Sense of Number

Visual Calculations Policy

SoN Full Training Edition for

St. Martin's C of E Primary School.

July 2014

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For sole use within St. Martin's C of E Primary School.

'A picture is worth 1000 words!'

www.senseofnumber.co.uk

Guide to using a Visual Calculations Policy

The Sense of Number Visual Calculations Policy provides a visual representation of a school's counting policy and its written and mental calculation policy.

Typical uses:

Classroom: The slides are printed out (e.g. A4) and the appropriate slides are displayed within each classroom for continual reference or on a working wall.

Teacher Reference: The slides are printed out (e.g. 9 slides per A4 page) and inserted in the teacher's planning folder.

Parents: The slides are used to communicate to parents the methods being taught and used within school.

Website: Slides from the VCP are inserted on a school's maths webpages. (Please note: the VCP should not be made available for download)

KC1: Key Concepts!

Addition

8 + 2 = 10

"What is 8 add 2?"
Answer: 10

Subtraction

8 - 2 = 6

"What is 8 subtract 2?"
Answer: 6

"The difference between 8 and 2 is 6"

KC2: Key Concepts!

Multiplication

×

8 x 2 = 16

"8 multiplied by 2" means
"8, 2 times" or
"2 groups of 8"

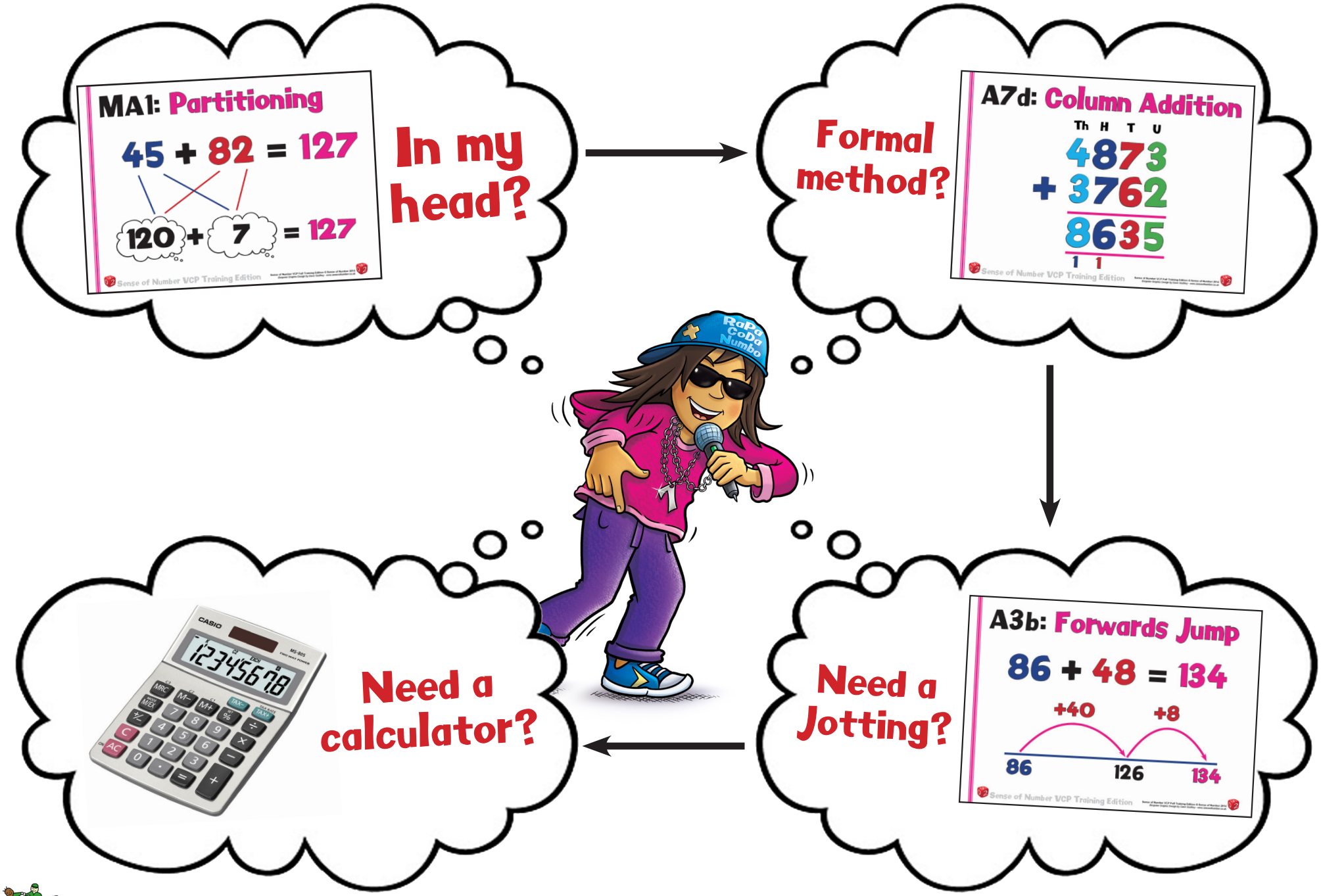
Division

÷

8 ÷ 2 = 4

"8 divided by 2" means "How many groups of 2 are there in 8?" Answer: 4

("8 shared into 2 sets is 4")



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1

Can I do this in my head?

2

Do I need to use a drawing or a jotting?

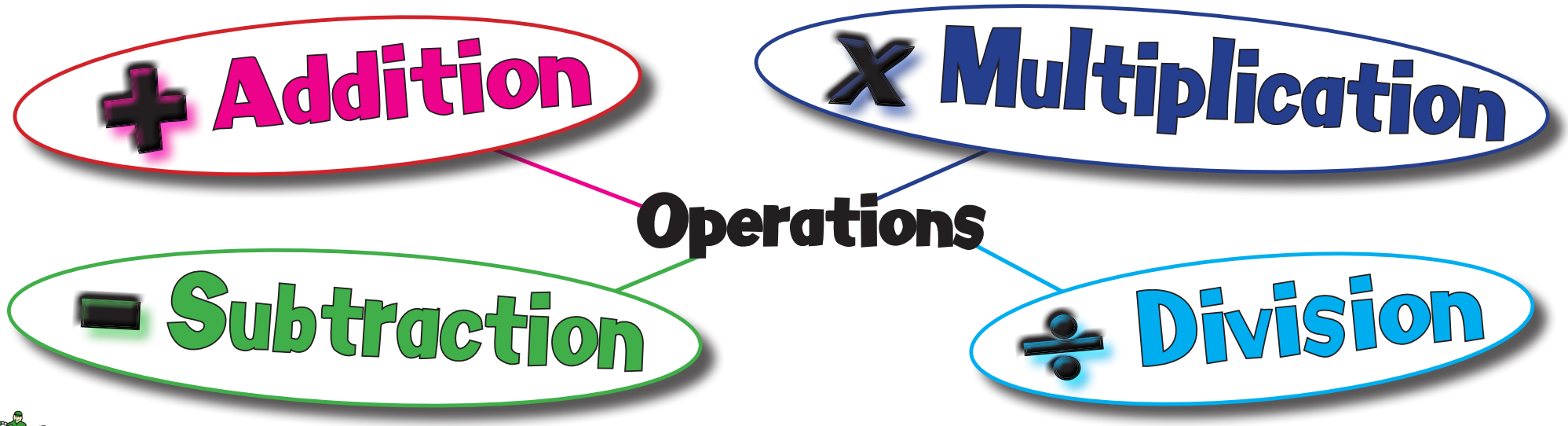
3

Do I need an expanded or a standard method?

4

Do I need a calculator?

Calculation Vocabulary



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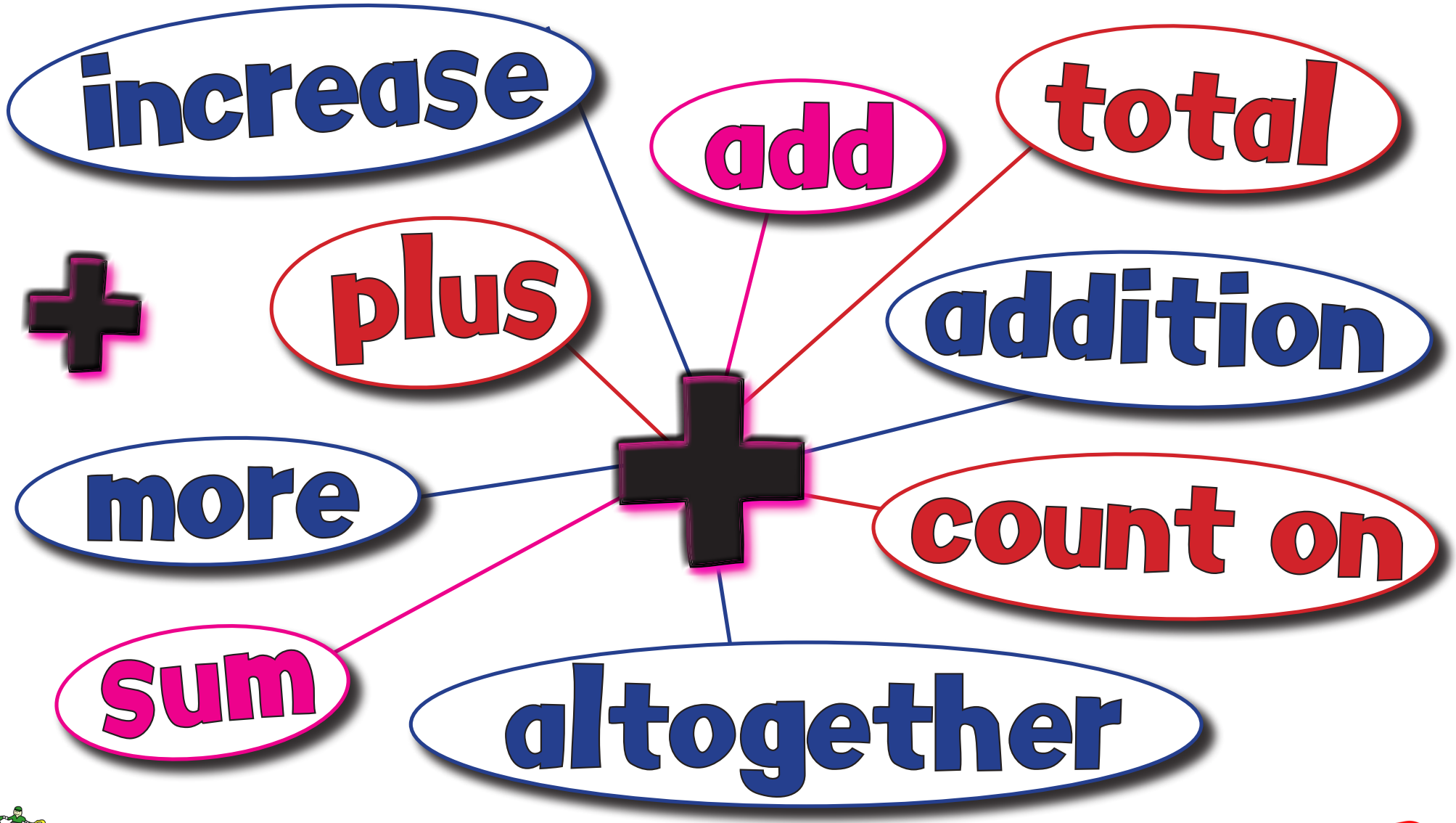
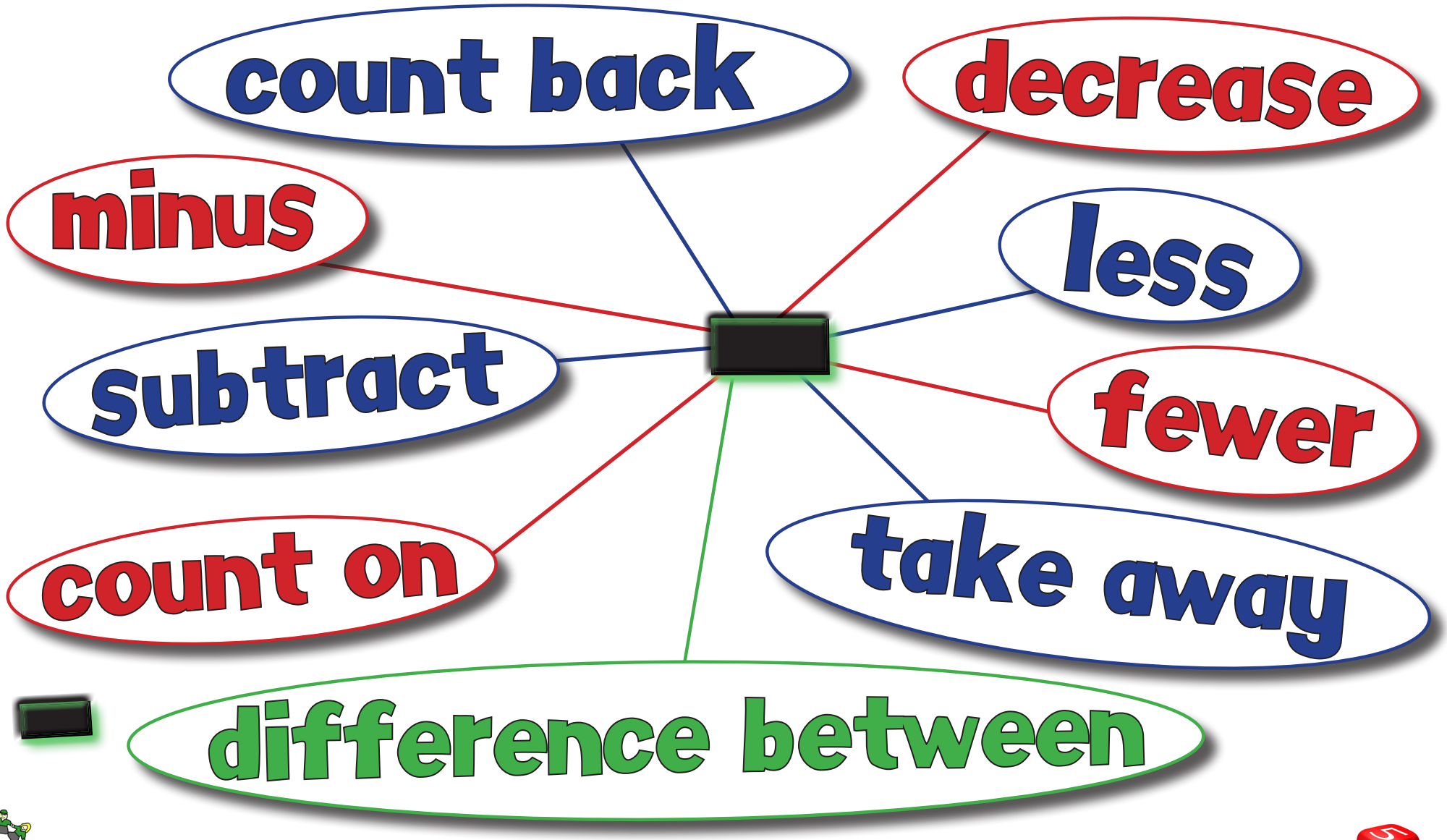
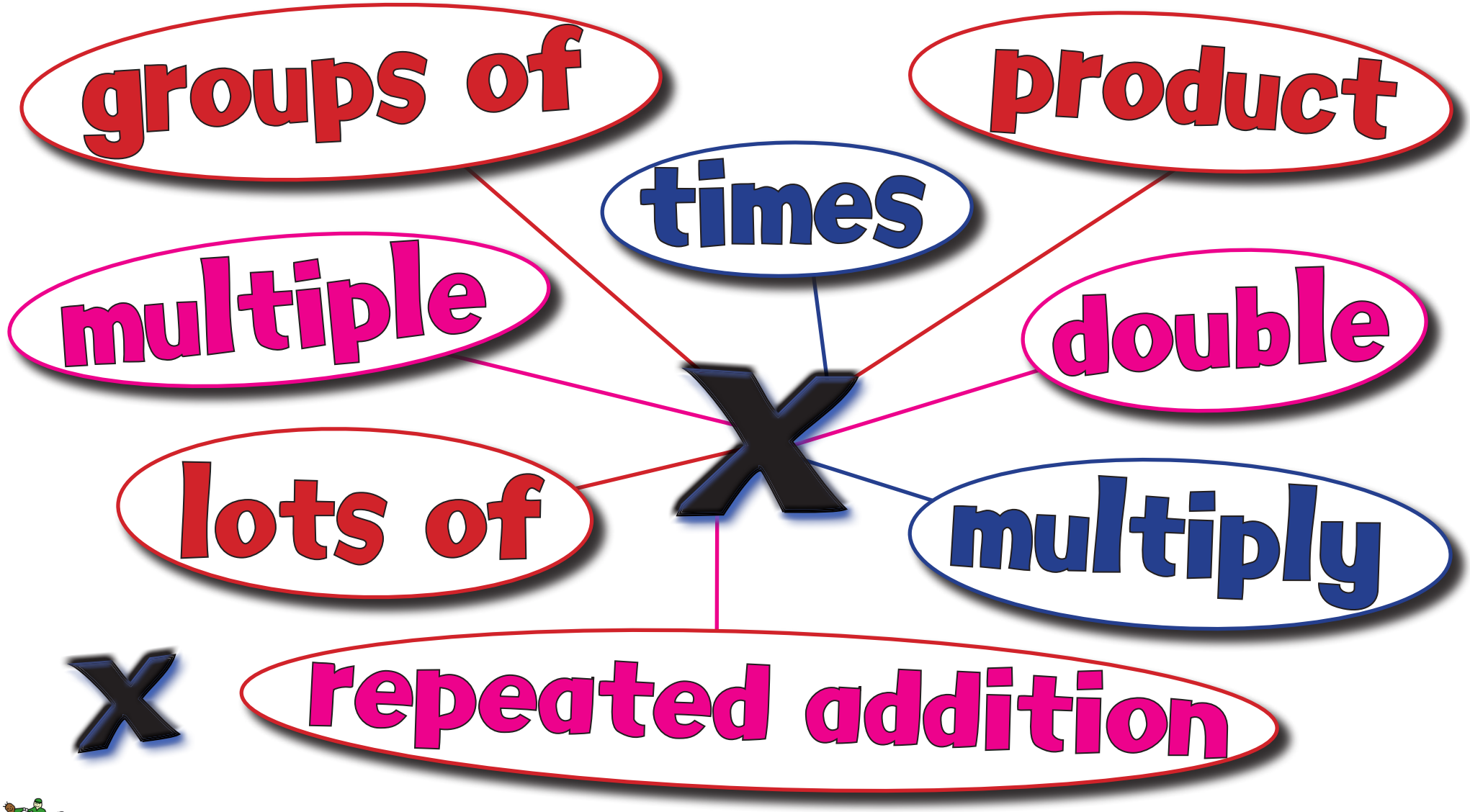
Addition Vocabulary



Subtraction Vocabulary



Multiplication Vocabulary



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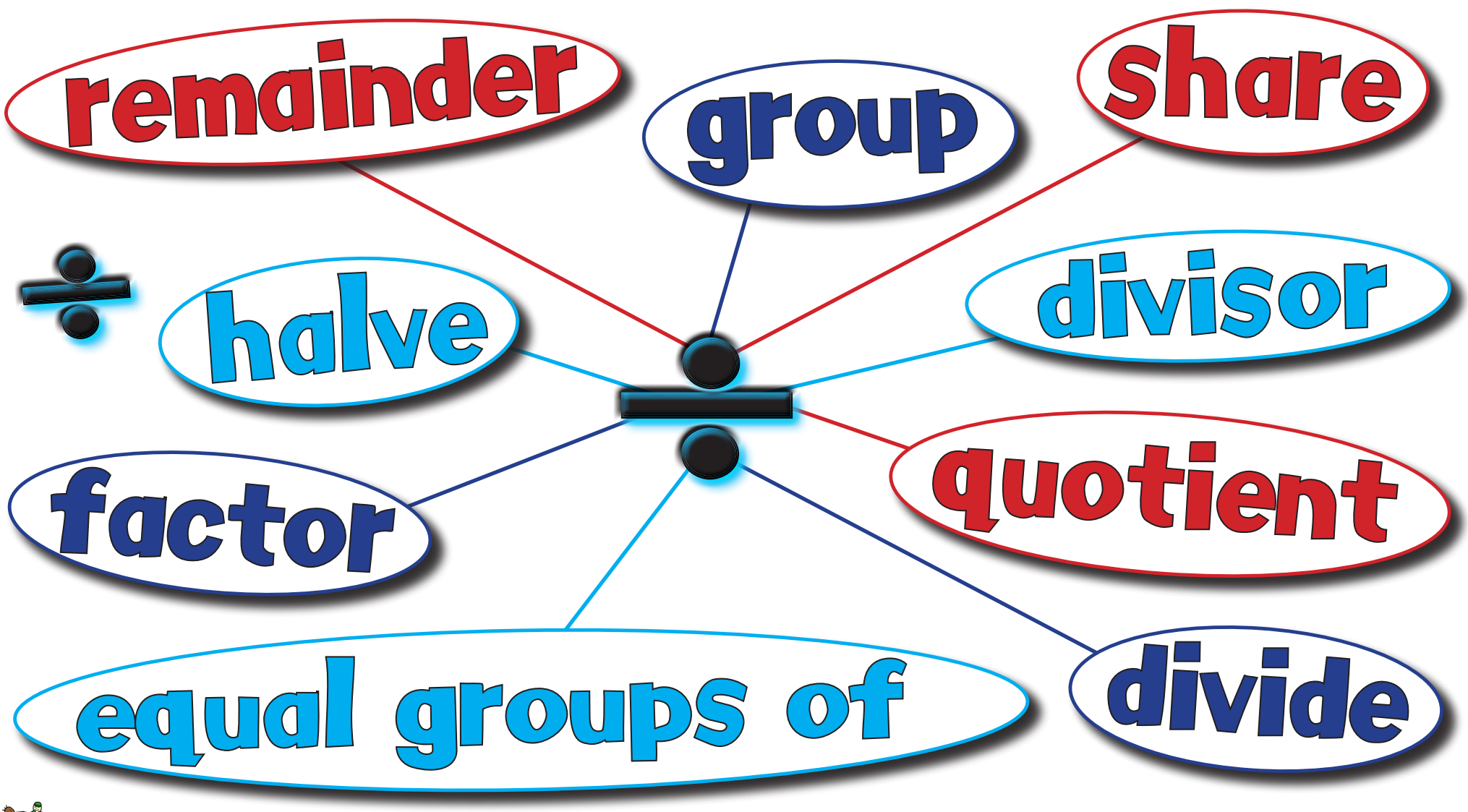
Division Vocabulary



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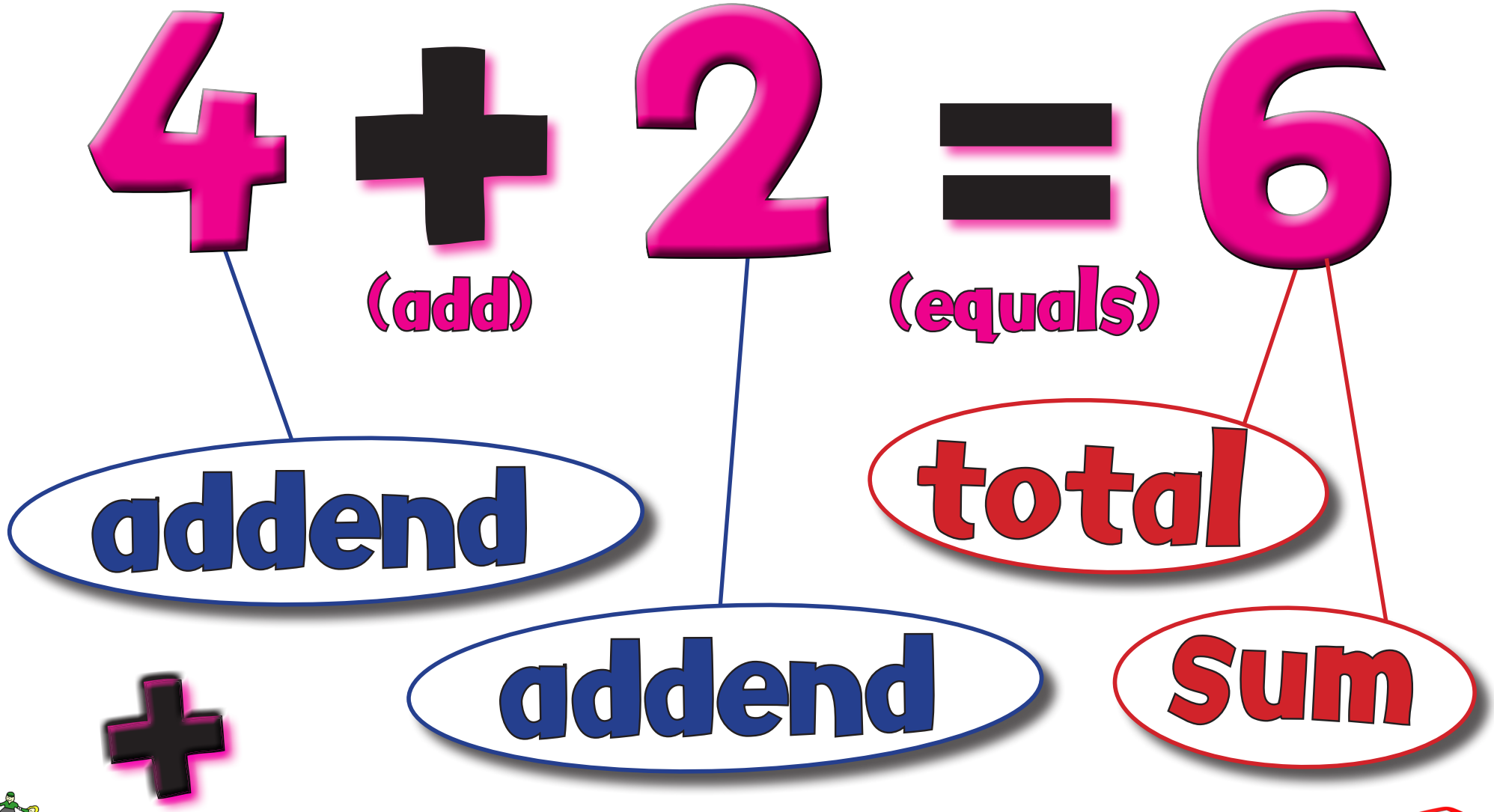
Addition Calculation



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Subtraction Calculation

6 − 2 = 4

(subtract) (equals)

minuend

subtrahend

difference

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Multiplication Calculation

$4 \times 2 = 8$

(multiplied by) (equals)

multiplicand

product

multiplier

×

Division Calculation

8 ÷ 2 = 4

(divided by) (equals)

dividend

divisor

quotient

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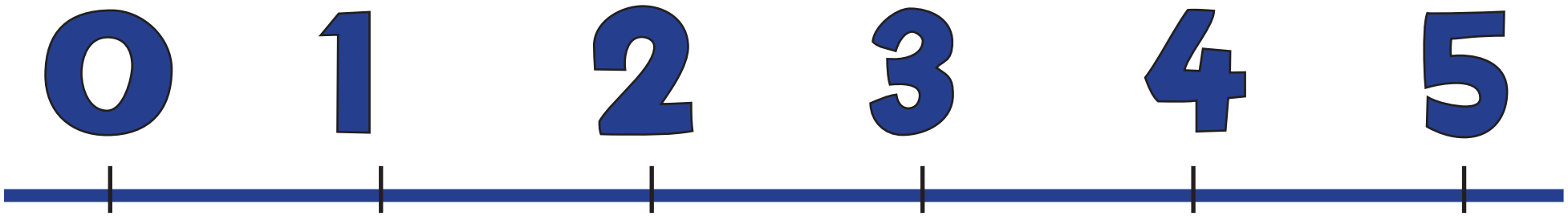
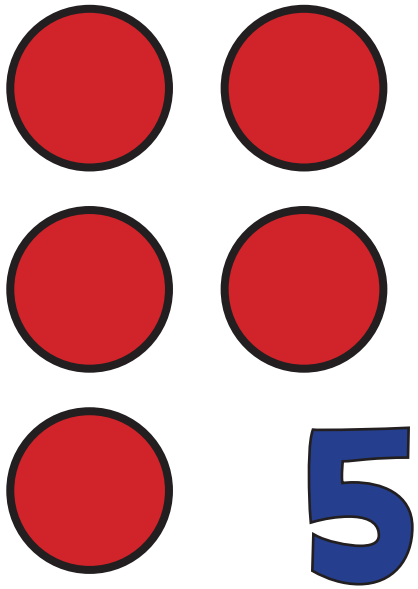
C1a: Number Order

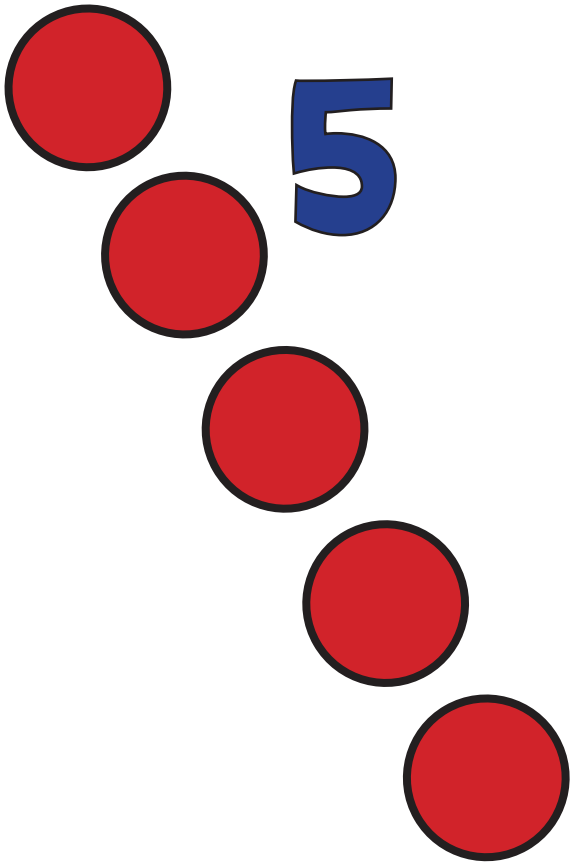


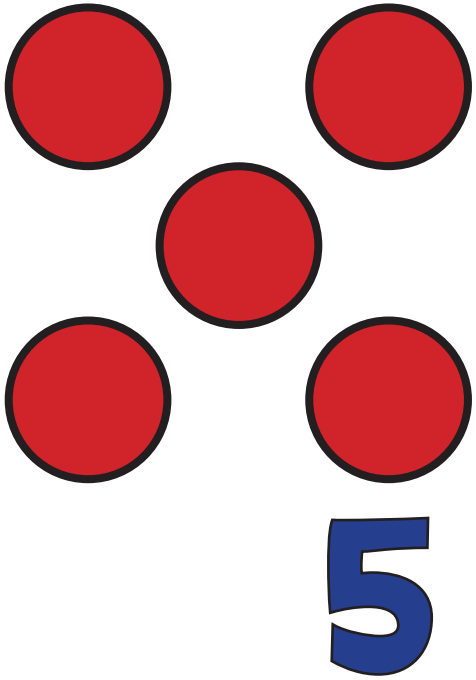
The Numbers must be said once and always in the conventional order.

