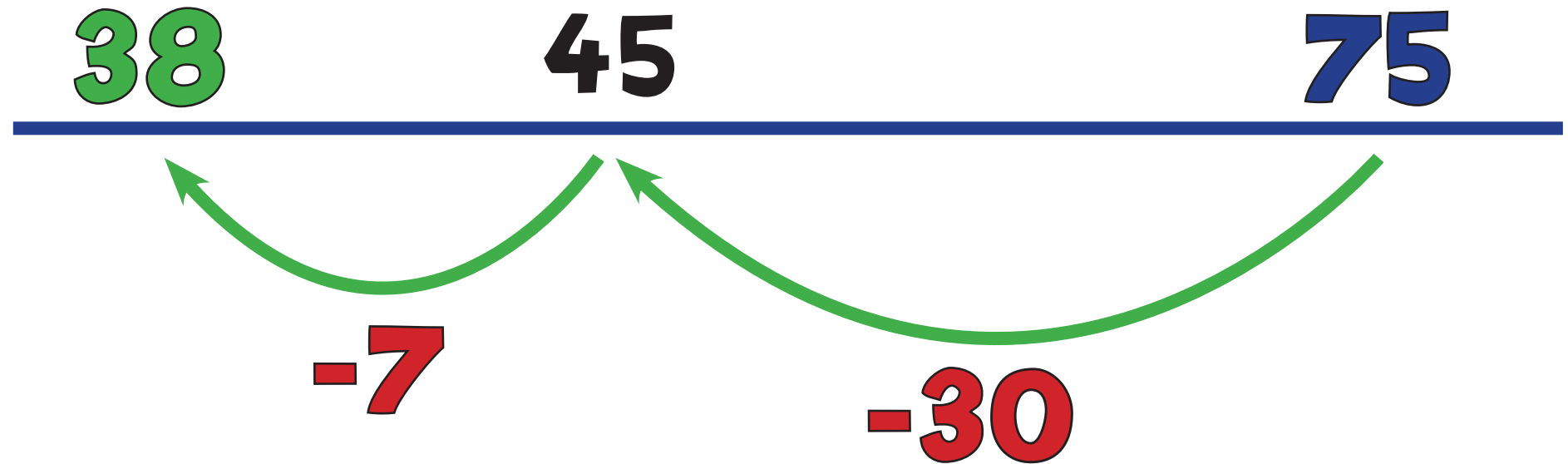


$$87 - 23 = 64$$



S5a: Backwards Jump

2

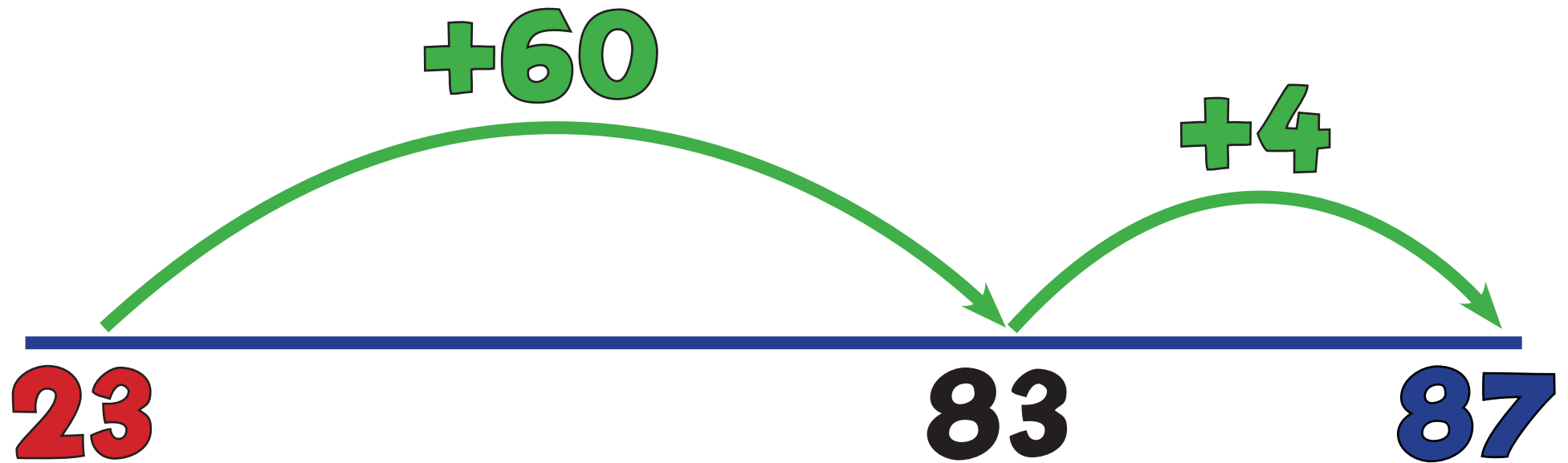


$$75 - 37 = 38$$



S6: 10s Jump, 1s Jump!

2

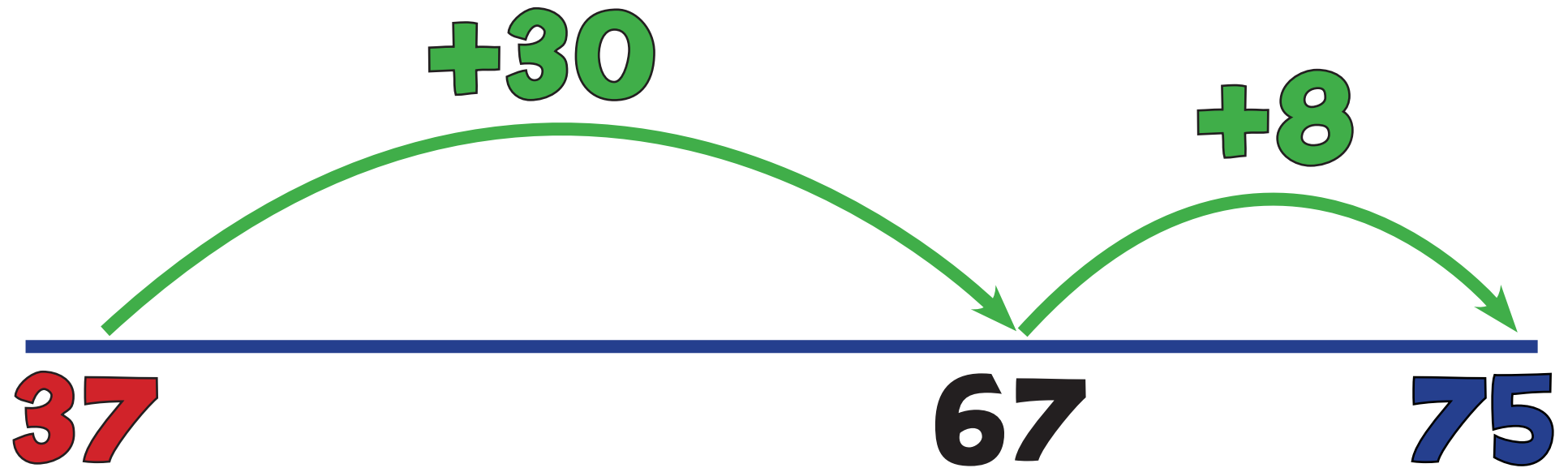


$$87 - 23 = 64$$



S6a: 10s Jump, 1s Jump!

2

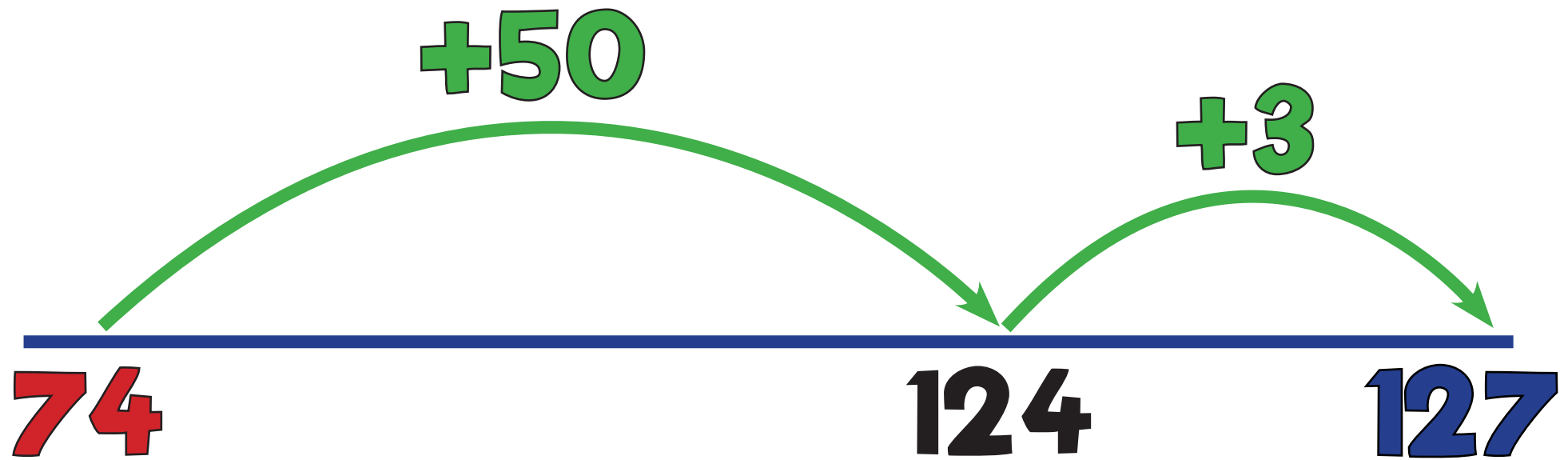


$$75 - 37 = 38$$



S6b: 10s Jump, 1s Jump!

3

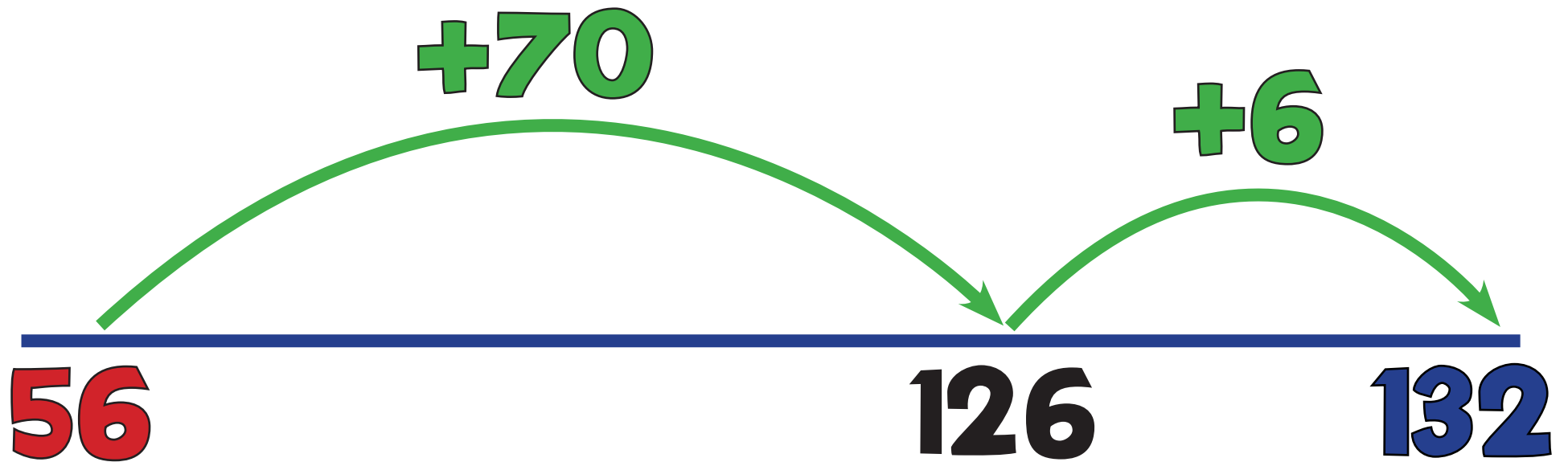


$$127 - 74 = 53$$



S6c: 10s Jump, 1s Jump!

3

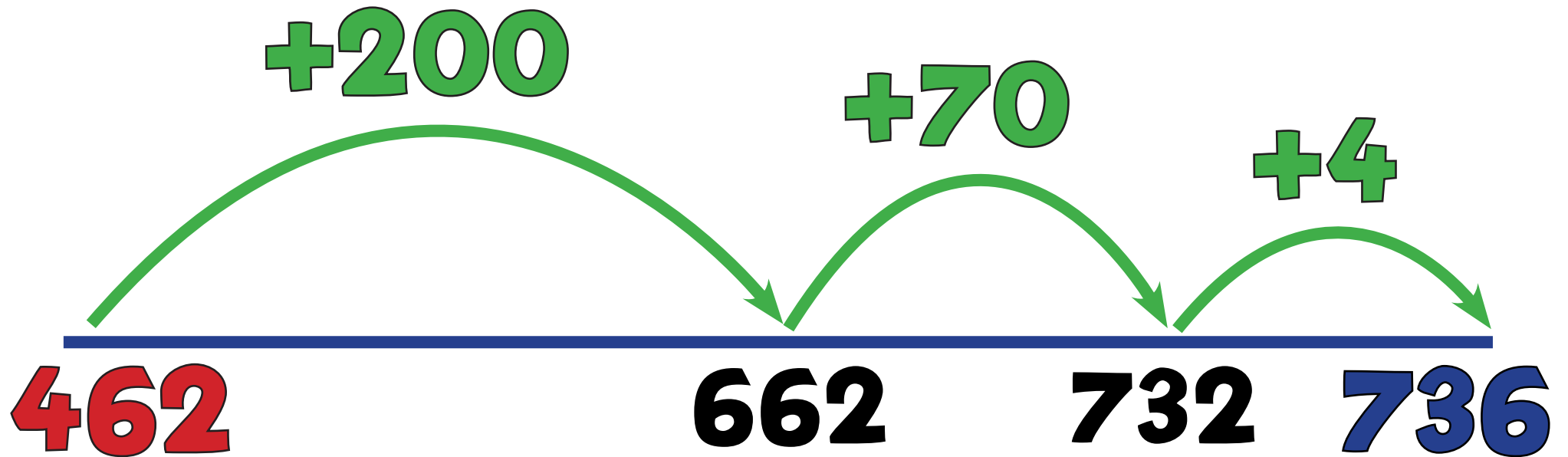


$$132 - 56 = 76$$



S6d: 100s, 10s, 1s Jump

3

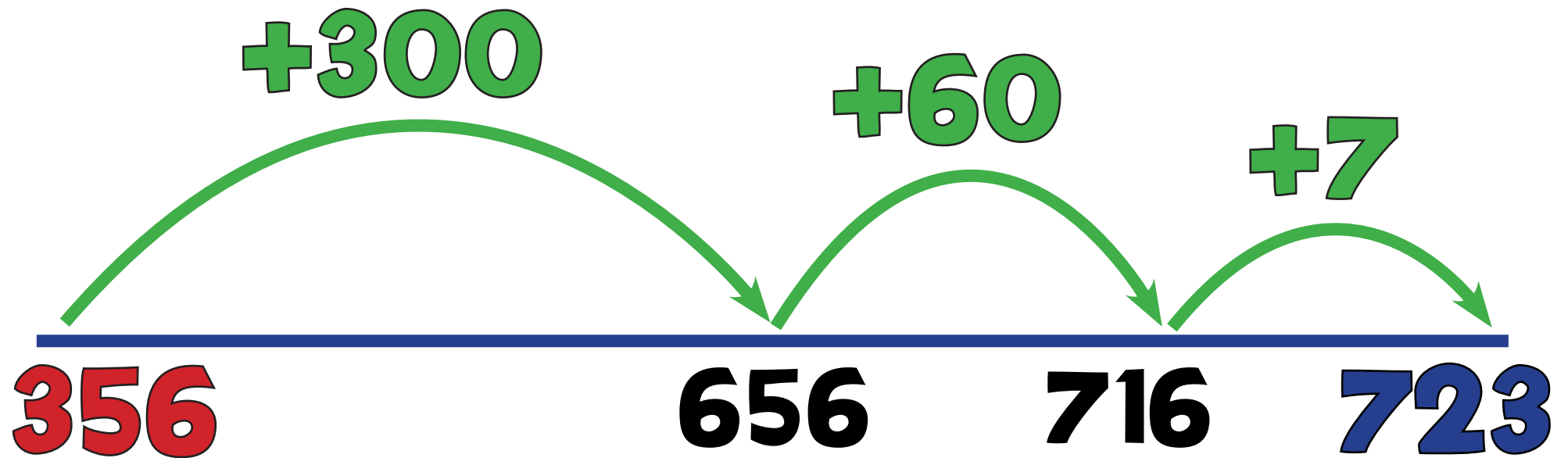


$$736 - 462 = 274$$



S6e: 100s, 10s, 1s Jump

3

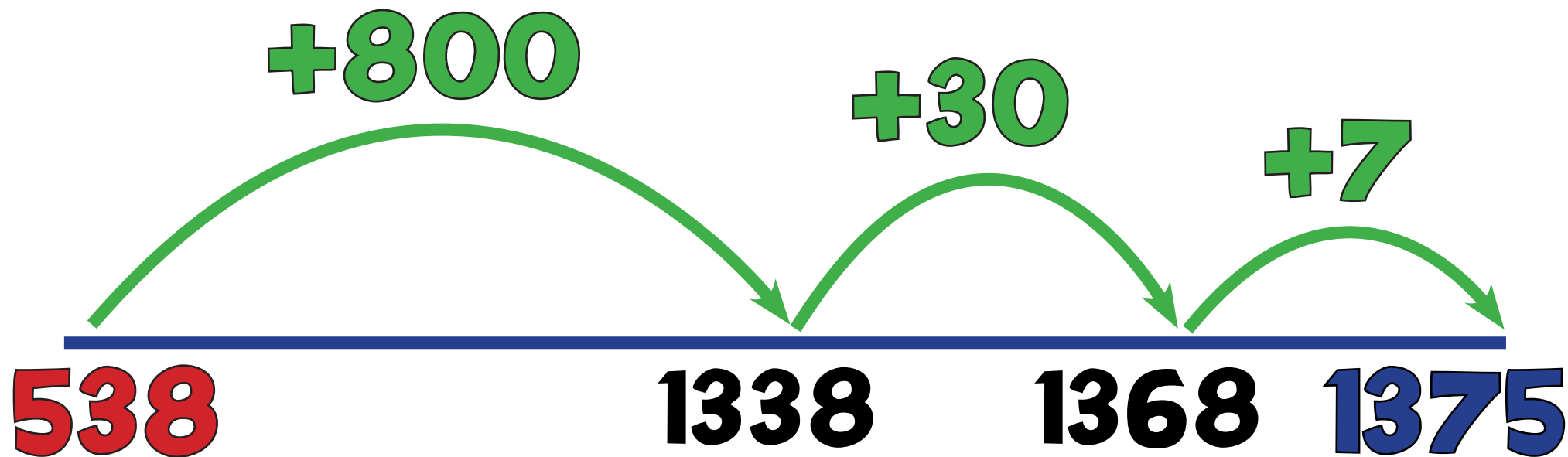


$$723 - 356 = 367$$



S6f: 100s, 10s, 1s Jump

4

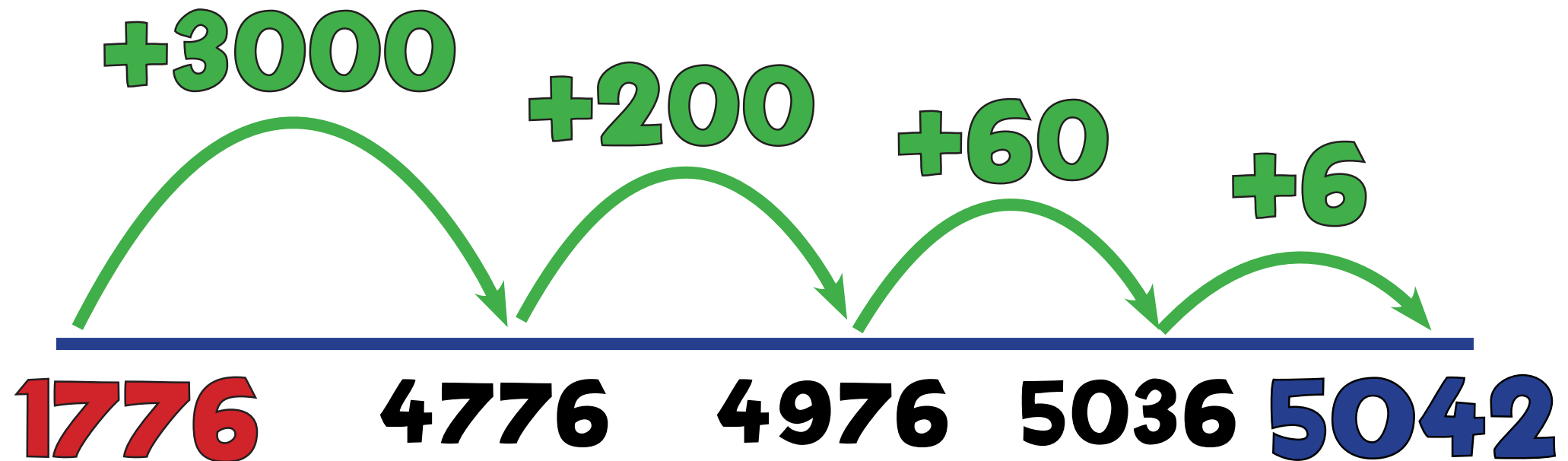


$$1375 - 538 = 837$$



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

4

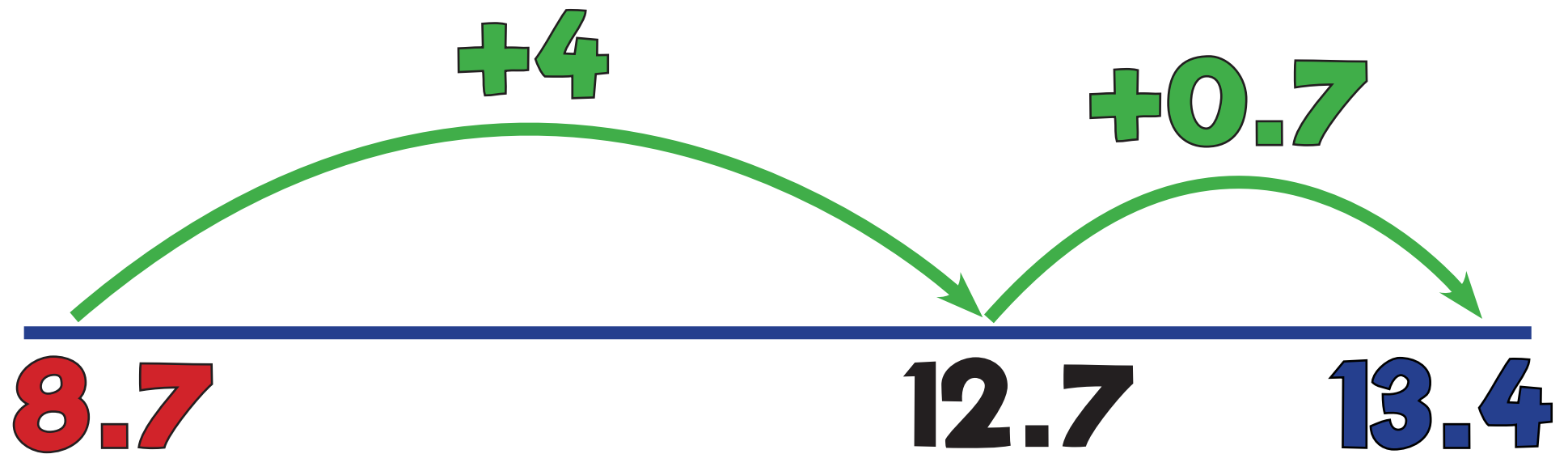


$$5042 - 1776 = 3266$$



S6i: 1s Jump, Tenths Jump!

5

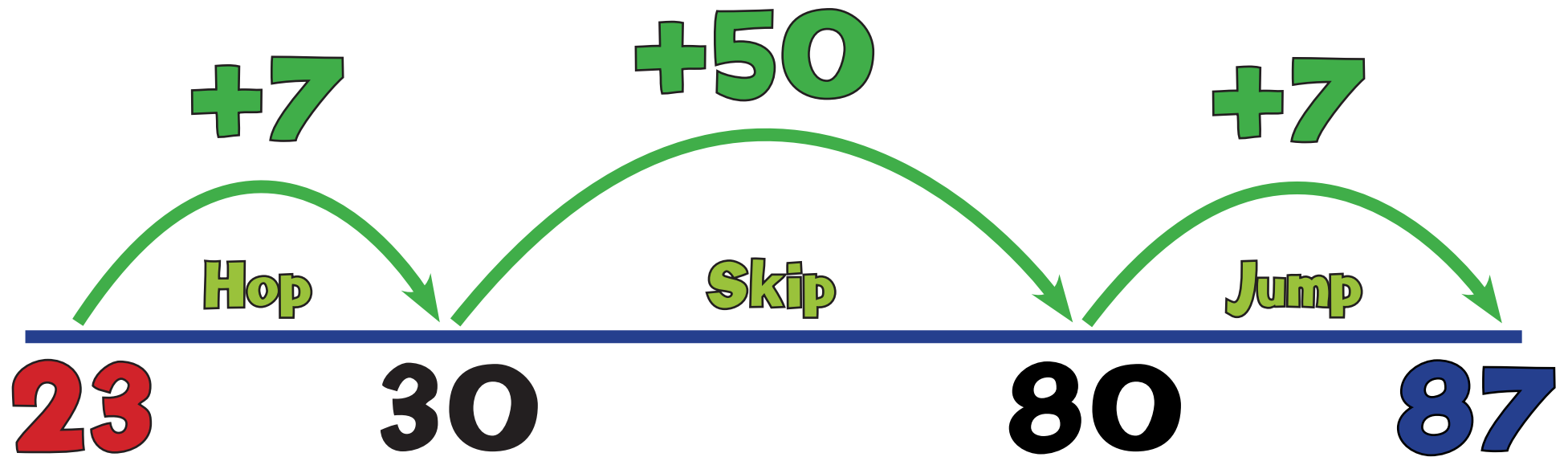


$$13.4 - 8.7 = 4.7$$



S7: Triple Jump!

2

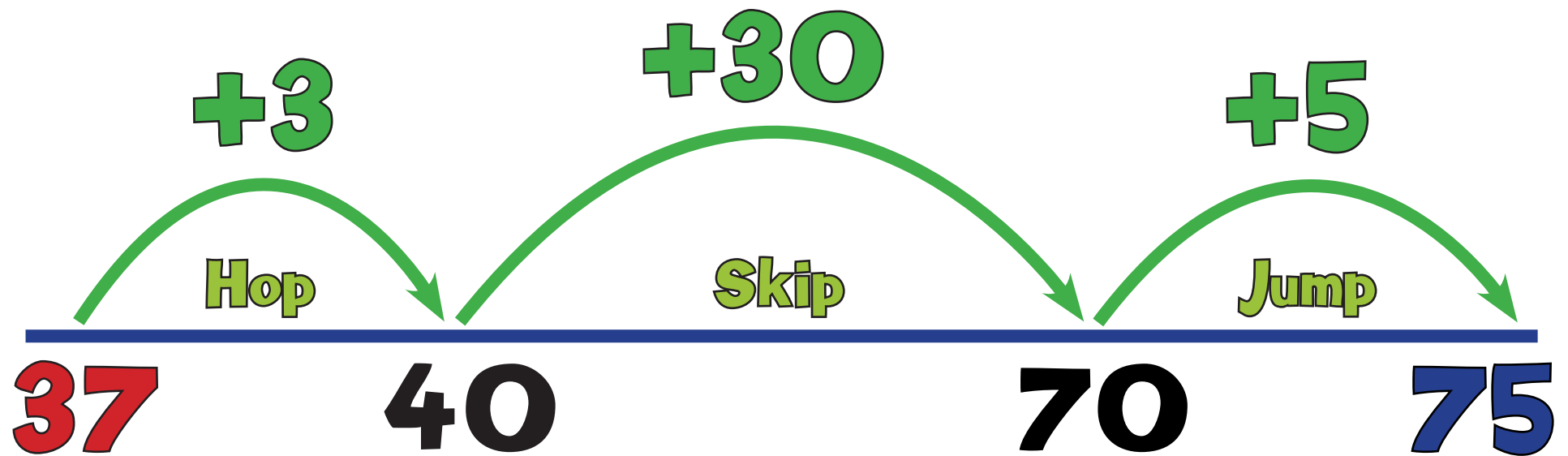


$$87 - 23 = 64$$



S7a: Triple Jump!

2

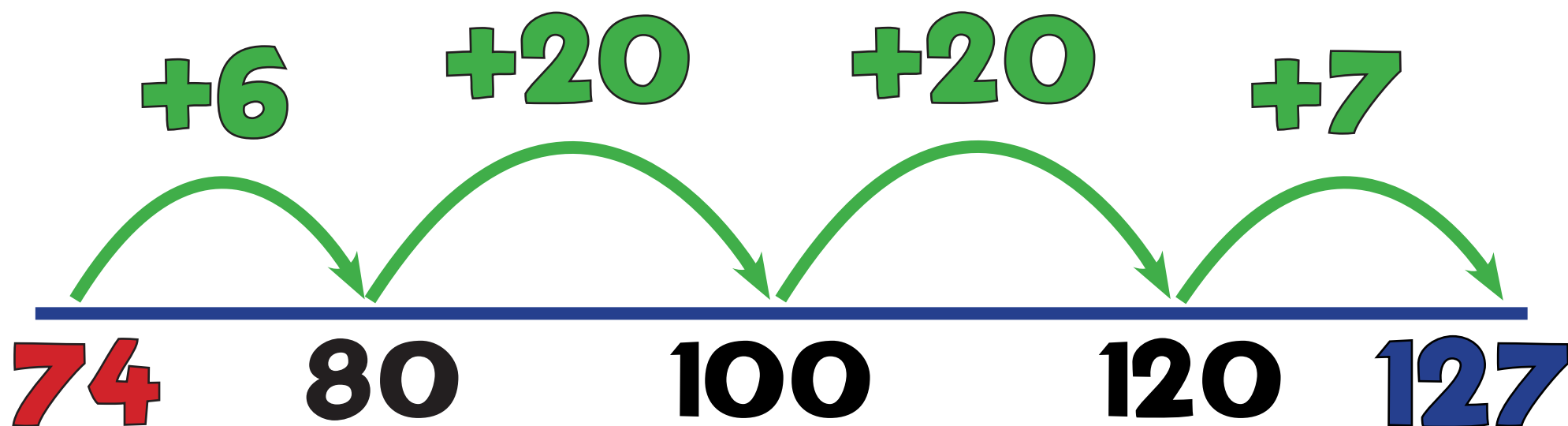


$$75 - 37 = 38$$



S7b: Quad Jump!

3

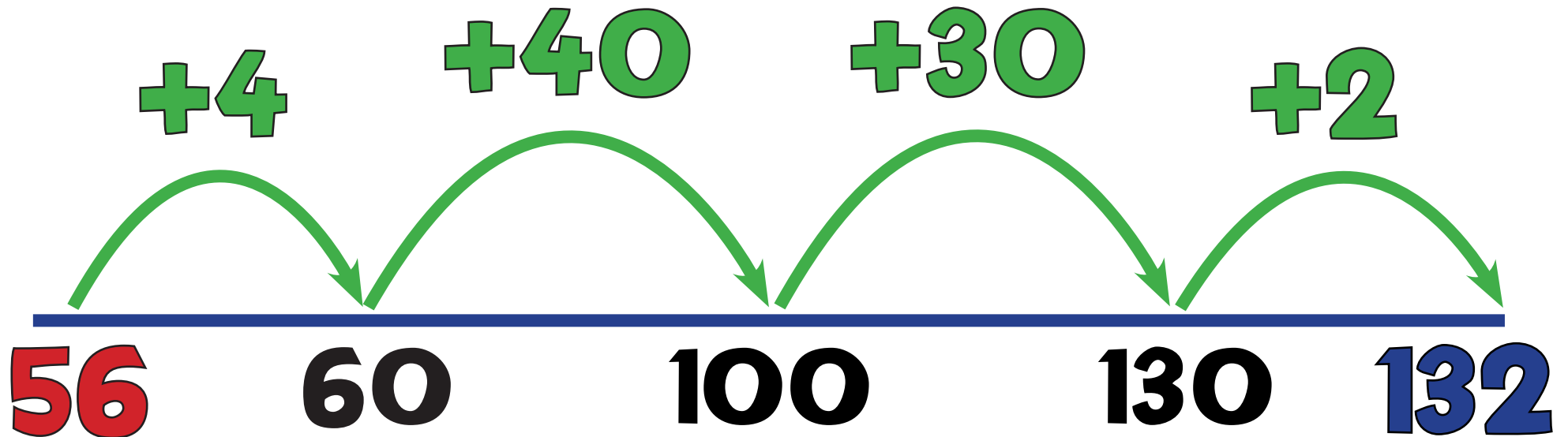


$$127 - 74 = 53$$



S7c: Quad Jump!

3

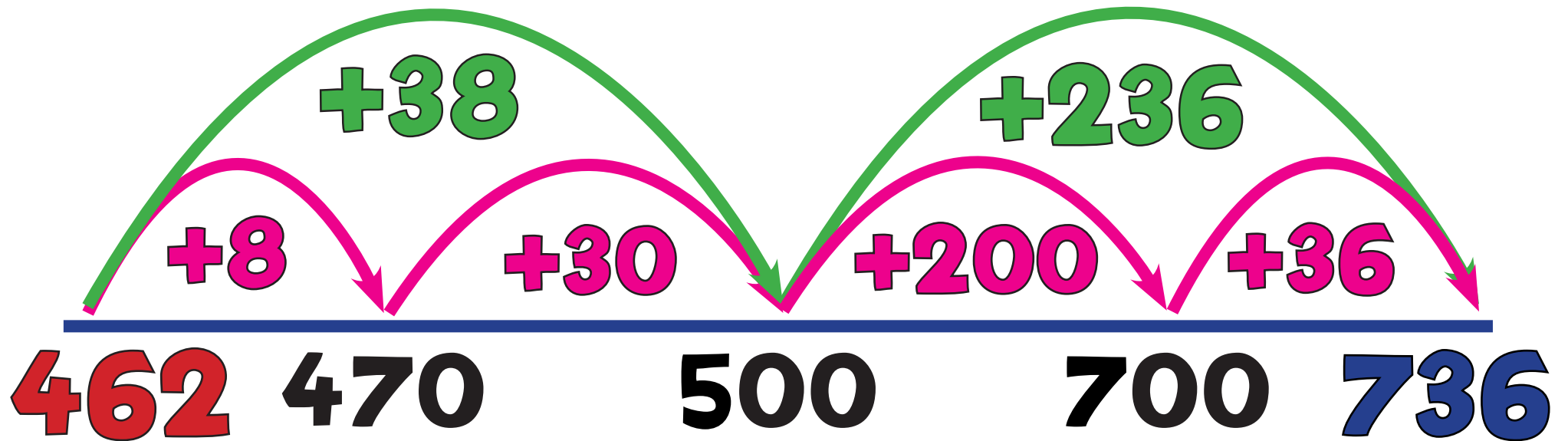


$$132 - 56 = 76$$



S7d: Big Jump!

3

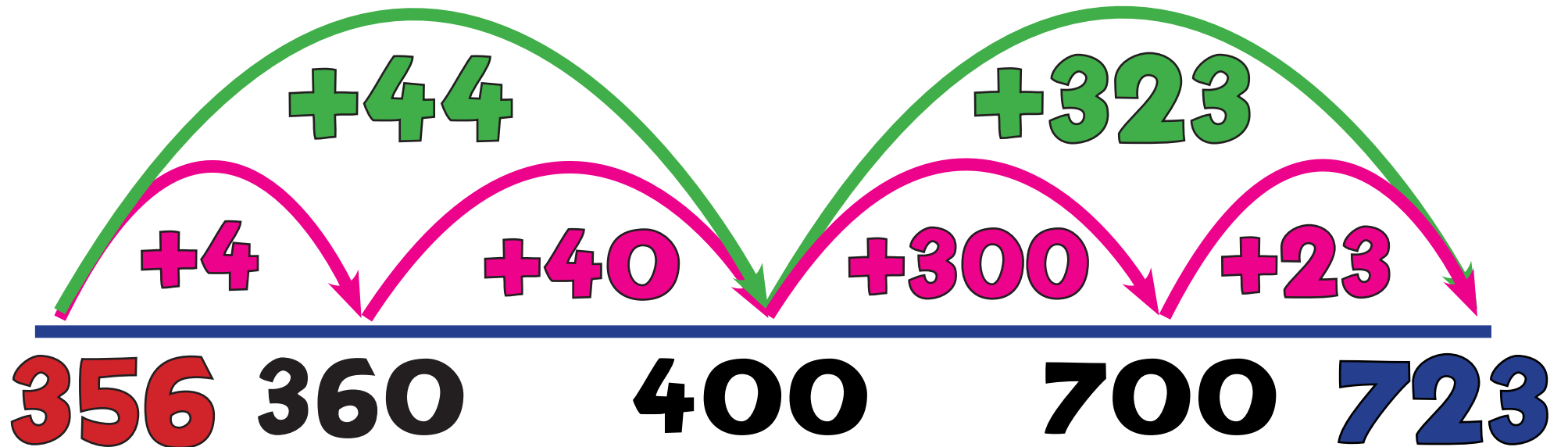


$$736 - 462 = 274$$



S7e: Big Jump!

3

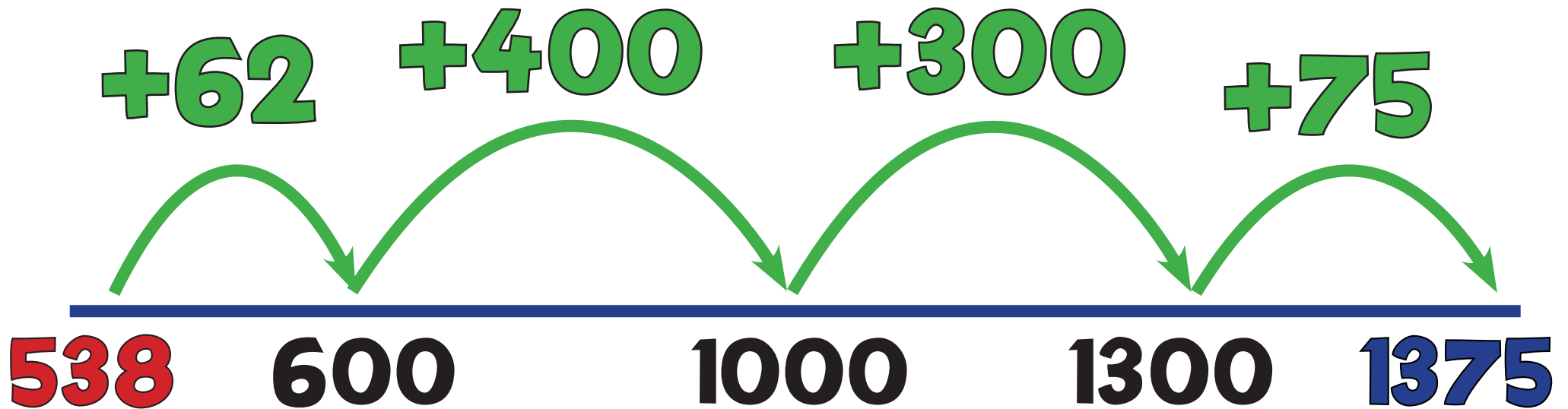


$$723 - 356 = 367$$



S7f: Quad Jump Extreme

4

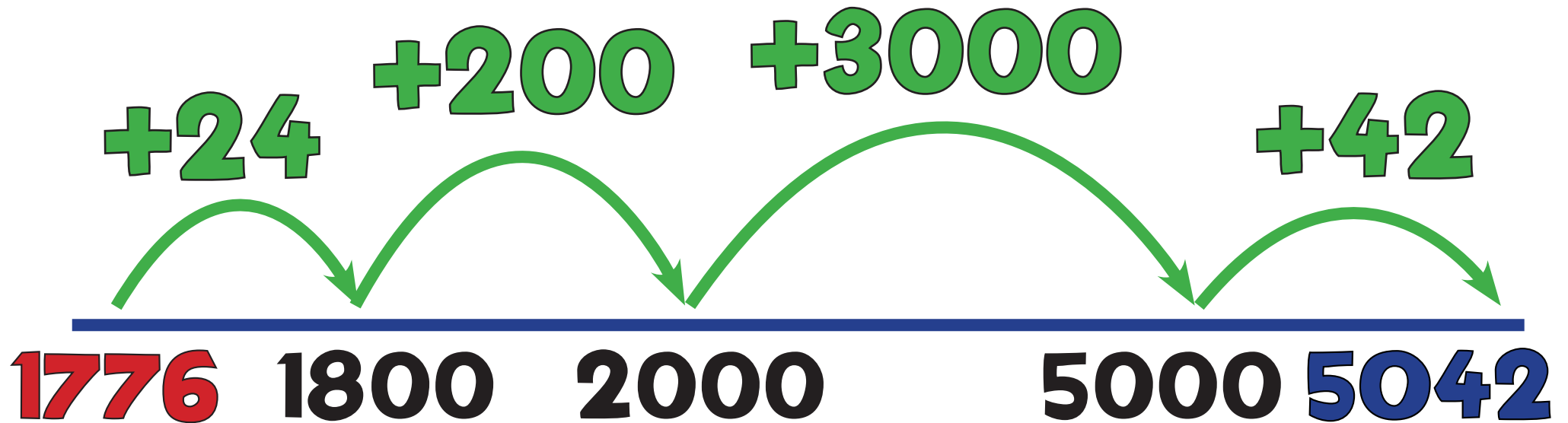


$$1375 - 538 = 837$$



S7g Quad Jump Extreme

4

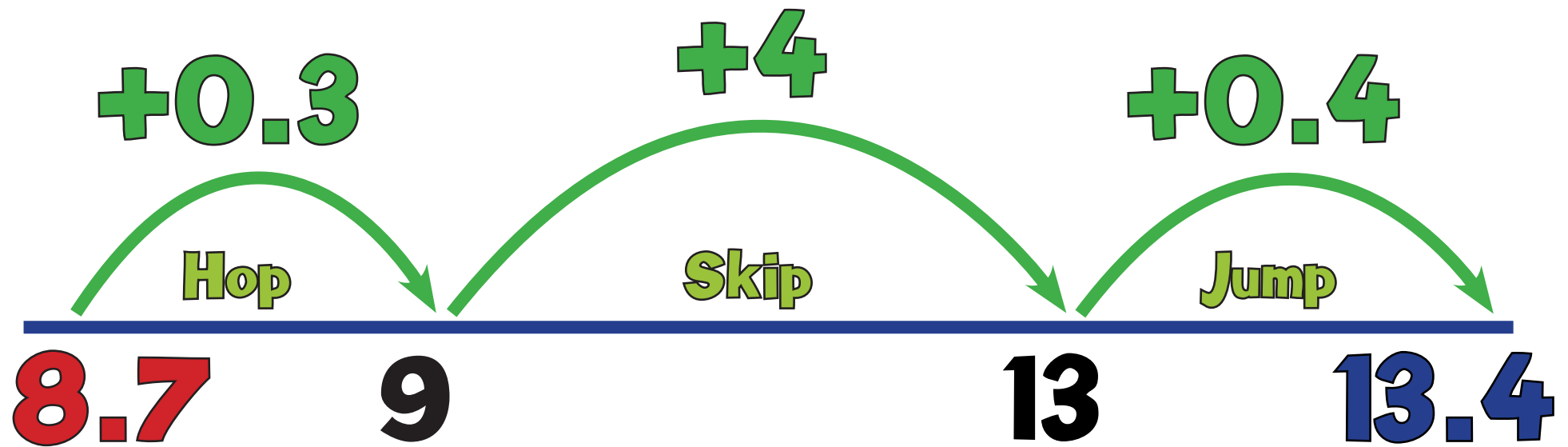


$$5042 - 1776 = 3266$$



S7i: Decimal T-J!