C1b: At a Glance

Subitising



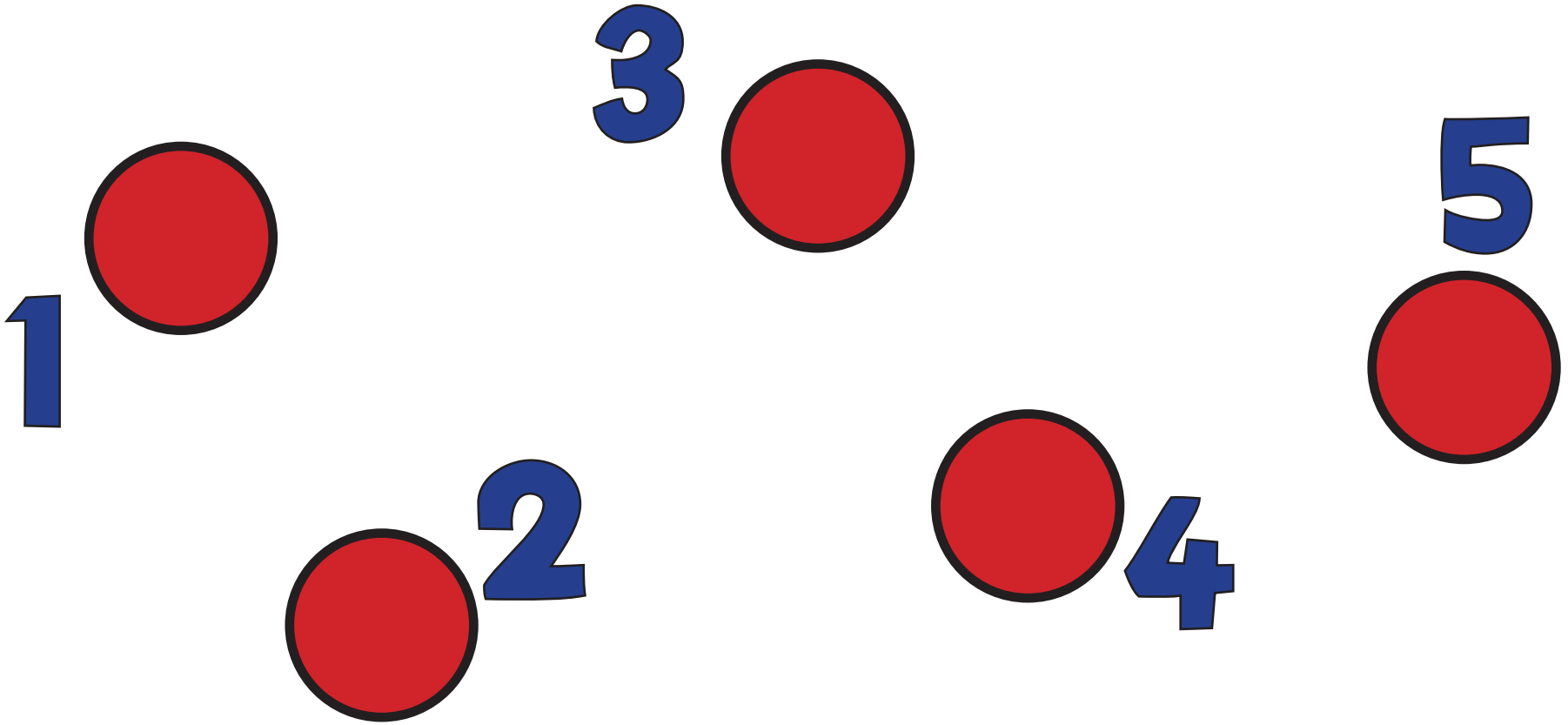




See at a glance how many are in small collections and attach correct number names to such collections.

C2a: Number Match

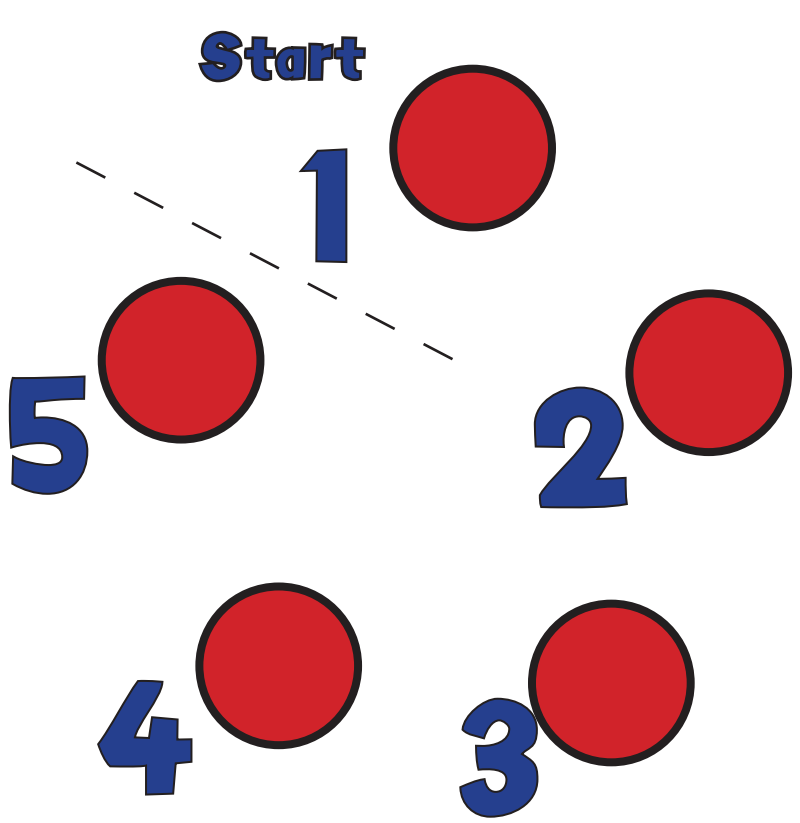
One to One Correspondence

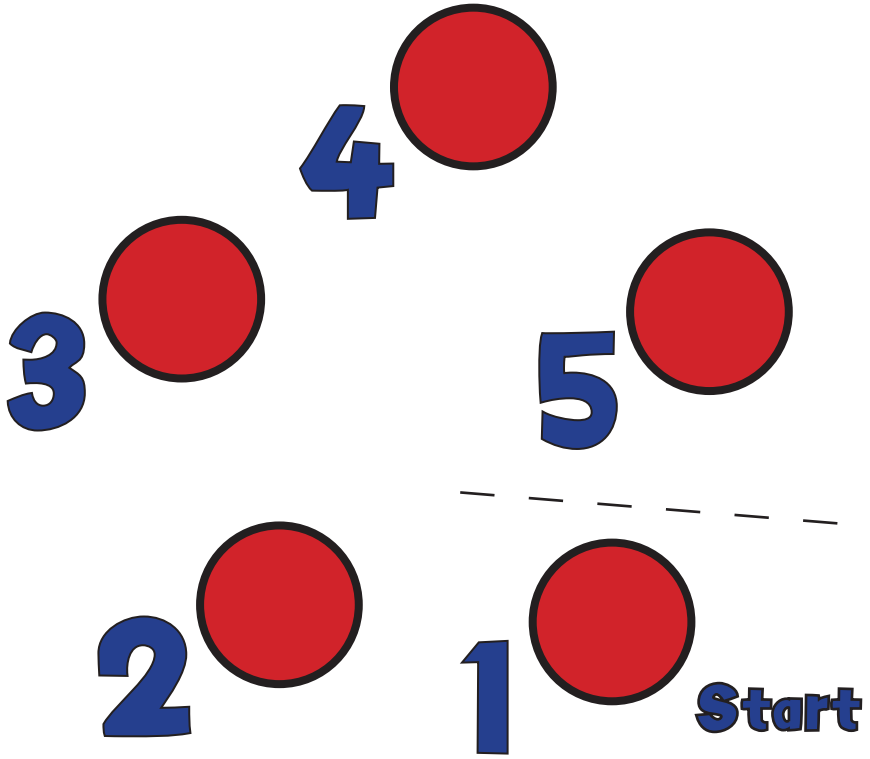


Each object to be counted must be touched or 'included' exactly once as the numbers are said.

C2b: Counting Objects

Starting Point and Order Irrelevance

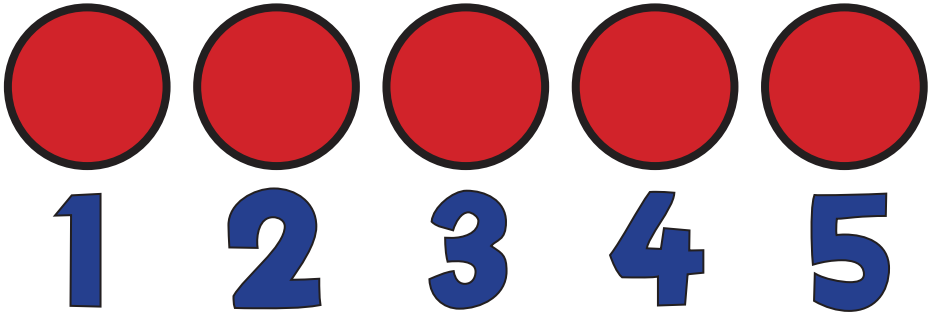


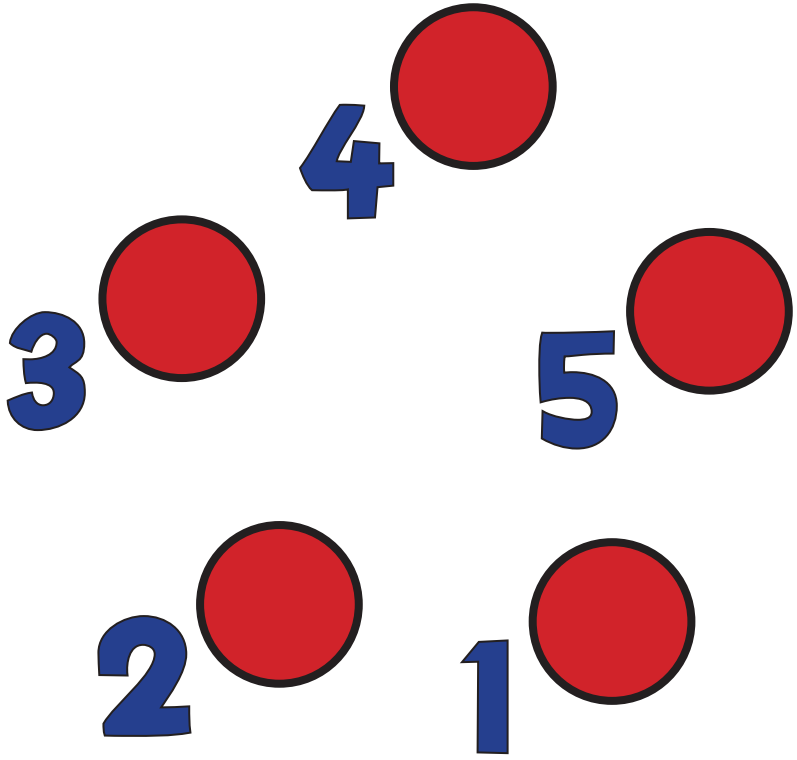


The objects can be touched in any order. The starting point and order in which the objects are counted does not affect how many there are.

C2c: Order Arrangement

Arrangement Irrelevance

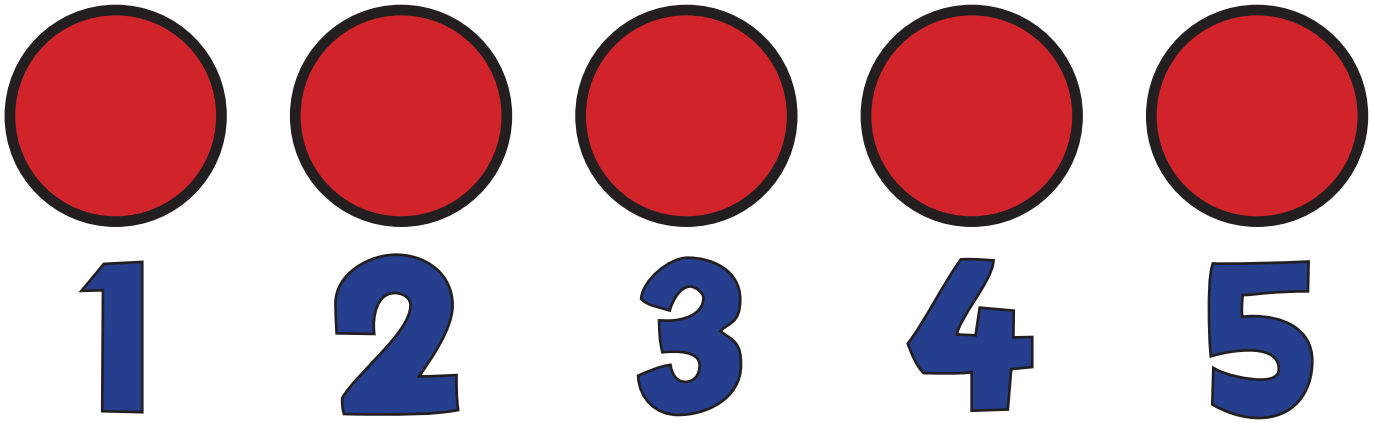




The arrangement of the objects does not affect how many there are.

C3: How Many?

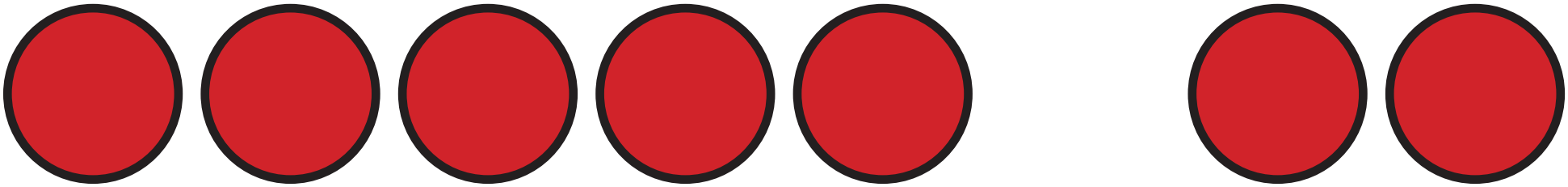
Final number is the total



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

C4: Arranging

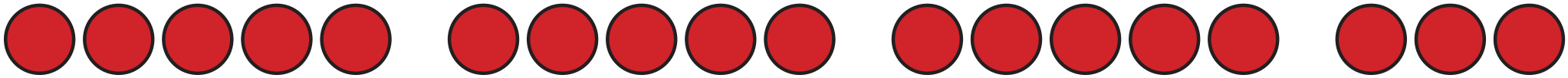
Sets of 5



7

C4a: Arranging

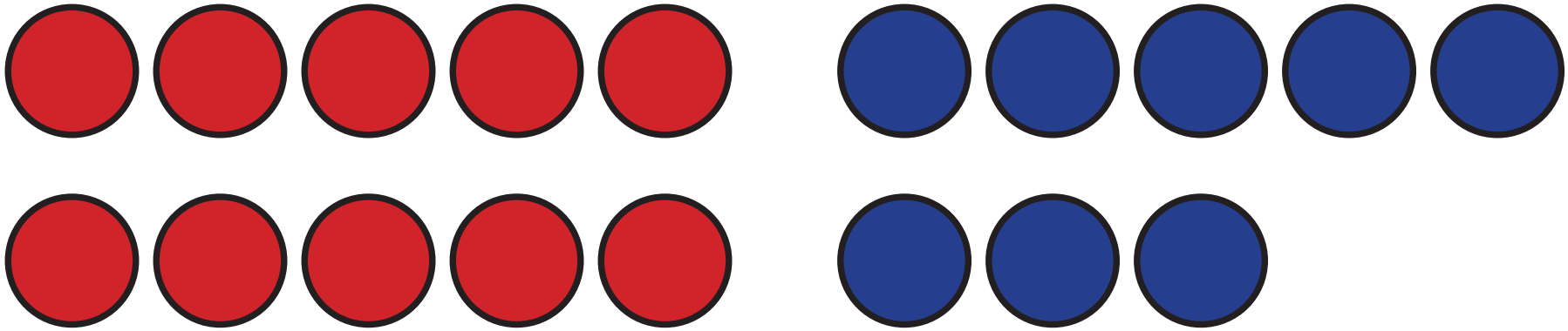
Sets of 5



18

C4b: Arranging

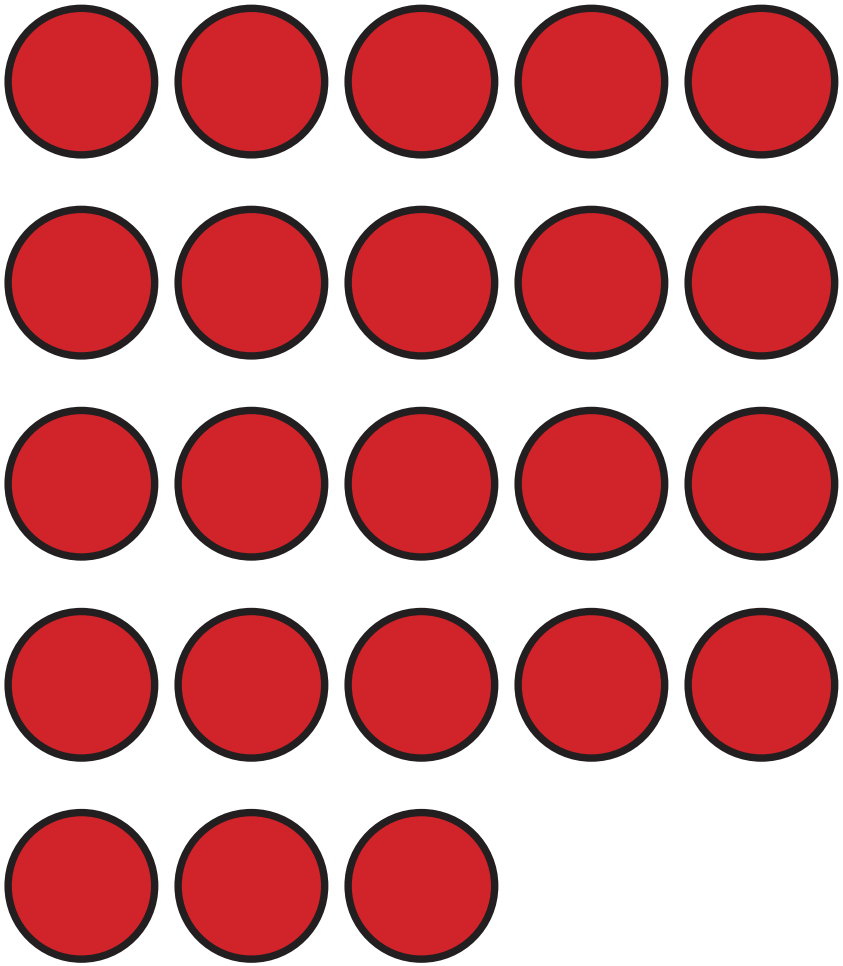
Sets of 5 (Non Linear)



18

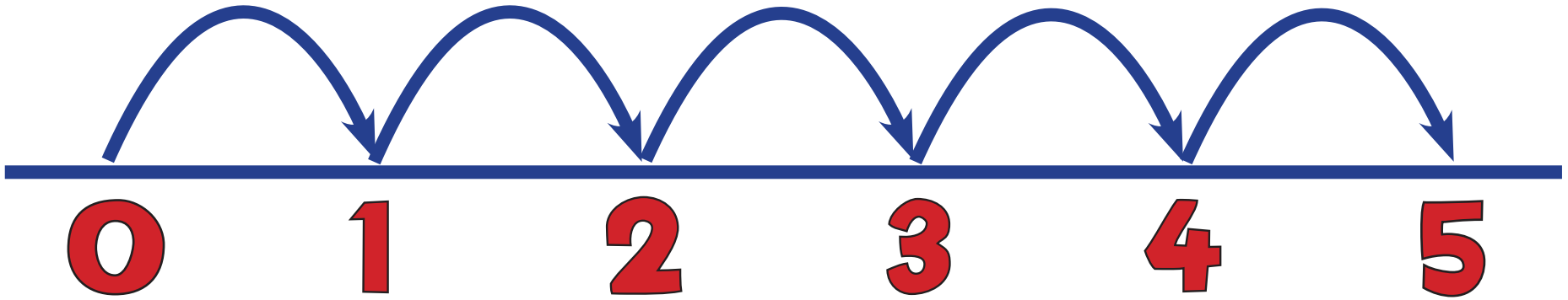
C4c: Arranging

Sets of 5 (Non Linear)

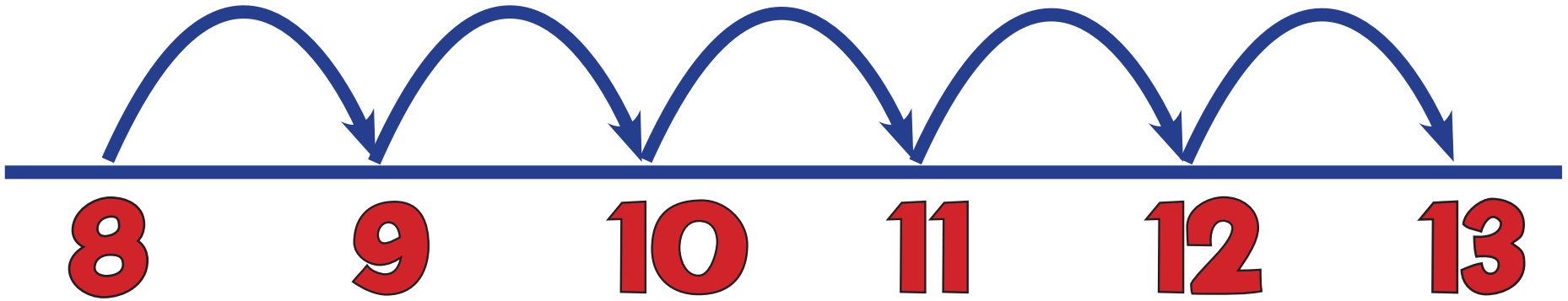


43

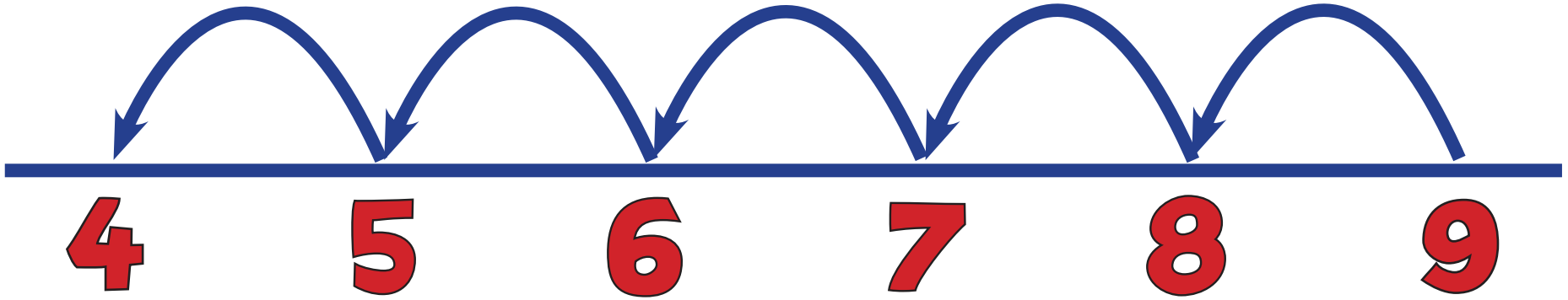
C5: Counting Forwards



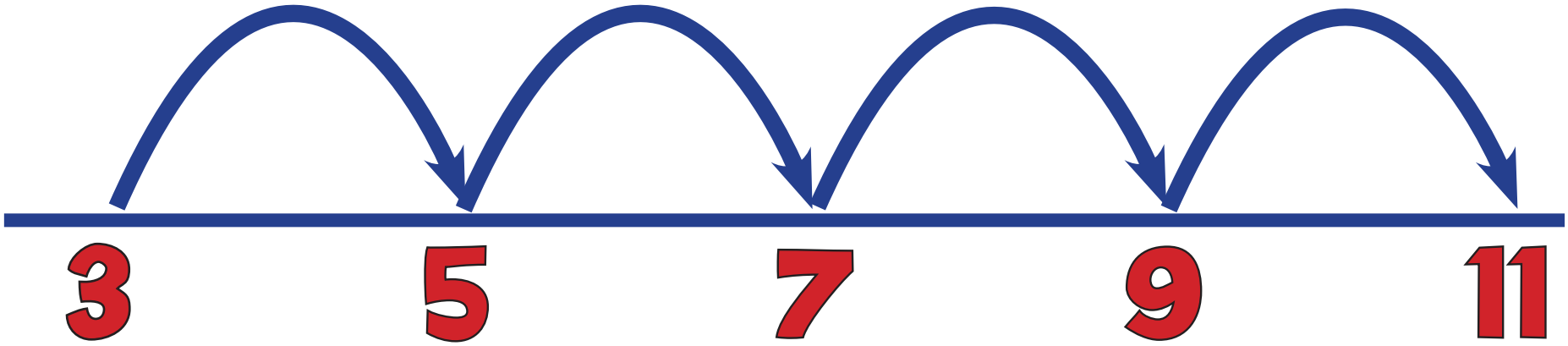
C6: Counting On



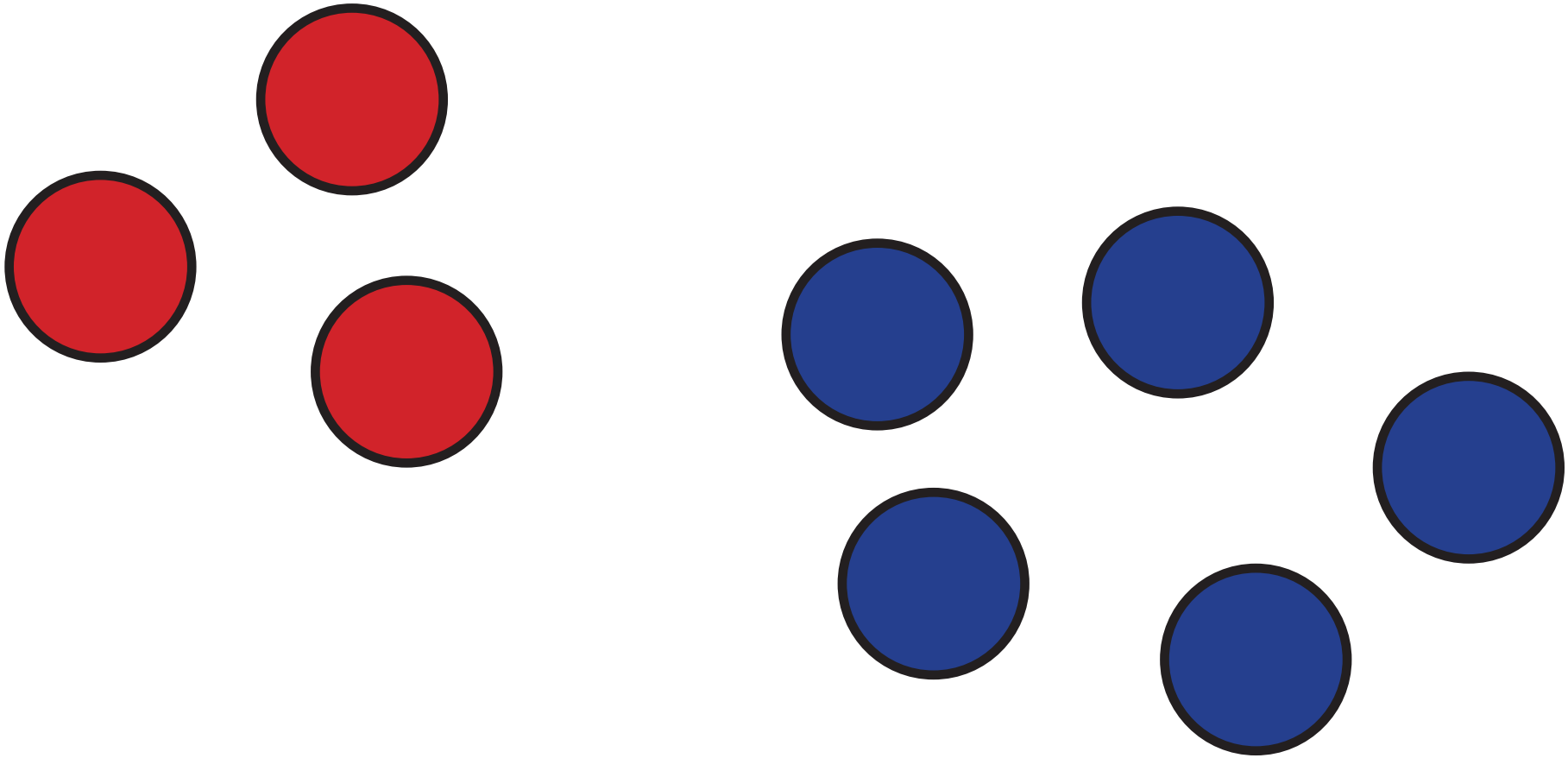
C7: Counting Back



C8: Counting in Steps

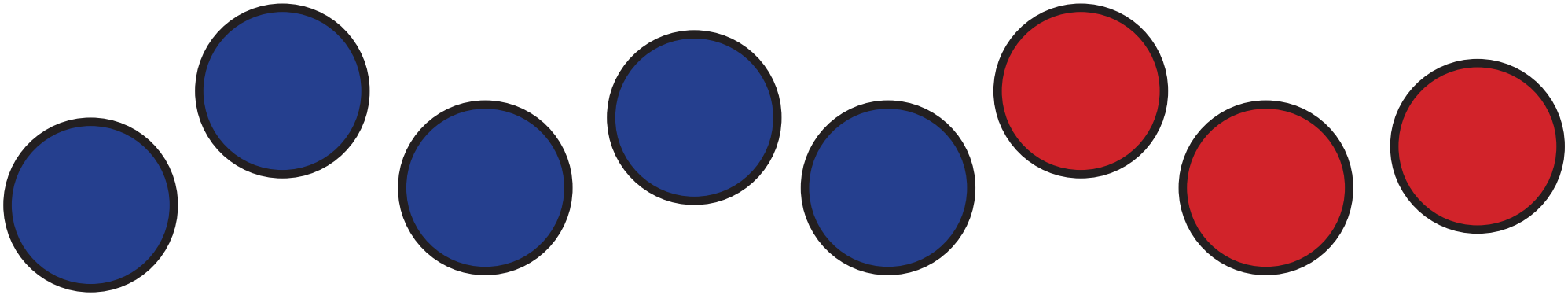


A1: Objects & Pictures



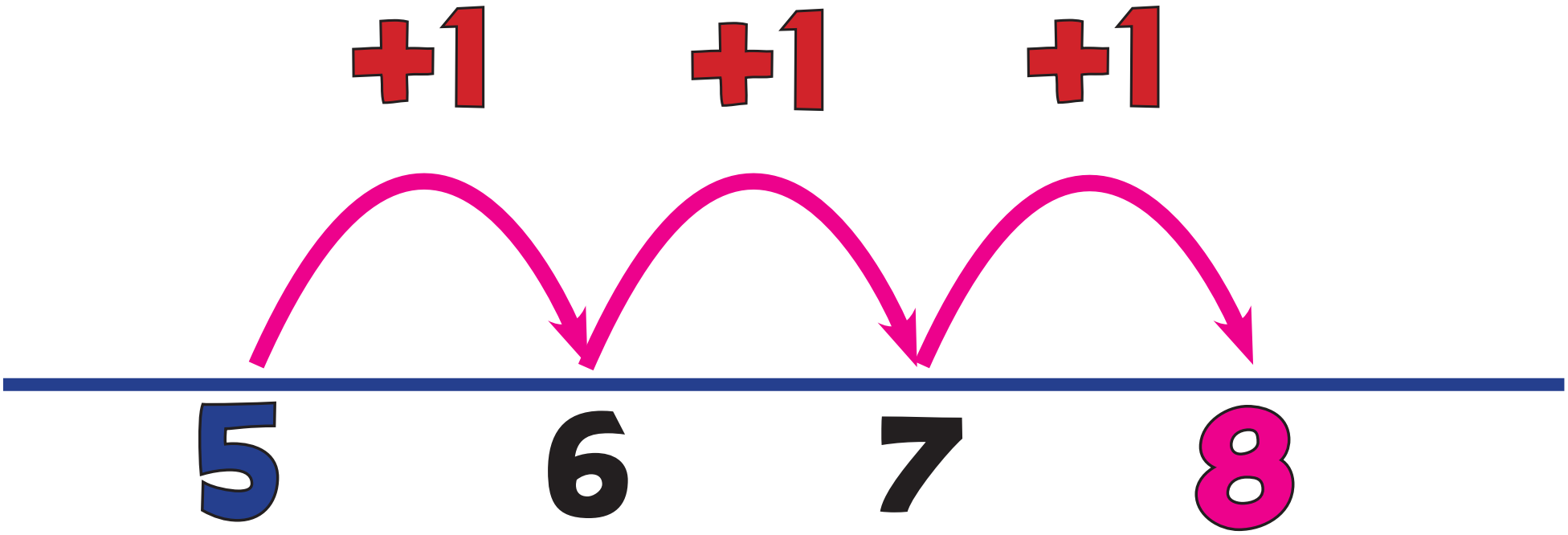
"If I have 3 and then 5 more, how many altogether? Answer: 8"

A1a: Largest Number 1st



5 + 3 = 8

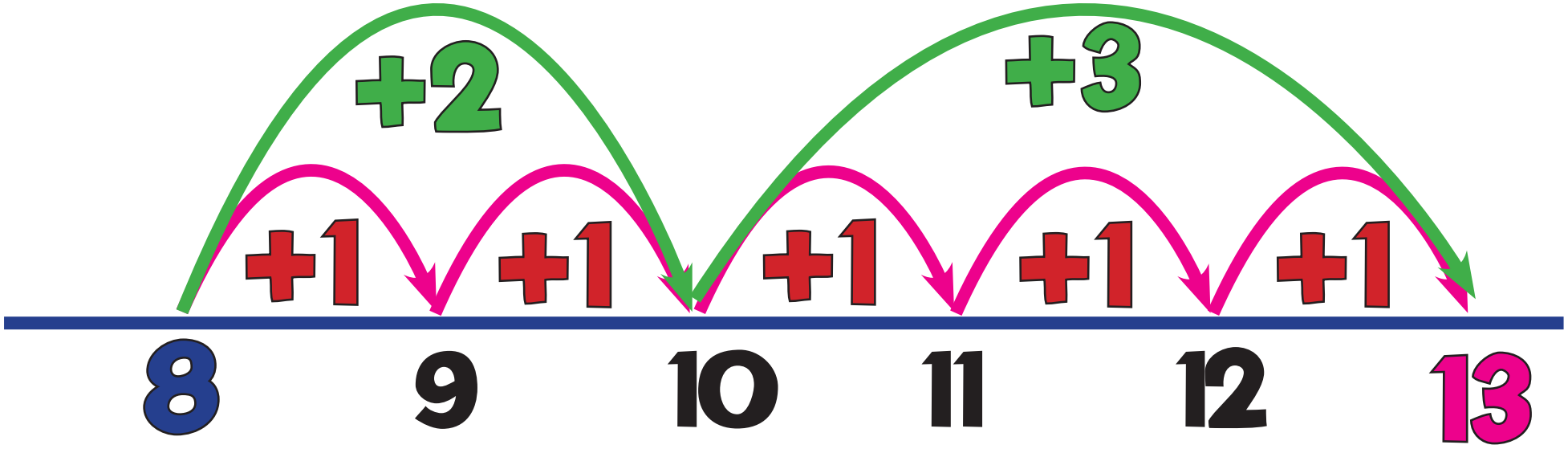
A2: Counting On



$$5 + 3 = 8$$

A2a: Counting On

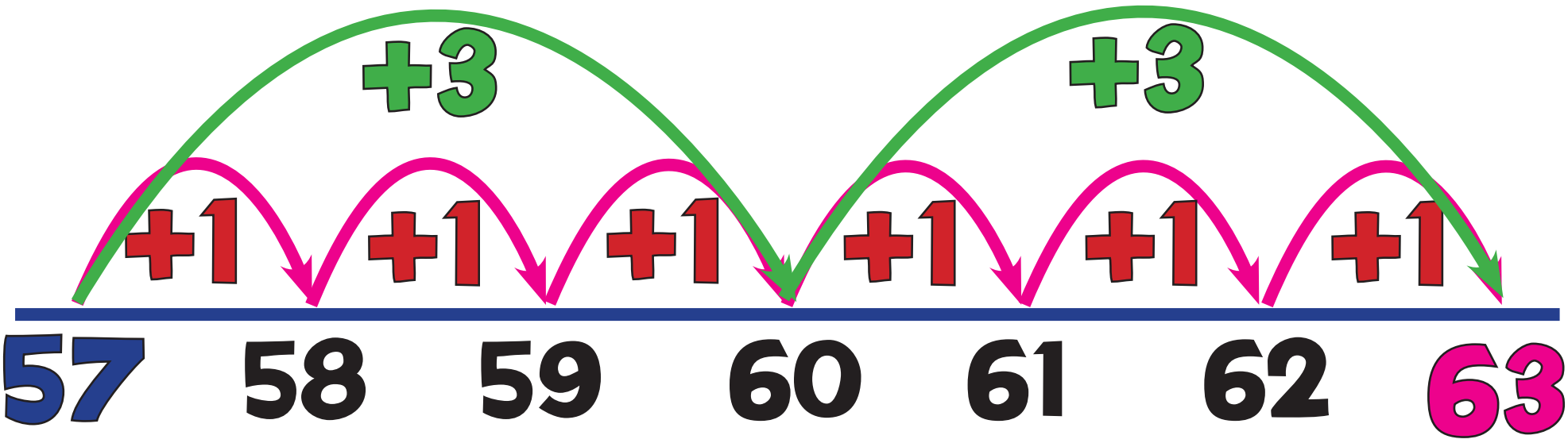
Bridging 10



8 + 5 = 13

A2b: Counting On

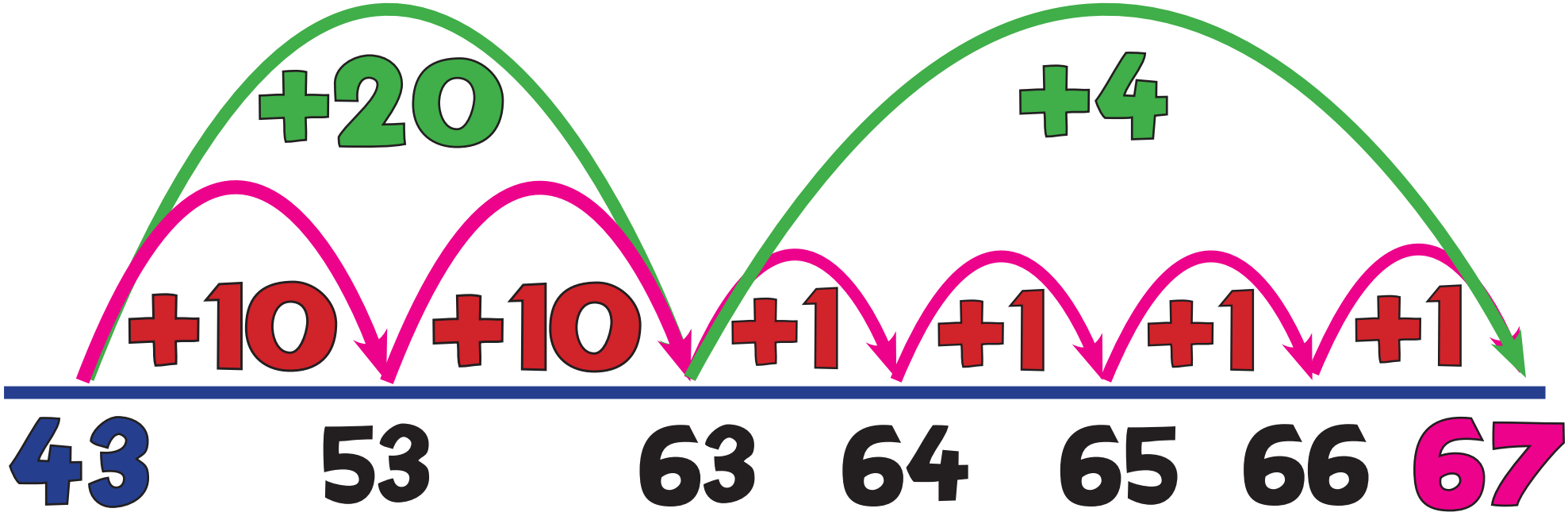
Bridging 10s Number



57 + 6 = 63

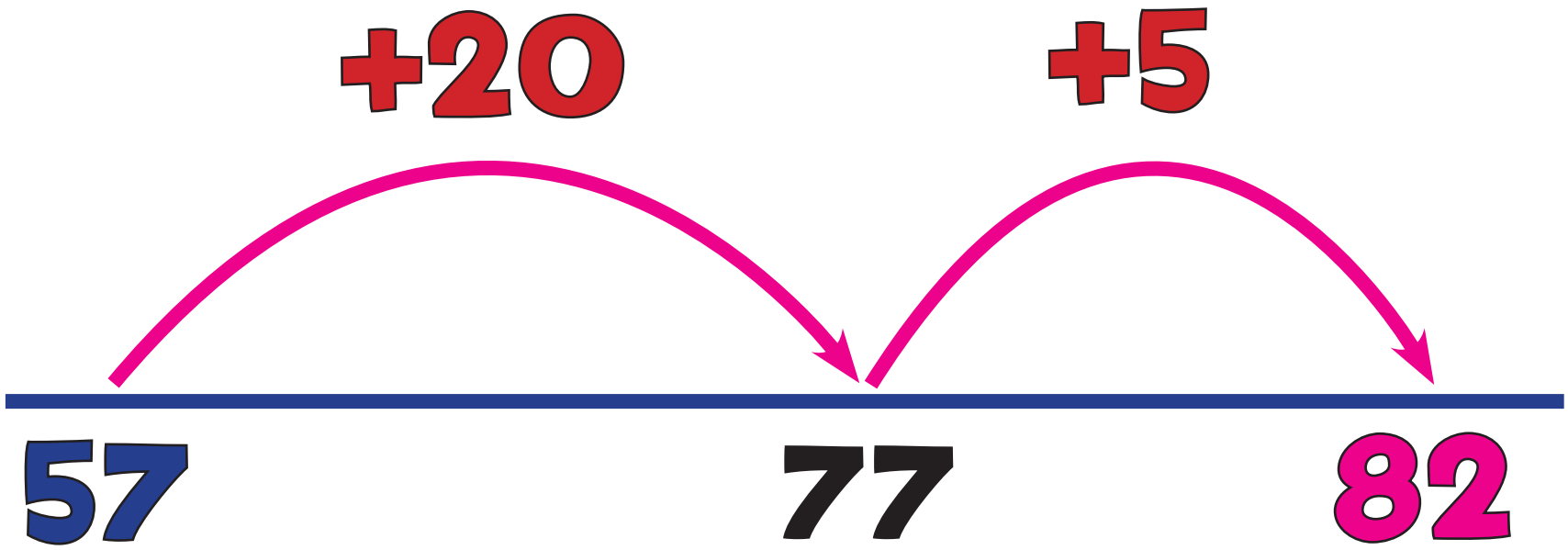
A3: Forwards Jump

43 + 24 = 67



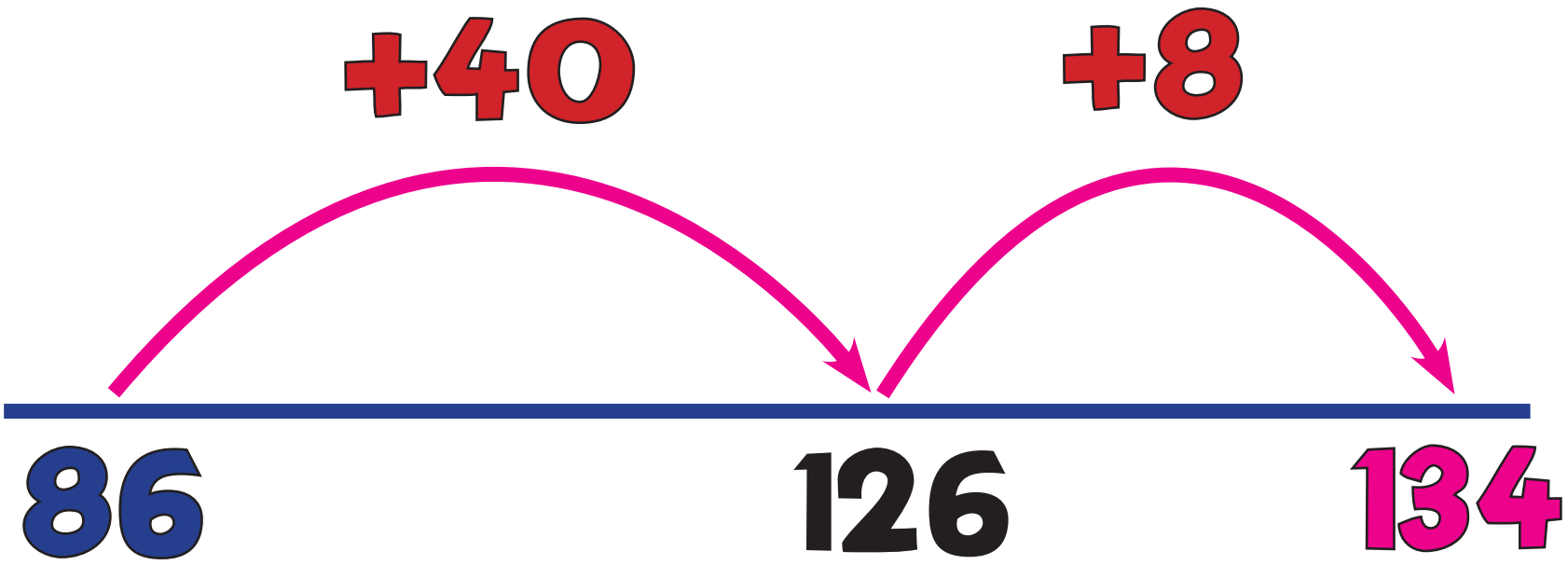
A3a: Forwards Jump

57 + 25 = 82



A3b: Forwards Jump

86 + 48 = 134



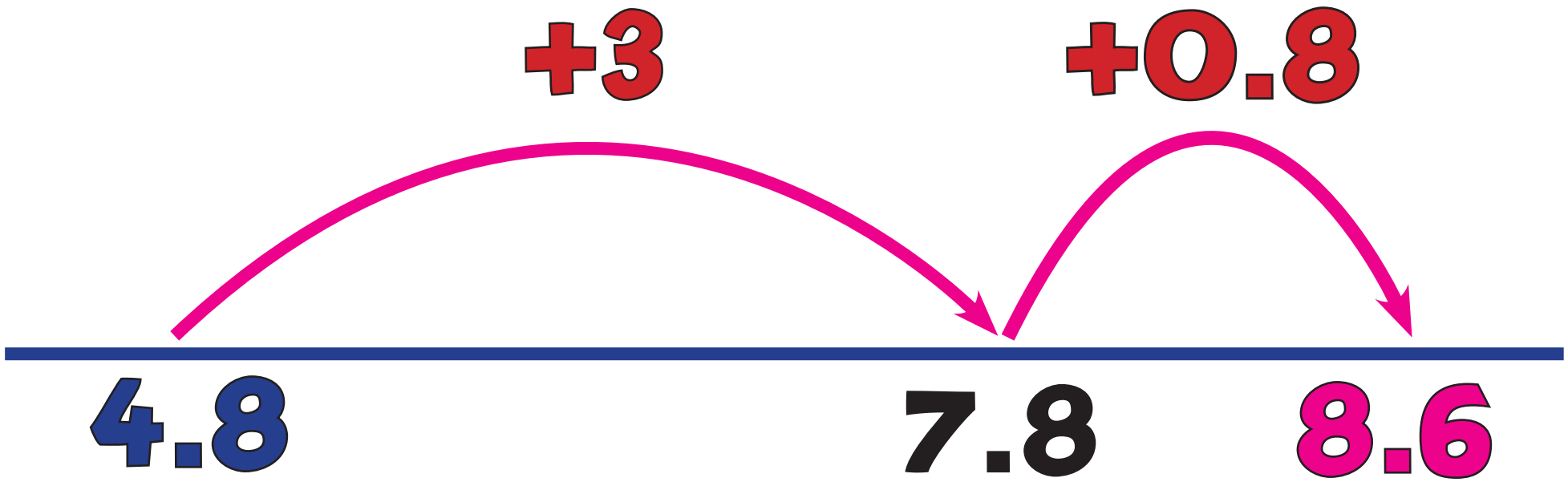
A3c: Forwards Jump

687 + 248 = 935

+200 +40 +8

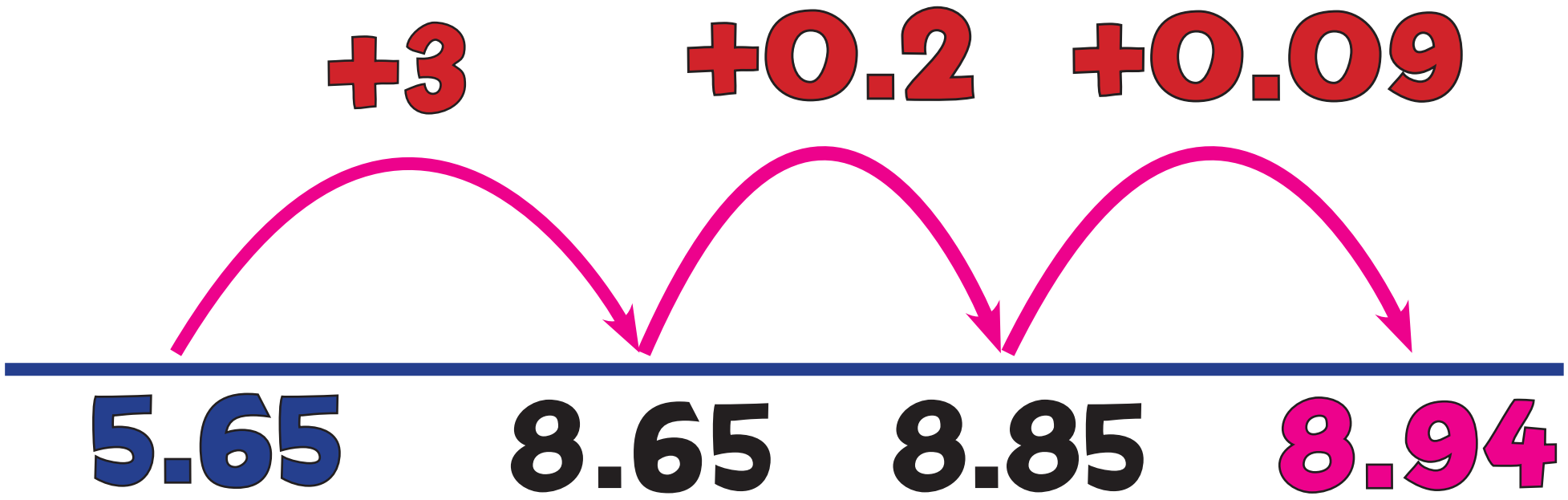
A3f: Decimal Jump

4.8 + 3.8 = 8.6



A3g: Decimal Jump

5.65 + 3.29 = 8.94



A4: Partitioning

$$43 + 24 = 67$$

$$40 + 20 = 60$$

$$3 + 4 = 7$$

$$60 + 7 = 67$$

A4a: Partitioning

$$57 + 25 = 82$$

$$50 + 20 = 70$$

$$7 + 5 = 12$$

$$82$$

A4b: Partitioning

$$86 + 48 = 134$$

$$80 + 40 = 120$$

$$6 + 8 = 14$$

$$120 + 14 = 134$$

A4c: Partitioning

687 + 248 = 935

600 + 200 = 800

80 + 40 = 120

7 + 8 = 15

935

A4f: Partitioning

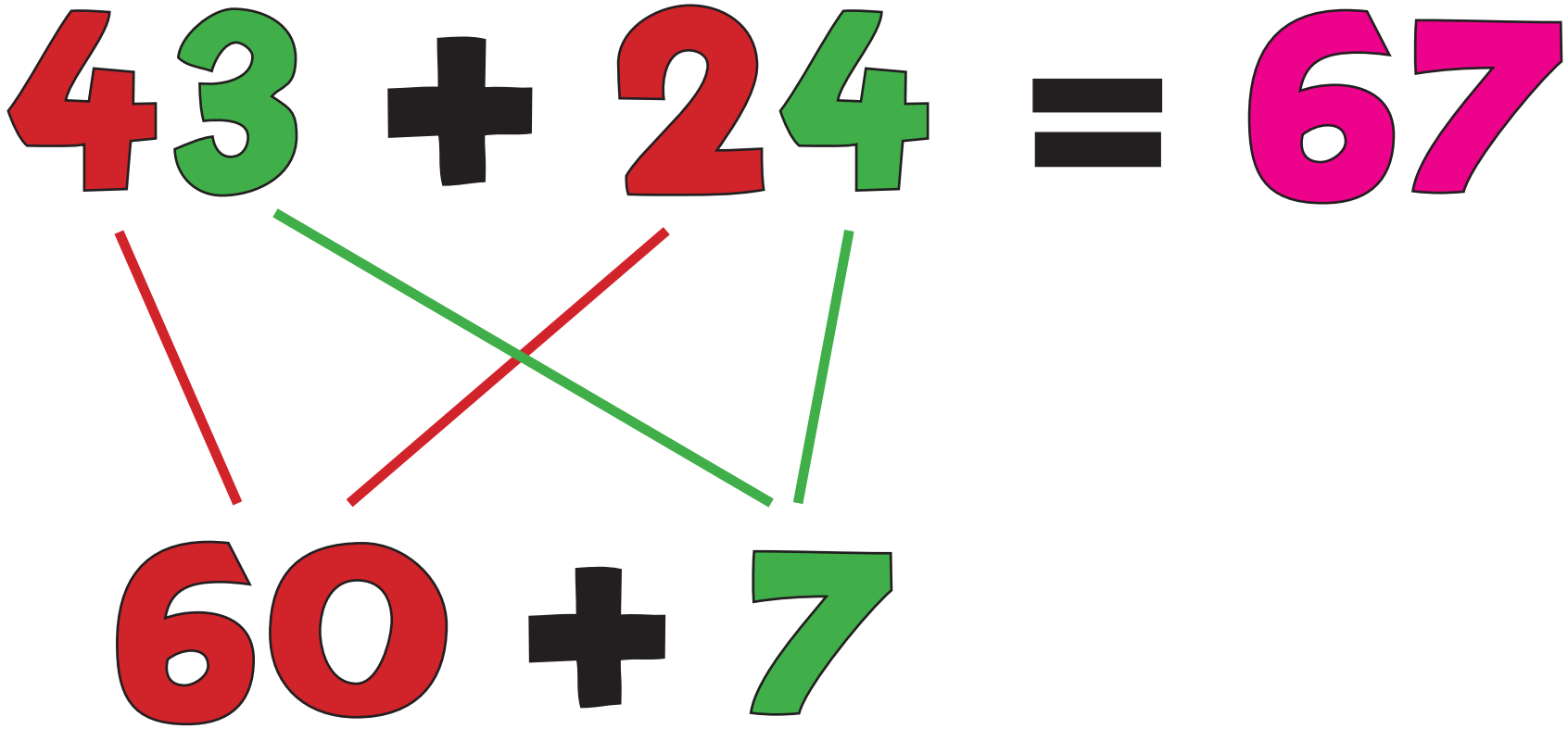
$$4.8 + 3.8 = 8.6$$

$$4 + 3 = 7$$

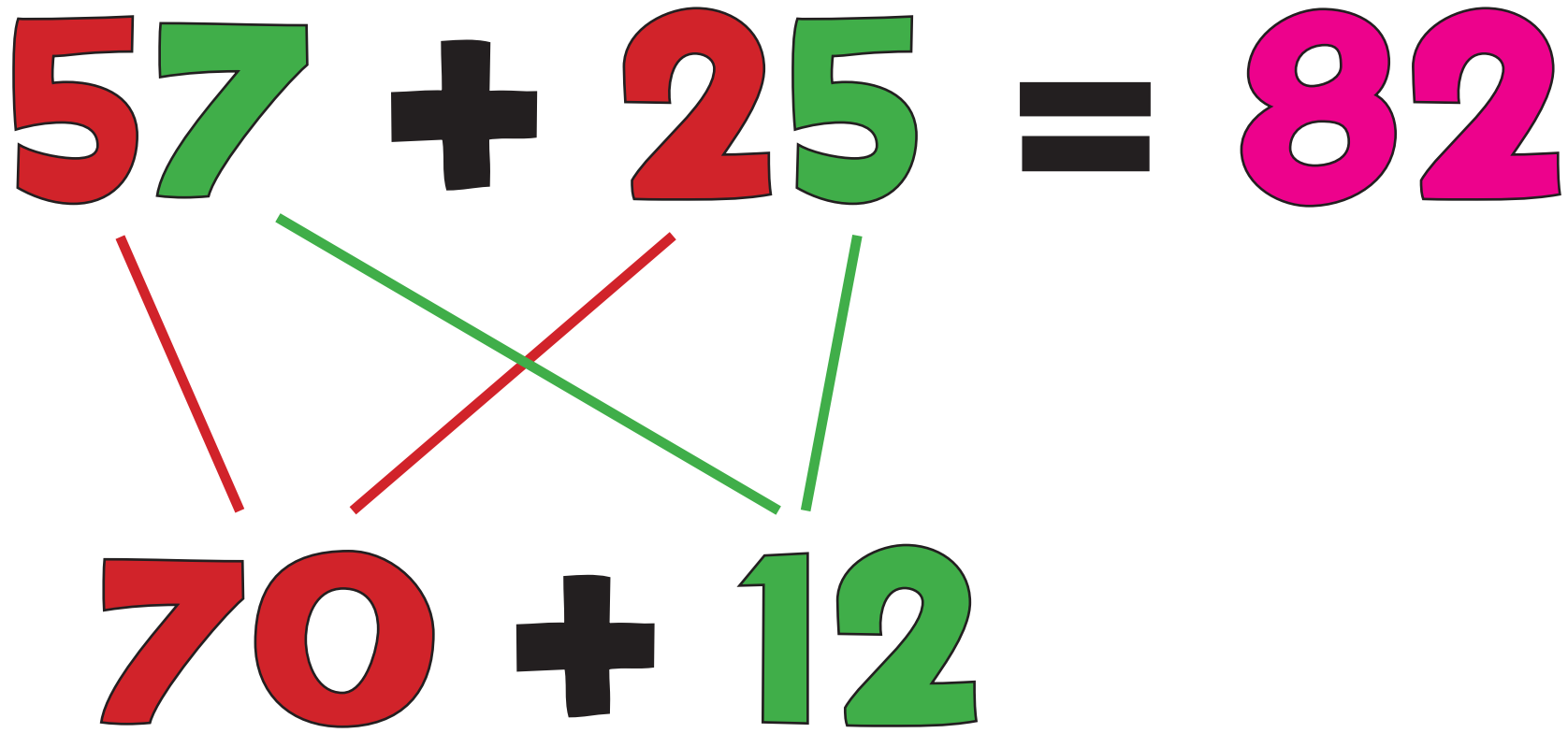
$$0.8 + 0.8 = 1.6$$

$$8.6$$

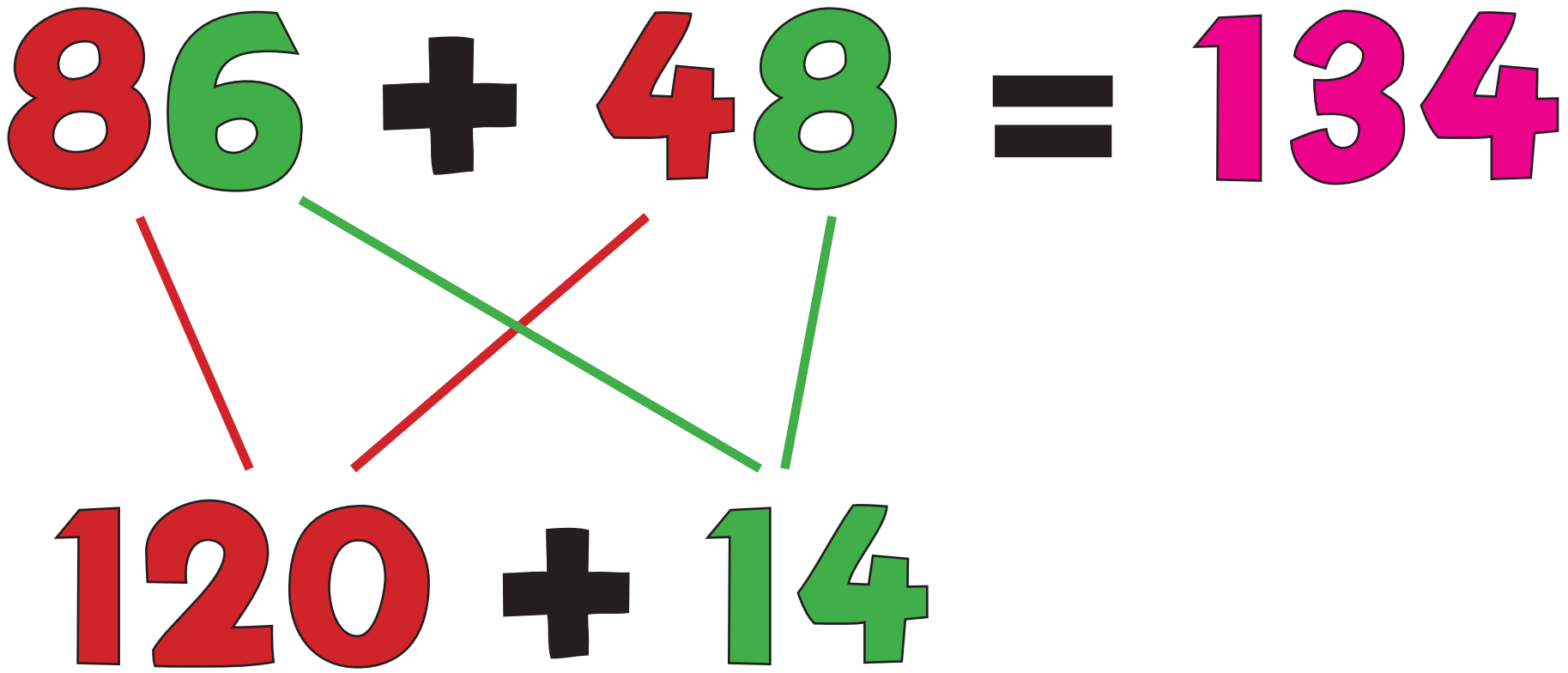
A5: Partition Jot



A5a: Partition Jot

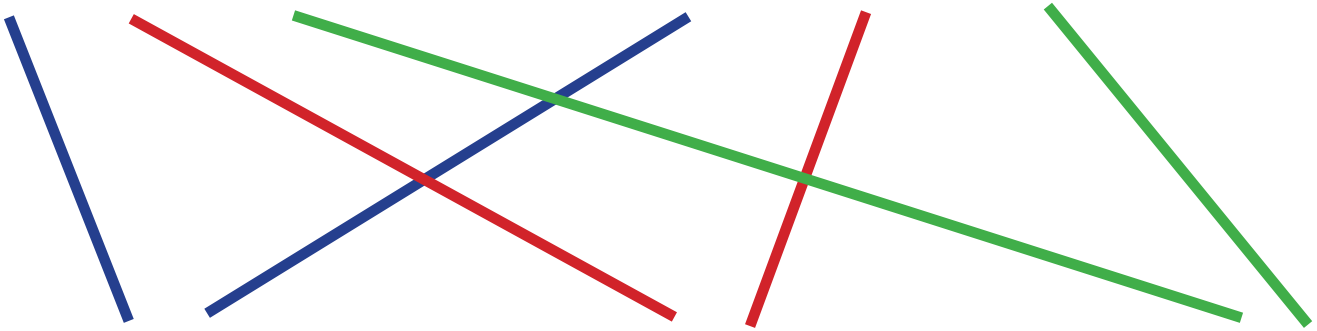


A5b: Partition Jot



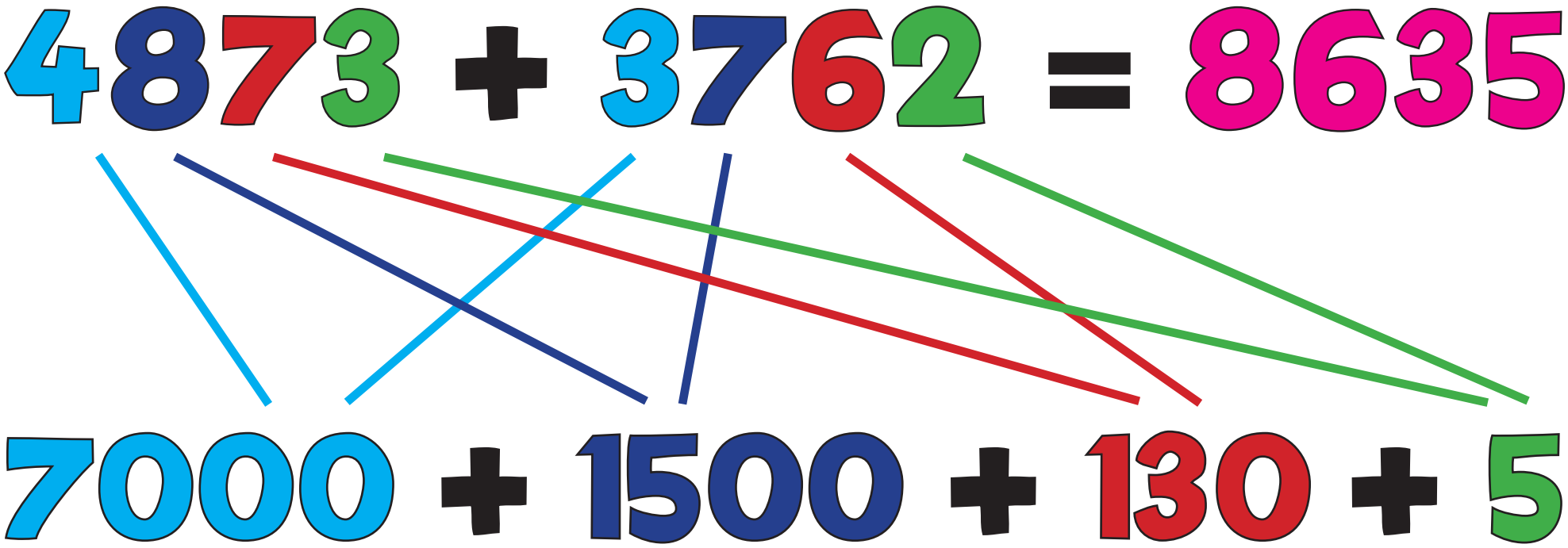
A5c: Partition Jot

687 + 248 = 935



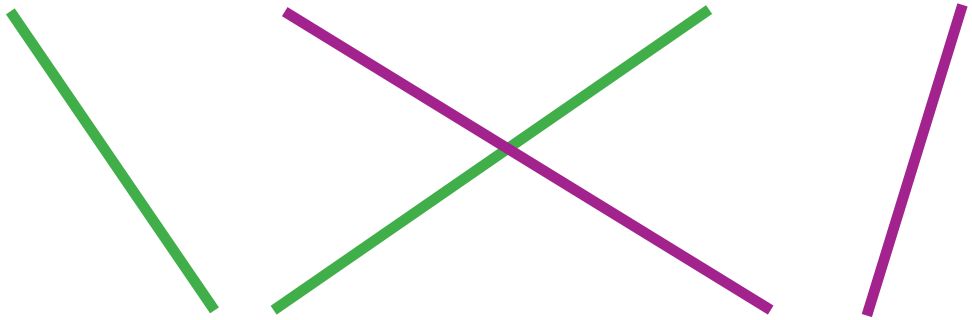
800 + 120 + 15

A5d: Partition Jot



A5f: Partition Jot

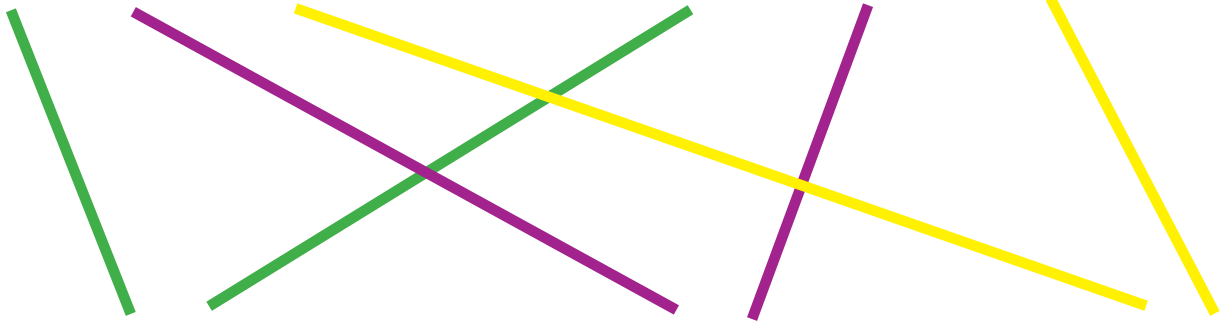
$$4.8 + 3.8 = 8.6$$



$$7 + 1.6$$

A5g: Partition Jot

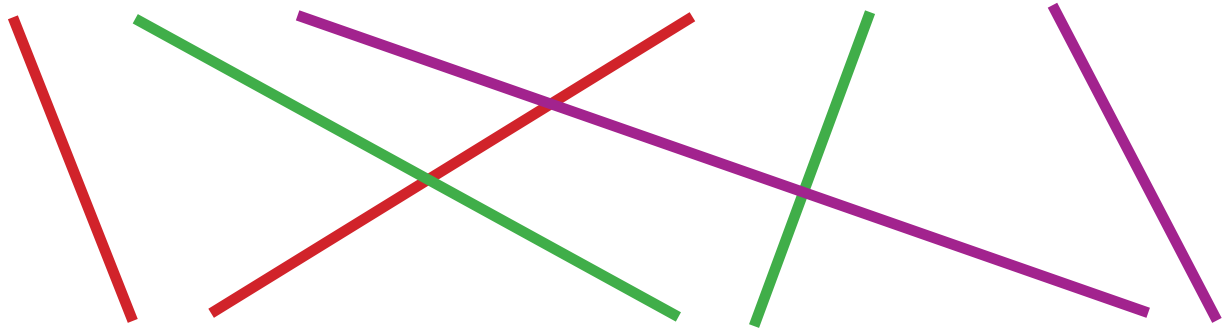
5.65 + 3.29 = 8.94



8 + 0.8 + 0.14

A5h: Partition Jot

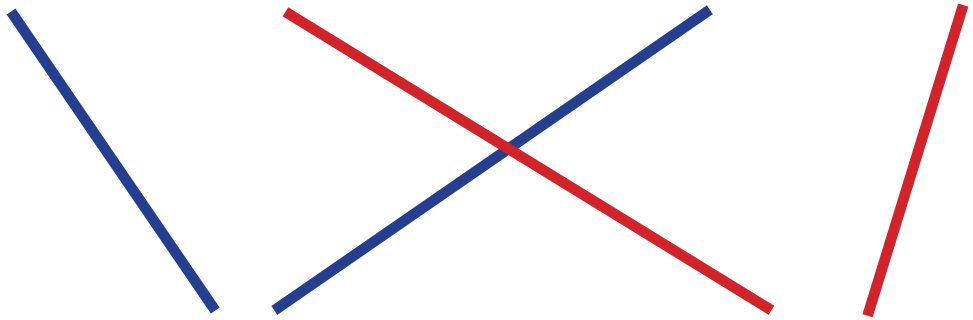
76.7 + 58.5 = 135.2



120 + 14 + 1.2

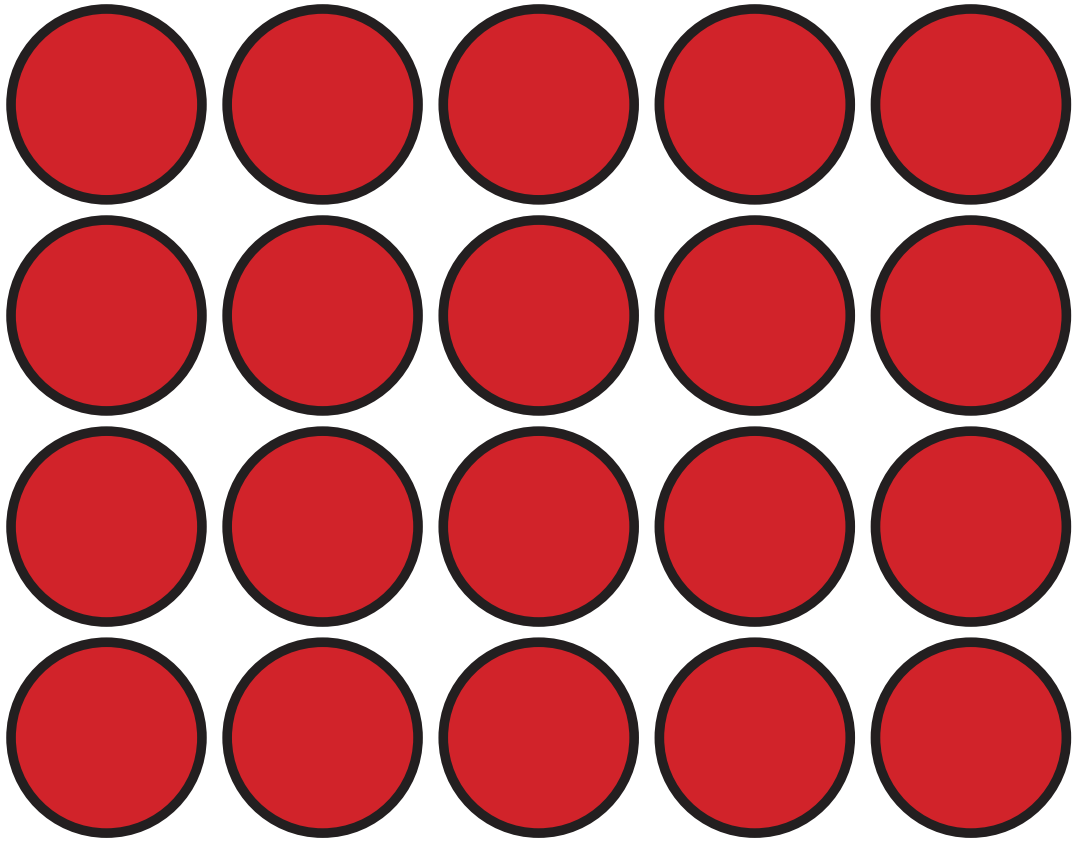
A5i: Partition Jot

£38.25 + £27.46 = £65.71



£65.00 + £0.71

D3: Division Array



4 columns of 5 ... 5 rows of 4

(A6: Additional Expanded Column) Addition

	T	U
	4	3
+	2	4
	6	0
	6	7

(A6: Additional:a Expanded Column) Addition

	T	U
	5	7
+	2	5
	1	2
	7	0
	8	2

(A6: Additional:b Expanded Column) Addition

H	T	U
	8	6
+	4	8
	1	4
1	2	0
1	3	4

A6: Expanded Column Addition

	H	T	U
	6	8	7
+	2	4	8
			15
	1	20	
	8	00	
	9	3	5

(A7: Column Addition)

Additional

T	U
4	3
+ 2	4
6	7

(A7: Column Addition)

Additional:a

	T	U
	5	7
+	2	5
	8	2
	1	

(A7: Column Addition)