5



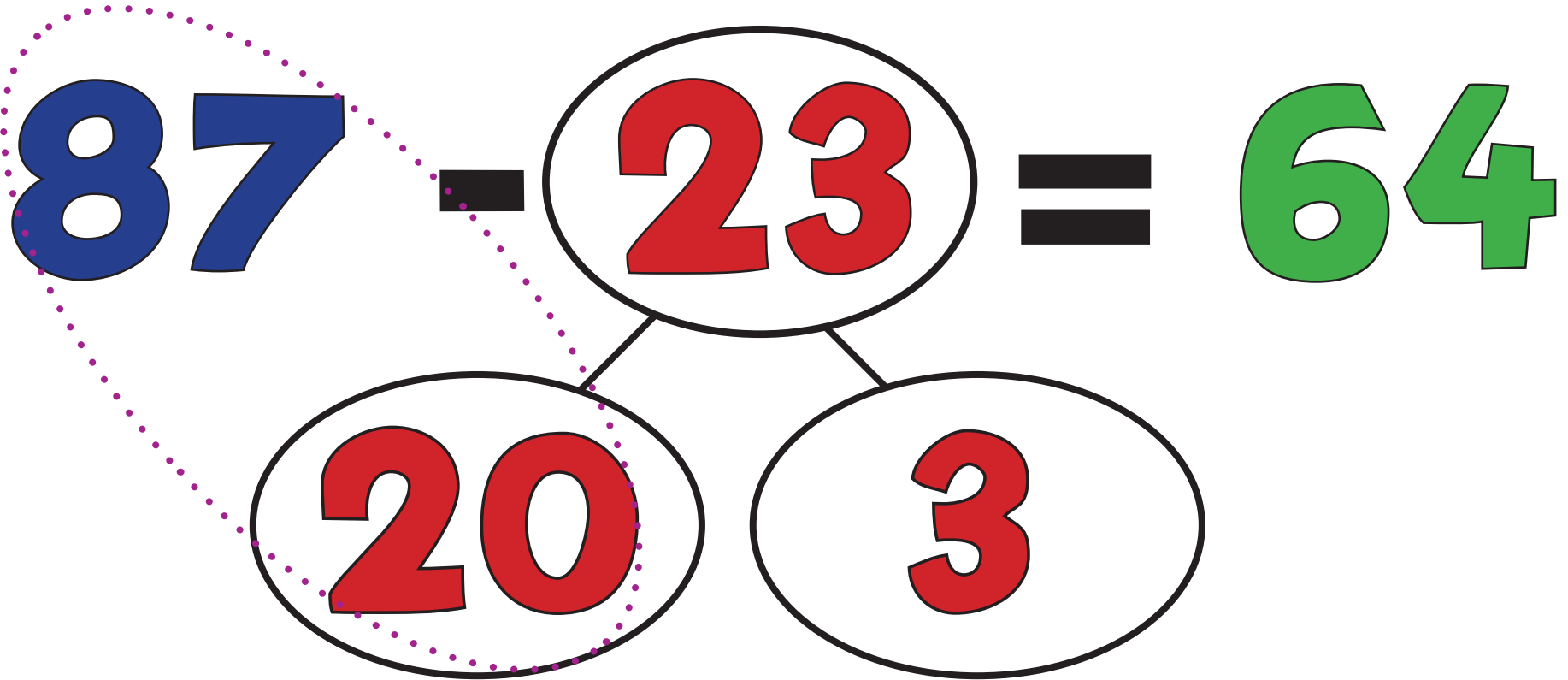
$$13.4 - 8.7 = 4.7$$



S8: Part/Whole (S)

2

Partition the Subtrahend



$$87 - 20 = 67 \quad | \quad 67 - 3 = 64$$



S8a: Part/Whole (S)

2

Partition the Subtrahend

$$75 - 37 = 38$$

$$35$$

$$2$$

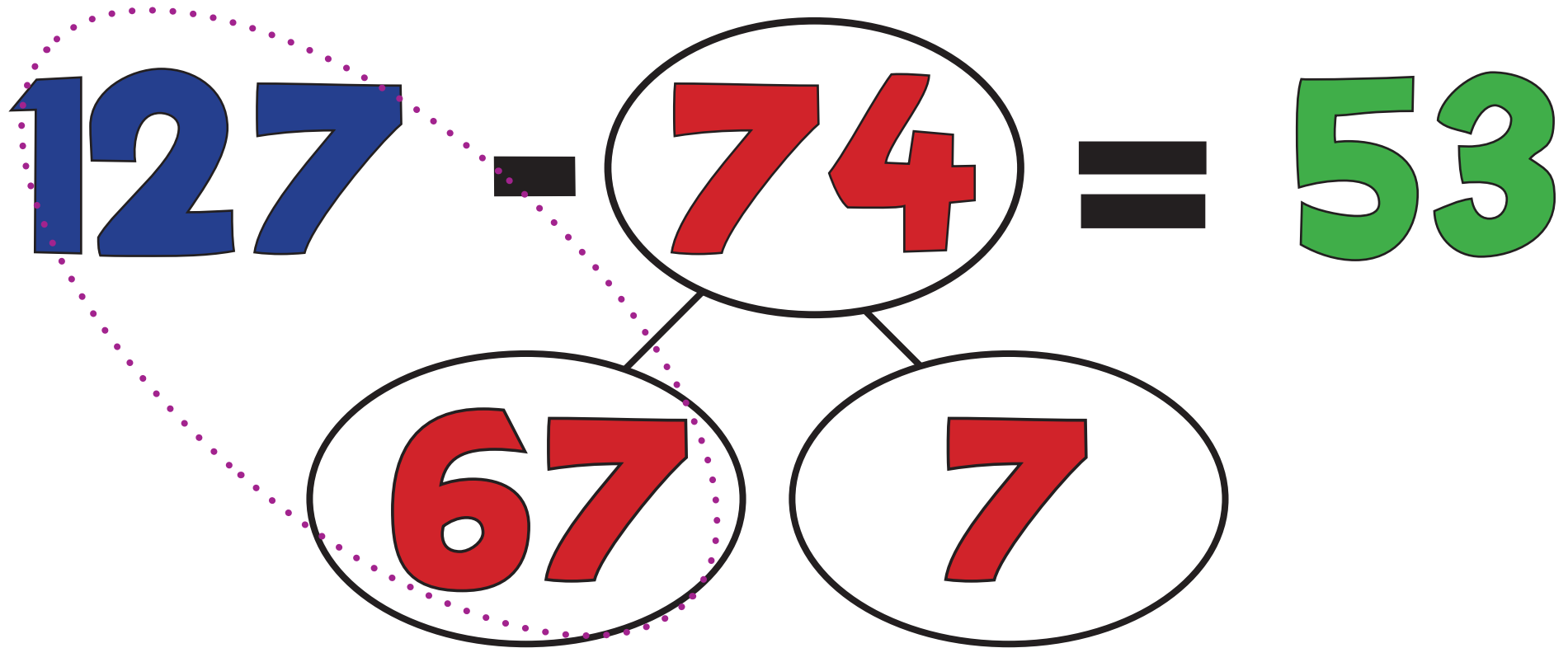
$$75 - 35 = 40 \quad | \quad 40 - 2 = 38$$



S8b: Part/Whole (S)

3

Partition the Subtrahend



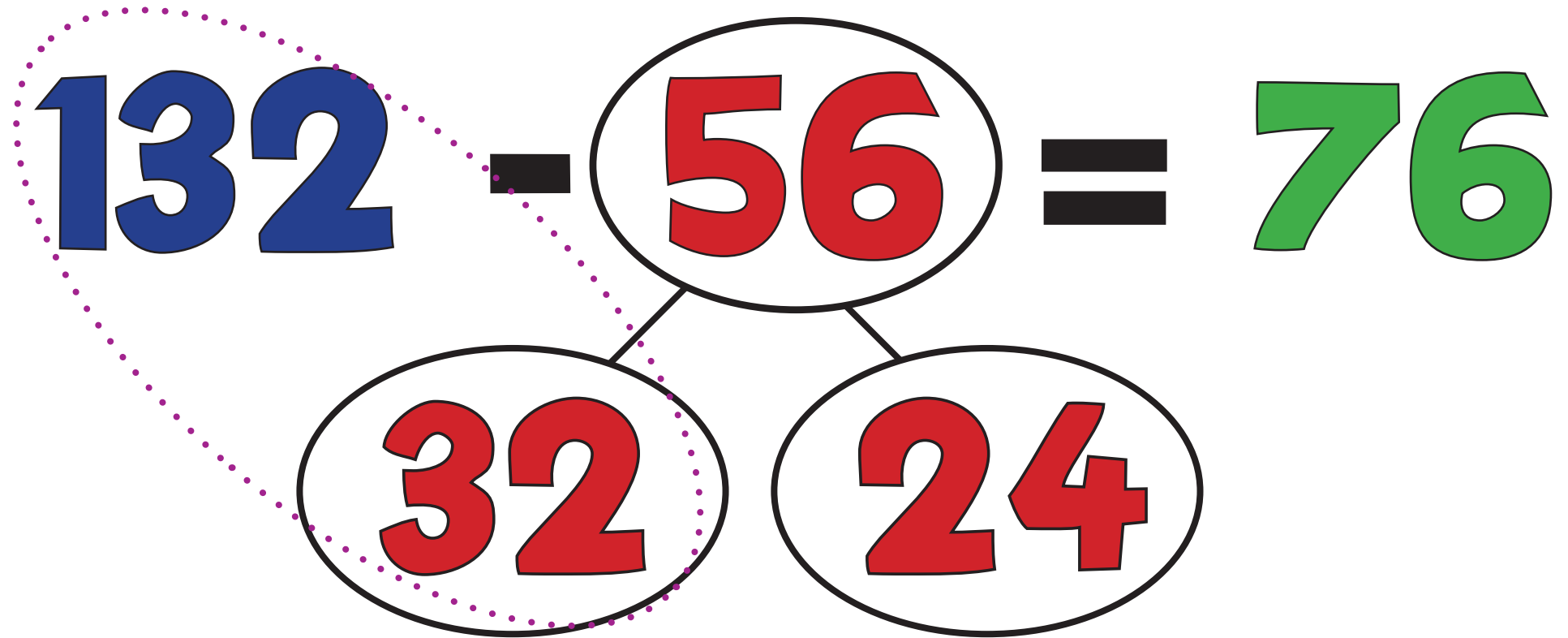
$$127 - 67 = 60 \quad | \quad 60 - 7 = 53$$



S8c: Part/Whole (S)

3

Partition the Subtrahend



$$132 - 32 = 100$$

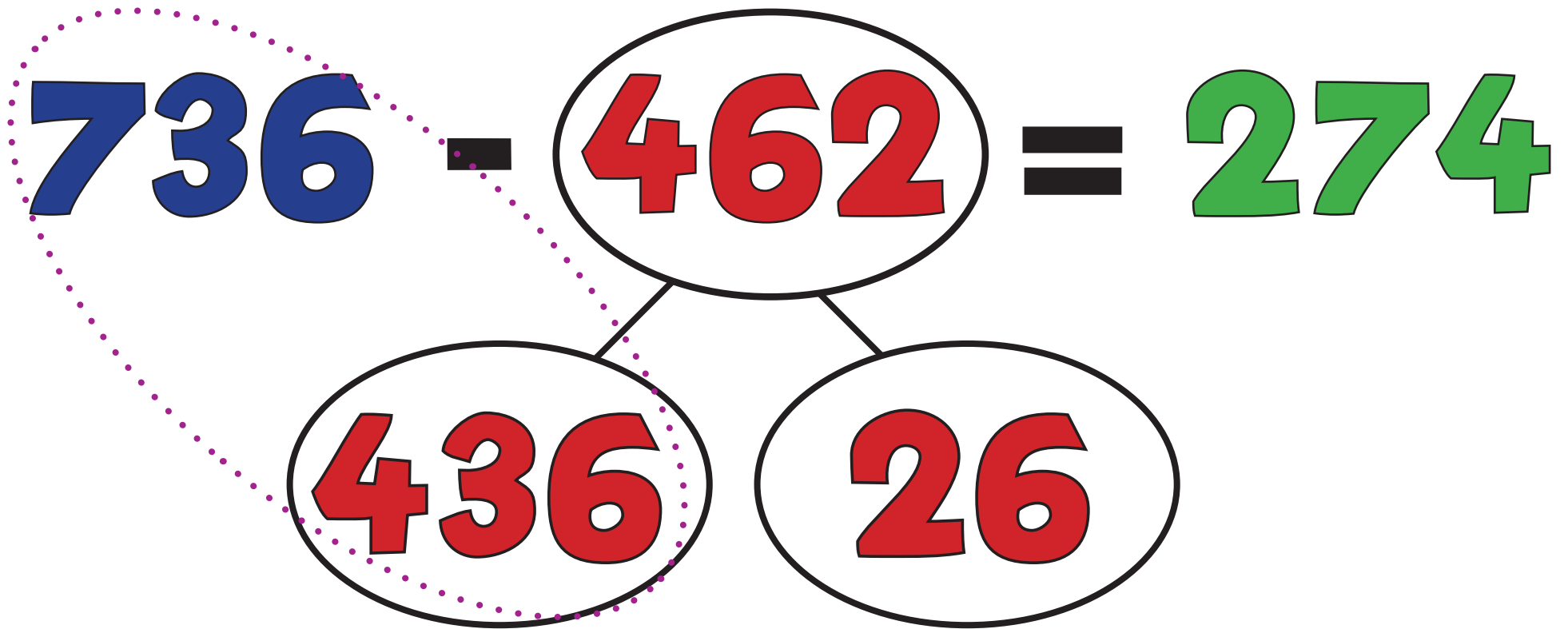
$$100 - 24 = 76$$



S8d: Part/Whole (S)

3

Partition the Subtrahend



$$736 - 436 = 300 \quad | \quad 300 - 26 = 274$$



S8e: Part/Whole (S)

3

Partition the Subtrahend

$$723 - 356 = 367$$

323

33

$$723 - 323 = 400 \quad | \quad 400 - 33 = 367$$



S8f: Part/Whole (S)

4

Partition the Subtrahend

$$1375 - 538 = 837$$

The subtrahend 538 is partitioned into 525 and 13.

$$1375 - 525 = 850 \quad | \quad 850 - 13 = 837$$



S8h: Part/Whole (S)

5

Partition the Subtrahend

$$13.4 - 8.7 = 4.7$$

$$8.4$$

$$0.3$$

$$13.4 - 8.4 = 5 \quad | \quad 5 - 0.3 = 4.7$$



S9a: Part/Whole (M)

2

Partition the Minuend

$$75 - 37 = 38$$



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

$$3 + 35 = 38$$

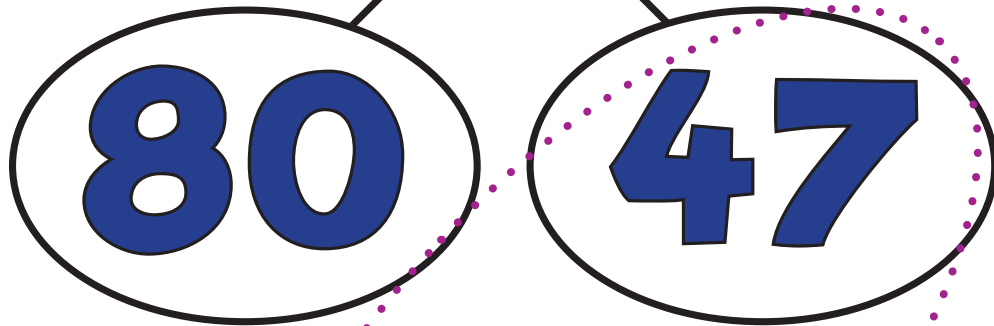


S9b: Part/Whole (M)

3

Partition the Minuend

$$127 - 74 = 53$$



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

$$6 + 47 = 53$$

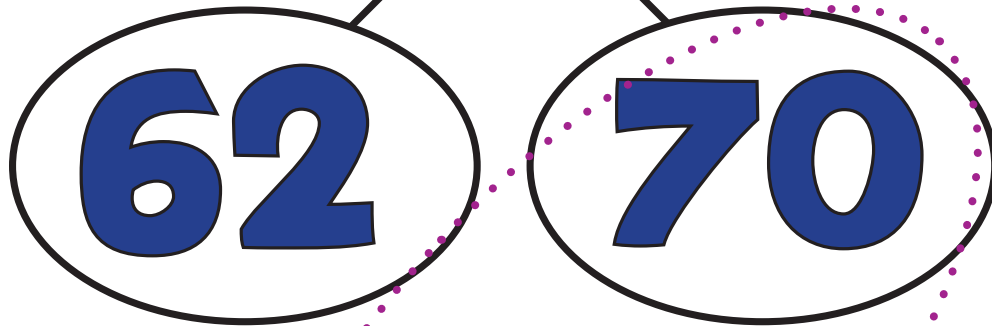


S9c: Part/Whole (M)

3

Partition the Minuend

$$132 - 56 = 76$$



$$\begin{array}{r} - 56 \\ \hline 6 \end{array}$$

$$6 + 70 = 76$$



S9d: Part/Whole (M)

3

Partition the Minuend

$$736 - 462 = 274$$

500

236

$$\begin{array}{r} - 462 \\ \hline \end{array}$$

38

$$38 + 236 = 274$$



S9e: Part/Whole (M)

3

Partition the Minuend

$$723 - 356 = 367$$

400

323

$$\begin{array}{r} - 356 \\ \hline \end{array}$$

44

$$44 + 323 = 367$$

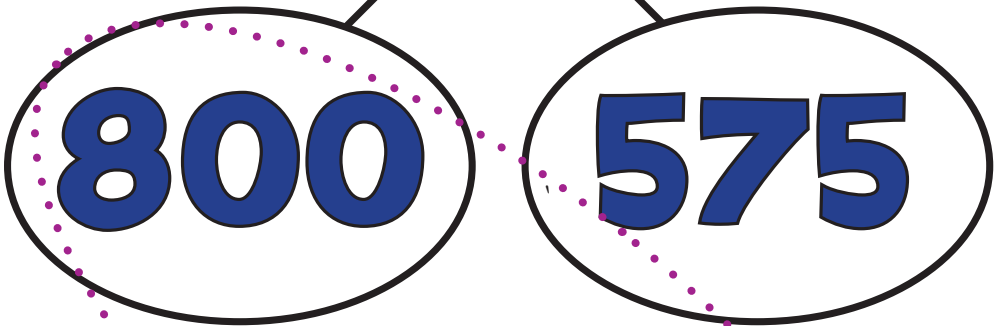


S9f: Part/Whole (M)

4

Partition the Minuend

$$1375 - 538 = 837$$



$$\begin{array}{r} - 538 \\ \hline 37 \end{array}$$

$$37 + 800 = 837$$

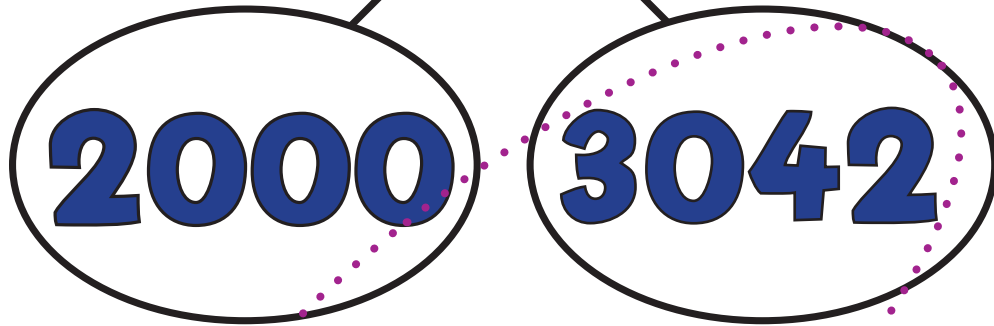


S9g: Part/Whole (M)

4

Partition the Minuend

$$5042 - 1776 = 3266$$



$$\begin{array}{r} - 1776 \\ \hline \end{array}$$

$$224$$

$$224 + 3042 = 3266$$

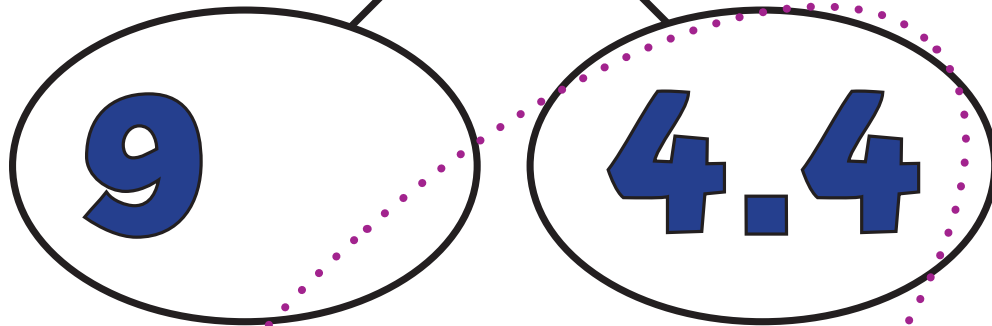


S9h: Part/Whole (M)

5

Partition the Minuend

$$13.4 - 8.7 = 4.7$$



$$\begin{array}{r} - 8.7 \\ \hline 0.3 \end{array}$$

$$0.3 + 4.4 = 4.7$$



S10: Expanded Column

2

Subtraction

$$87 - 23 = 64$$

80	7
20	3
<hr/>	
60	4



S10a: Expanded Column

2 Subtraction

$$75 - 37 = 38$$

60	70	1	5
	30		7
<hr/>			
	30		8



S10b: Expanded Column

3

Subtraction

$$127 - 74 = 53$$

⁰	¹	
100	20	7
-	70	4
<hr/>		
	50	3



S10c: Expanded Column

3

Subtraction

$$132 - 56 = 76$$

⁰	¹²⁰	¹
100	30	2
-	50	6
<hr/>		
	70	6



S10d: Expanded Column

3

Subtraction (100, 10, 1s)

$$736 - 462 = 274$$

	600		1	
	700		30	6
-	400		60	2
<hr/>				
	200		70	4



S10e: Expanded Column

3

Subtraction (100, 10, 1s)

$$723 - 356 = 367$$

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



S11: Column Subtraction

2 Additional

$$\begin{array}{r} \text{10} \quad \text{1} \\ 87 \\ - 23 \\ \hline 64 \end{array}$$



S11a: Column Subtraction

2

$$\begin{array}{r} \text{10} \\ 6 \text{7} \text{5} \\ - 3 \text{7} \\ \hline 3 \text{8} \end{array}$$

The diagram illustrates the column subtraction process for 675 minus 37. The number 675 is written in red, and 37 is written in red. The result, 38, is written in green. A blue minus sign is positioned to the left of the second column. A green horizontal line is drawn below the second column. A red diagonal line is drawn through the 7 in the second column, with a red '1' written above it, indicating a borrowing of 10 from the 6 in the third column. The 6 in the third column is crossed out with a red diagonal line, and a red '6' is written above it, indicating that the 6 has become 16 after borrowing.