Additional:b

H	T	U
	8	6
+	4	8
1	3	4
1	1	

A7: Column Addition

H	T	U
6	8	7
+ 2	4	8
9	3	5
1	1	

A7d: Column Addition

Th	H	T	U
	4	8	7 3
+	3	7	6 2
	8	6	3 5
	1		1

A7e: Column Addition

M	HTh	TTh	Th	H	T	U
	7	8	7	5	6	7
+	4	4	6	2	7	8
1	2	3	3	8	4	5
	1	1	1		1	1

A7f: Column Addition

	U	$\frac{1}{10}$
	4	.8
+	3	.8
	8	.6
	1	

A7g: Column Addition

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

A7h: Column Addition

	T	U	$\frac{1}{10}$
	76	.	7
+	58	.	5
	135	.	2
	1	1	1

A7i: Column Addition

With Money

	£	38.	25
+	£	27.	46
	£	65.	71
		1	1

A7 j: Column Addition

With Decimals

73.4 + 5.67 = 79.07

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

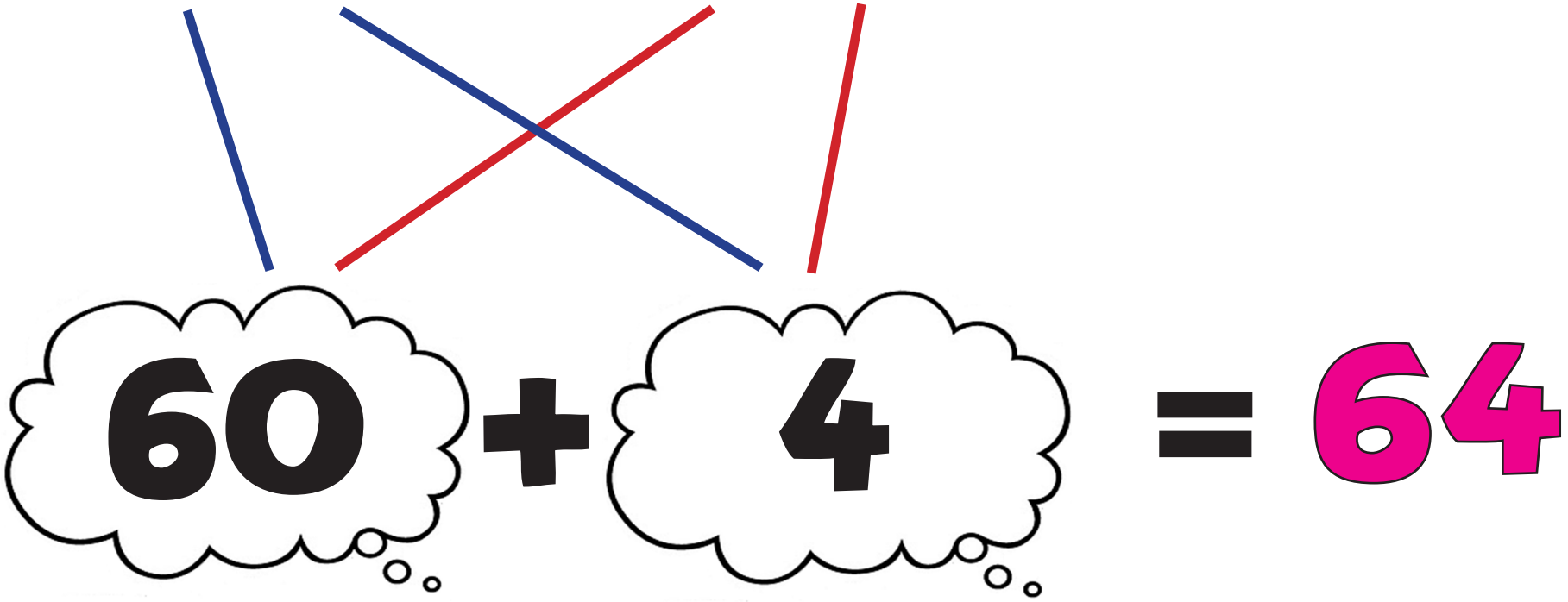
MA1: Partitioning

45 + 82 = 127

MA1: Partitioning

Year 2

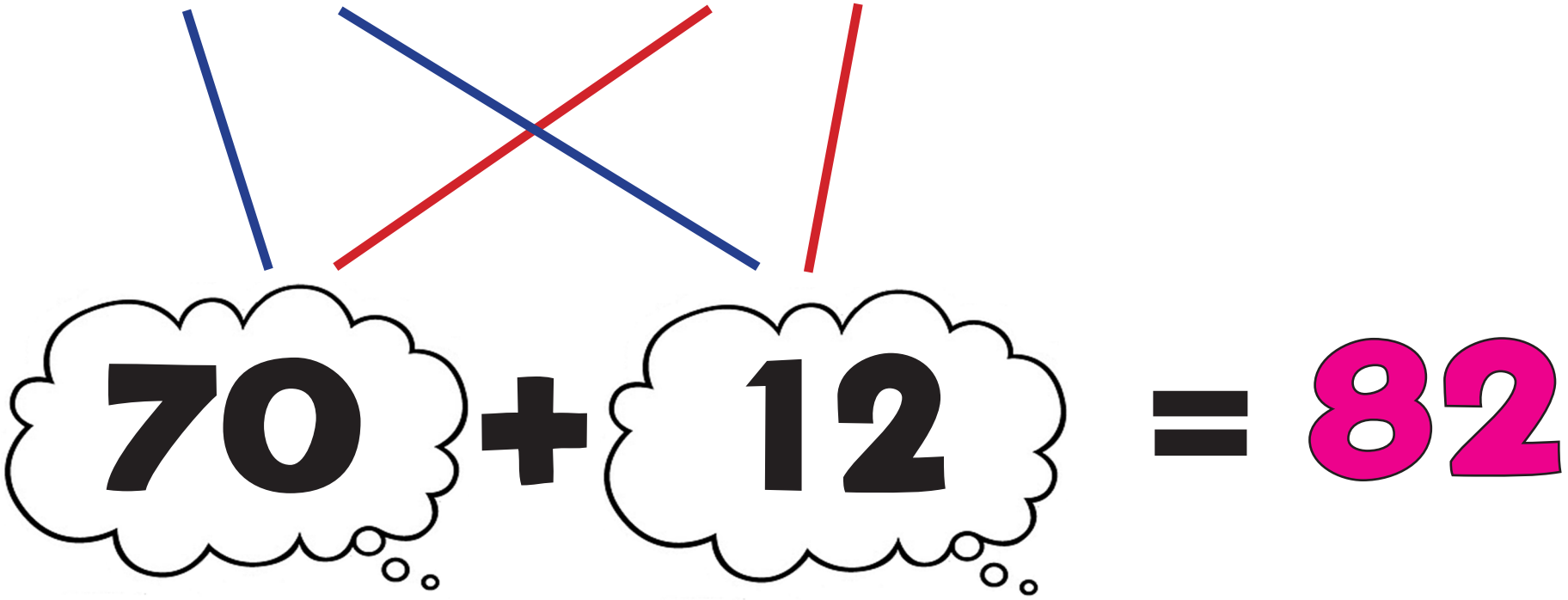
43 + 21 = 64



MA1: Partitioning

Year 3

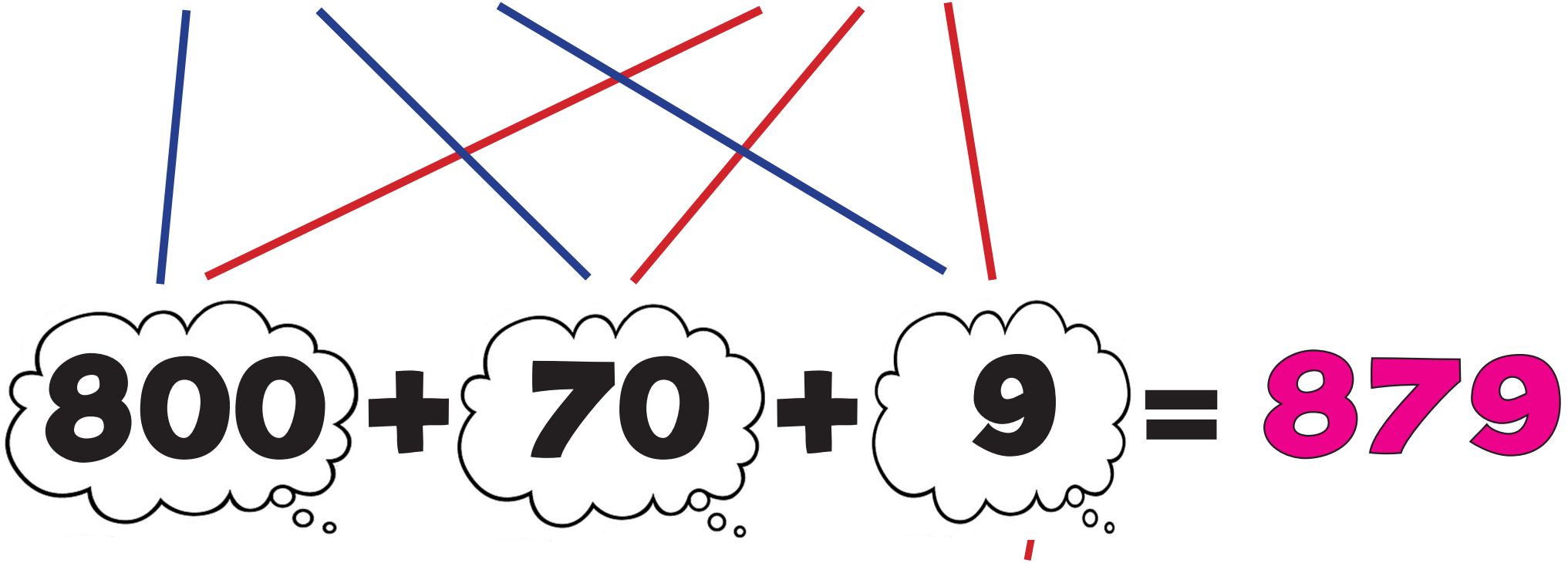
57 + 25 = 82



MA1: Partitioning

Year 4

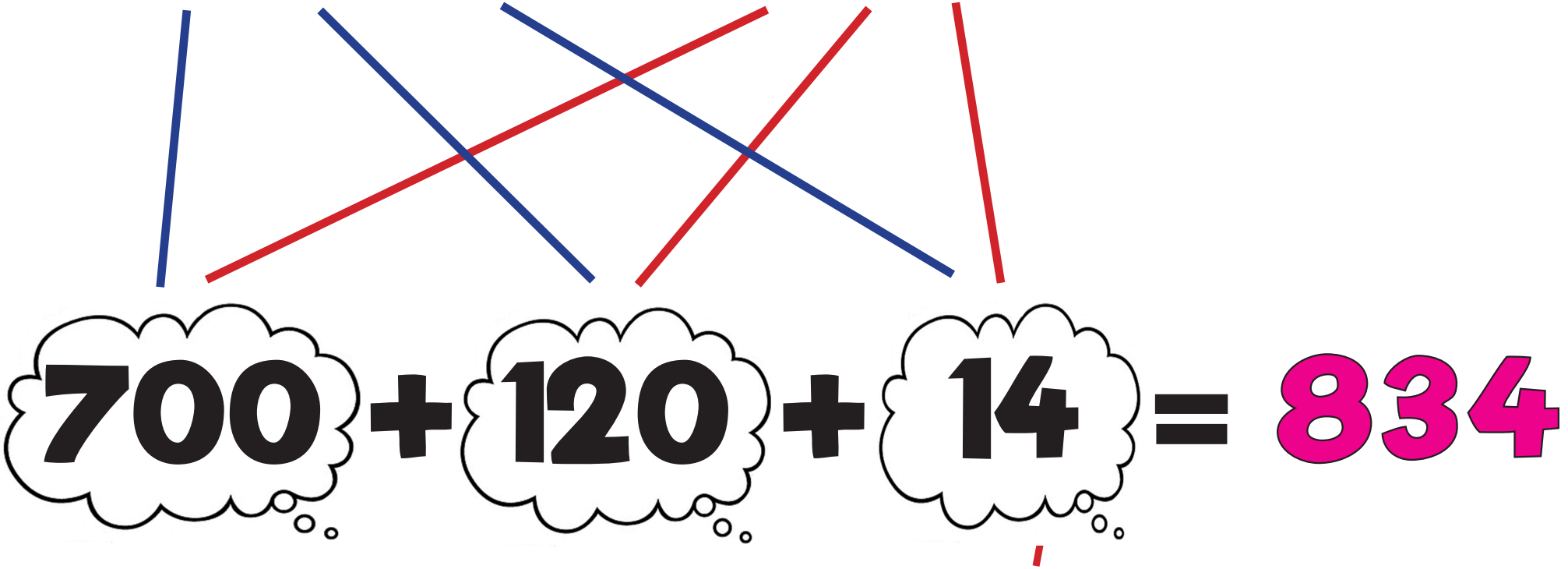
648 + 231 = 879



MA1: Partitioning

Year 5

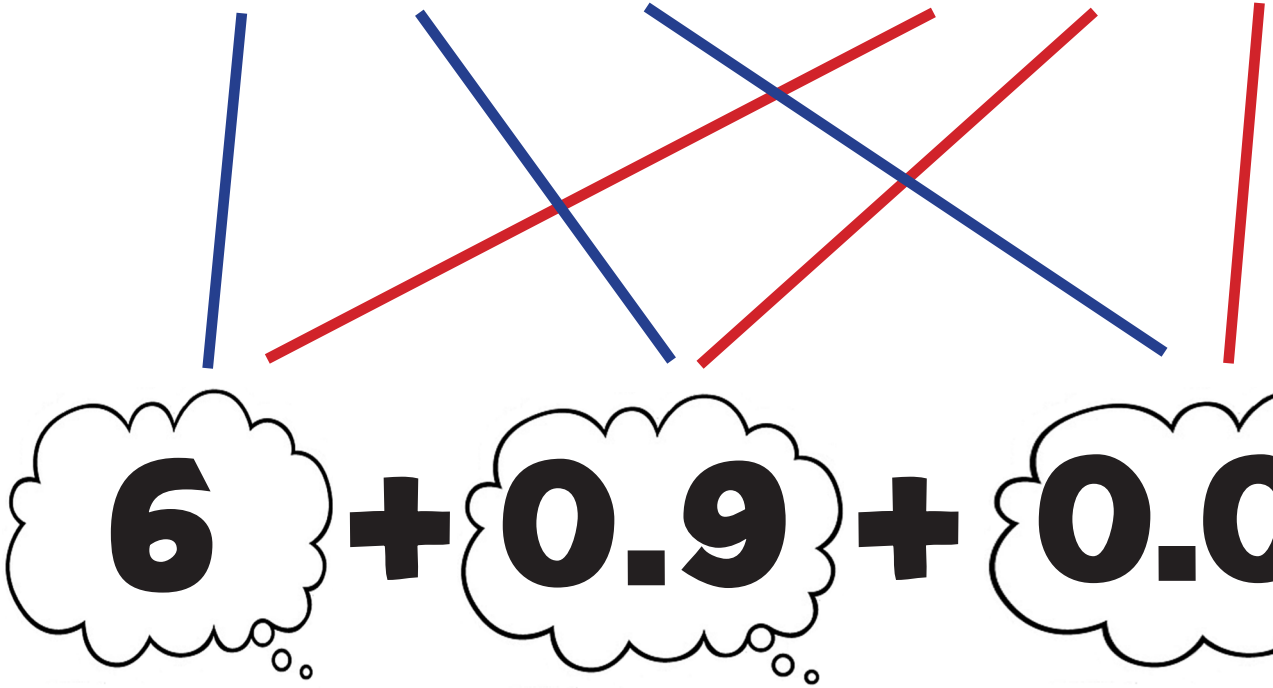
576 + 258 = 834



MA1: Partitioning

Year 6

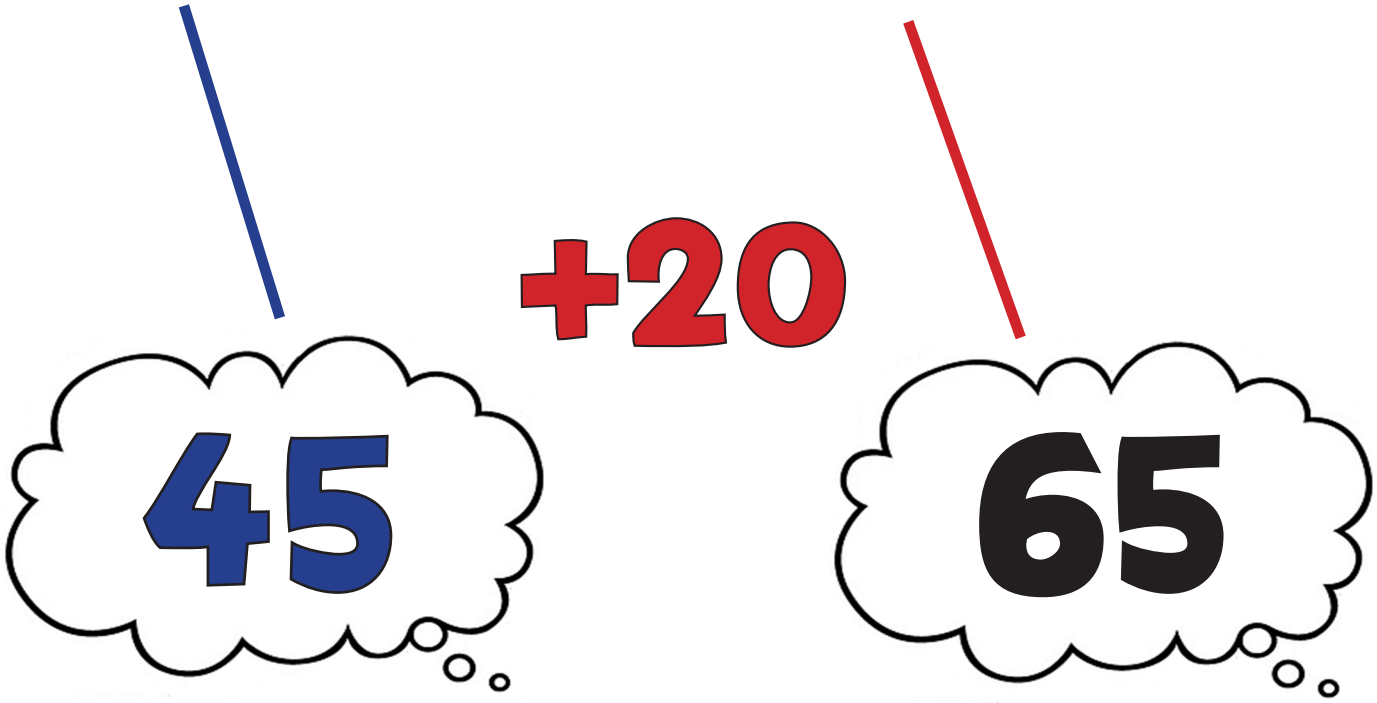
$4.73 + 2.21 = 6.94$



$6 + 0.9 + 0.04 = 6.94$

MA2: Counting On

45 + 20 = 65

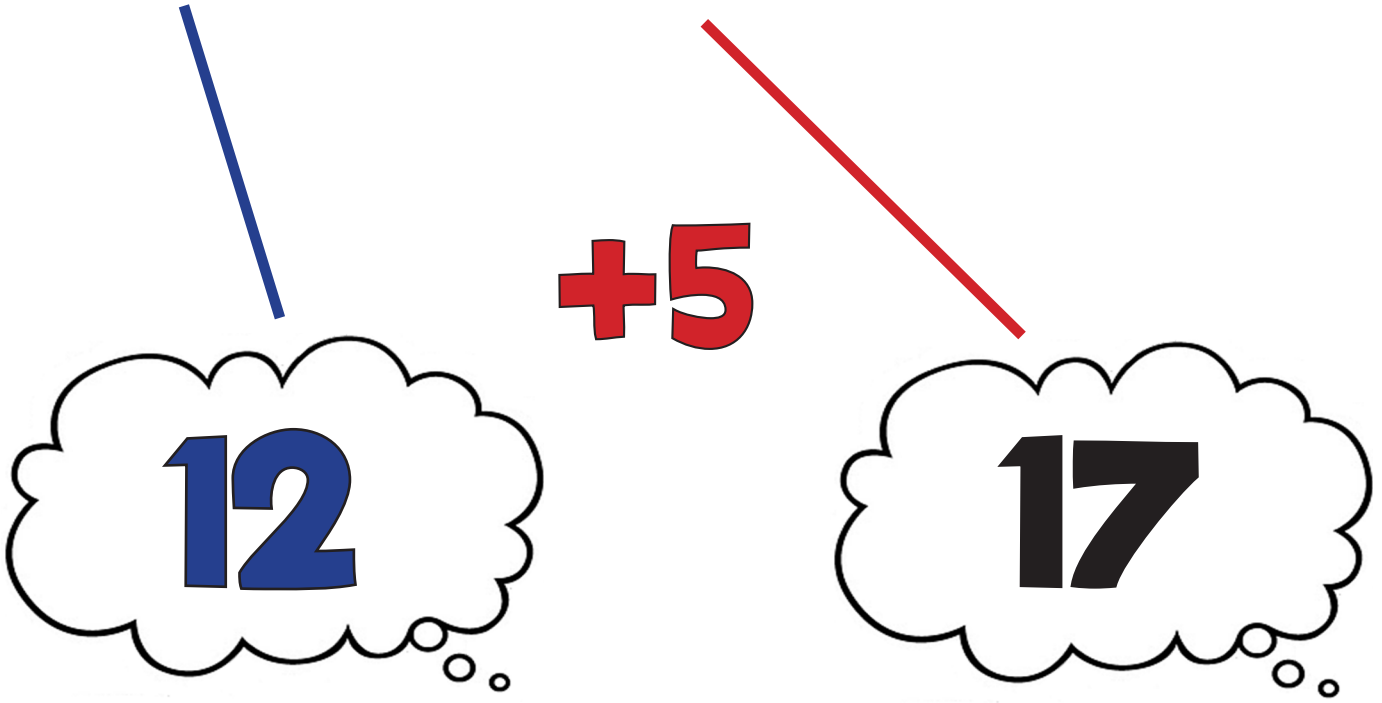


MA2a: Counting On

Year 1

Ones

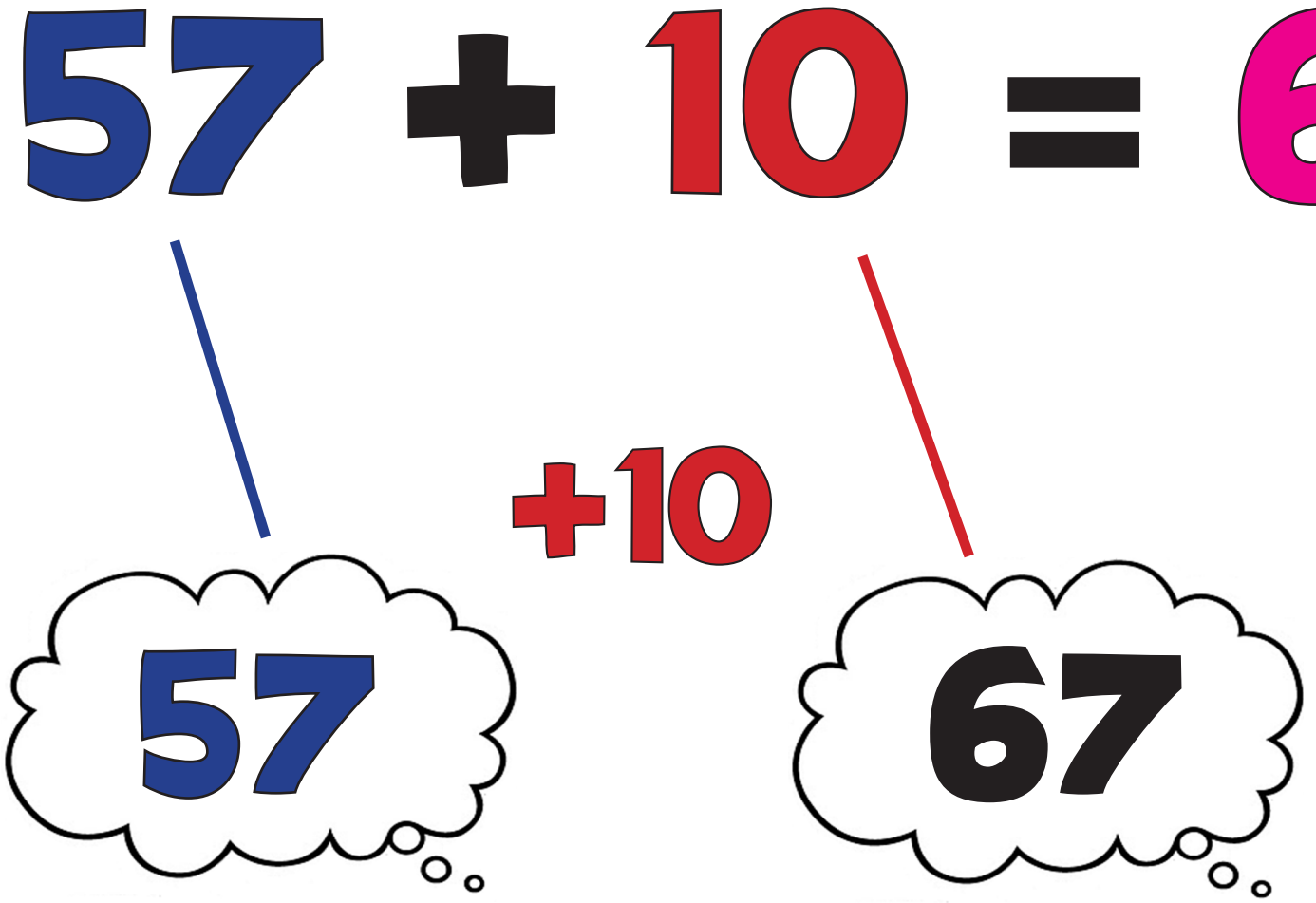
$$12 + 5 = 17$$



MA2b: Counting On

Year 1

Tens

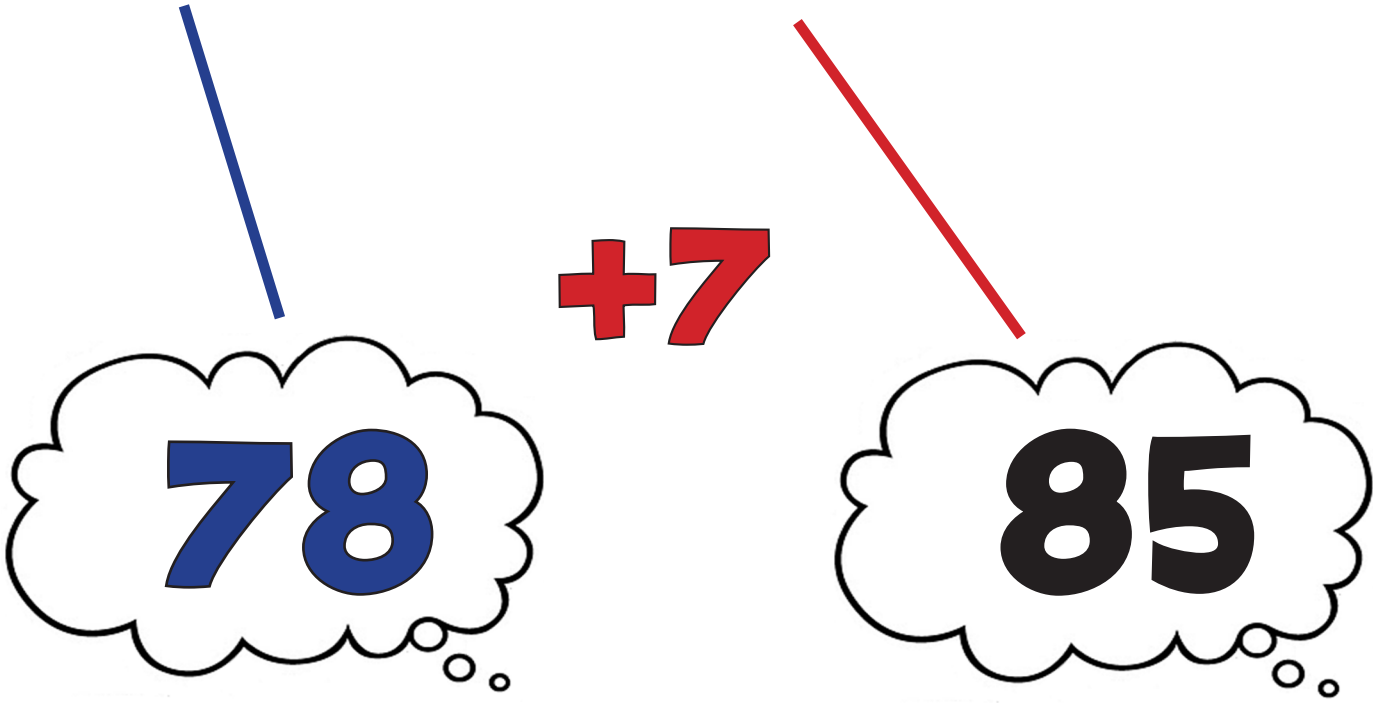


MA2a: Counting On

Year 2

Ones

$$78 + 7 = 85$$

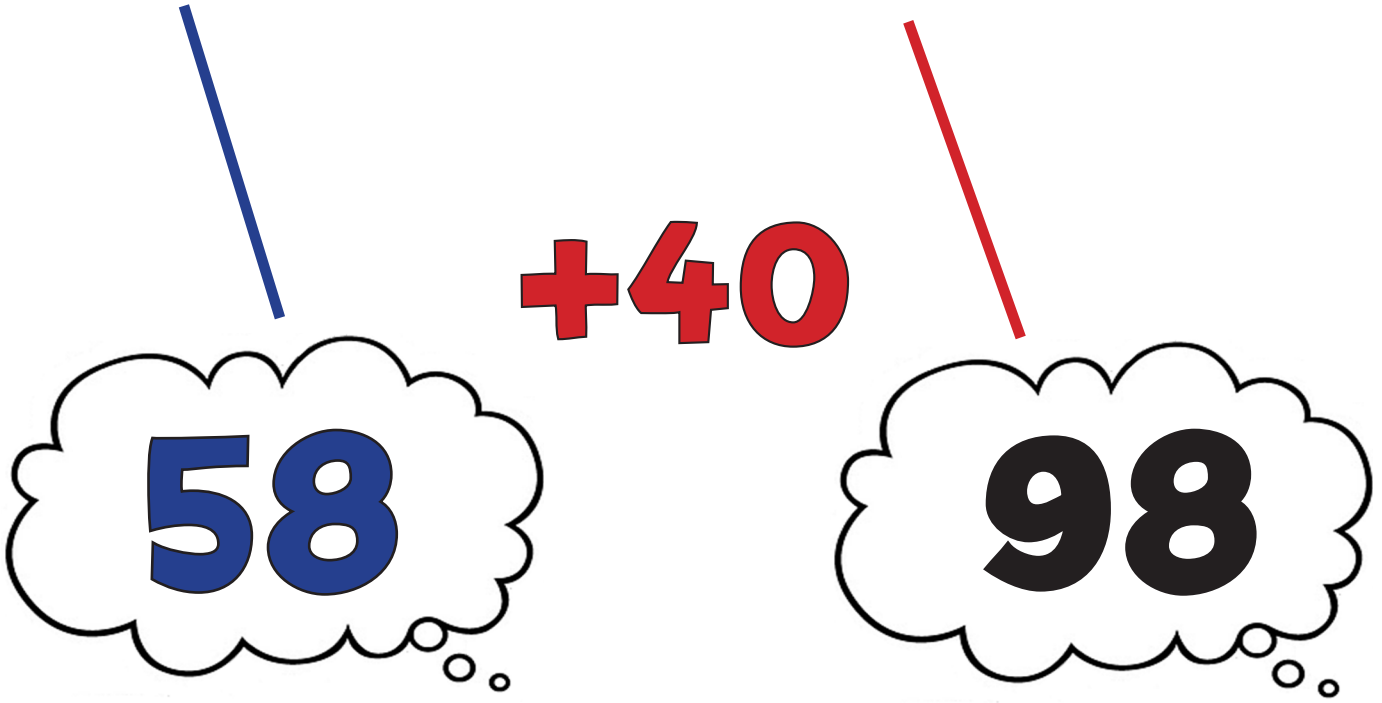


MA2b: Counting On

Year 2

Tens

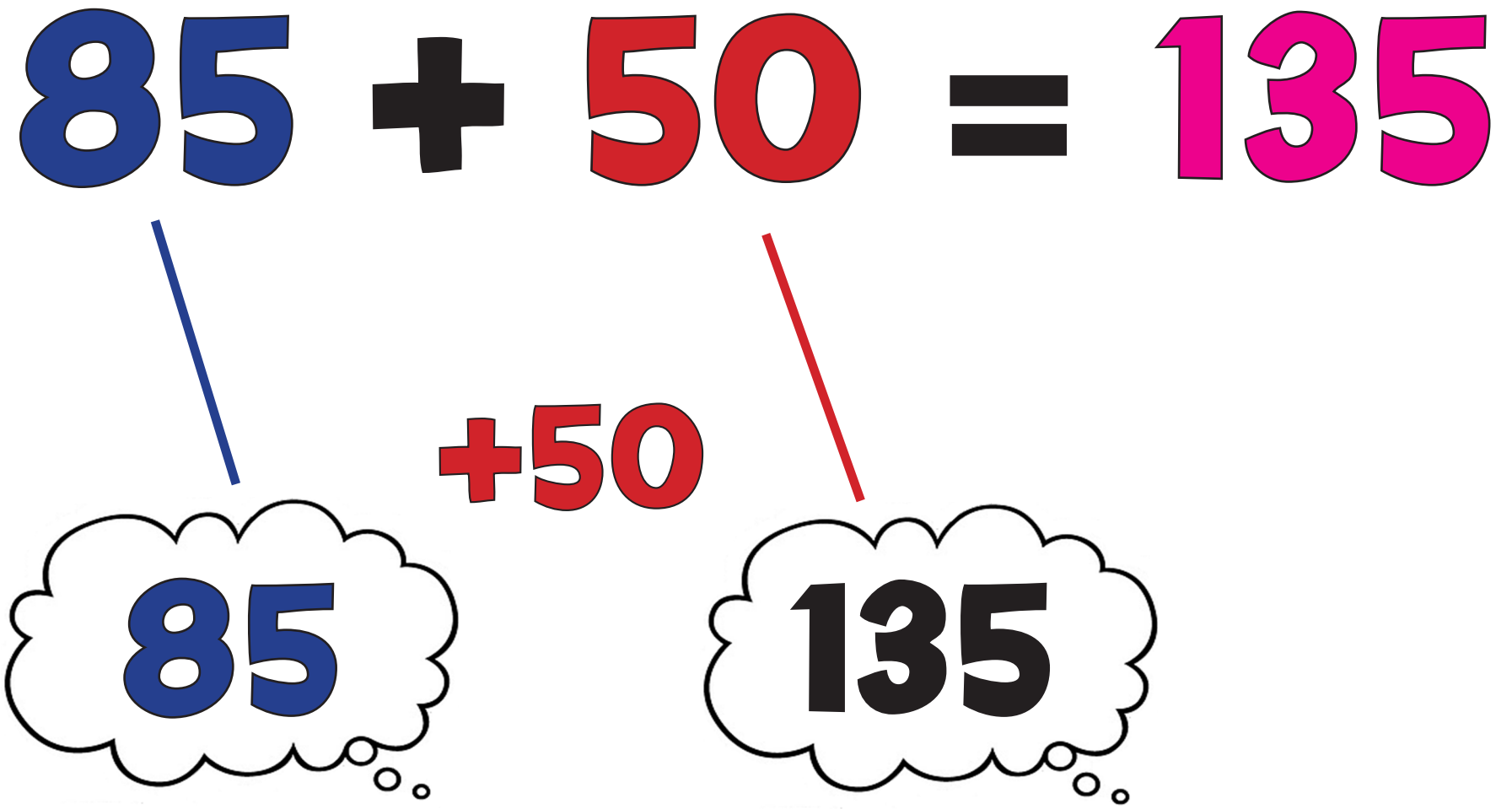
$$58 + 40 = 98$$



MA2a: Counting On

Year 3

Tens



MA2b: Counting On

Year 3