S11b: Column Subtraction

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ \text{0} \quad \text{1} \\ \begin{array}{r} \cancel{1}27 \\ - 74 \\ \hline 53 \end{array} \end{array}$$



S11c: Column Subtraction

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ \text{0} \quad \text{12} \quad \text{1} \\ \text{1} \quad \text{3} \quad \text{2} \\ - \quad \text{5} \quad \text{6} \\ \hline \text{7} \quad \text{6} \\ \hline \end{array}$$



S11d: Column Subtraction

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ \text{6} \quad \text{1} \\ \text{7} \text{3} \text{6} \\ - \text{4} \text{6} \text{2} \\ \hline \text{2} \text{7} \text{4} \end{array}$$



S11e: Column Subtraction

3

$$\begin{array}{r} \text{100} \quad \text{10} \quad \text{1} \\ \text{6} \quad \text{11} \quad \text{1} \\ \text{7} \text{2} \text{3} \\ - \text{3} \text{5} \text{6} \\ \hline \text{3} \text{6} \text{7} \end{array}$$



S11f: Column Subtraction

4

$$\begin{array}{r} \overset{0}{1} \overset{1}{3} \\ - \quad 5 \\ \hline 83 \end{array} \qquad \begin{array}{r} \overset{6}{7} \overset{1}{5} \\ - \quad 38 \\ \hline 37 \end{array}$$



S11g: Column Subtraction

4

$$\begin{array}{r} \overset{4}{5} \overset{19}{0} \overset{13}{4} \overset{1}{2} \\ - 1776 \\ \hline 3266 \end{array}$$



S11h: Column Subtraction

5

$$\begin{array}{r} \\ 742831 \\ - 427358 \\ \hline 315473 \end{array}$$

The diagram illustrates column subtraction with borrowing. The top row shows the minuend 742831 and the subtrahend 427358. A minus sign is placed to the left of the subtrahend. The result 315473 is shown below a pink horizontal line. Borrowing is indicated by numbers above the digits: 3 above the first 4, 1 above the 2, 7 above the 8, 12 above the 3, and 1 above the 1. Black diagonal lines are drawn through the 4, 8, and 3 in the top row. The numbers are color-coded: 7 (purple), 4 (yellow), 2 (light blue), 8 (dark blue), 3 (red), 1 (green), 4 (purple), 2 (yellow), 7 (light blue), 3 (dark blue), 5 (red), 8 (green), 3 (purple), 1 (yellow), 5 (light blue), 4 (dark blue), 7 (red), 3 (green).



S11i: Column Subtraction

5

$$\begin{array}{r} \begin{array}{ccc} 10 & 1 & \frac{1}{10} \\ 0 & 12 & 1 \\ \hline 1 & 3 & 4 \\ \hline - & 8 & 7 \\ \hline 4 & 7 & \end{array} \end{array}$$



S11j: Column Subtraction

5

$$\begin{array}{r} \begin{array}{cccc} 10 & 1 & \cdot & \frac{1}{10} & \frac{1}{100} \\ 6 & 11 & & 13 & 1 \\ \cancel{7} & \cancel{2} & \cdot & \cancel{4} & 3 \\ - & 4 & 7 & \cdot & 8 & 5 \\ \hline 2 & 4 & \cdot & 5 & 8 \end{array} \end{array}$$



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	.	9	7			
	6	.	4	3			



Multiplication Strategies

171		Calculation & Vocabulary
173	M1	Objects and Pictures
175	M2	Repeated Addition
177	M3	Arrays
179	M4	Multi Boing!
181	M5	Partitoning
183	M6	Grid Method
186	M7	Expanded Column
189	M8	Column Multiplication
193	M9	Grid Method (Long Mult.)
201	M10	Long Multiplication



Multiplication Calculation

$$4 \times 2 = 8$$

(multiplied by)

(equals)

multiplicand

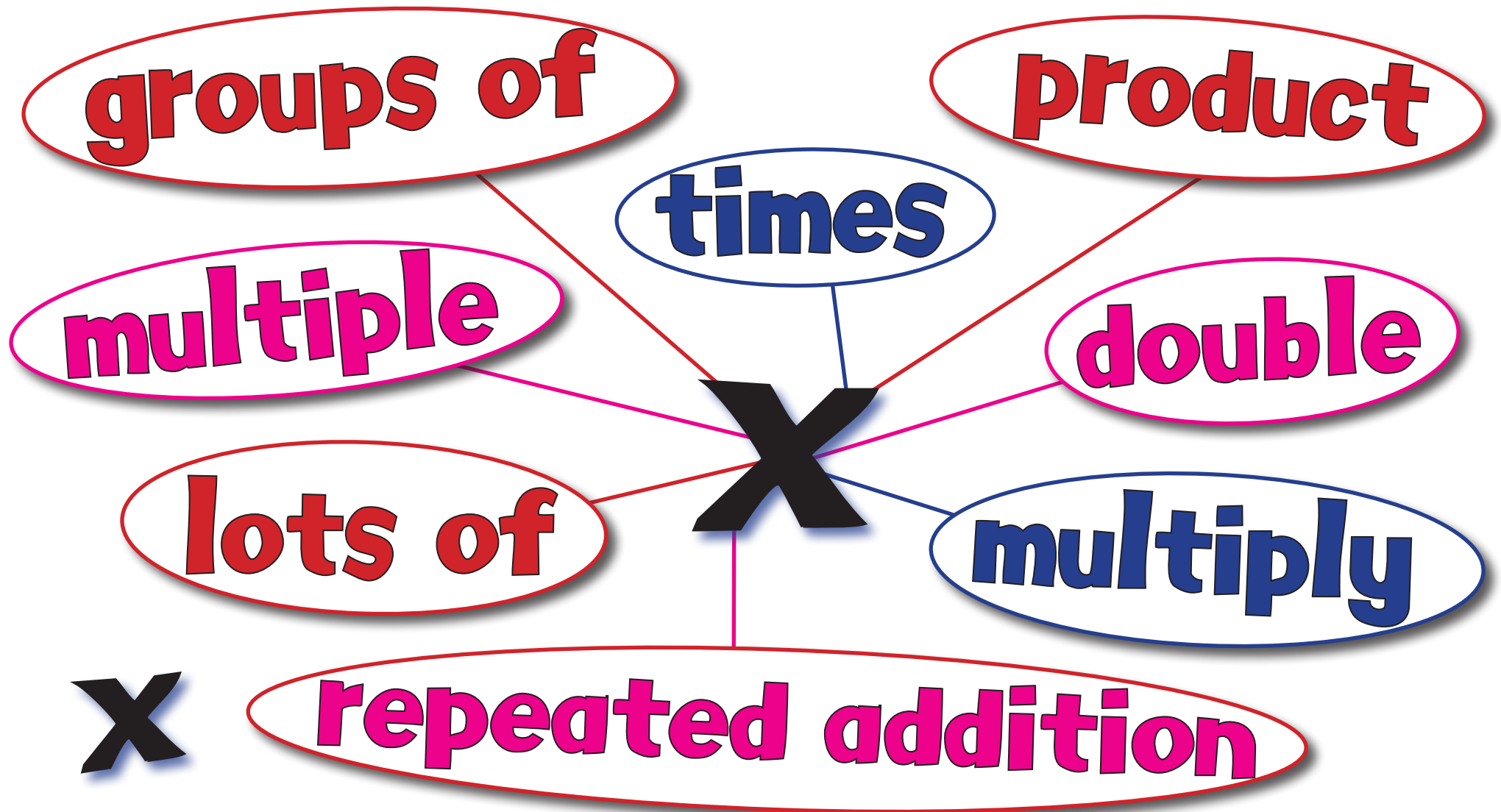
product

multiplier

x

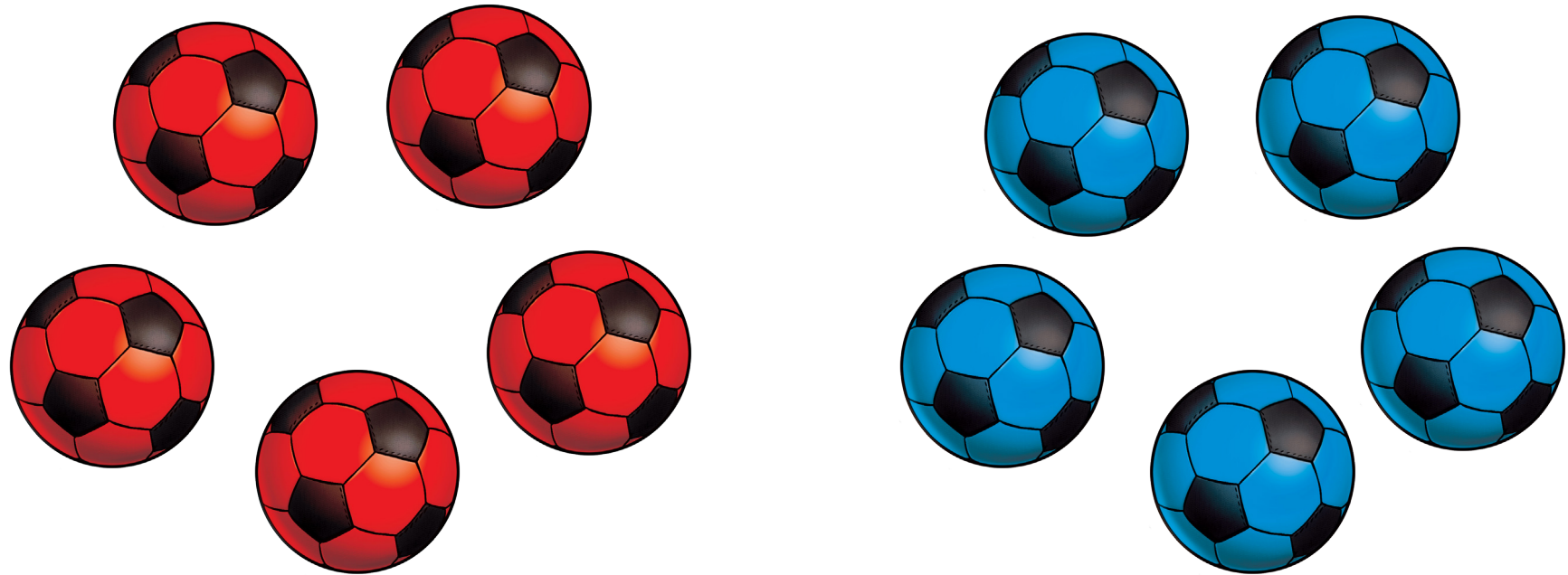


Multiplication Vocabulary



M1: Objects and Pictures

1

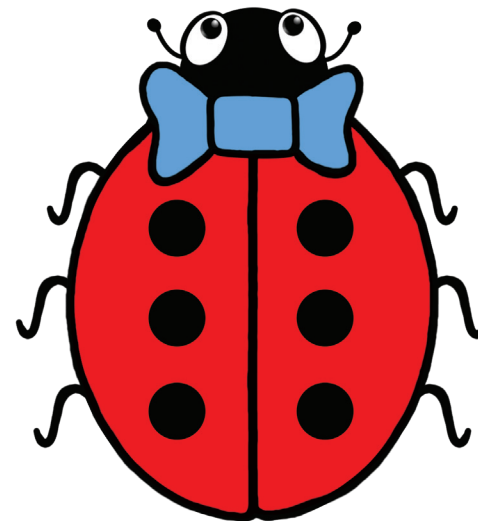


“A bag of **5 red** footballs and a bag of **5 blue** footballs makes **10** footballs altogether.”



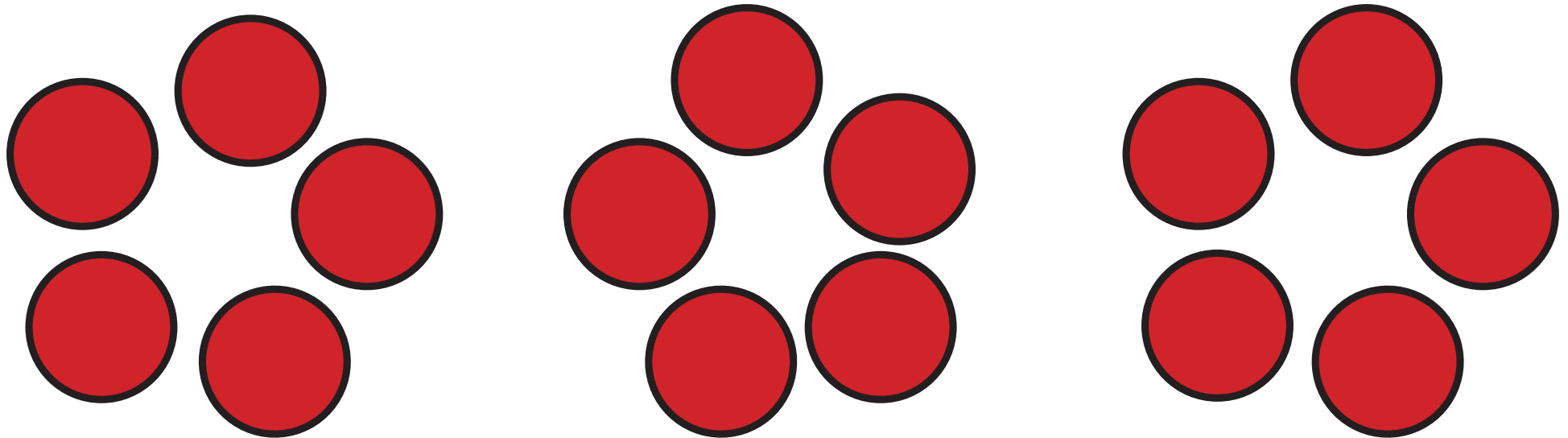
M1a: Objects and Pictures

1



M2: Repeated Addition

2 (Groups)



$$5 \times 3 = 5 + 5 + 5 = 15$$

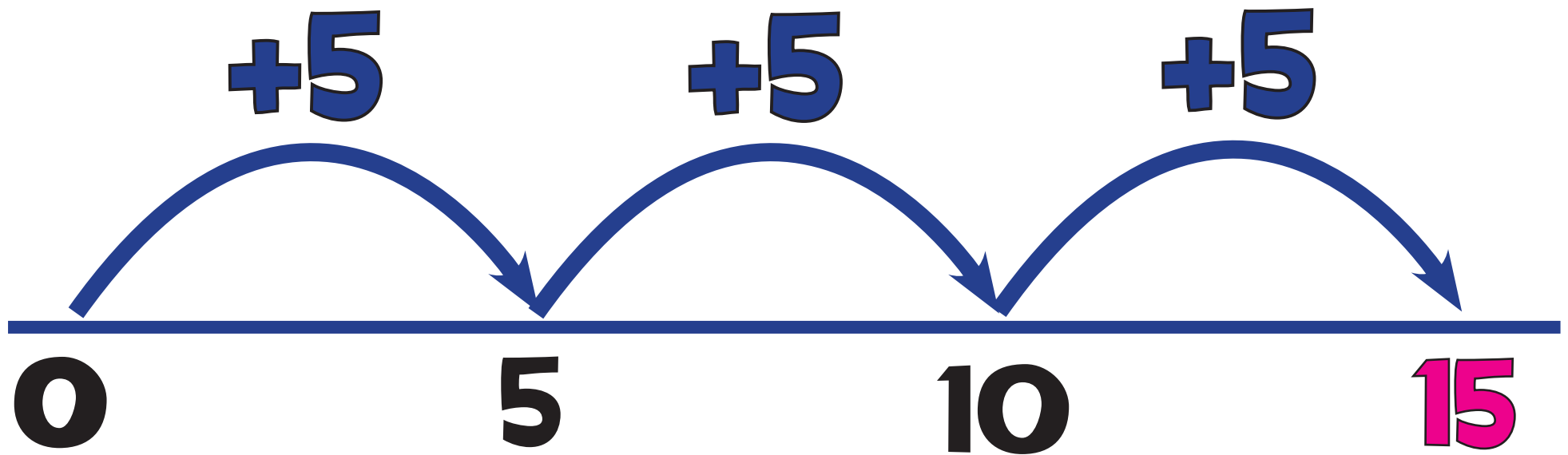
“5 multiplied by 3” means “5, 3 times”, which gives “3 lots of 5”!



M2a: Repeated Addition

(Number Line)

2



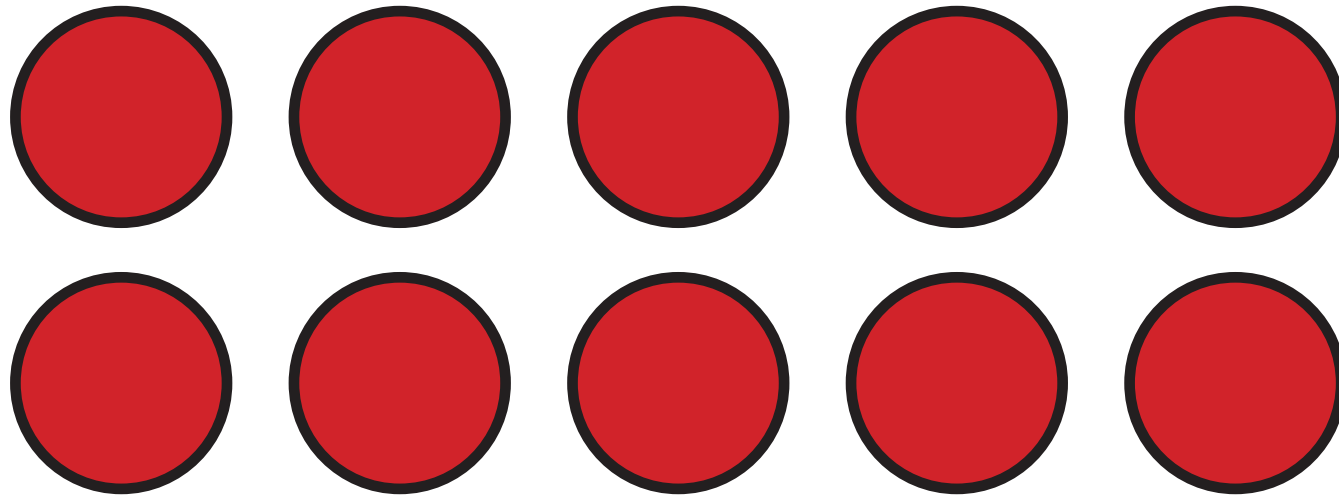
$$5 \times 3 = 5 + 5 + 5 = 15$$

“5 times 3” means “5, 3 times!”