Hundreds

534 + 300 = 834

+300

534

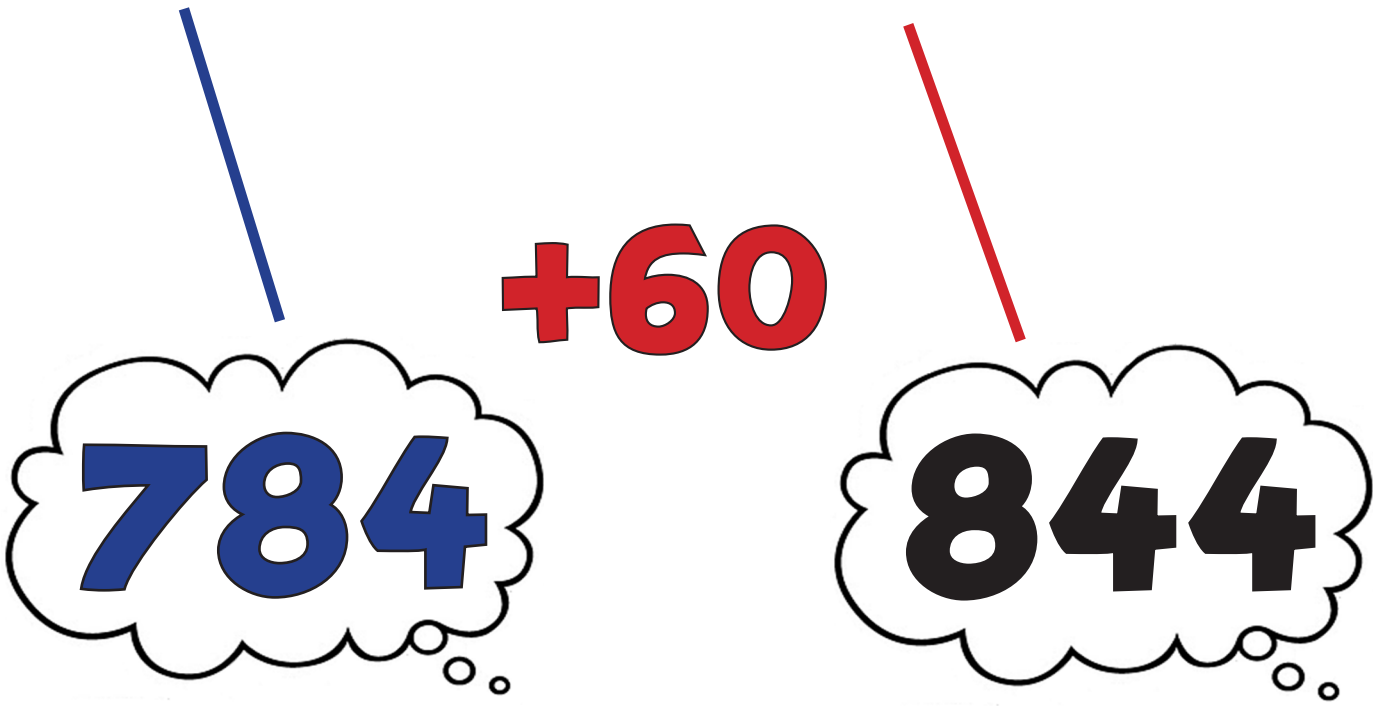
834

MA2a: Counting On

Year 4

Tens

784 + 60 = 844



MA2b: Counting On

Year 4

Hundreds

4837 + 3000 = 834

+3000

4837

7837

MA2a: Counting On

Year 5

Hundreds

837 + 500 = 1337

+500

837

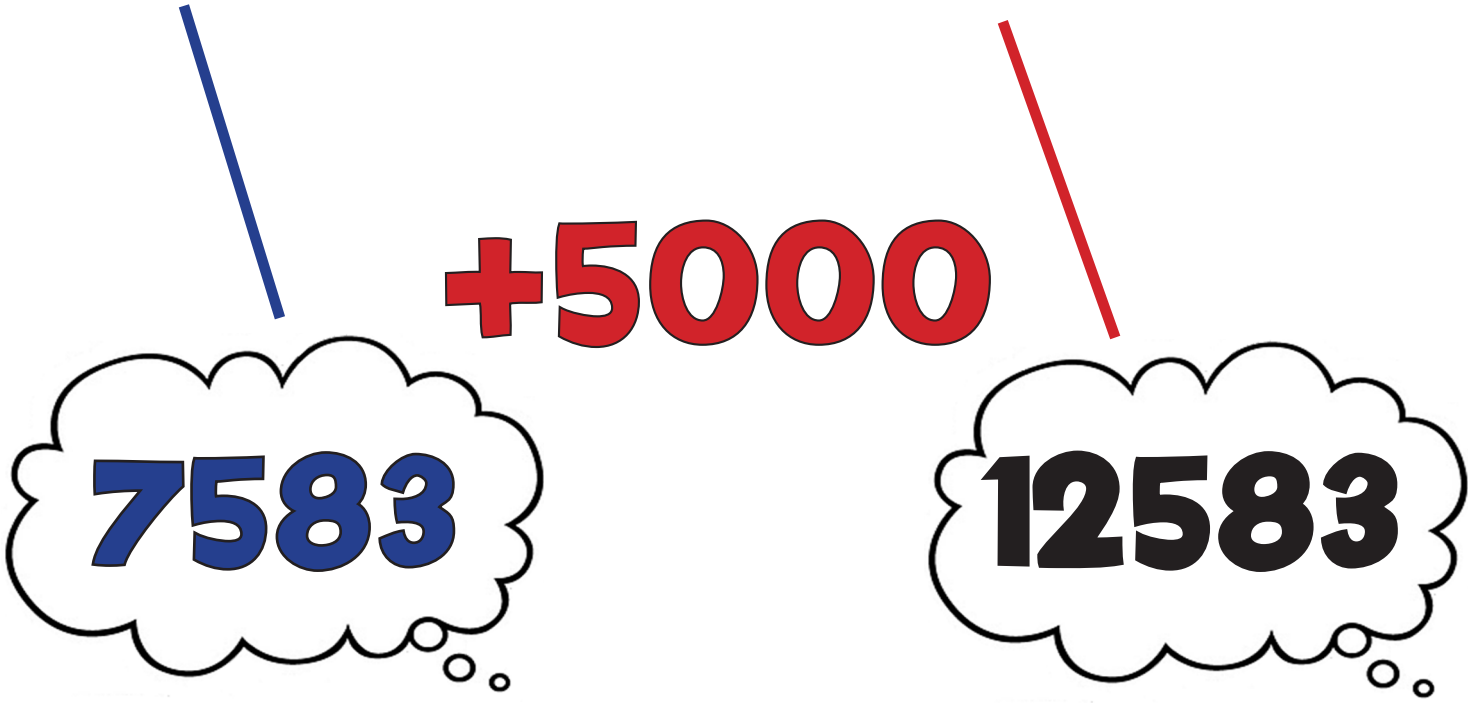
1337

MA2b: Counting On

Year 5

Thousands

7583 + 5000 = 12583



MA2a: Counting On

Year 6

Ten Thousands

43,826 + 30,000 = 73,826

+30,000

MA2b: Counting On

Year 6

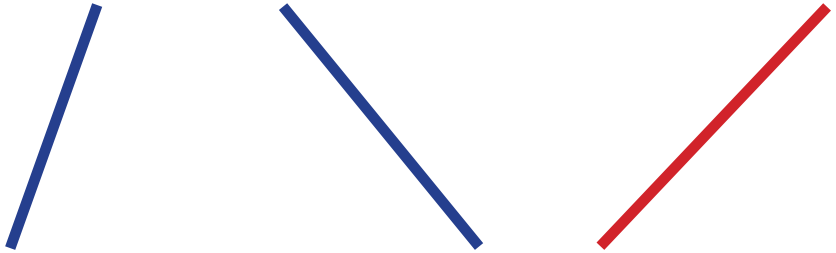
Millions

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

+4,000,000

MA3: Number Bonds

45 + 95 = 140

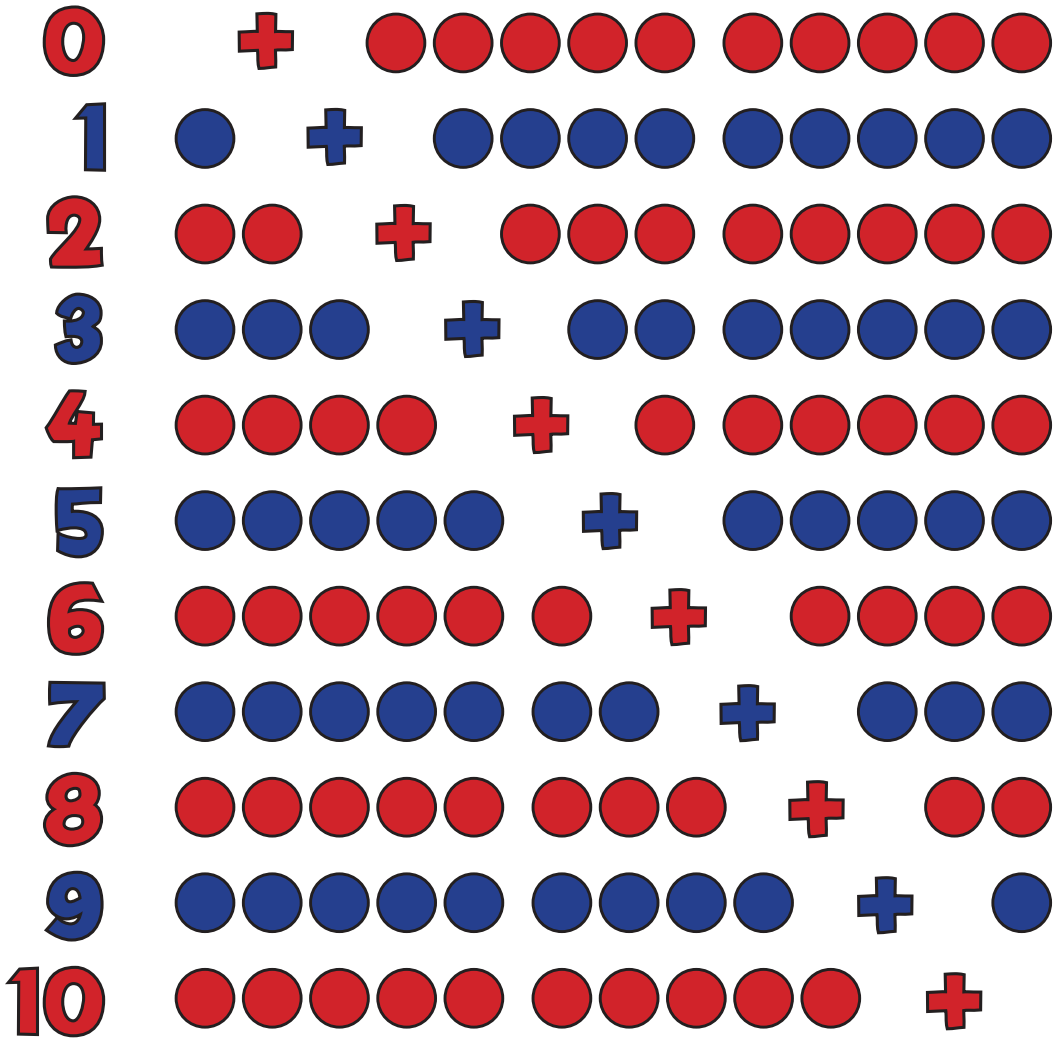


40 + 100 = 140

MA3: Number Bonds

Year 1

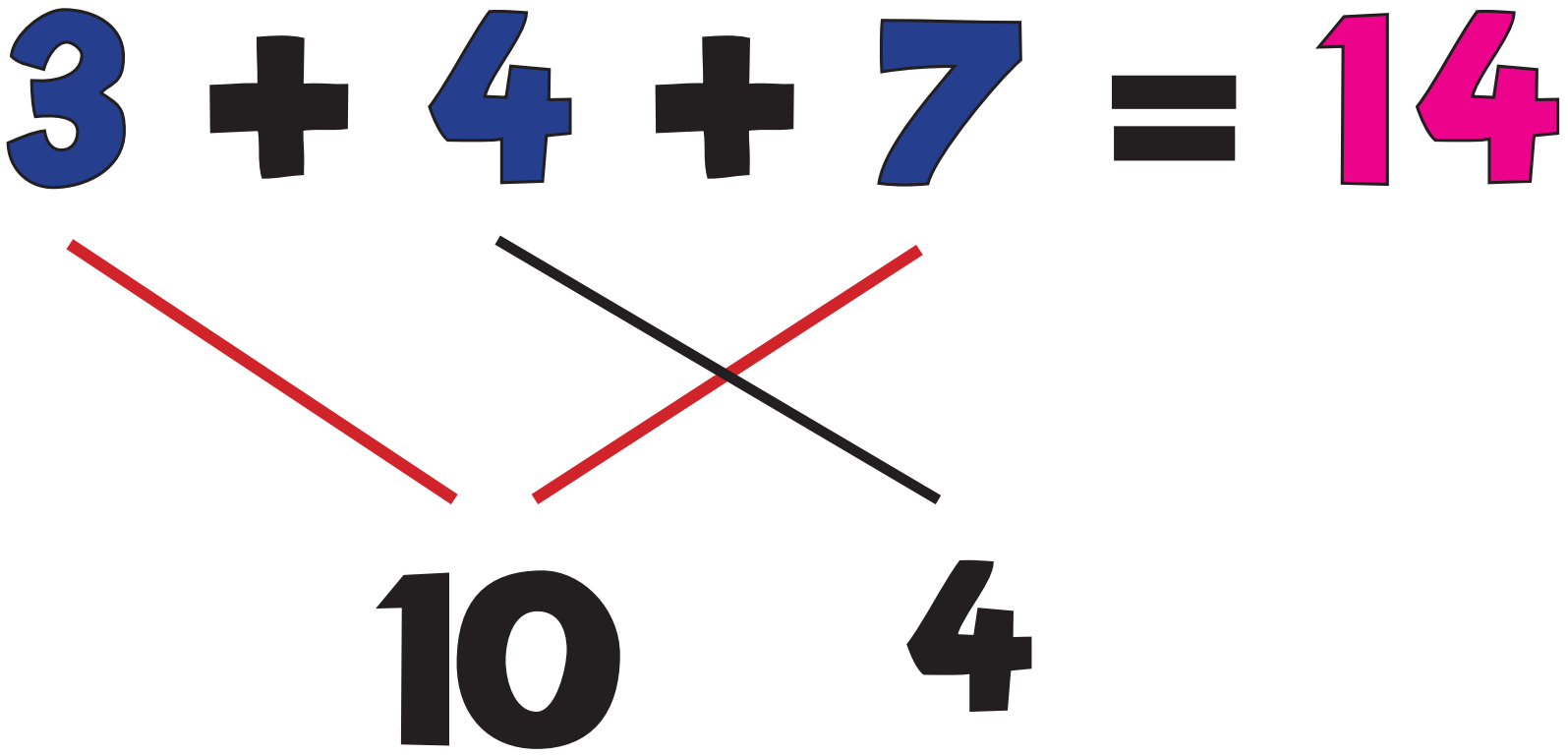
Learn Bonds



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

MA3: Number Bonds

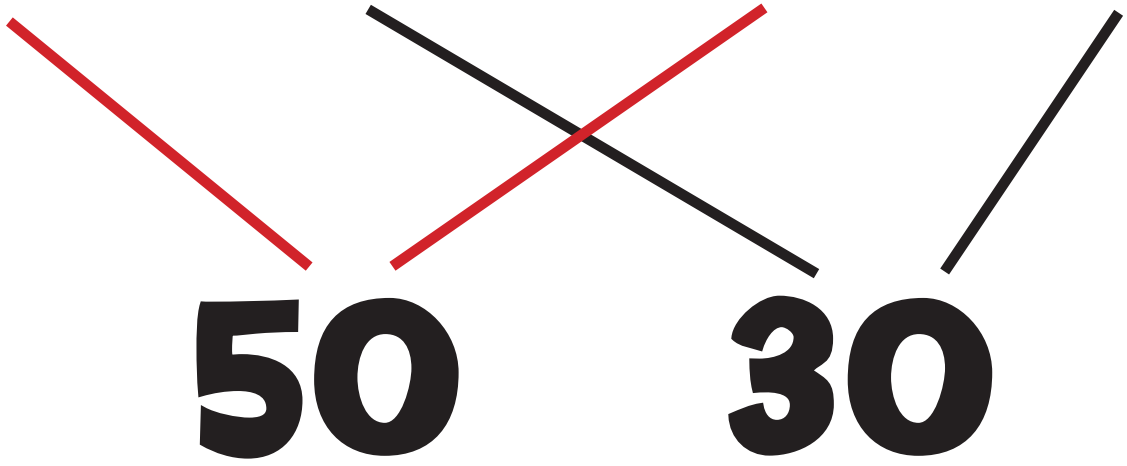
Year 2



MA3: Number Bonds

Year 3

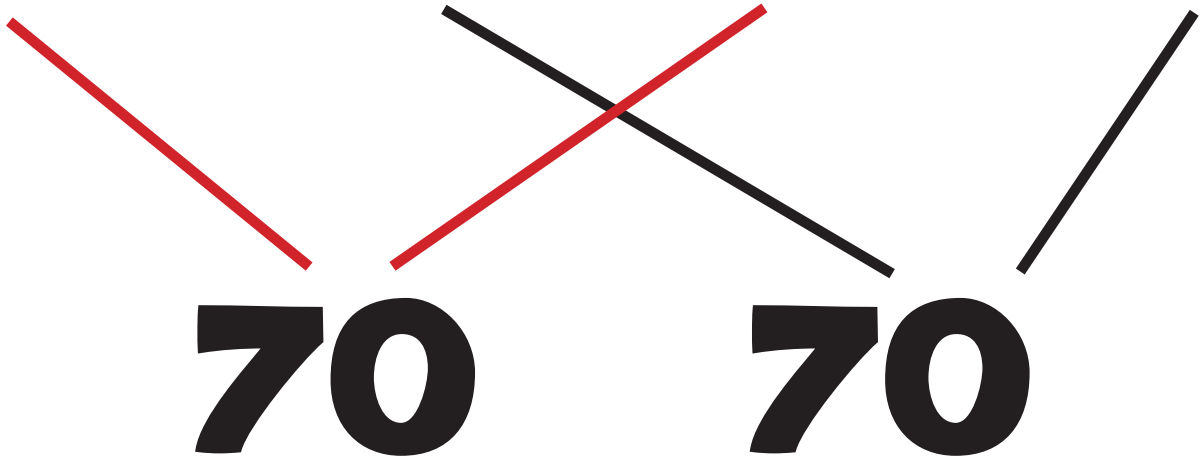
43 + 9 + 7 + 21 = 80



MA3: Number Bonds

Year 4

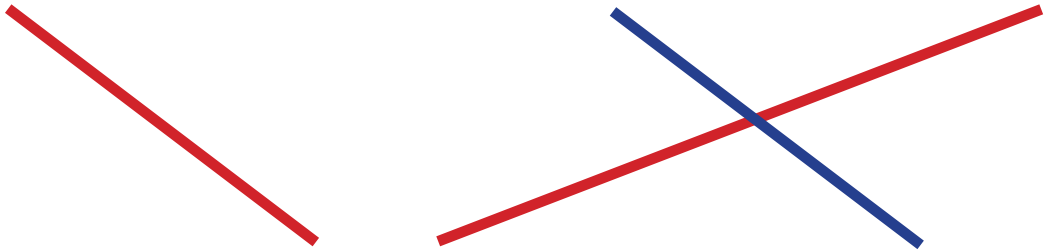
$$42 + 16 + 28 + 54 = 140$$



MA3: Number Bonds

Year 5

£4.56 + £3.27 + £1.44 = £9.27

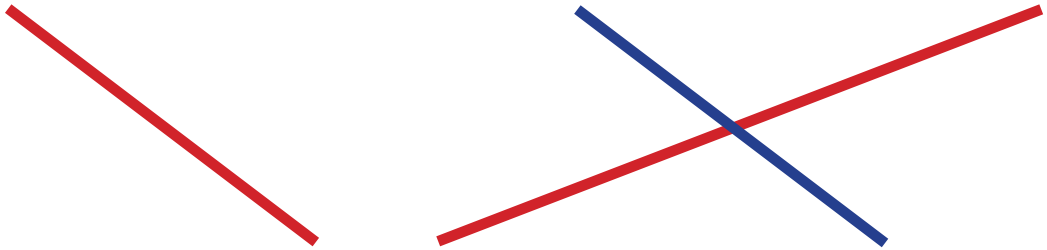


£6.00 £3.27

MA3: Number Bonds

Year 6

$$24.25 + 31.63 + 21.75 = 77.63$$



46 31.63

MA4: Double & Adjust

45 + 46 = 91

45 + 45 + 1

90 + 1 = 91

MA4: Double & Adjust

Year 1

$5 + 6 = 11$

$5 + 5 + 1$

$10 + 1 = 11$

MA4: Double & Adjust

Year 2

$$7 + 8 = 15$$

$$7 + 7 + 1$$

$$14 + 1 = 15$$

MA4: Double & Adjust

Year 3

$$16 + 17 = 33$$

$$16 + 16 + 1$$

$$32 + 1 = 33$$

MA4: Double & Adjust

Year 4

$$37 + 38 = 75$$

$$37 + 37 + 1$$

$$74 + 1 = 75$$

MA4: Double & Adjust