M3: Arrays

1

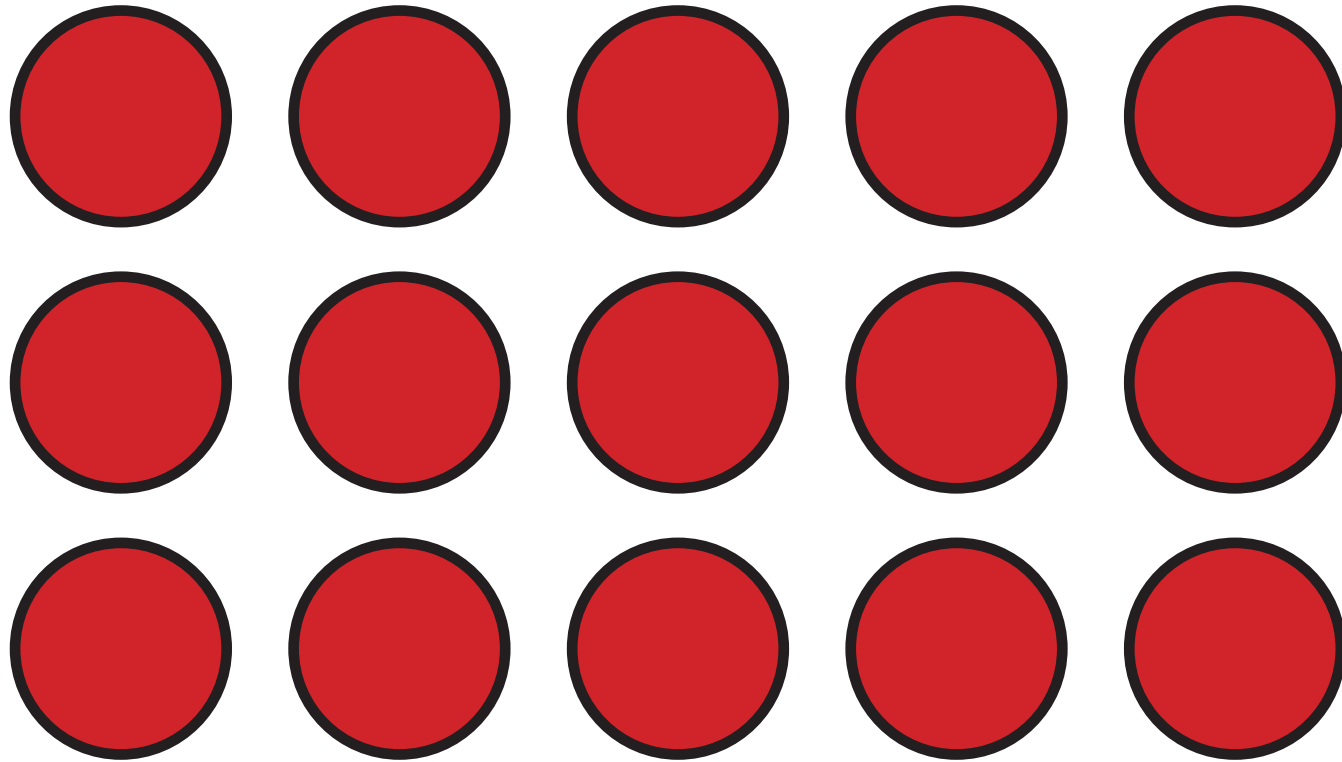


“2 groups of 5 counters” or “5 groups of 2 counters” - “10 counters altogether”



M3: Arrays

2

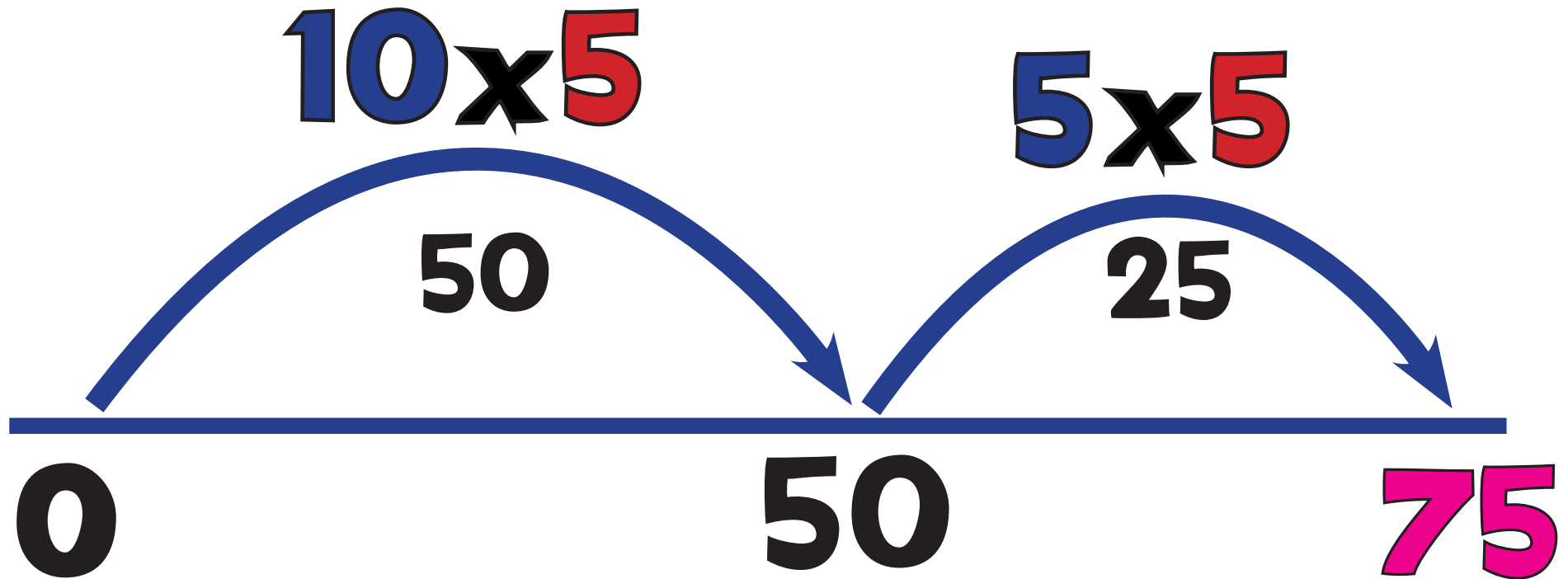


$$3 \times 5 = 15 \text{ or } 5 \times 3 = 15$$



M4: Multi Boing!

3

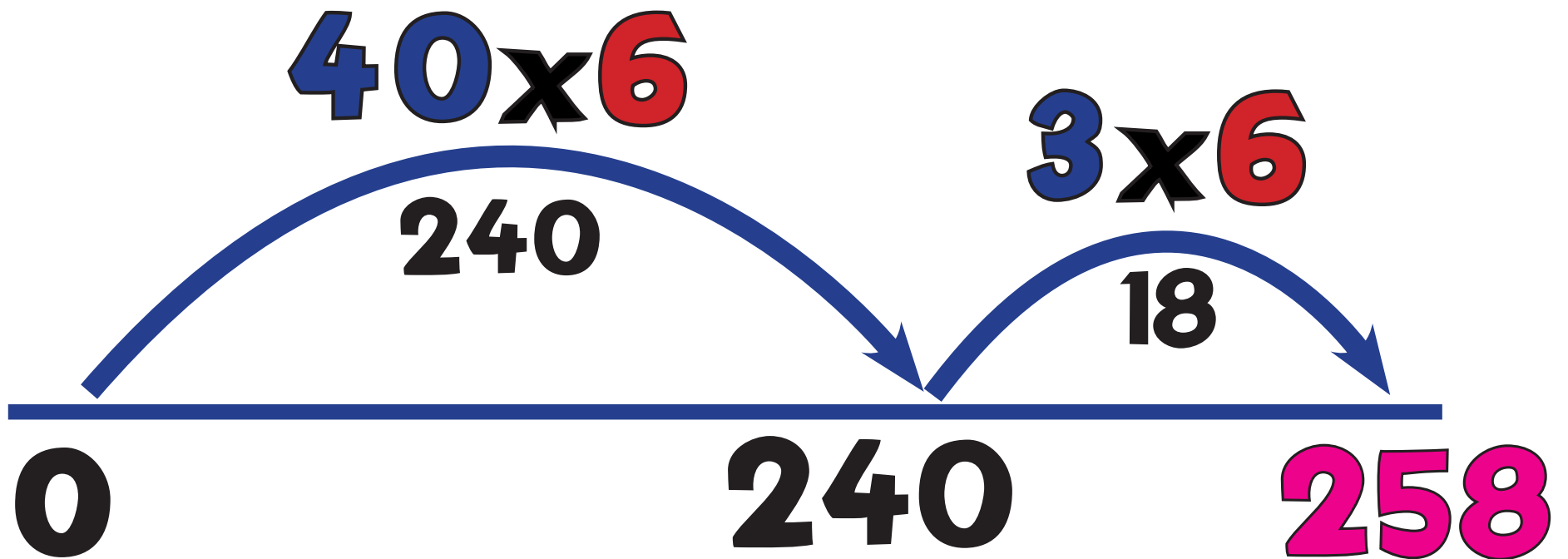


$$15 \times 5 = 75$$



M4a: Multi Boing!

4



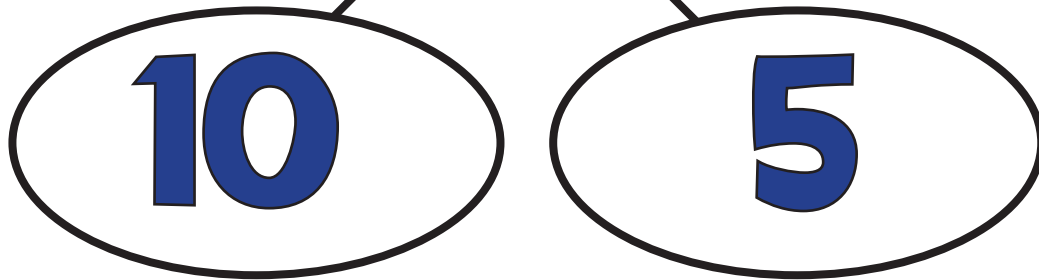
$$43 \times 6 = 258$$



M5: Partitioning

3

$$15 \times 5 = 75$$



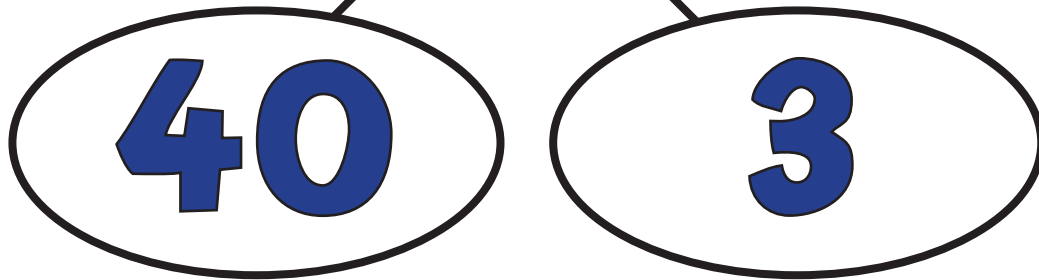
$$50 + 25 = 75$$



M5a: Partitioning

4

$$\textcircled{43} \times 6 = 258$$



$$\begin{array}{c} | \\ 40 \\ | \\ 240 \end{array} \quad \begin{array}{c} | \\ 3 \\ | \\ 18 \end{array} \times 6 = 258$$



M6: Grid Method

Short Multiplication

3

$$15 \times 5 = 75$$

x	10	5
5	50	25

$$50 + 25 = 75$$



M6a: Grid Method

4

Short Multiplication

$$43 \times 6 = 258$$

x	40	3
6	240	18

$$240 + 18 = 258$$



M6b: Grid Method

4

Short Multiplication

$$147 \times 4 = 588$$

x	100	40	7
4	400	160	28

$$400 + 160 + 28 = 588$$



M7: Expanded Column

3

$$\begin{array}{r} \\ 10 \\ 15 \\ \times 5 \\ \hline 25 \\ 50 \\ \hline 75 \end{array}$$

(5 x 5)

(10 x 4)



M7 a: Expanded Column

4

	100	10	1	
		4	3	
x			6	
			<hr/>	
		18		(3 x 6)
	24	0		(40 x 6)
			<hr/>	
	25	8		
			<hr/>	



M7b: Expanded Column

4

$$\begin{array}{r} 100 \quad 10 \quad 1 \\ 147 \\ \times \quad 4 \\ \hline \end{array}$$

28

$$(7 \times 4)$$

160

$$(40 \times 4)$$

400

$$(100 \times 4)$$

588



M8: Column Multiplication

3

$$\begin{array}{r} 10 \\ 15 \\ \times 5 \\ \hline 75 \\ \hline 2 \end{array}$$



M8a: Column Multiplication

4

	100	10	1
		4	3
x			6
<hr/>			
	2	5	8
<hr/>			
		1	



M8b: Column Multiplication

4

	100	10	1
	1	4	7
x			4
<hr/>			
	5	8	8
<hr/>			
	1	2	



M8c: Column Multiplication

4

$$\begin{array}{r} 3647 \\ \times \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 14588 \\ \times \quad 212 \\ \hline \end{array}$$



M9: Grid Method

5

Long Multiplication

$$15 \times 12 = 180$$

x	10	5
10	100	50
2	20	10

$$100 + 50 + 20 + 10 = 180$$



M9a: Grid Method

5

Long Multiplication

$$43 \times 65 = 2795$$

x	40	3
60	2400	180
5	200	15

$$2400 + 180 + 200 + 15 = 2795$$



M9b: Grid Method

5

Long Multiplication

$$243 \times 68 = 16,524$$

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

$$14580 + 1944 = 16,524$$



M9c: Grid Method

5

Long Multiplication

$$203 \times 68 = 13,804$$

x	200	0	3
60	12000	0	180
8	1600	0	24

$$= 12,180$$

$$= 1,624$$

$$12180 + 1624 = 13,804$$



M9d: Decimal Grid

5

Short Multiplication

$$3.6 \times 4 = 14.4$$

x	3	0.6
4	12	2.4

$$12 + 2.4 = 14.4$$



M9e: Decimal Grid

6

Short Multiplication

$$47.2 \times 3 = 141.6$$

x	40	7	0.2
3	120	21	0.6

$$120 + 21 + 0.6 = 141.6$$



M9f: Grid Method

6

Short Multiplication

$$7.38 \times 6 = 44.28$$

x	7	0.3	0.08
6	42	1.8	0.48

$$42 + 1.8 + 0.48 = 44.28$$



M9g: Grid Method

6

Long Multiplication

$$24.3 \times 2.5 = 60.75$$

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

$$48.6 + 12.15 = 60.75$$



M10b: Long Multiplication

Column

6

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

(243 x 8)

(243 x 60)

1



M10c: Long Multiplication

Column

6

$$\begin{array}{r} 203 \\ \times 68 \\ \hline 1624 \\ + 12180 \\ \hline 13804 \end{array}$$

(203 x 8)

(203 x 60)

1



M10d: Column Multiplication

5

$$10 \quad 1 \quad \cdot \quad \frac{1}{10}$$

$$3.6$$

$$\times 4$$

$$14.4$$

$$2$$



M10e: Column Multiplication

6

100 10 1 ■ $\frac{1}{10}$

47.2

x 3

141.6

2



M10f: Column Multiplication

6

$$\begin{array}{r} 10 \quad 1 \quad \cdot \quad \frac{1}{10} \quad \frac{1}{100} \\ 7.38 \\ \times 6 \\ \hline 44.28 \\ \hline 4 \quad 2 \quad 4 \end{array}$$



M10g Long Multiplication

Column Decimals

6

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

$$\begin{array}{r}
 24.3 \\
 \times 2.5 \\
 \hline
 12.15 \\
 + 48.60 \\
 \hline
 60.75 \\
 \hline
 1
 \end{array}$$

(24.3 x 0.5)

(24.3 x 2)



M10h: Long Multiplication

Column

6

$$\begin{array}{r} 3786 \\ \times 48 \\ \hline 30288 \\ + 151440 \\ \hline 181728 \\ \hline 1 \end{array}$$

$$(3786 \times 8)$$

$$(3786 \times 40)$$



Division Strategies

211		Calculation & Vocabulary
213	D1	Objects and Pictures (Sharing)
214	D2	Objects and Pictures (Grouping)
215	D3	Sharing
216	D4	Grouping
217	D5	Grouping on a Number Line
220	D6	Grouping Grid
221	D7	Chunking Jump
223	D8	Find the Hunk
225	D9	Mega Hunk
235	D10	Short Division
245	D11	Chunking
257	D12	Long Division (Short Division Method)
258	D13	Long Division (Chunking Method)
260	D14	Long Division (Traditional Method)



Division Calculation

$$8 \div 2 = 4$$

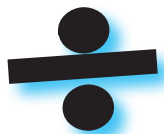
(divided by)

(equals)

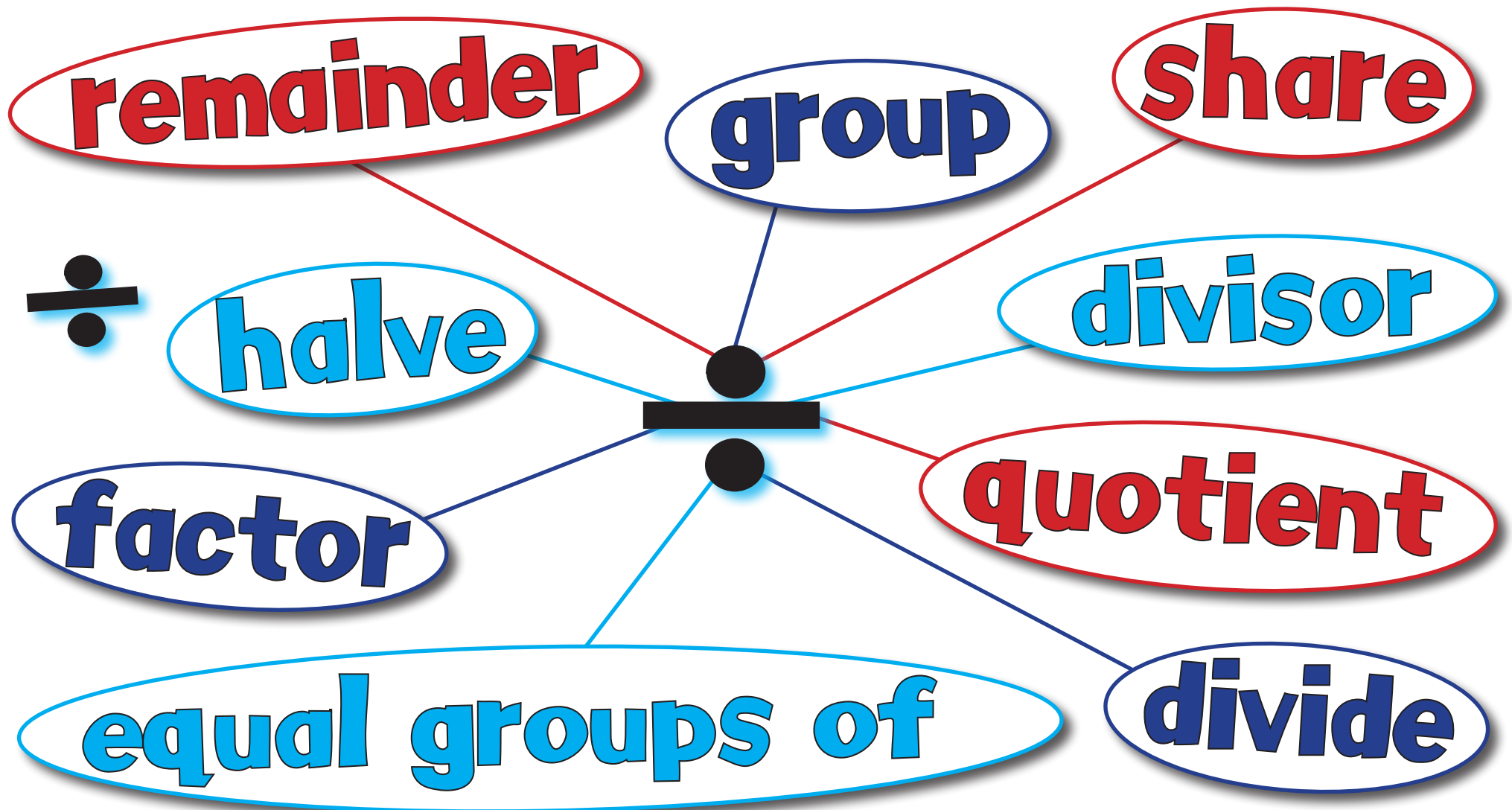
dividend

quotient

divisor



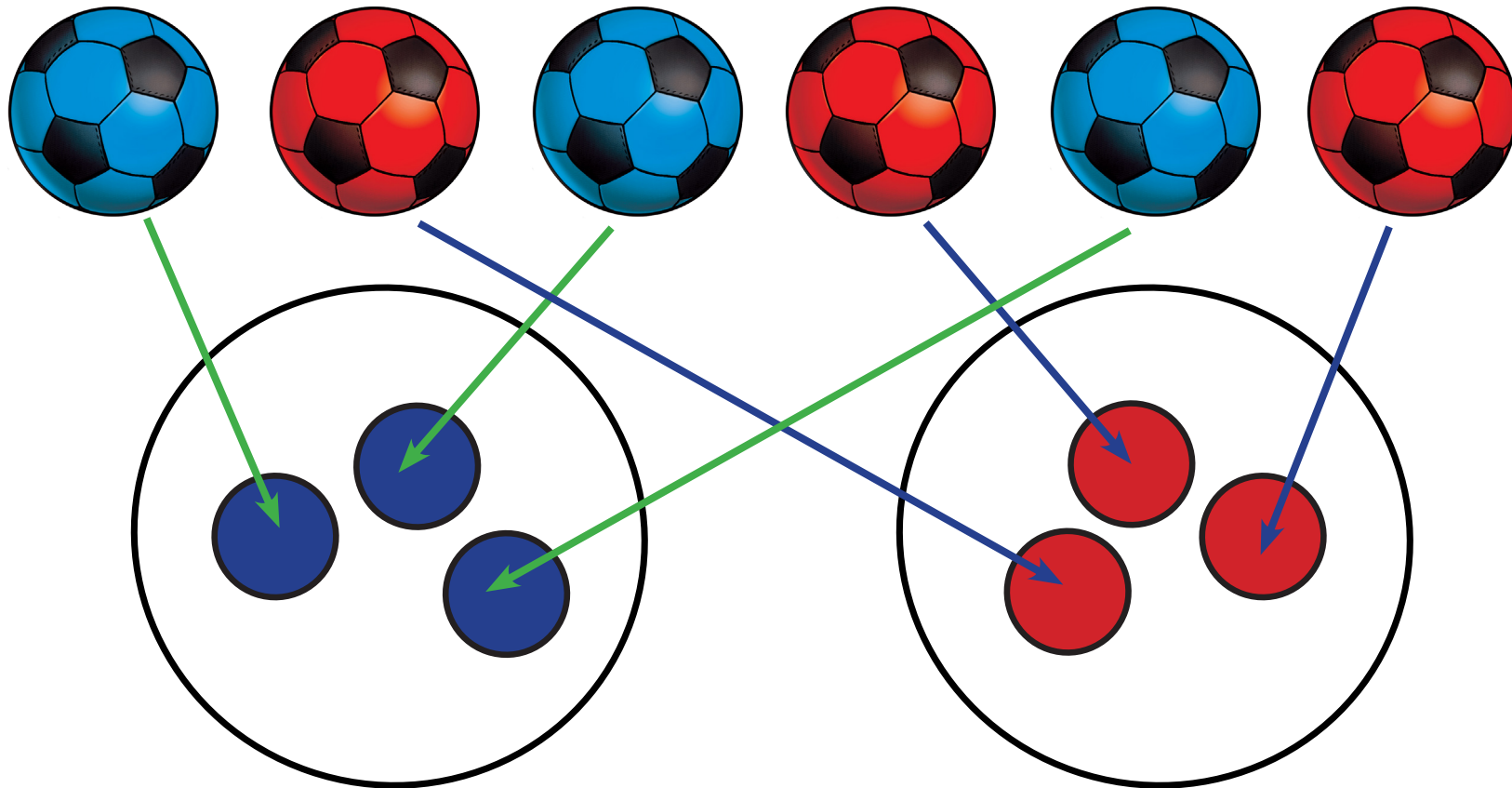
Division Vocabulary



D1: Objects and Pictures

1

Sharing



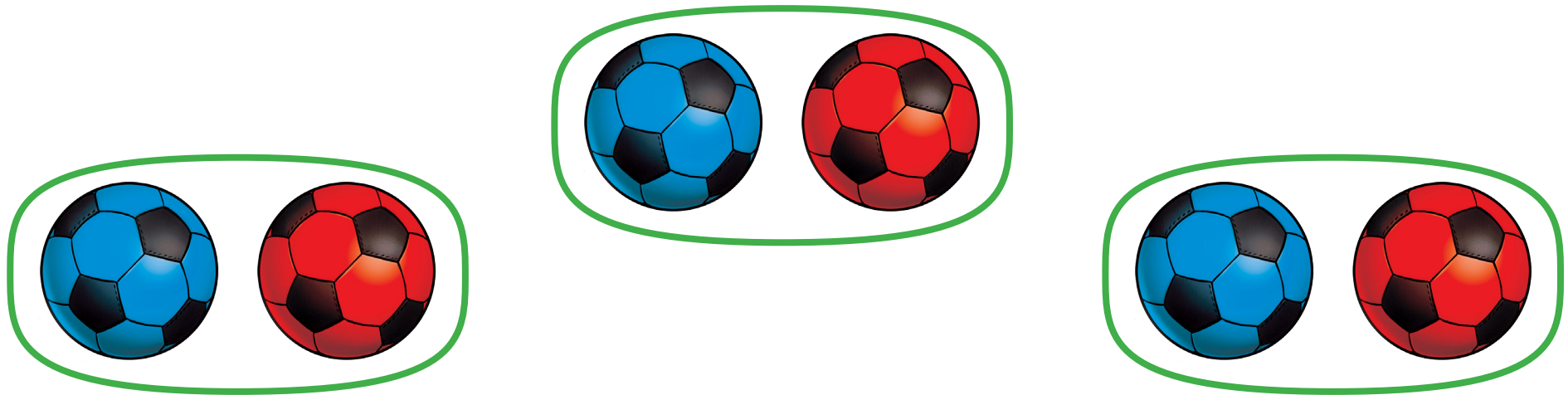
“If I share 6 footballs fairly into 2 bags, how many footballs in each bag?” Answer: 3