Year 5

$$125 + 127 = 252$$

$$125 + 125 + 2$$

$$250 + 2 = 252$$

MA4: Double & Adjust

Year 6

$$4.5 + 4.7 = 9.2$$

$$4.5 + 4.5 + 0.2$$

$$9 + 0.2 = 9.2$$

MA5: Round & Adjust

45 + 39 = 84

45 + 40 - 1

85 - 1 = 84

MA5: Round & Adjust

Year 1

45 + 9 = 54

45 + 10 - 1 =

55 - 1 = 54

MA5: Round & Adjust

Year 2

$$45 + 19 = 64$$

$$45 + 20 - 1$$

$$65 - 1 = 64$$

MA5: Round & Adjust

Year 3

45 + 97 = 142

45 + 100 - 3

145 - 3 = 142

MA5: Round & Adjust

Year 4

345 + 298 = 643

345 + 300 - 2

645 - 2 = 643

MA5: Round & Adjust

Year 5

4645 + 1996 = 6641

4645 + 2000 - 4

6645 - 4 = 6641

MA5: Round & Adjust

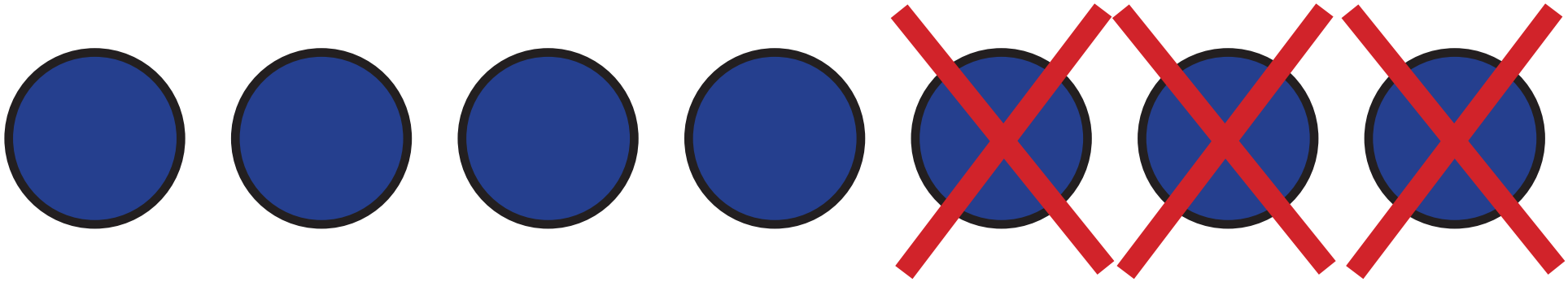
Year 6

45.2 + 49.9 = 95.1

45.2 + 50 - 0.1

95.2 - 0.1 = 95.1

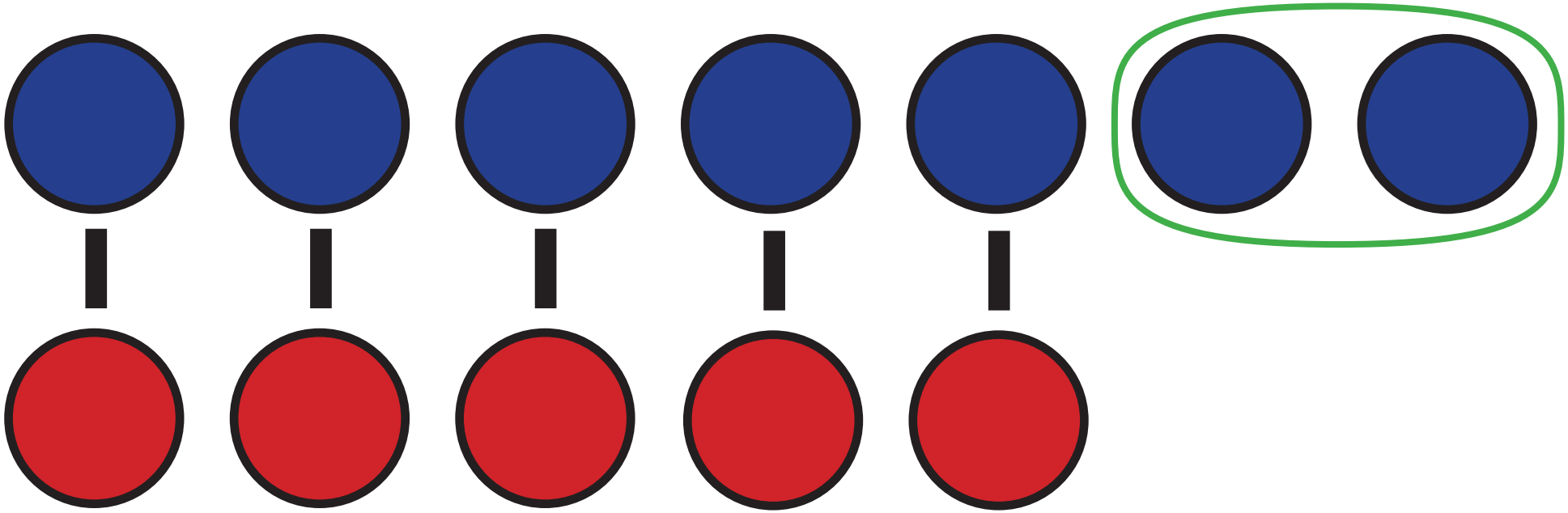
S1: Objects



$$7 - 3 = 4$$

"What do I get if I take 3 away from 7? Answer: 4"

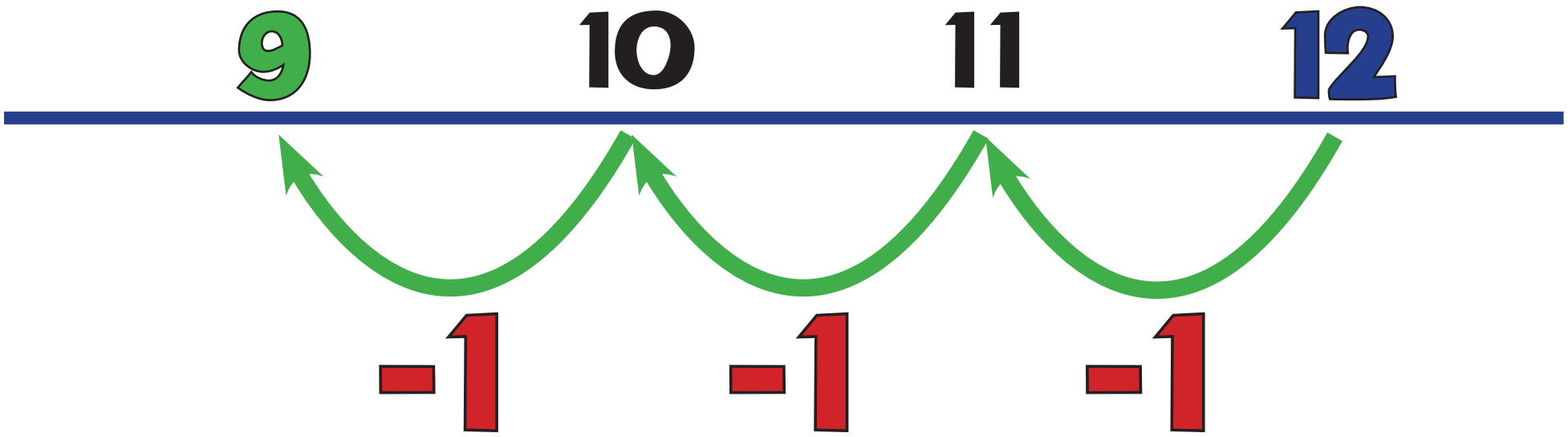
S2: What's the Difference?



7 - 5 = 2

"How many more is 7 than 5? What is the difference?"

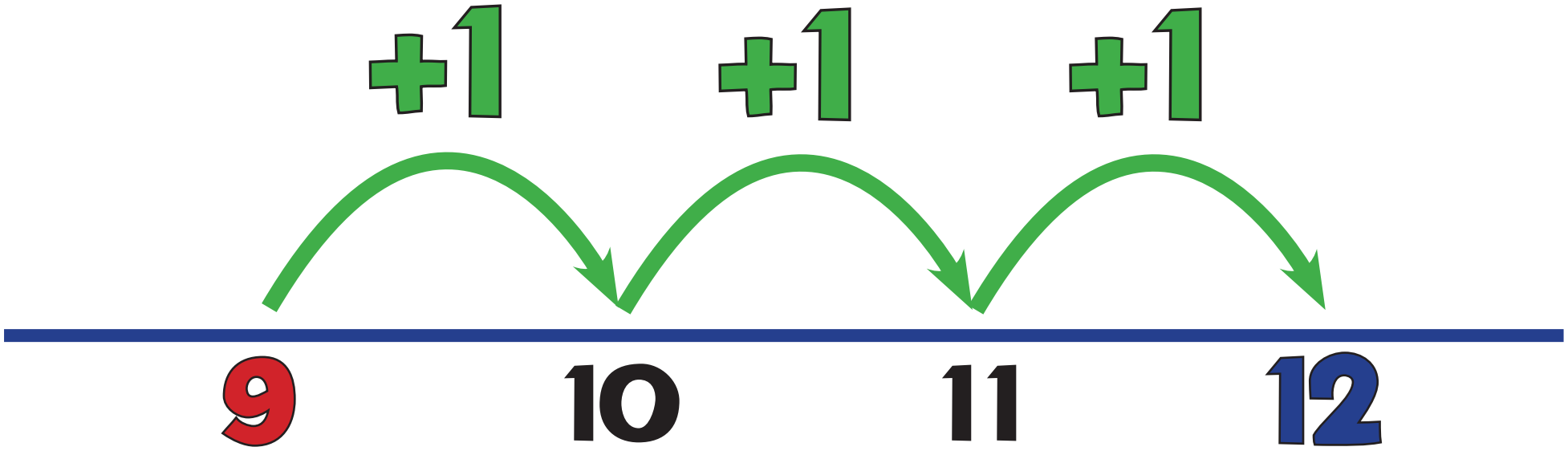
S3: Counting Back



12 - 3 = 9

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

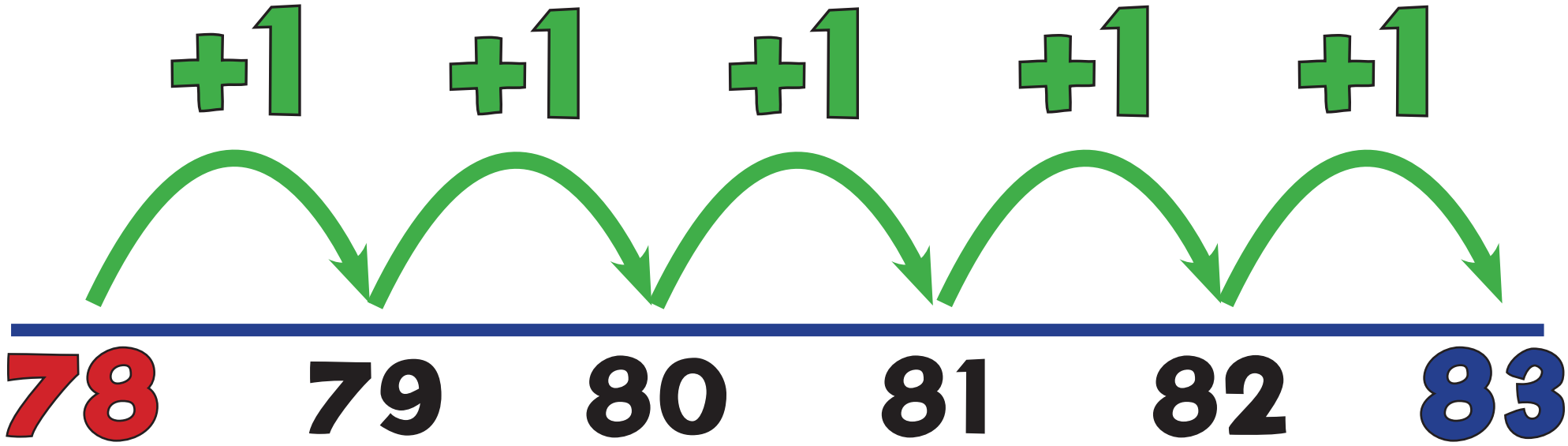
S4: Counting On



12 - 9 = 3

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

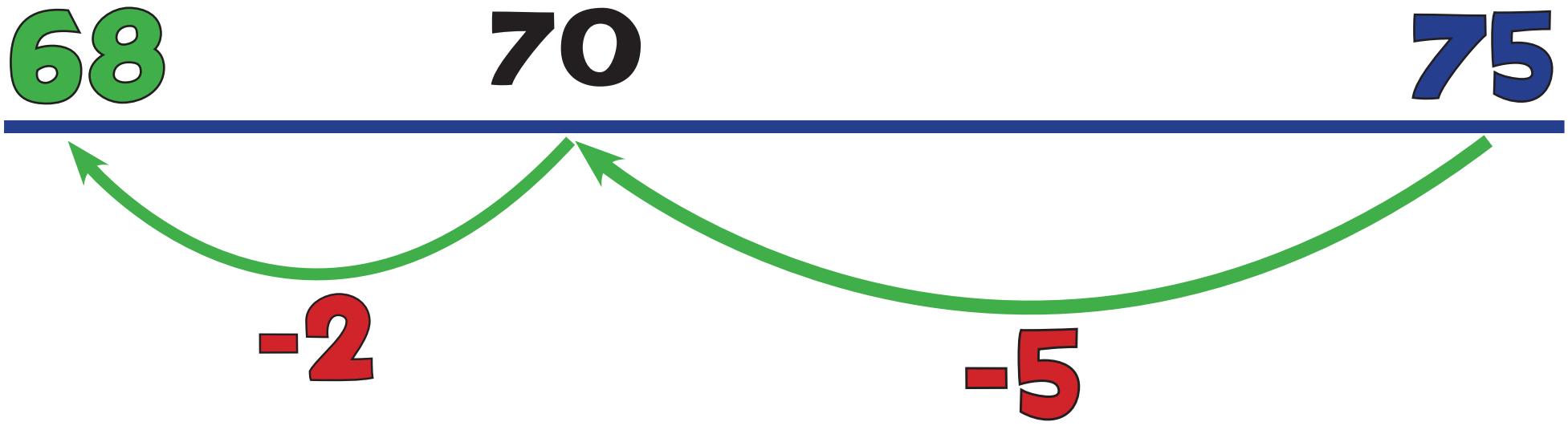
S4a: Counting On



83 - 78 = 5

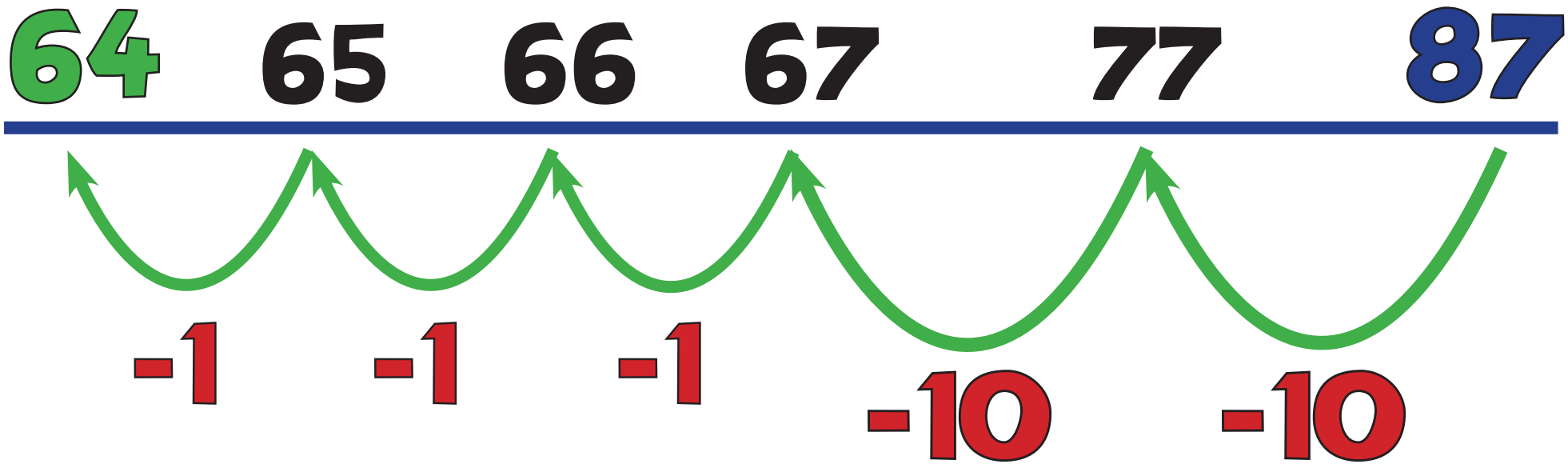
"How many more is 83 than 78? What is the difference?"

S5: Backwards Boing



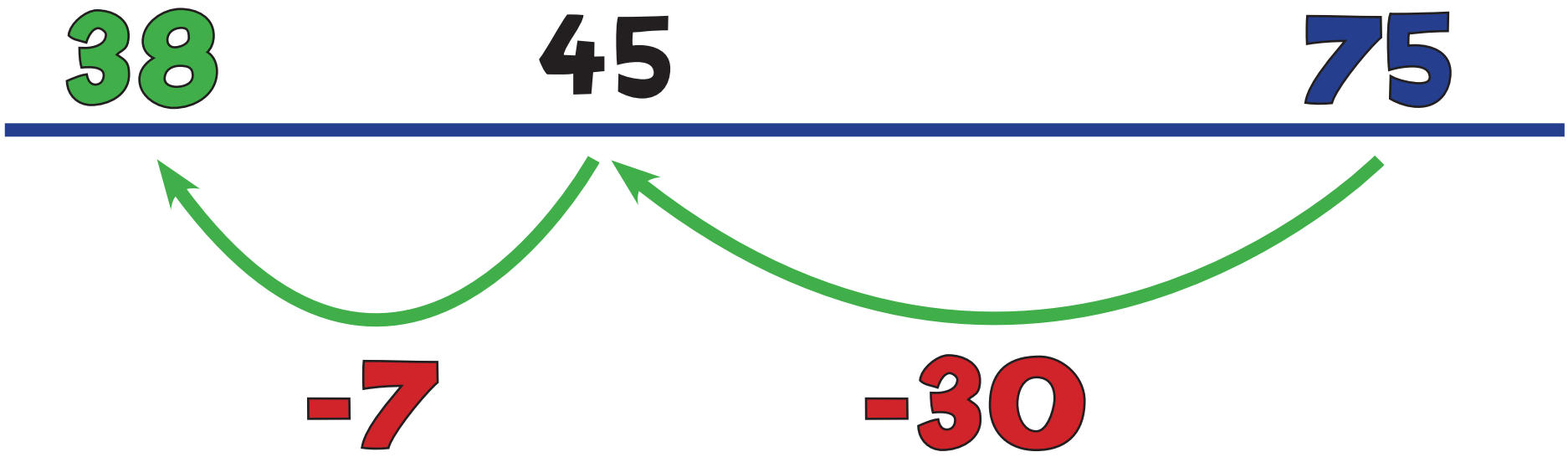
75 - 7 = 68

S6: Backwards Bounce



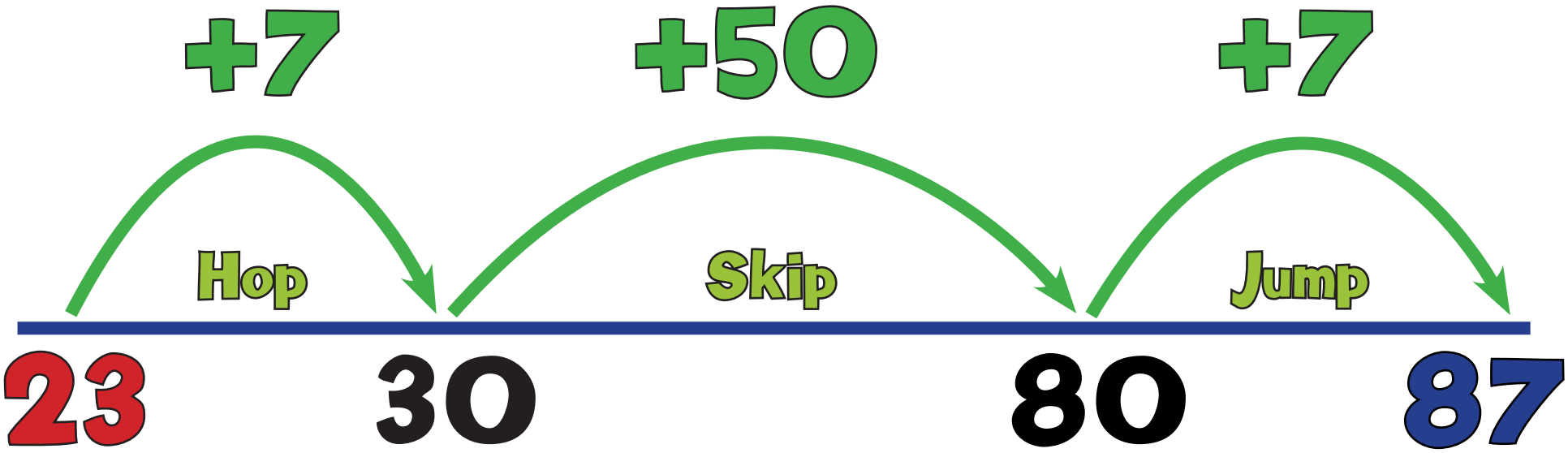
87 - 23 = 64

S7: Backwards Jump



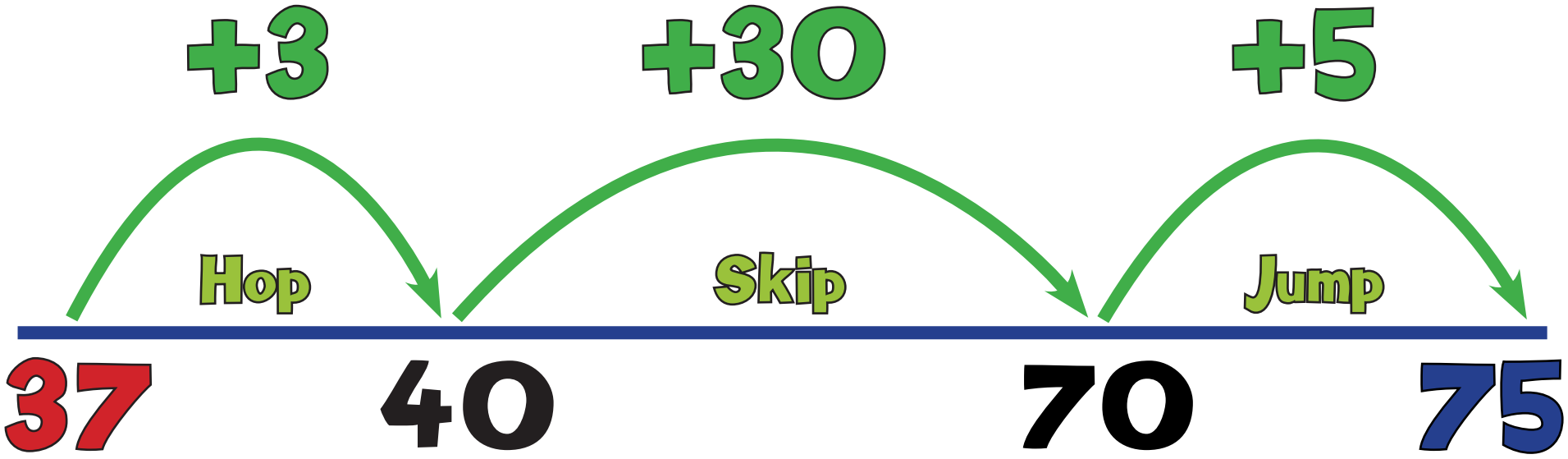
75 - 37 = 38

(S8: Additional Triple Jump!)



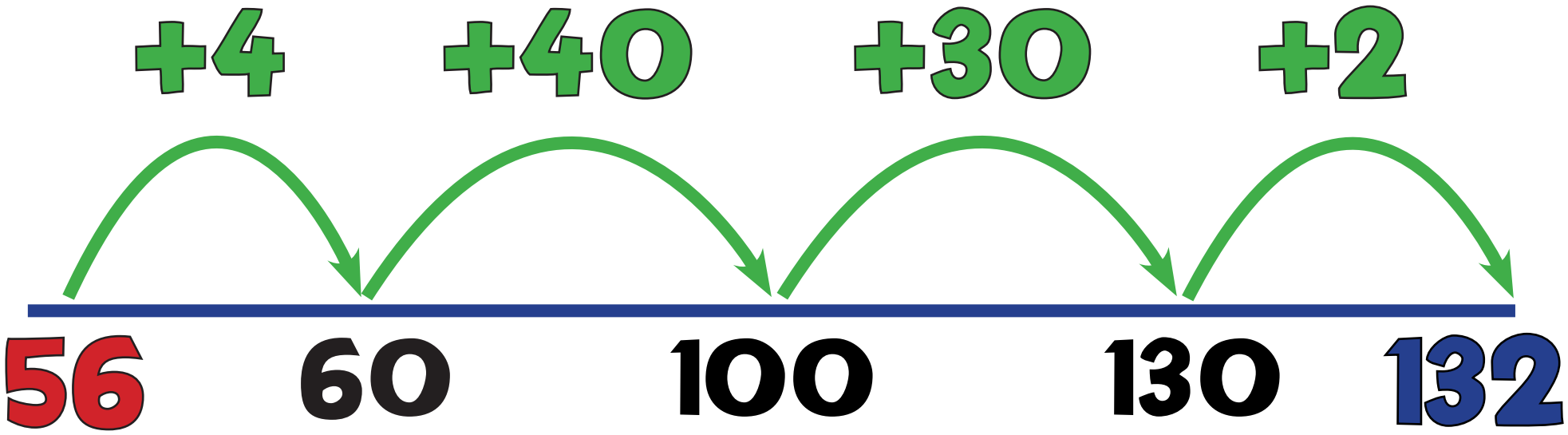
87 - 23 = 64

S8: Triple Jump!



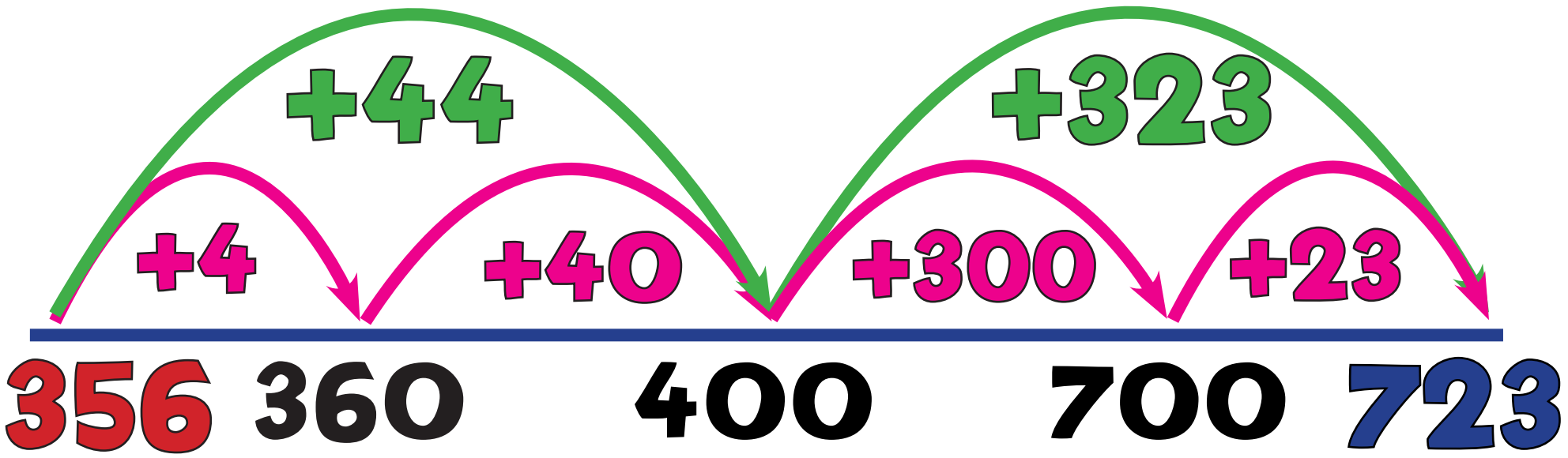
75 - 37 = 38

S8b: Quad Jump!



132 - 56 = 76

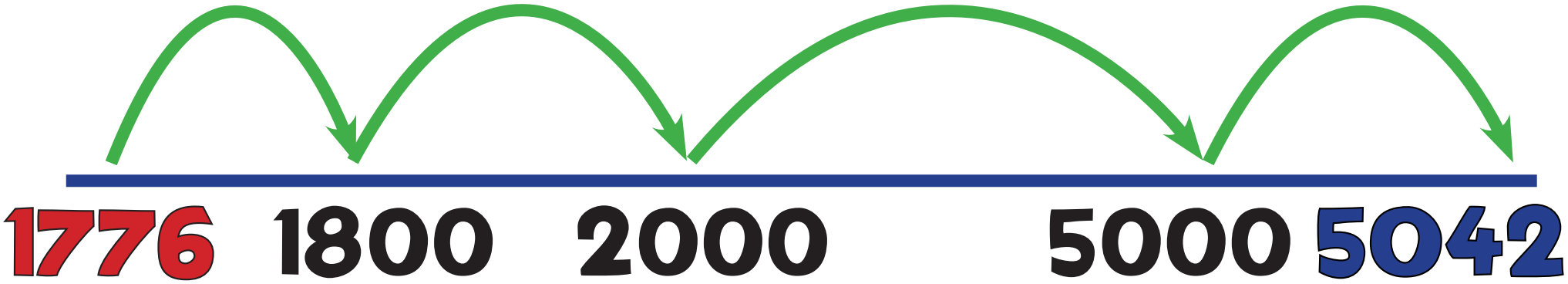
S8c: Big Jump!



723 - 356 = 367

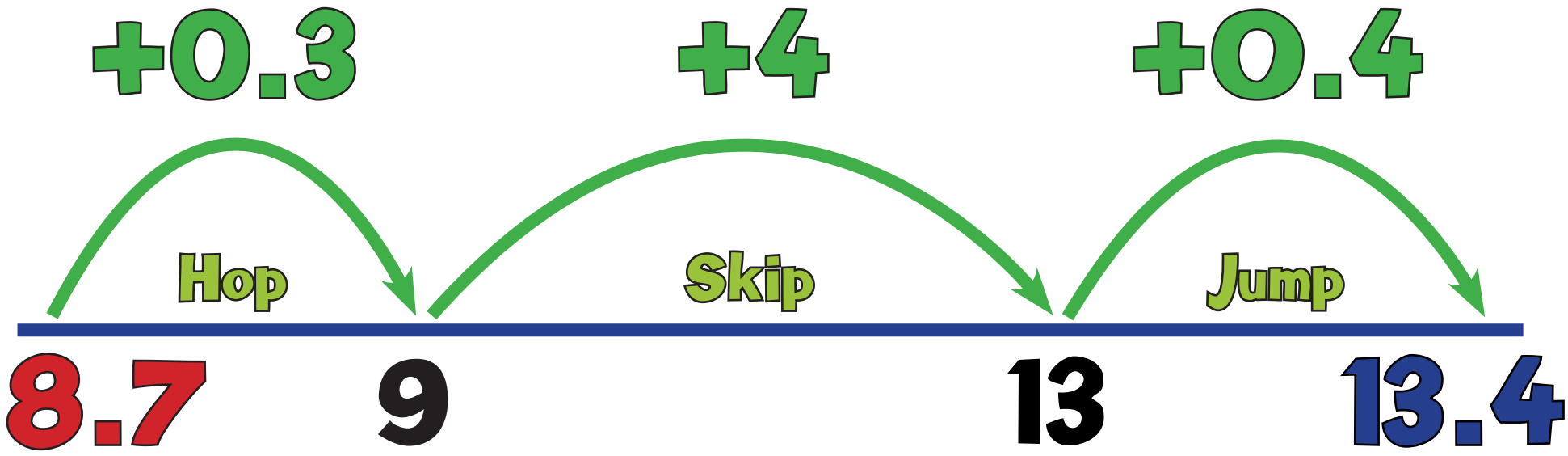
S8d: Quad Jump Extreme

+24 +200 +3000 +42



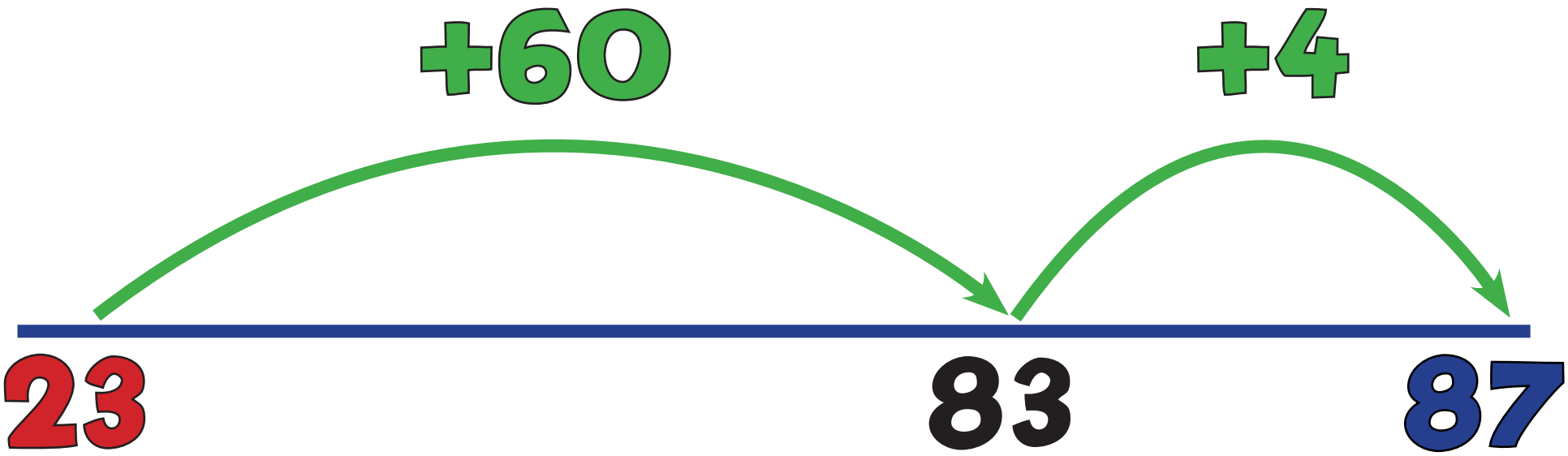
5042 - 1776 = 3266

S8f: Decimal T-J!



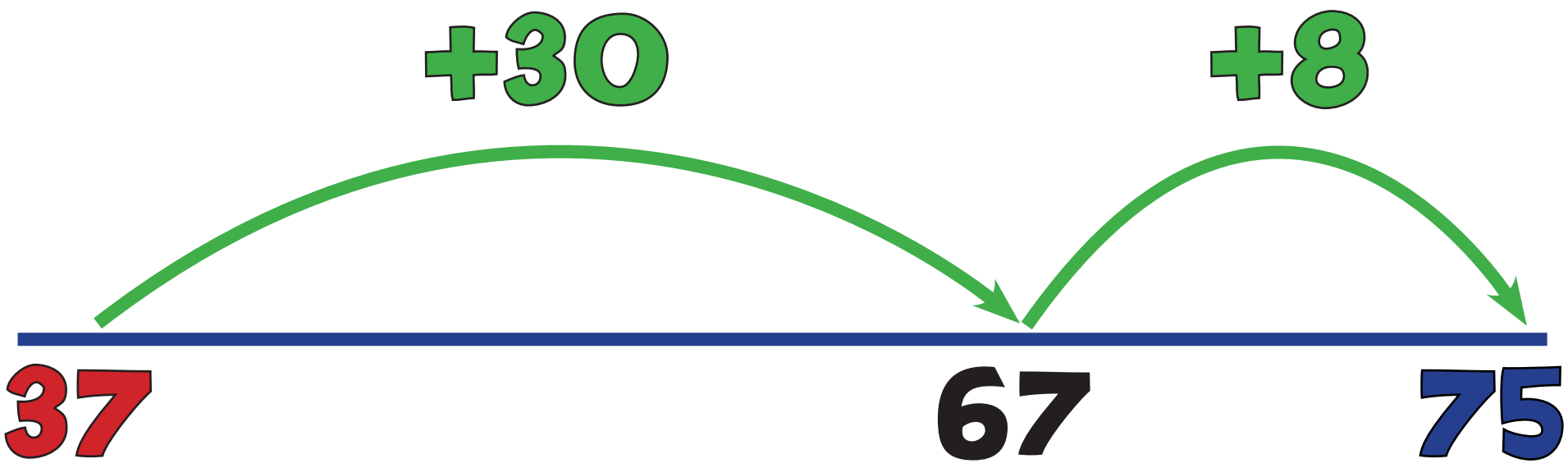
13.4 - 8.7 = 4.7

(S9: Additional 10s Jump, 1s Jump!)



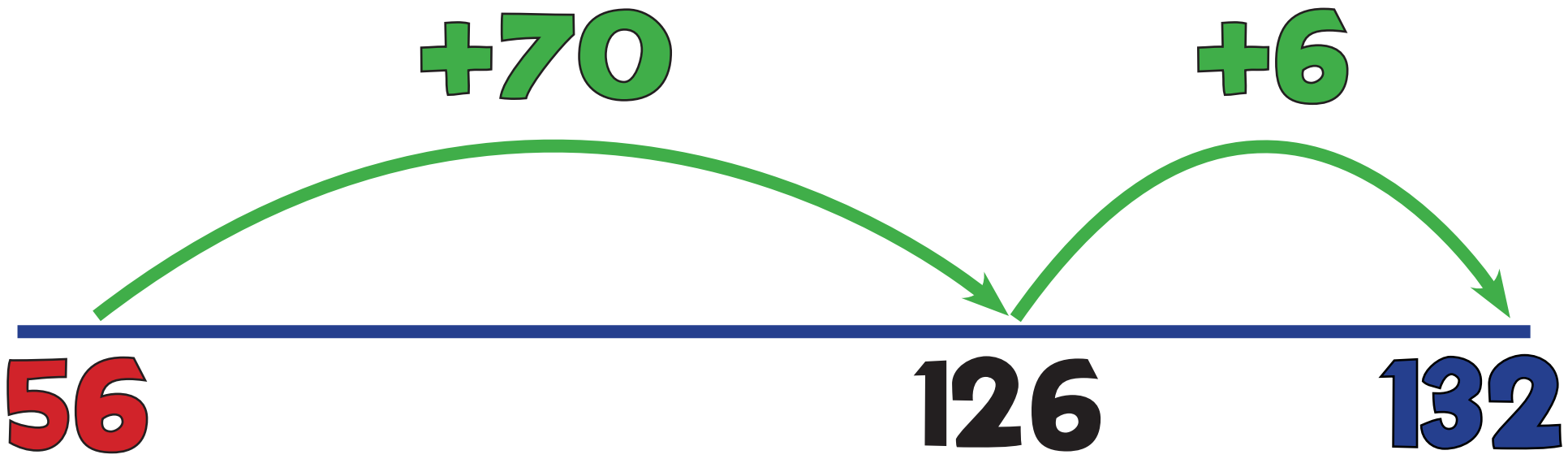
87 - 23 = 64

S9: 10s Jump, 1s Jump!



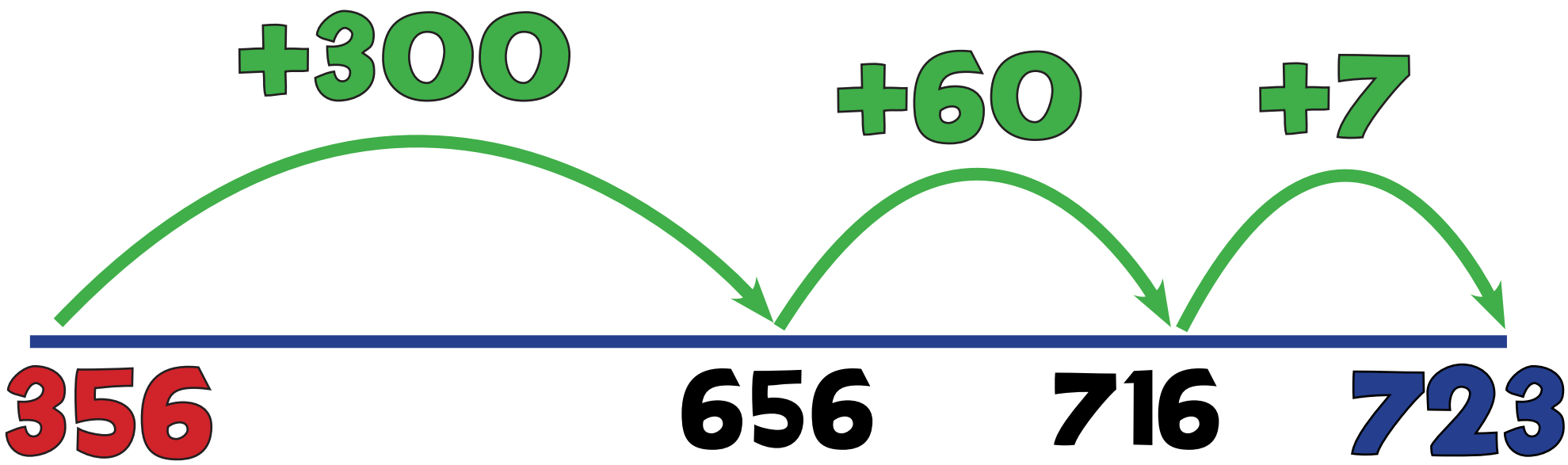
75 - 37 = 38

S9b: 10s Jump, 1s Jump!



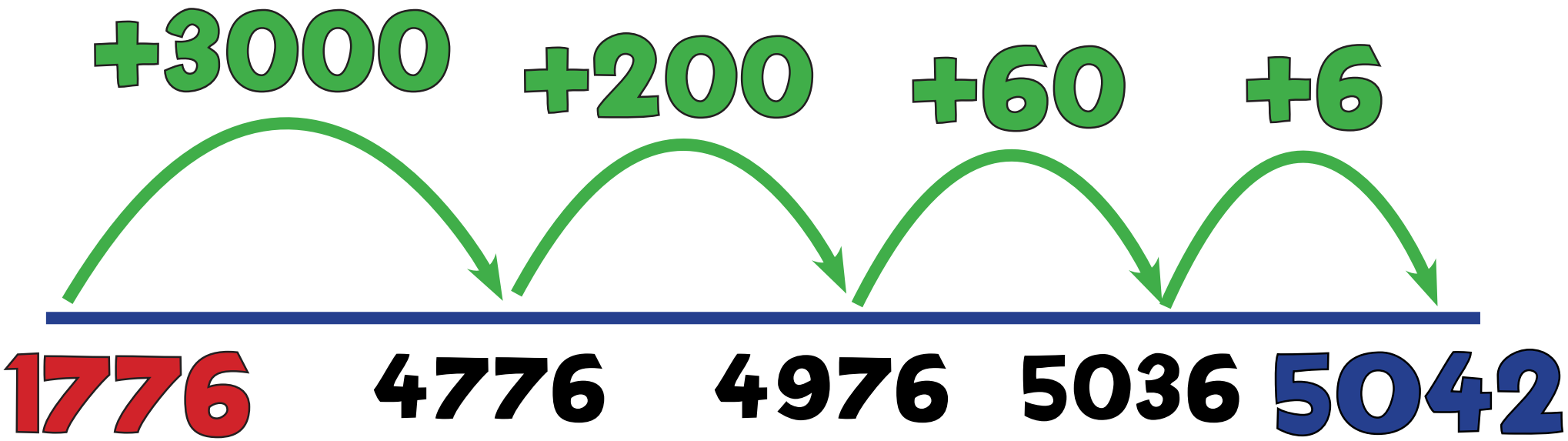
132 - 56 = 76

S9c: 100s, 10s, 1s Jump



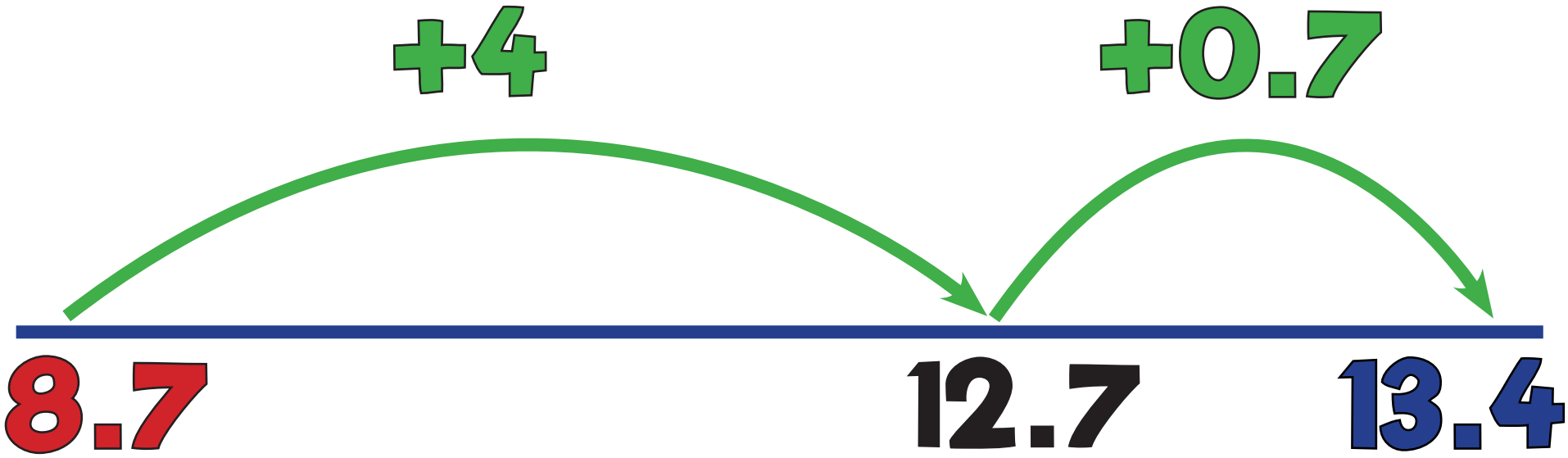
723 - 356 = 367

S9d: 1000s, 100s, 10s, 1s Jump



5042 - 1776 = 3266

S9f: 1s Jump, Tenths Jump!



13.4 - 8.7 = 4.7

(S10: Expanded Column)

Additional

Subtraction

$$87 - 23 = 64$$

80	7
20	3
60	4

(S10: Expanded Column)

Additional:a

Subtraction

75 - 37 = 38

60 ~~70~~	1 5
30	7
30	8

(S10: Expanded Column)

Additional:b

Subtraction

$$132 - 56 = 38$$

~~100~~ 0	~~130~~ 120	12 1
−	50	6
	70	6

S10: Expanded Column

Subtraction (HTU -HTU)

723 - 356 = 367

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

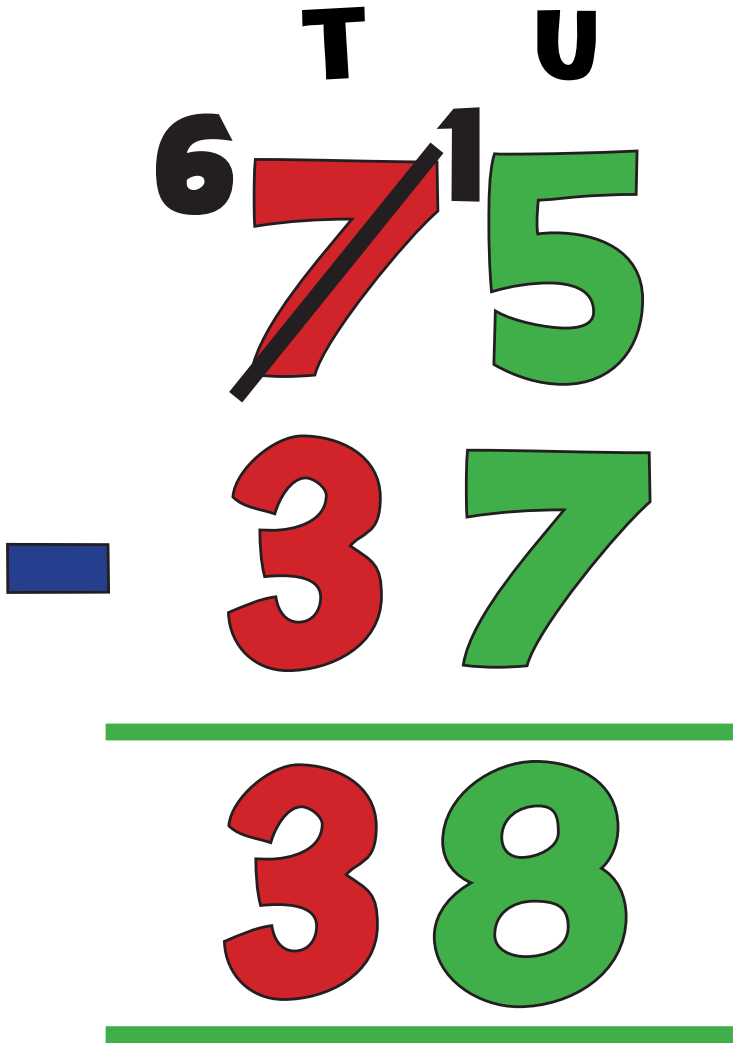
(S11: Column Subtraction)

Additional

	T	U
	8	7
−	2	3
	6	4

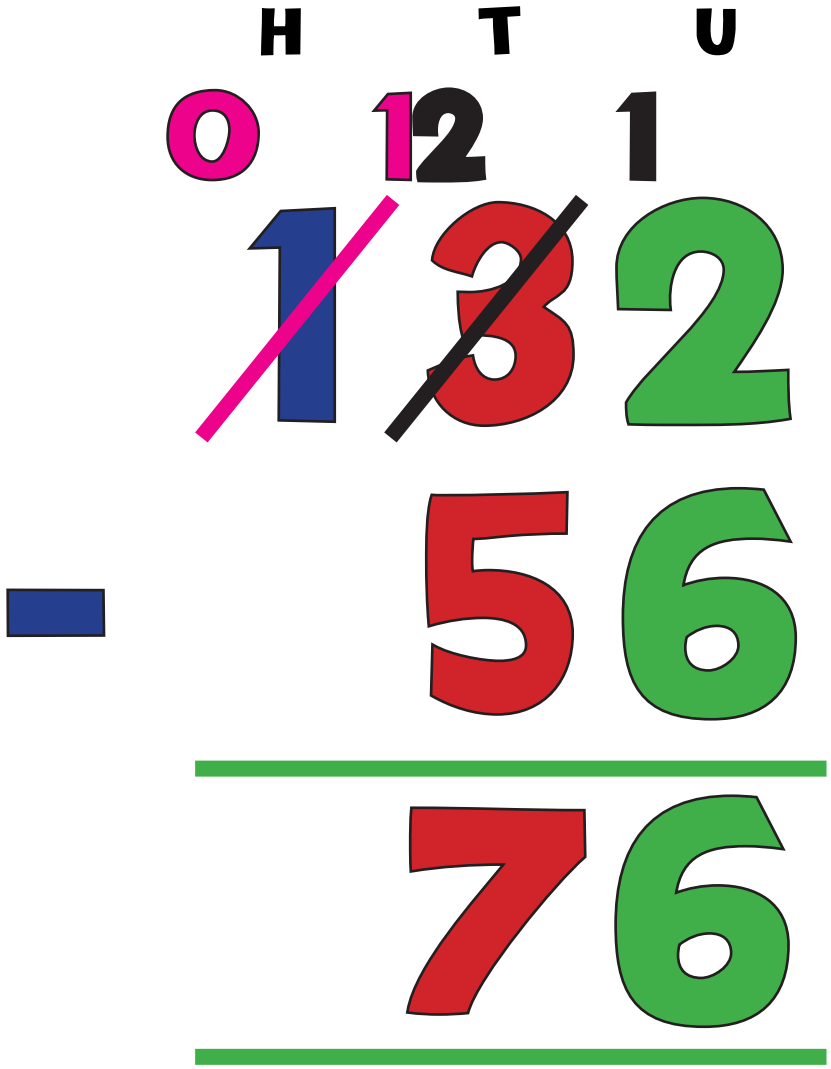
(S11: Column Subtraction)