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

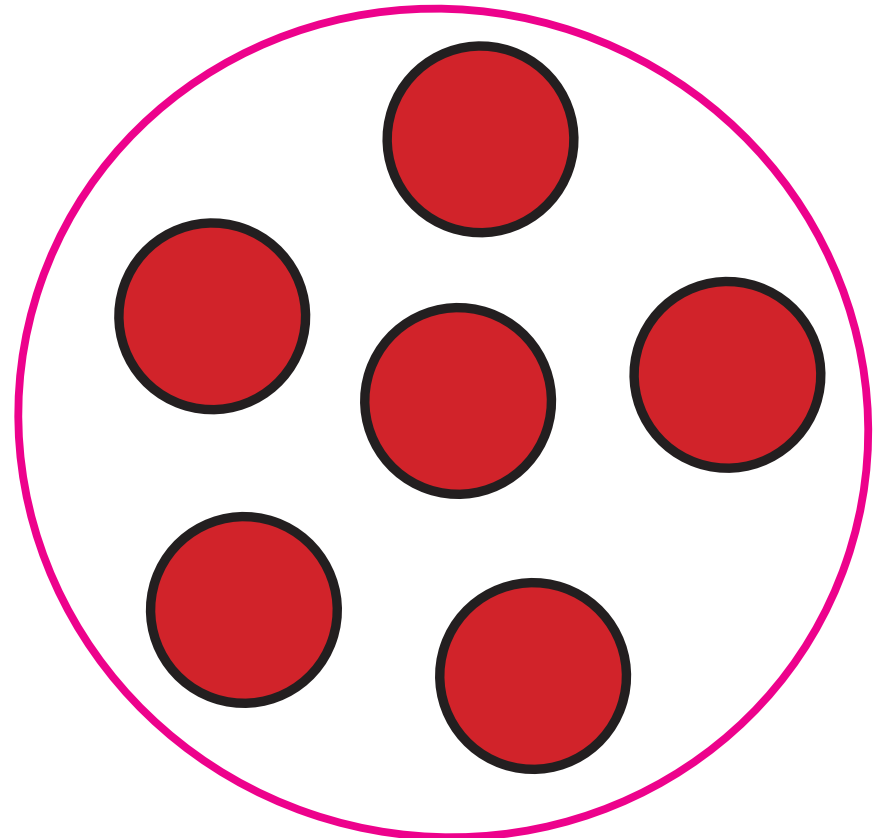
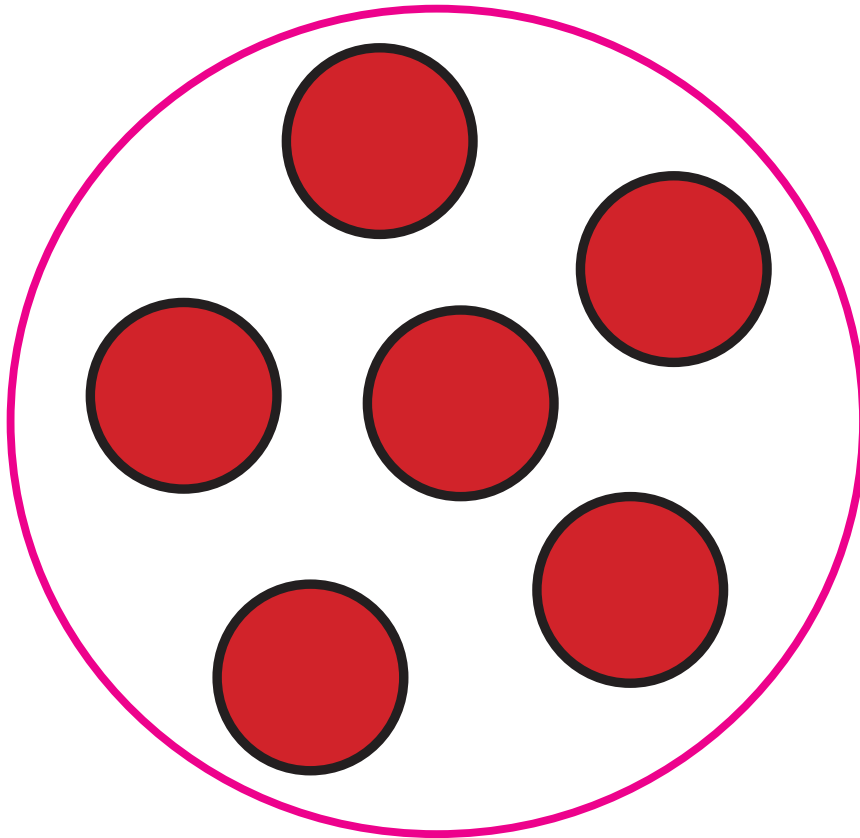


D3: Division as Sharing

2

$$12 \div 2 = 6$$

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

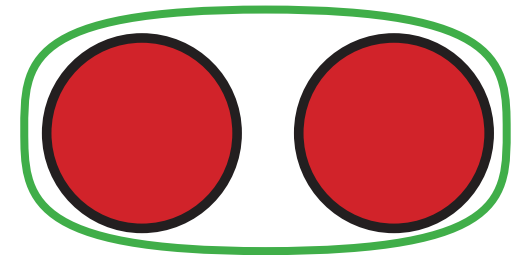
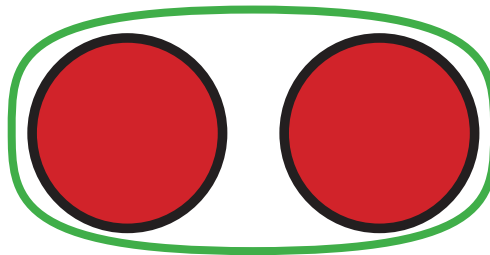
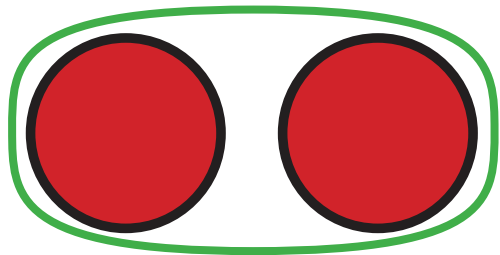
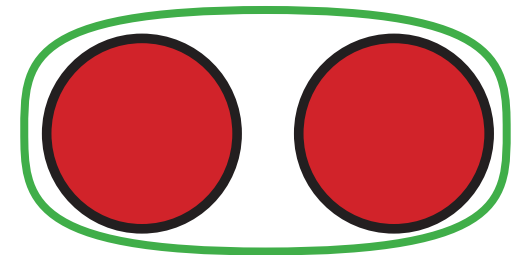
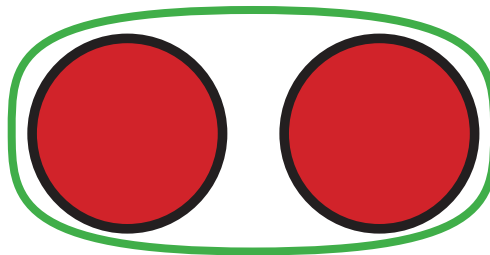
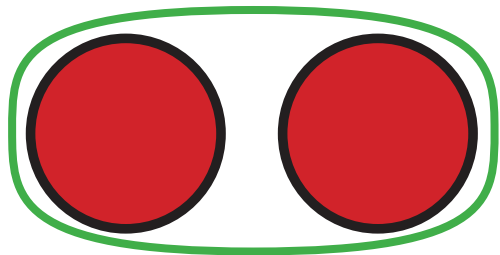


D4: Division as Grouping

2

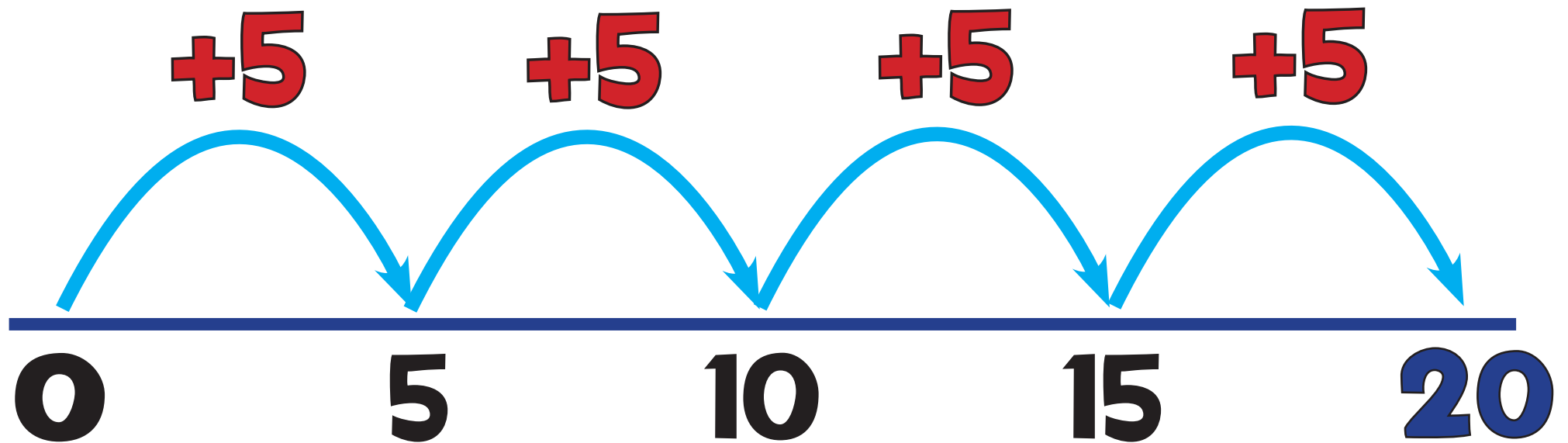
$$12 \div 2 = 6$$

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



D5: Grouping on a Number Line

2



“How many 5s in 20?”

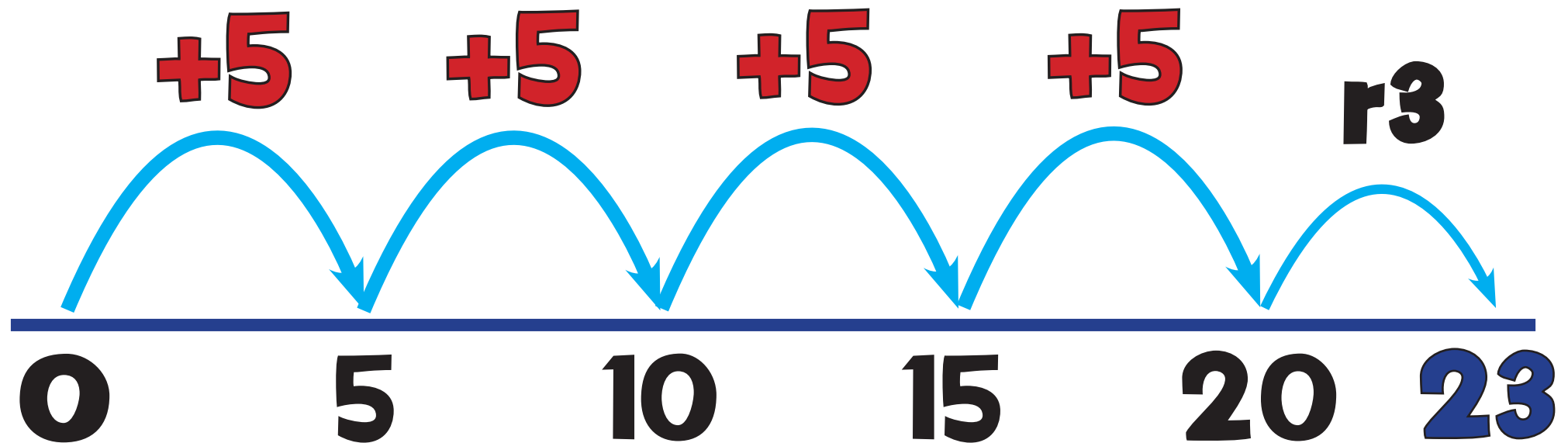
Answer: 4

$$20 \div 5 = 4$$



D5a: Grouping on a Number Line

2



“How many 5s in 23?”

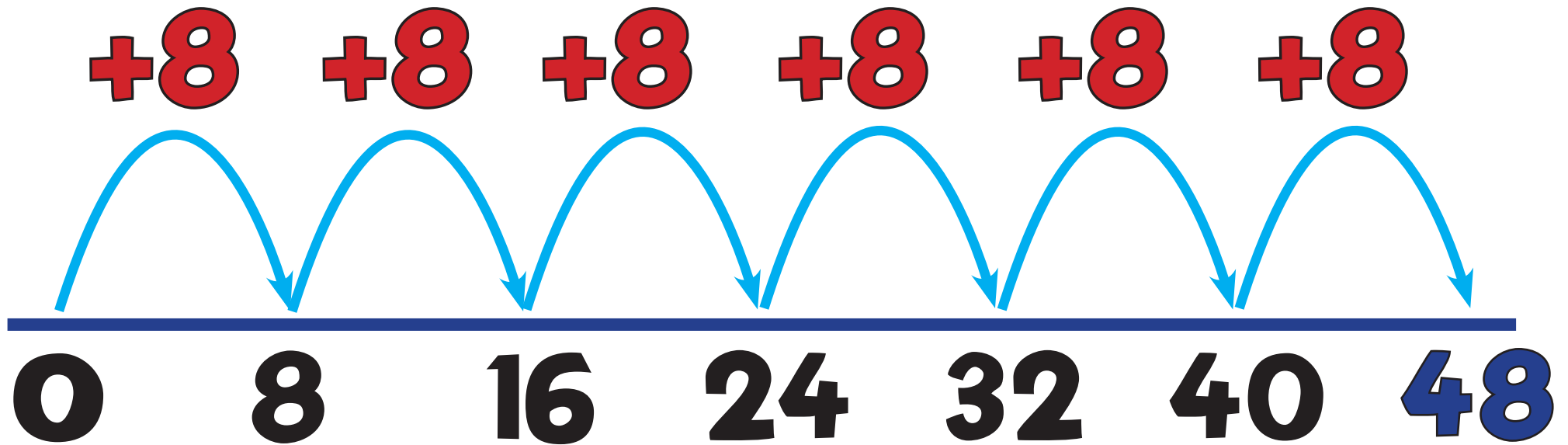
Answer: **4 remainder 3**

$$23 \div 5 = 4r3$$



D5b: Grouping on a Number Line

3



"How many 8s in 48?"

Answer: 6

$$48 \div 8 = 6$$



D6: Grouping Grid

3

4	4	4	4	4
4				3

“How many times can I fit (groups of) 4 into 27?”

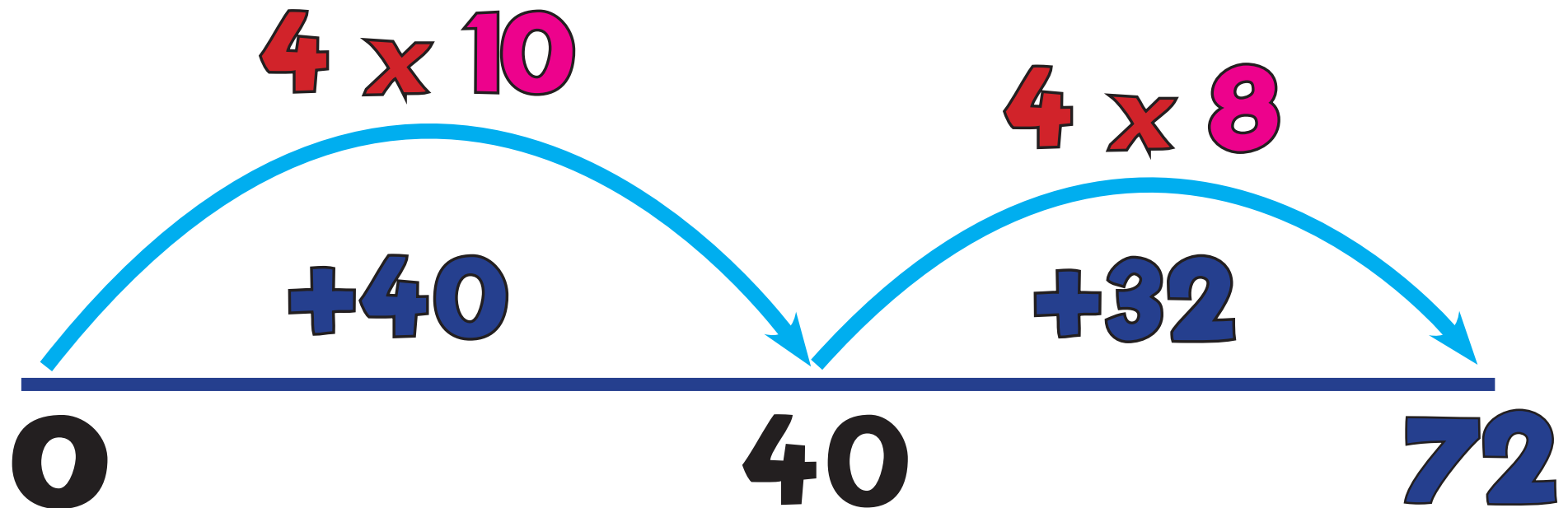
Answer: 6r3

$$27 \div 4 = 6r3$$



D7: Chunking Jump

3



$$72 \div 4 = 18$$

“How many 4s in 72?”

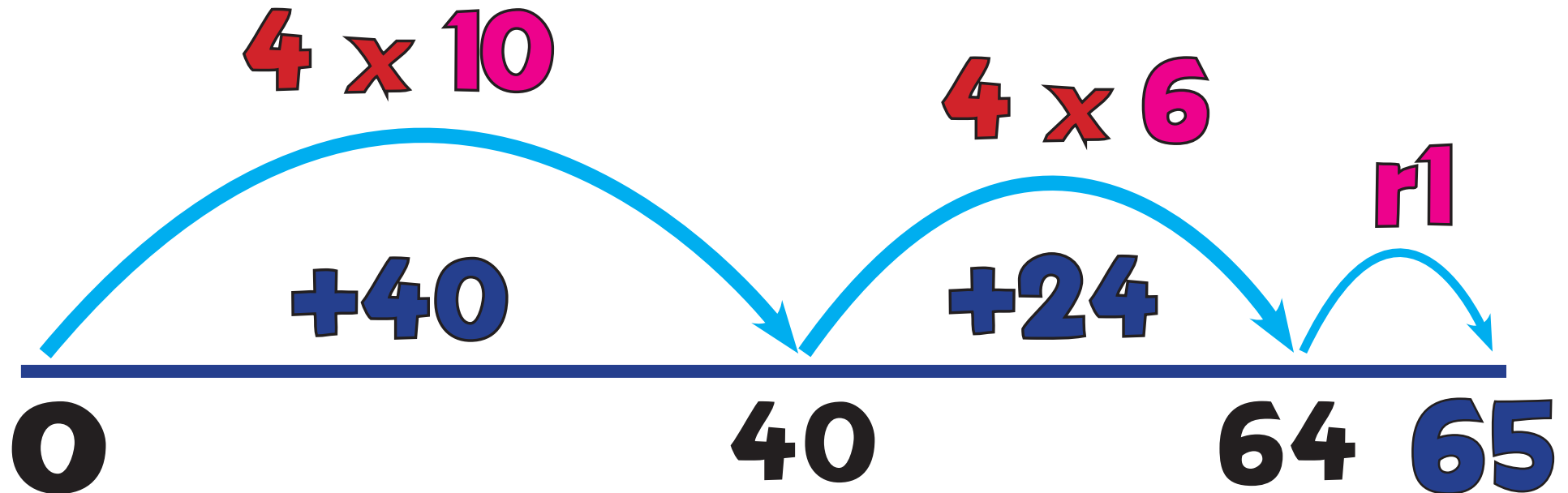
Answer: 18



D7 a: Chunking Jump

3

Remainders



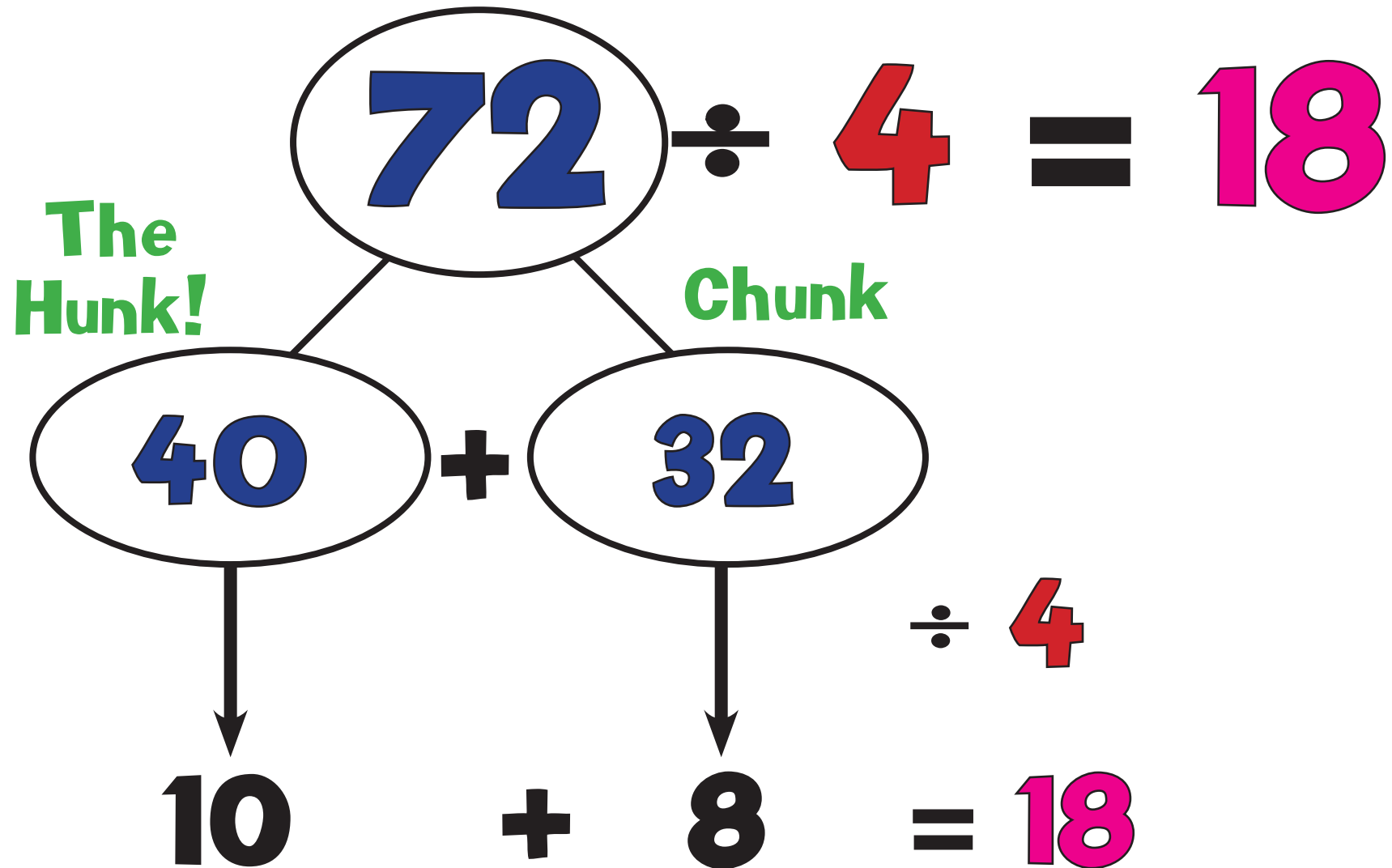
“How many 4s in 65?”
Answer: 16r1

$$65 \div 4 = 16r1$$



D8: Find the Hunk!

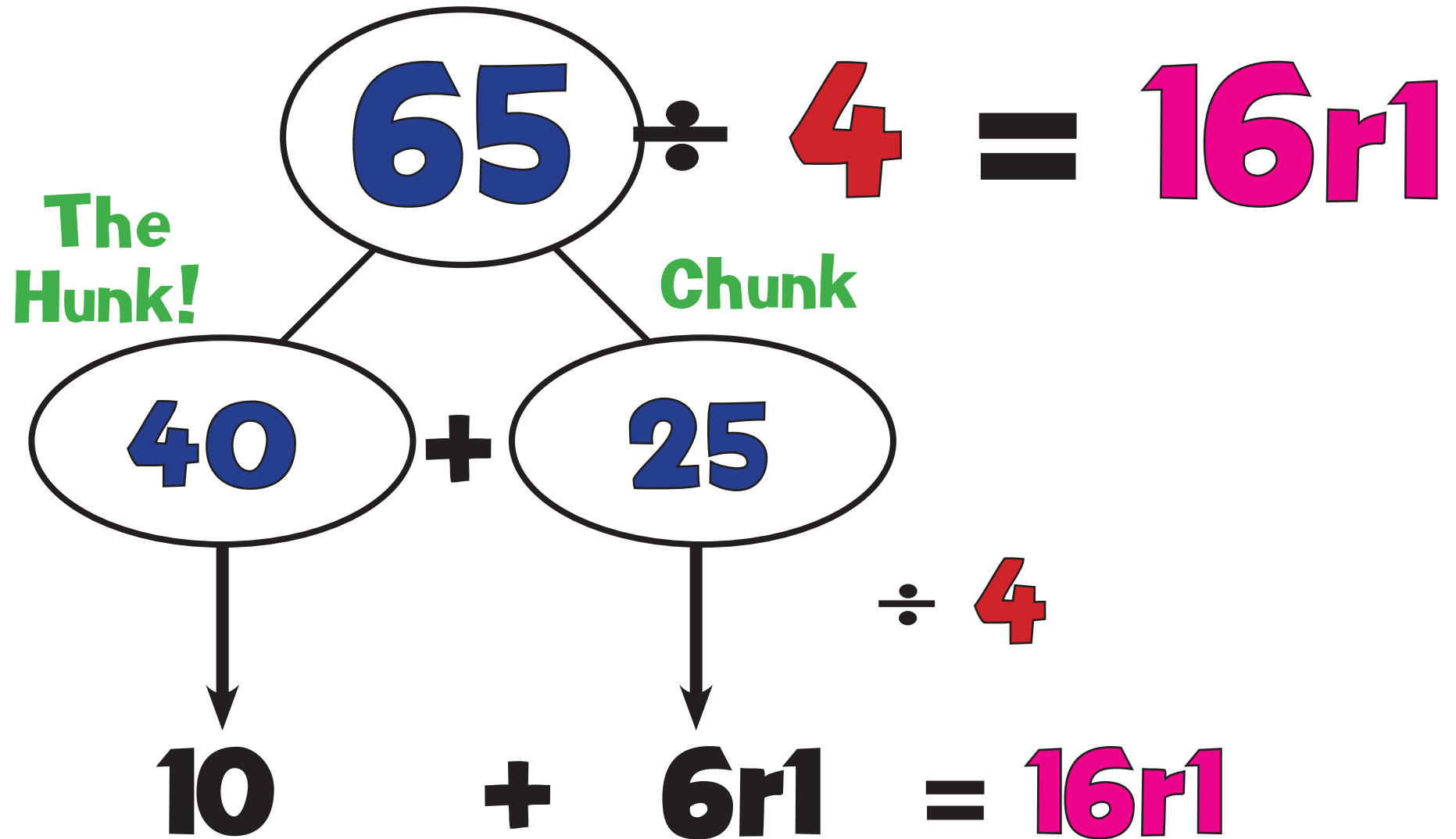
3



D8a: Find the Hunk!

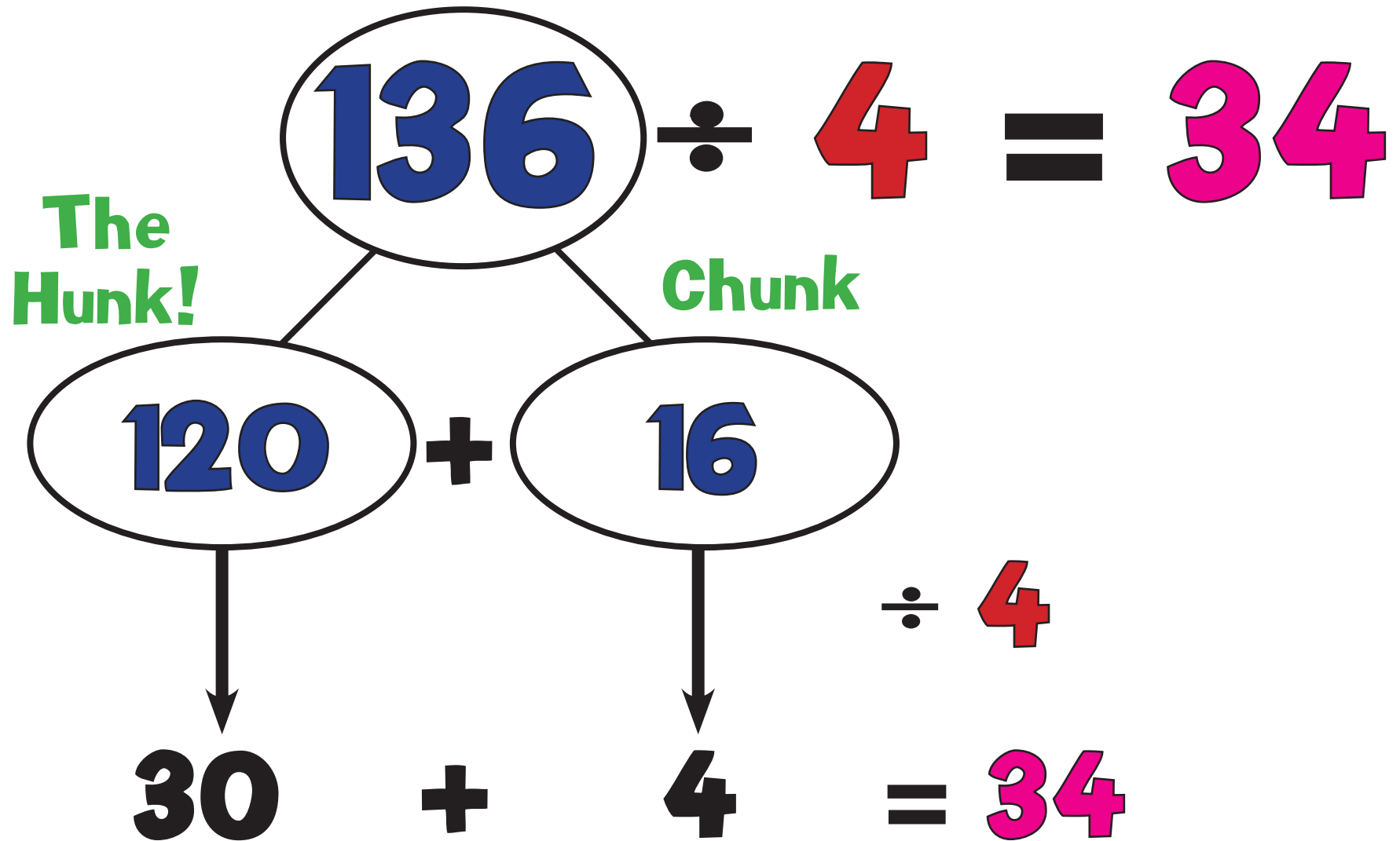
3

Remainders



D9: Mega Hunk!

4



D9c: Mega Hunk!

4

Remainders

$$145 \div 6 = 24r1$$

Mega
Hunk!

Chunk

$$120 + 25$$

$$20 + 4r1 = 24r1$$



D9d: Mega Hunk!

5

Remainders

$$394 \div 6 = 65r4$$

Mega
Hunk!

Chunk

$$360 + 34$$

$$60 + 5r4 = 65r4$$



D9e: Mega Hunk!

5

$$536 \div 4 = 134$$

$$400 + 120 + 16$$

$$100 + 30 + 4 = 134$$



D9f: Mega Hunk!

5

$$1278 \div 6 = 213$$

$$1200 + 60 + 18$$

$$200 + 10 + 3 = 213$$



D9g: Mega Hunk!

5

$$5978 \div 7 = 854$$

$$5600 + 350 + 28$$

$$800 + 50 + 4 = 854$$



D9h: Mega Hunk!

5

$$846 \div 5 = 169r1$$

$$500 + 300 + 46$$

$$100 + 60 + 9r1 = 169r1$$



D9i: Mega Hunk!

6

Simple Long Division

$$480 \div 15 = 32$$

Mega
Hunk!

Chunk

$$450 + 30$$

$$30 \div 15 = 2$$
$$30 + 2 = 32$$



D9j: Decimal Hunk!

6

$$18 \div 1.5 = 12$$

The
Hunk!

Chunk

$$15 + 3$$

$$10 + 2 = 12$$



D9k: Decimal Hunk!

6

$$87.5 \div 7 = 12.5$$

$$70 + 14 + 3.5$$

$$10 + 2 + 0.5 = 12.5$$



D10: Short Division

3

$$72 \div 4 = 18$$

$$\begin{array}{r} 18 \\ 4 \overline{) 72} \end{array}$$

The diagram shows the short division of 72 by 4. The divisor 4 is on the left. The dividend 72 is on the right, with a pink bracket above it. The quotient 18 is written above the dividend. A small red '3' is written above the 2 in the dividend, indicating the number of times 4 goes into 2.



D10a: Short Division

3

$$65 \div 4 = 16r1$$

$$\begin{array}{r} 16r1 \\ 4 \overline{) 65} \end{array}$$



D10b: Short Division

4

$$136 \div 4 = 34$$

$$\begin{array}{r} 34 \\ 4 \overline{) 136} \end{array}$$



D10c: Short Division

4

$$145 \div 6 = 24r1$$

$$\begin{array}{r} 24r1 \\ 6 \overline{) 145} \end{array}$$



D10d: Short Division

5

$$394 \div 6 = 65r4$$

$$\begin{array}{r} 65r4 \\ \hline 6 \overline{) 394} \end{array}$$



D10e: Short Division

5

$$536 \div 4 = 134$$

$$\begin{array}{r} 134 \\ 4 \overline{) 536} \end{array}$$



D10f: Short Division

5

$$1278 \div 6 = 213$$

$$\begin{array}{r} 213 \\ 6 \overline{) 1278} \end{array}$$



D10g: Short Division

5

$$5978 \div 7 = 854$$

$$\begin{array}{r} 854 \\ 7 \overline{) 5978} \end{array}$$



D10h: Short Division

5

Different Remainders

$$\begin{array}{r} 169.2 \\ 5 \overline{) 846.0} \end{array}$$

$$846 \div 5$$

$$\begin{array}{r} 169 \text{ r}1 \\ 5 \overline{) 846} \end{array}$$

$$\begin{array}{r} 169 \frac{1}{5} \\ 5 \overline{) 846} \end{array}$$



D10k: Short Division

6

$$87.5 \div 7 = 12.5$$

$$\begin{array}{r} 12.5 \\ 7 \overline{) 87.5} \\ \underline{7} \\ 17 \\ \underline{14} \\ 35 \\ \underline{35} \\ 0 \end{array}$$



D11: Chunking

3

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

$$72 \div 4 = 18$$



D11: Chunking

3

$$\begin{array}{r} 16r1 \\ 4 \overline{) 65} \\ - 40 \quad (4 \times 10) \\ \hline 25 \\ - 24 \quad (4 \times 6) \\ \hline 1 \end{array}$$

$$65 \div 4 = 16r1$$



D11bA: Chunking

4

$$\begin{array}{r} 34 \\ 4 \overline{) 136} \\ \underline{-120} \quad (4 \times 30) \\ 16 \\ \underline{-16} \quad (4 \times 4) \\ 0 \end{array}$$

$$136 \div 4 = 34$$



D11bB: Chunking

4

$$\begin{array}{r} 34 \\ 4 \overline{) 136} \\ \underline{- 40} \quad (4 \times 10) \\ 96 \\ \underline{- 40} \quad (4 \times 10) \\ 56 \\ \underline{- 40} \quad (4 \times 10) \\ 16 \\ \underline{- 16} \quad (4 \times 4) \\ 0 \end{array}$$

$$136 \div 4 = 34$$



D11c: Chunking

4

Remainders

$$\begin{array}{r} 24r1 \\ 6 \overline{) 145} \\ \underline{-120} \quad (6 \times 20) \\ 25 \\ \underline{-24} \quad (6 \times 4) \\ 1 \end{array}$$

$$145 \div 4 = 24r1$$



D11d: Chunking

5

Remainders

65r4

$$\begin{array}{r} 6 \overline{) 394} \\ - 360 \quad (6 \times 60) \\ \hline 34 \\ - 30 \quad (6 \times 5) \\ \hline 4 \end{array}$$

$$394 \div 6 = 65r4$$



D11e: Chunking

5

Mega Chunk

$$\begin{array}{r} 134 \\ 4 \overline{)536} \\ - 400 \\ \hline 136 \\ - 120 \\ \hline 16 \\ - 16 \\ \hline 0 \end{array}$$

(4 x 100)

(4 x 30)

(4 x 4)

$$536 \div 4 = 134$$



D11f: Chunking

5

Mega Chunk

$$\begin{array}{r} 213 \\ 6 \overline{) 1278} \\ - 1200 \quad (6 \times 200) \\ \hline 78 \\ - 60 \quad (6 \times 10) \\ \hline 18 \\ - 18 \quad (6 \times 3) \\ \hline 0 \end{array}$$

$$1278 \div 6 = 213$$



D11g: Chunking

5

Mega Chunk

$$\begin{array}{r} 854 \\ 7 \overline{) 5978} \\ - 5600 \\ \hline 378 \\ - 350 \\ \hline 28 \\ - 28 \\ \hline 0 \end{array} \quad \begin{array}{l} (7 \times 800) \\ (7 \times 50) \\ (7 \times 4) \end{array}$$

$$5978 \div 7 = 854$$



D11h: Chunking

5

Mega Chunk

$$\begin{array}{r} 169r1 \\ 5 \overline{)846} \\ - 500 \quad (5 \times 100) \\ \hline 346 \\ - 300 \quad (5 \times 60) \\ \hline 46 \\ - 45 \quad (5 \times 9) \\ \hline 1 \end{array}$$

$$846 \div 5 = 169r1$$



D11iA: Chunking

6

Long Division

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

$$480 \div 15 = 32$$



D11iB: Chunking

6

Long Division

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

$$480 \div 15 = 32$$



D12: Long Division

6

Short Division Method

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

The diagram shows a short division problem. The divisor is 37, written in black. The dividend is 983, with the digits 9, 8, and 3 colored blue, red, and green respectively. A pink bracket is drawn under the dividend. The quotient is 26, written in pink above the dividend, with a remainder of 21, also written in pink to the right of the dividend. Above the digit 9 in the dividend, there is a small blue '9'. Above the digit 8, there is a small red '24'.



D12b: Long Division

6

Short Division Method

$$\begin{array}{r} 38 \\ 59 \overline{) 2242} \\ \underline{118} \\ 106 \\ \underline{106} \\ 0 \\ \underline{0} \\ 0 \end{array}$$



D13a1: Long Division

6

Chunking Method

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

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



D13a2: Long Division

6

Chunking Method

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

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



D13b1: Long Division

6

Chunking Method

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

$$2242 \div 59 = 38$$



D13b2: Long Division

Chunking Method

6

$$\begin{array}{r} 39 \\ 59 \overline{) 2242} \\ \underline{- 590} (59 \times 10) \\ 1652 \\ \underline{- 590} (59 \times 10) \\ 1062 \\ \underline{- 590} (59 \times 10) \\ 472 \\ \underline{- 472} (59 \times 8) \\ 0 \end{array}$$

$$2242 \div 59 = 38$$



D14: Long Division

6

Traditional Method

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

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



D14b: Long Division

6

Traditional Method

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

$$2242 \div 59 = 38$$



MF: 2x Table Facts

$2 \times 1 = 2$

$2 \times 7 = 14$

$2 \times 2 = 4$

$2 \times 8 = 16$

$2 \times 3 = 6$

$2 \times 9 = 18$

$2 \times 4 = 8$

$2 \times 10 = 20$

$2 \times 5 = 10$

$2 \times 11 = 22$

$2 \times 6 = 12$

$2 \times 12 = 24$



MF: 3x Table Facts

$3 \times 1 = 3$

$3 \times 7 = 21$

$3 \times 2 = 6$

$3 \times 8 = 24$

$3 \times 3 = 9$

$3 \times 9 = 27$

$3 \times 4 = 12$

$3 \times 10 = 30$

$3 \times 5 = 15$

$3 \times 11 = 33$

$3 \times 6 = 18$

$3 \times 12 = 36$



MF: 4x Table Facts

$4 \times 1 = 4$

$4 \times 7 = 28$

$4 \times 2 = 8$

$4 \times 8 = 32$

$4 \times 3 = 12$

$4 \times 9 = 36$

$4 \times 4 = 16$

$4 \times 10 = 40$

$4 \times 5 = 20$

$4 \times 11 = 44$

$4 \times 6 = 24$

$4 \times 12 = 48$



MF: 5x Table Facts

$5 \times 1 = 5$

$5 \times 7 = 35$

$5 \times 2 = 10$

$5 \times 8 = 40$

$5 \times 3 = 15$

$5 \times 9 = 45$

$5 \times 4 = 20$

$5 \times 10 = 50$

$5 \times 5 = 25$

$5 \times 11 = 55$

$5 \times 6 = 30$

$5 \times 12 = 60$



MF: 6x Table Facts

$6 \times 1 = 6$

$6 \times 7 = 42$

$6 \times 2 = 12$

$6 \times 8 = 48$

$6 \times 3 = 18$

$6 \times 9 = 54$

$6 \times 4 = 24$

$6 \times 10 = 60$

$6 \times 5 = 30$

$6 \times 11 = 66$

$6 \times 6 = 36$

$6 \times 12 = 72$



MF: 7x Table Facts

$7 \times 1 = 7$

$7 \times 7 = 49$

$7 \times 2 = 14$

$7 \times 8 = 56$

$7 \times 3 = 21$

$7 \times 9 = 63$

$7 \times 4 = 28$

$7 \times 10 = 70$

$7 \times 5 = 35$

$7 \times 11 = 77$

$7 \times 6 = 42$

$7 \times 12 = 84$



MF: 8x Table Facts

$8 \times 1 = 8$

$8 \times 7 = 56$

$8 \times 2 = 16$

$8 \times 8 = 64$

$8 \times 3 = 24$

$8 \times 9 = 72$

$8 \times 4 = 32$

$8 \times 10 = 80$

$8 \times 5 = 40$

$8 \times 11 = 88$

$8 \times 6 = 48$

$8 \times 12 = 96$



MF: 9x Table Facts

$9 \times 1 = 9$

$9 \times 7 = 63$

$9 \times 2 = 18$

$9 \times 8 = 72$

$9 \times 3 = 27$

$9 \times 9 = 81$

$9 \times 4 = 36$

$9 \times 10 = 90$

$9 \times 5 = 45$

$9 \times 11 = 99$

$9 \times 6 = 54$

$9 \times 12 = 108$



MF: 10x Table Facts

$10 \times 1 = 10$

$10 \times 7 = 70$

$10 \times 2 = 20$

$10 \times 8 = 80$

$10 \times 3 = 30$

$10 \times 9 = 90$

$10 \times 4 = 40$

$10 \times 10 = 100$

$10 \times 5 = 50$

$10 \times 11 = 110$

$10 \times 6 = 60$

$10 \times 12 = 120$



MF: 11x Table Facts

$11 \times 1 = 11$

$11 \times 7 = 77$

$11 \times 2 = 22$

$11 \times 8 = 88$

$11 \times 3 = 33$

$11 \times 9 = 99$

$11 \times 4 = 44$

$11 \times 10 = 110$

$11 \times 5 = 55$

$11 \times 11 = 121$

$11 \times 6 = 66$

$11 \times 12 = 132$



MF: 12x Table Facts

$12 \times 1 = 12$

$12 \times 7 = 84$

$12 \times 2 = 24$

$12 \times 8 = 96$

$12 \times 3 = 36$

$12 \times 9 = 108$

$12 \times 4 = 48$

$12 \times 10 = 120$

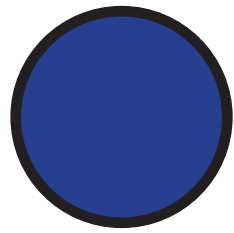
$12 \times 5 = 60$

$12 \times 11 = 132$

$12 \times 6 = 72$

$12 \times 12 = 144$

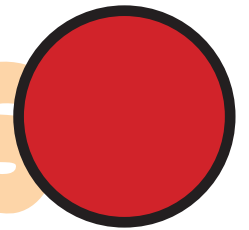




Sense of Number Standard Alternative Slides

Alternative
Layout Slides

by Dave Godfrey



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



(A7a: Column Addition)

2 Additional:a

$$\begin{array}{r} \text{10} \quad \text{1} \\ 57 \\ + 25 \\ \text{1} \\ \hline 82 \\ \hline \end{array}$$

Alterrative
Layouts
slides



A7b: Column Addition

2/3

100 10 1

75

+ 52

127

1

Alternative
Layouts
slides



A7c: Column Addition

2/3 Additional:b

100 10 1

Alternative
Layouts
Slides

$$\begin{array}{r} 86 \\ + 48 \\ \hline 134 \\ \hline 1 \quad 1 \end{array}$$



A7d: Column Addition

3

100 10 1

687

+ 248

1 1

935



A7e: Column Addition

3

	100	10	1
	7	3	8
+	5	2	4
	1	1	
<hr/>			
	1	2	6
	2	6	2
<hr/>			



A7f: Column Addition

4

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

Alternative Layouts



A7g: Column Addition

5

$$\begin{array}{r} 787567 \\ + 446278 \\ \hline 1233845 \end{array}$$

The diagram shows a column addition problem with carry-over values. The top row contains the numbers 7, 8, 7, 5, 6, 7. The second row contains a plus sign followed by 4, 4, 6, 2, 7, 8. Below the second row, a horizontal pink line separates it from the third row, which contains the carry-over values 1, 1, 1, 1, 1. Below the third row, another horizontal pink line separates it from the bottom row, which contains the final sum: 1, 2, 3, 3, 8, 4, 5.



A7h: Column Addition

5

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

Alternative Layouts



A7i: Column Addition

5

$$\begin{array}{r} \begin{array}{c} 1 \quad \cdot \quad \frac{1}{10} \quad \frac{1}{100} \\ 5.65 \\ + 3.29 \\ \hline 8.94 \end{array} \end{array}$$

1



A7j: Column Addition

5

$$\begin{array}{r} \text{10} \quad \text{1} \quad \cdot \quad \frac{1}{10} \\ 76.7 \\ + 58.5 \\ \hline 135.2 \end{array}$$

1 1 1



A7k: Column Addition

5

With Money

$$\begin{array}{r} \text{€}38.25 \\ + \text{€}27.46 \\ \hline \text{€}65.71 \end{array}$$

The image shows a column addition problem for money. The first number is €38.25, with the digits colored as follows: 3 (red), 8 (green), 25 (purple and blue). The second number is €27.46, with the digits colored as follows: 2 (red), 7 (green), 46 (purple and blue). A pink horizontal line is drawn below the second number. Below the line, the number 1 is written in green under the 8 and in blue under the 6. A second pink horizontal line is drawn below the 1s. The final result is €65.71, with the digits colored as follows: 6 (red), 5 (green), 71 (purple and blue). A pink horizontal line is drawn below the final result.



A71: Column Addition

5

With Decimals

$$73.4 + 5.67 = 79.07$$

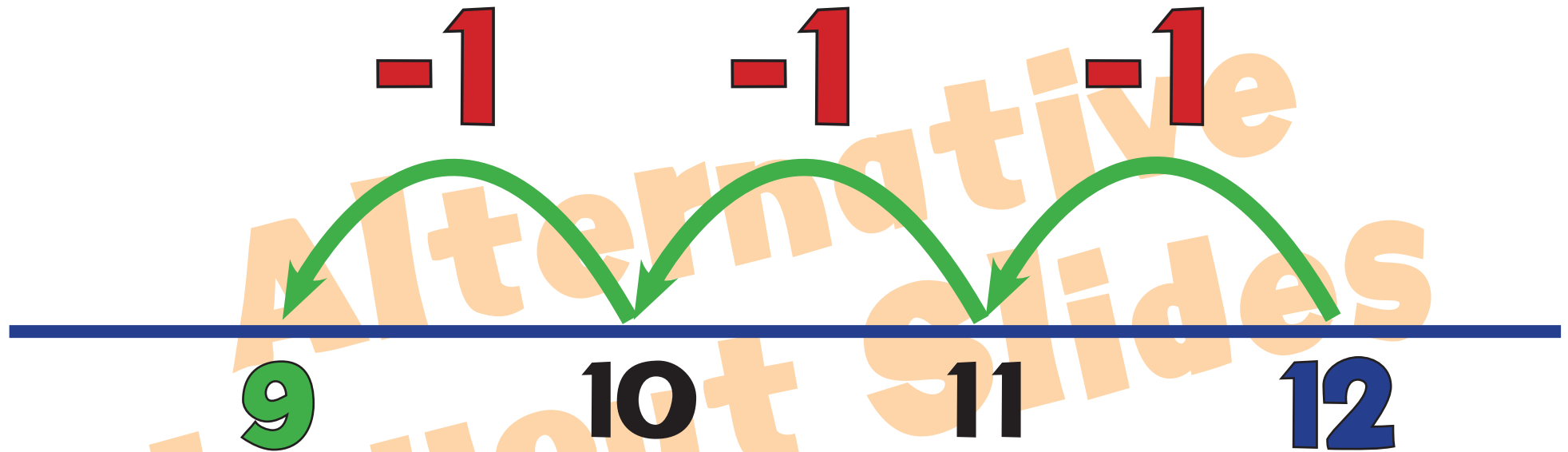
Alternative
Layouts
slides

$$\begin{array}{r} 10 \quad 1 \quad \square \quad \frac{1}{10} \quad \frac{1}{100} \\ 73.4 \\ + 5.67 \\ \hline 79.07 \end{array}$$



S2: Counting Back

1



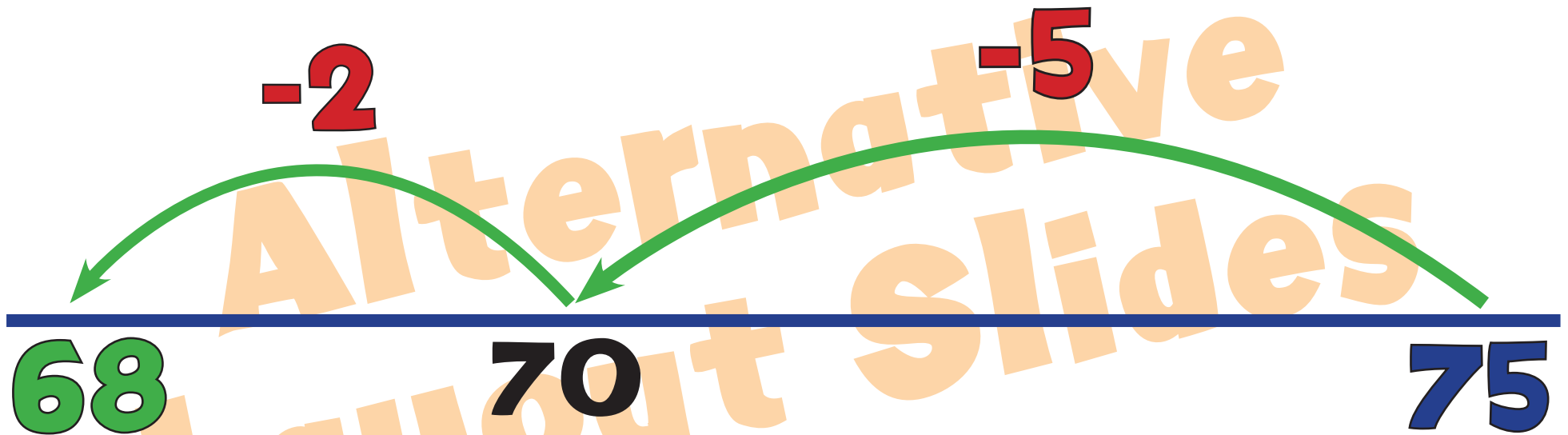
$$12 - 3 = 9$$

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



S2a: Backwards Boing

2

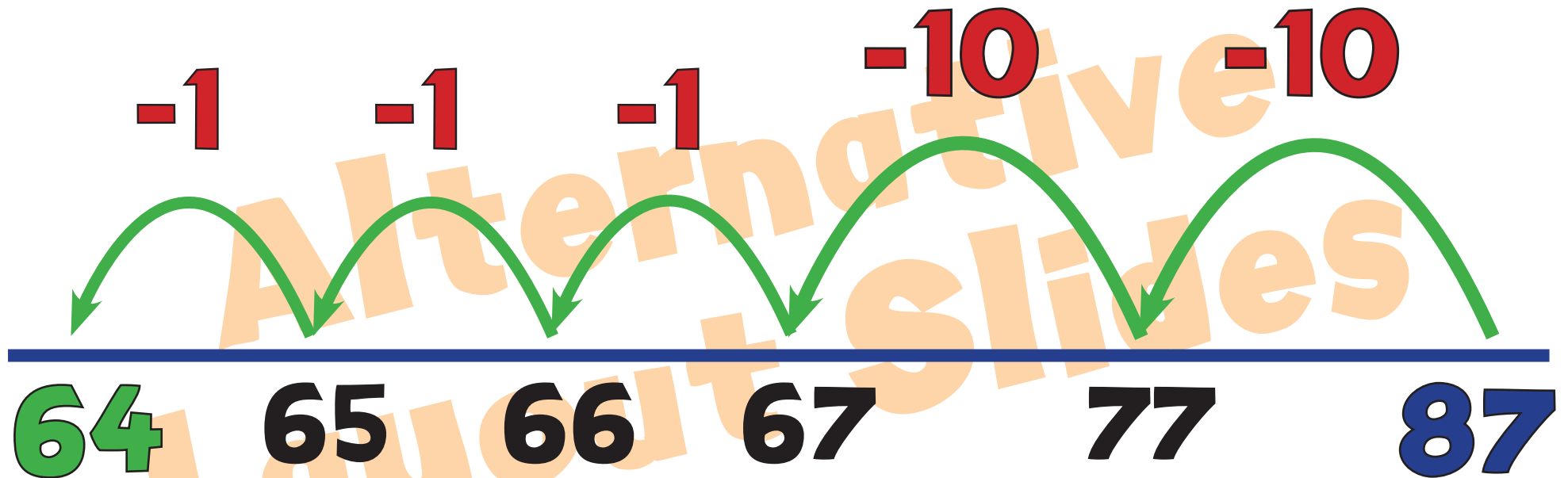


$$75 - 7 = 68$$



S4: Backwards Bounce

2

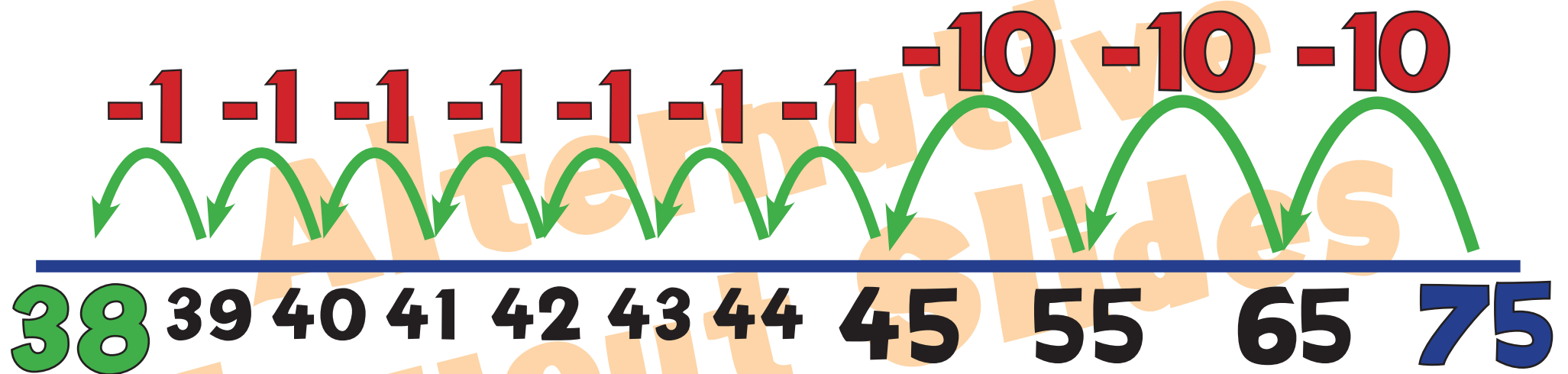


$$87 - 23 = 64$$



S4a: Backwards Bounce

2

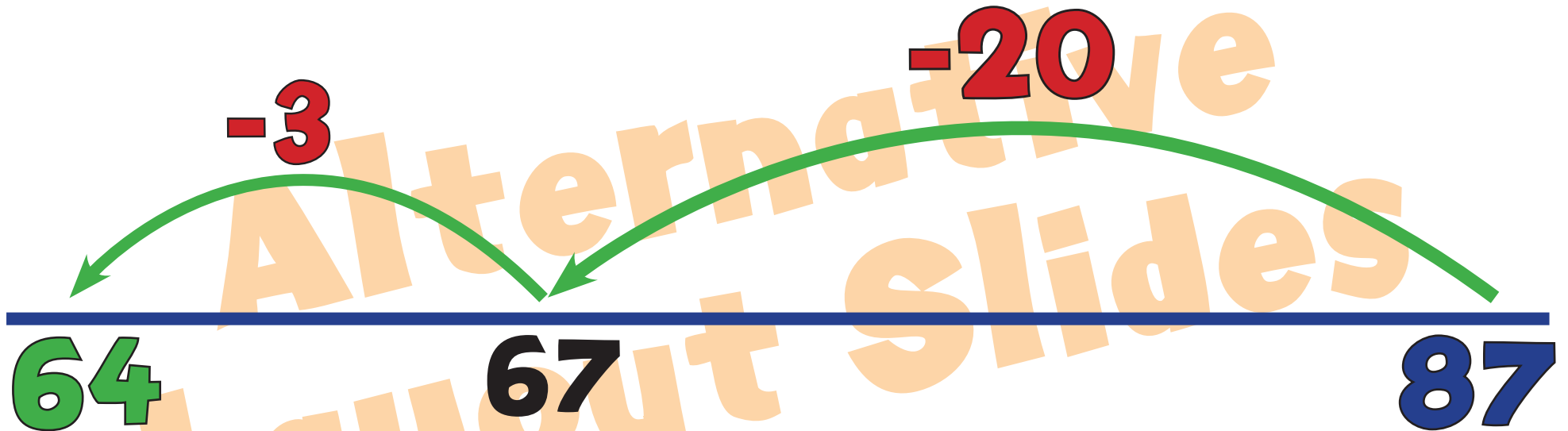


$$75 - 37 = 38$$



S5: Backwards Jump

2

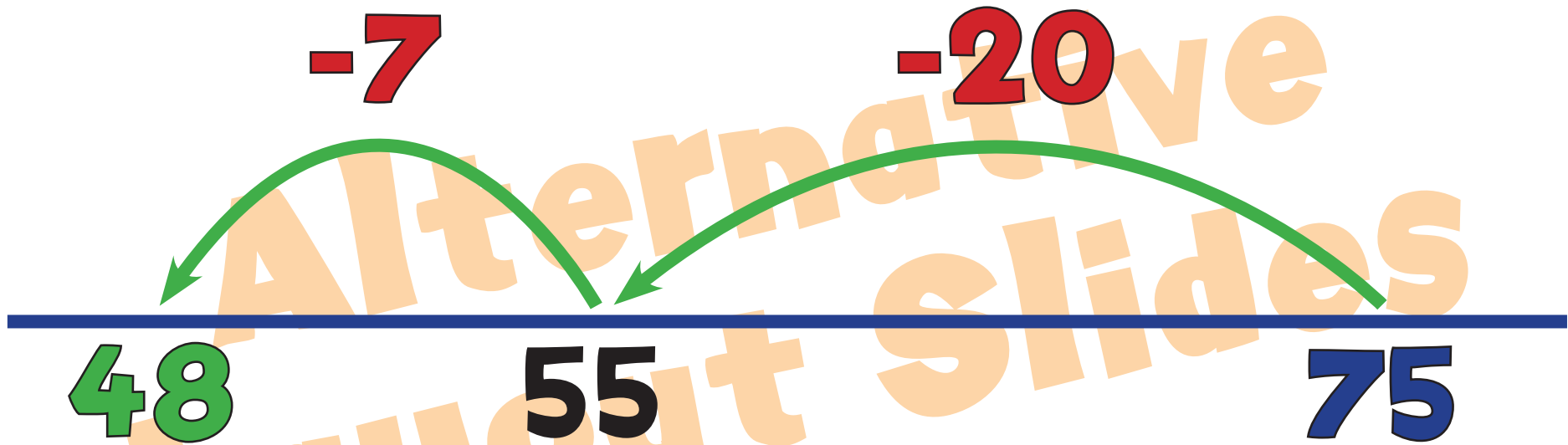


$$87 - 23 = 64$$



S5a: Backwards Jump

2



$$75 - 27 = 48$$



(M8: Column Multiplication)

3 Additional

Alternative Layout Slides

$$\begin{array}{r} 10 \quad 1 \\ 15 \\ \times 5 \\ \hline 75 \end{array}$$



(M8: Column Multiplication)

4 Additional: a

100 10 1

Alternative
Layout Slides

$$\begin{array}{r} 43 \\ \times 6 \\ \hline 258 \end{array}$$

24

1



M8: Column Multiplication

4

100 10 1

147

x 4

1 2

588

Alternative
Layout slides



M8a: Column Multiplication

4

3647
x 4

14588

2 1 2

Alterna
Layout slides



M10a: Long Multiplication

Column

5

$$\begin{array}{r} 43 \\ \times 65 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \quad 1 \\ 215 \end{array}$$

$$(43 \times 5)$$

$$\begin{array}{r} 2 \quad 1 \\ + 2580 \\ \hline \end{array}$$

$$(43 \times 60)$$

$$\begin{array}{r} 2795 \\ \hline \end{array}$$



M10b: Long Multiplication

Column

5

$$\begin{array}{r} 243 \\ \times 68 \\ \hline 1944 \quad (243 \times 8) \\ 14580 \quad (243 \times 60) \\ \hline 16524 \end{array}$$

Alternative Layout Slides



M10c: Long Multiplication

Column

5

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

Alternative Lawcoast Slides



M10d: Column Multiplication

5

10 1 ■ $\frac{1}{10}$

3.6

x 4

2

14.4

Alternative
Layout Slides



M10e: Column Multiplication

6

100 10 1 ■ $\frac{1}{10}$

47.2

x 3

2

141.6



M10f: Column Multiplication

6

10 1 ■ $\frac{1}{10}$ $\frac{1}{100}$

7.38

x 6
4 2 4

44.28



M10g Long Multiplication

Column Decimals

6

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



M10h: Long Multiplication

Column

6

$$\begin{array}{r} 3786 \\ \times 48 \\ \hline 30288 \\ + 151440 \\ \hline 181728 \end{array}$$

Alternative Slides

(3786 x 8)

(3786 x 40)