Additional:a



(S11: Column Subtraction)

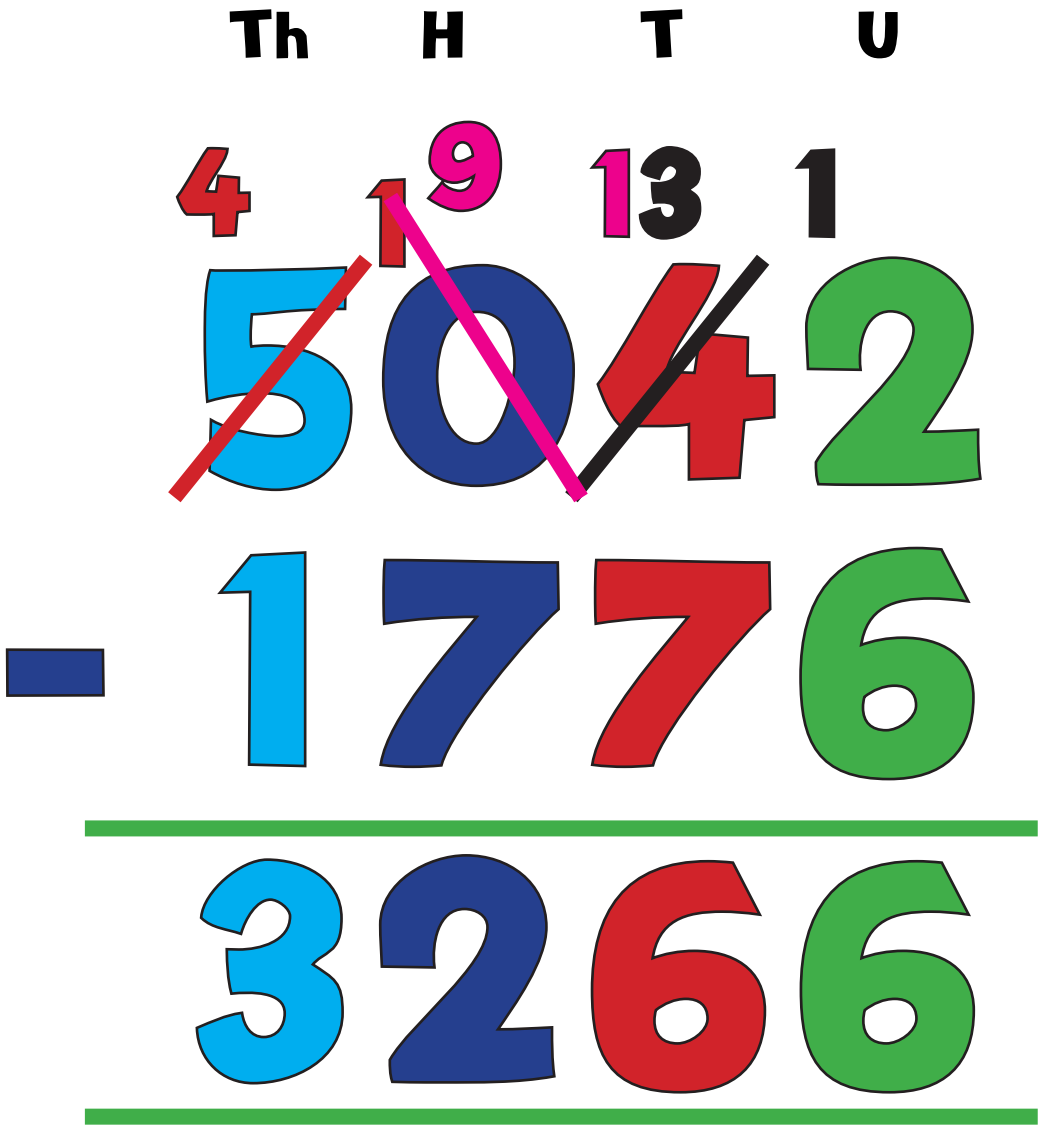
Additional:b



S11: Column Subtraction

	H	T	U
	6	11	1
	~~7~~	~~2~~	3
−	3	5	6
	3	6	7

S11d: Column Subtraction



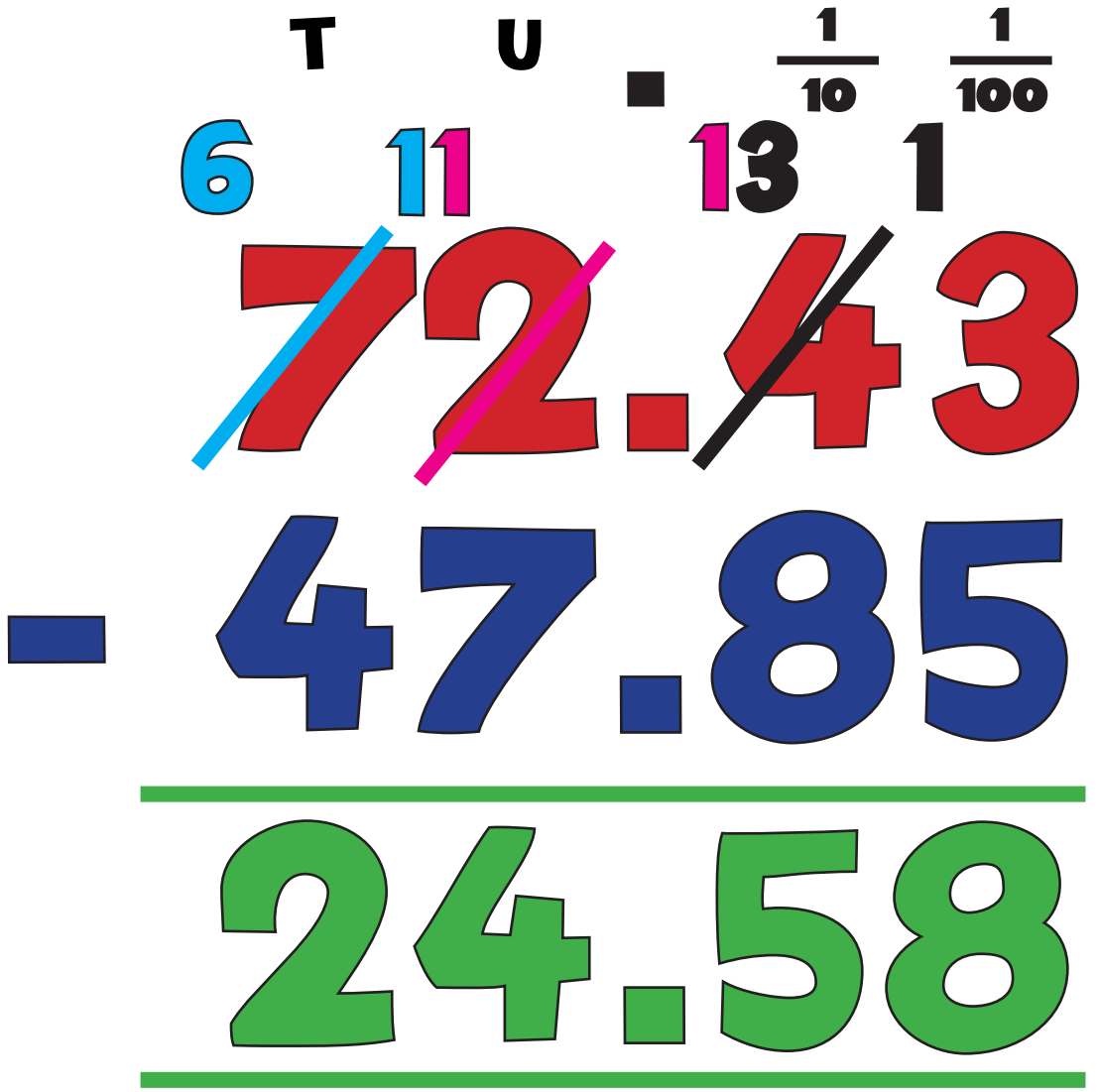
S11e: Column Subtraction

M	HTh	TTh	Th	H	T	U
		3	1	7	12	1
	7	~~4~~	2	~~8~~	~~3~~	1
−	4	2	7	3	5	8
	3	1	5	4	7	3

S11f: Column Subtraction

T	U	.	$\frac{1}{10}$
0	12		1
~~1~~	~~3~~	.	4
−	8	.	7
	4	.	7

S11g: Column Subtraction



S11h: Column Subtraction

With Decimals

$$12.4 - 5.97 = 6.43$$

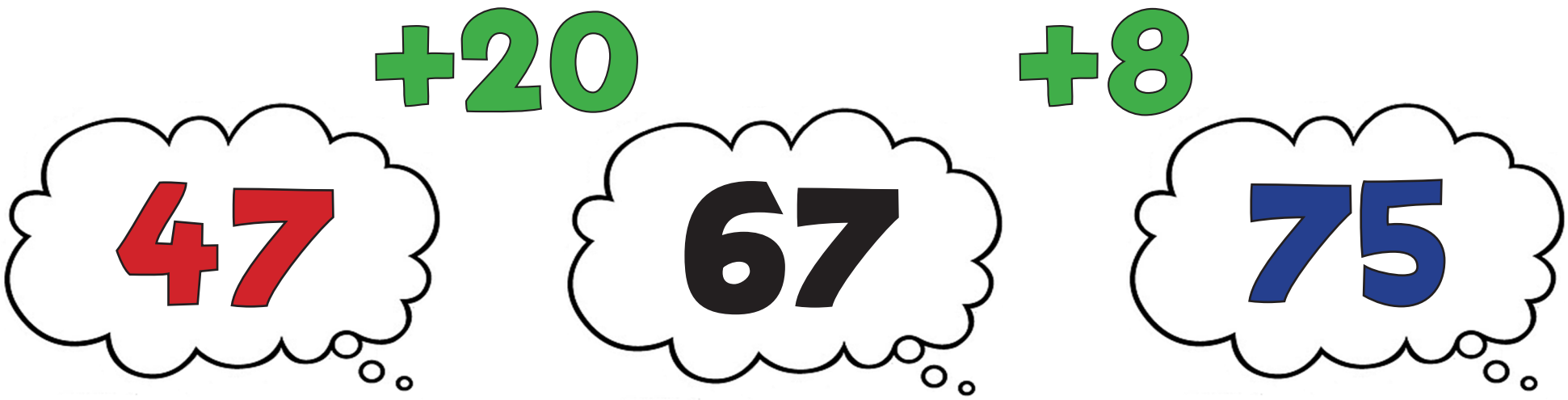
T	U	.	$\frac{1}{10}$	$\frac{1}{100}$
~~1~~ 11	~~2~~ 13	.	~~4~~ 1	0
	5	.	9	7
	6	.	4	3

MS1: Counting Back

46 - 21 = 25

MS2: Counting On

75 - 47 = 28



MS2a: Counting On

75 - 47 = 28

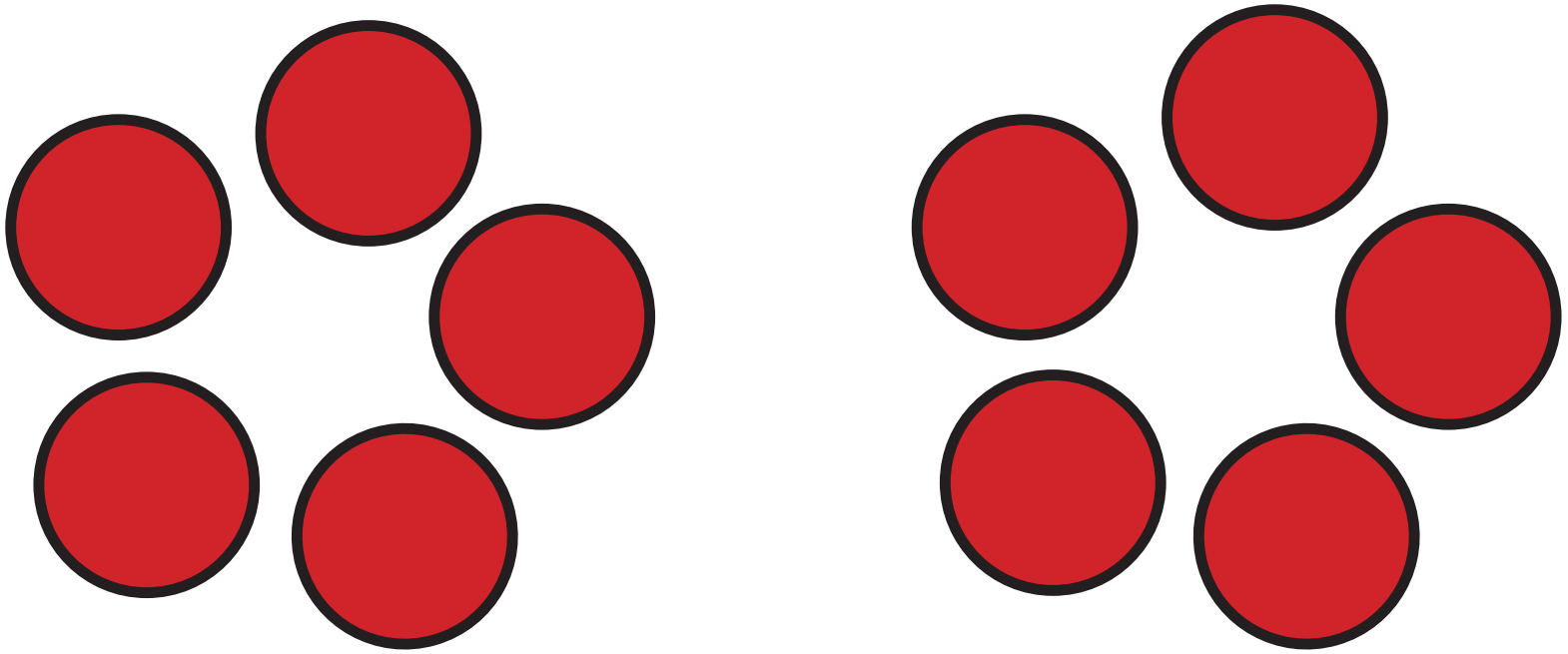
MS3: Round & Adjust

84 - 29 = 55

84 - 30 + 1

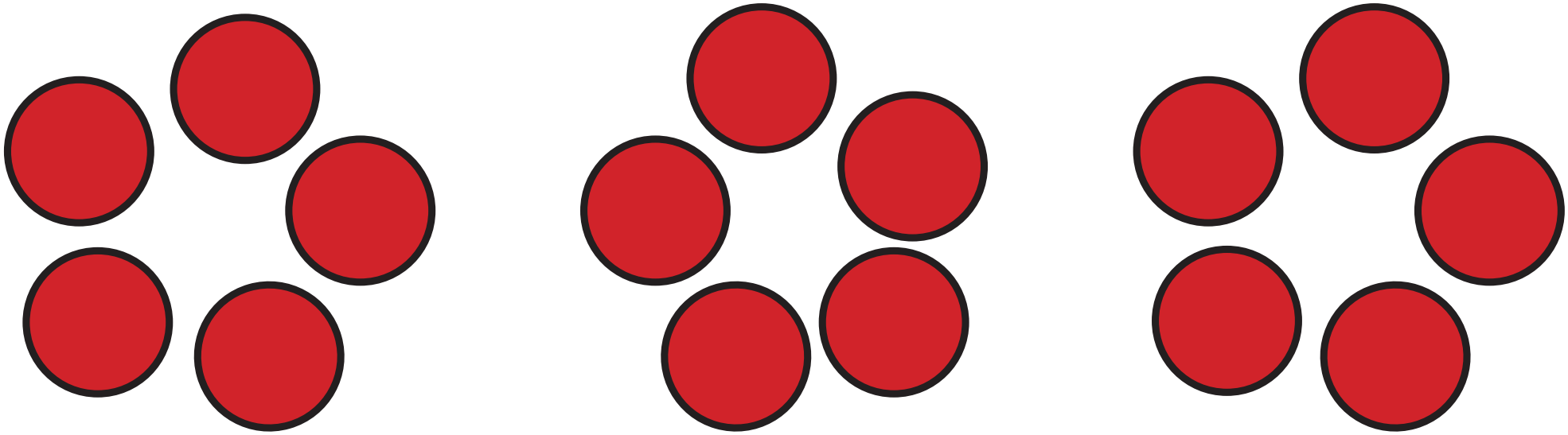
54 + 1 = 55

(M1: Groups)



"2 groups of 5 counters makes 10 counters altogether"

M1: Repeated Addition (Groups)



5 x 3 = 5 + 5 + 5 = 15

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

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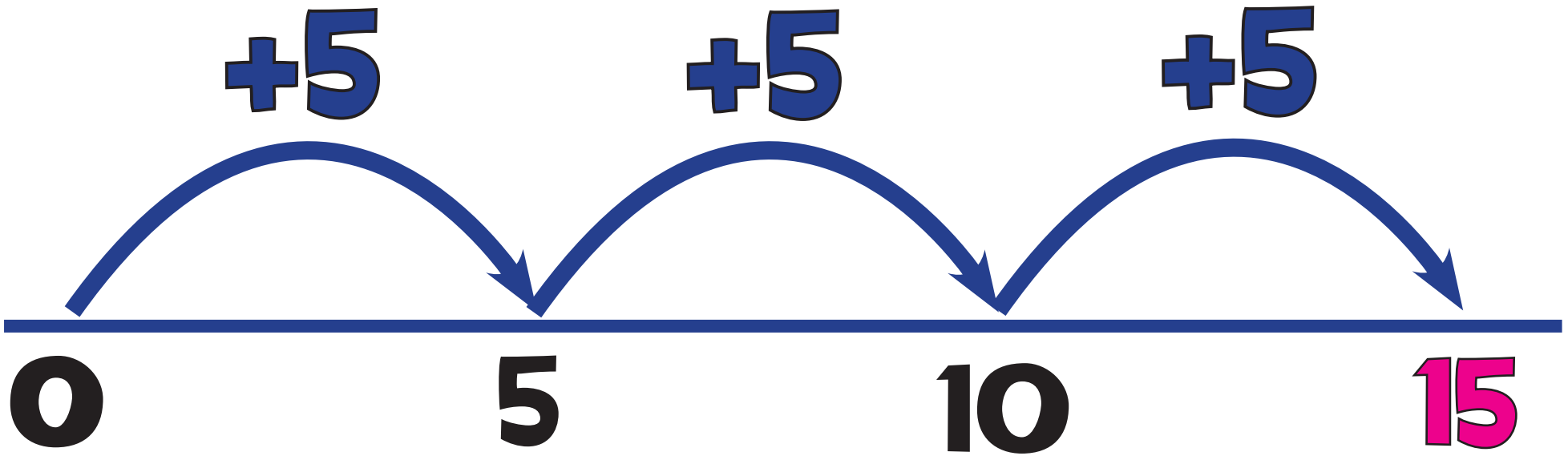
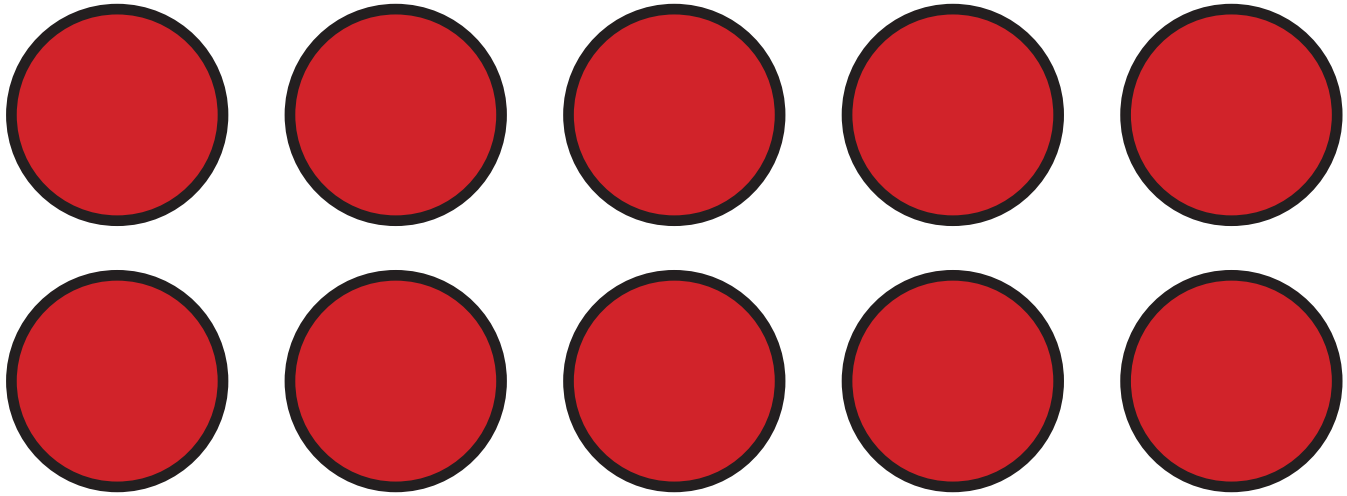
M2: Repeated Addition
(Number Line)



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

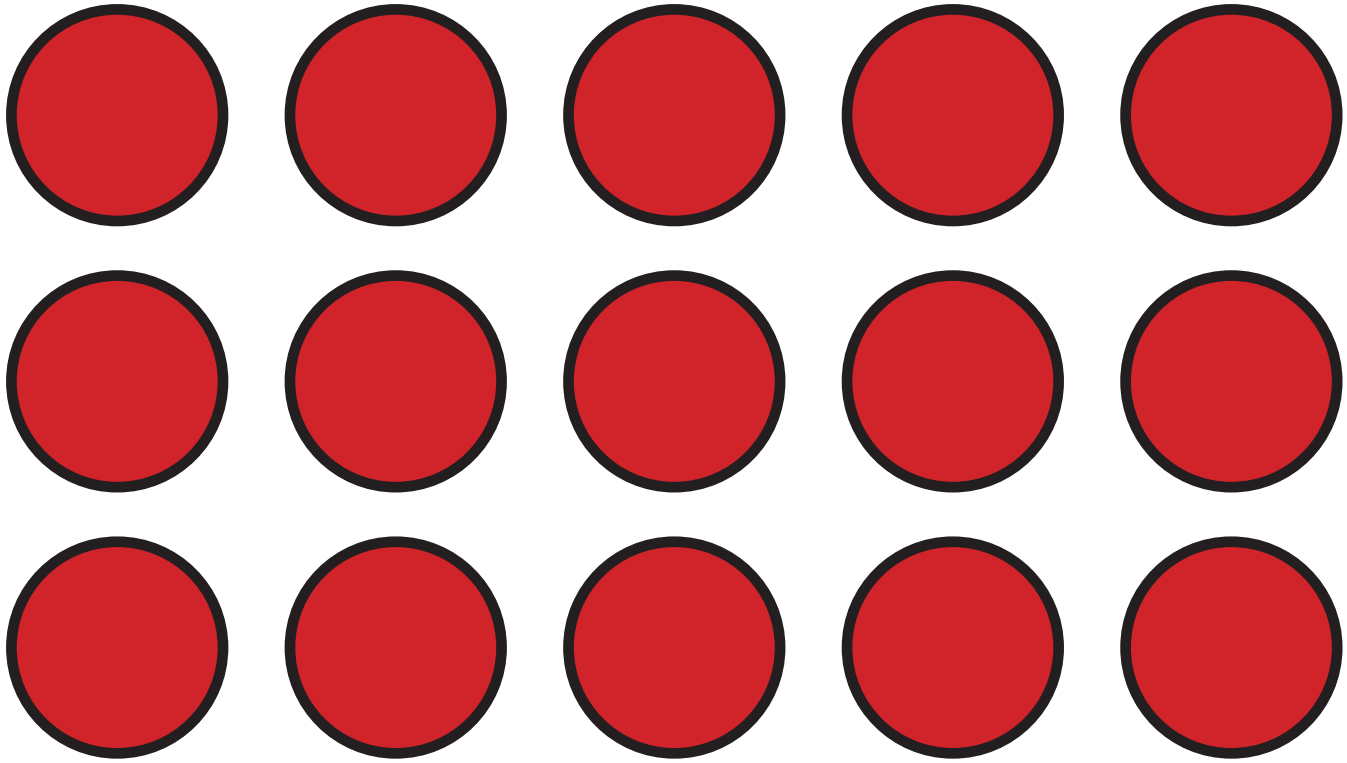
"5 times 3" means "5, 3 times!"

(M3: Arrays)



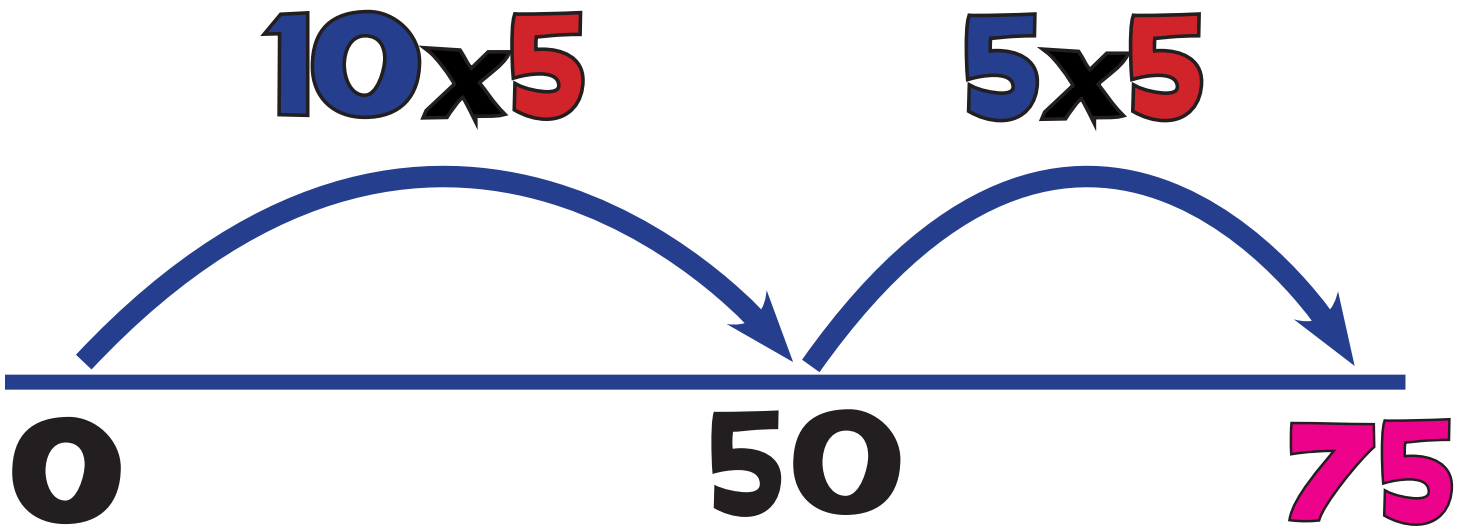
"2 groups of 5 counters" or "5 groups of 2 counters" - "10 counters altogether"

M3: Arrays



3 x 5 = 15 or 5 x 3 = 15

M4: Multi Boing!



10 x 5 = 50

5 x 5 = 25

75

15 x 5 = 75

M4a: Partitioning

$$15 \times 5 = 75$$

$$10 \times 5 = 50$$

$$5 \times 5 = 25$$

$$50 + 25 = 75$$

M5: Grid Method

Short Multiplication

15 x 5 = 75

x	10	5
5	50	25

50 + 25 = 75

M5a: Grid Method

Short Multiplication

43 x 6 = 258

x	40	3
6	240	18

240 + 18 = 258

M5b: Grid Method

Short Multiplication

147 x 4 = 588

x	100	40	7
4	400	160	28

400 + 160 + 28 = 588

M6: Expanded Column

Additional

	H	T	U	
		1	5	
x			5	
		2	5	(5 x 5)
		5	0	(5 x 10)
		7	5	

M6: Expanded Column

Additional a

	H	T	U	
		4	3	
x			6	
		1	8	(6 x 3)
	2	4	0	(6 x 40)
	2	5	8	

M6: Expanded Column

H	T	U		
1	4	7		
x		4		
		28	(4 x 7)	
	1	60	(4 x 40)	
4	0	0	(4 x 100)	
5	8	8		

(M7: Column Multiplication)

Additional

H	T	U
	1	5
x		5
	7	5
	2	

(M7: Column Multiplication)

Additional:a

H	T	U
	4	3
x		6
2	5	8
	1	

M7: Column Multiplication

H	T	U
1	4	7
x		4
5	8	8
1	2	

M8: Grid Method

Long Multiplication

43 x 65 = 2795

x	40	3
60	2400	180
5	200	15

2400 + 180 + 200 + 15 = 2795

M8a: Grid Method

Long Multiplication

243 x 68 = 16,524

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

14580 + 1944 = 16,524

M8b: Grid Method

Long Multiplication

203 x 68 = 13,804

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

= 12,180

= 1,624

12180 + 1624 = 13,804

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M8c: Decimal Grid

Short Multiplication

$3.6 \times 4 = 14.4$

x	3	0.6
4	12	2.4

$12 + 2.4 = 14.4$

M8d: Decimal Grid

Short Multiplication

47.2 x 3 = 141.6

x	40	7	0.2
3	120	21	0.6

120 + 21 + 0.6 = 141.6

M8e: Grid Method

Short Multiplication

$$7.38 \times 6 = 44.28$$

x	7	0.3	0.08
6	42	1.8	0.48

$$42 + 1.8 + 0.48 = 44.28$$

M8f: Grid Method

Long Multiplication

24.3 x 2.5 = 60.75

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

48.6 + 12.15 = 60.75

M9: Long Multiplication
Column

	Th	H	T	U	
			4	3	
x			6	5	
			2	1 5	(5 x 43)
			2	1	
+		2	5	8 0	(60 x 43)
		2	1		
		2	7	9 5	

M9a: Long Multiplication
Column

Th	H	T	U	
		2	4	3
x			6	8
	1	9	4	4
	1	3	2	
+ 1	4	5	8	0
1	2	1		
1	6	5	2	4
			1	

(8 x 243)

(60 x 243)

M9b: Long Multiplication
Column

Th	H	T	U	
		2	0	3
x			6	8
	1	6	2	4
	1	2	2	8
+	1	2	1	8
	1		1	0
	1	3	8	0
				4
	1			

(8 x 203)

(60 x 203)

M9c: Column Multiplication

T	U	.	$\frac{1}{10}$
	3	.	6
x			4
1	4	.	4
			2

M9d: Column Multiplication

H	T	U	.	$\frac{1}{10}$
4	7	.	2	
×		3		
1	4	1	.	6
		2		

M9e: Column Multiplication

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

M9f: Long Multiplication

Column Decimals

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

(0.5 x 24.3)

(2 x 24.3)

M9g: Long Multiplication

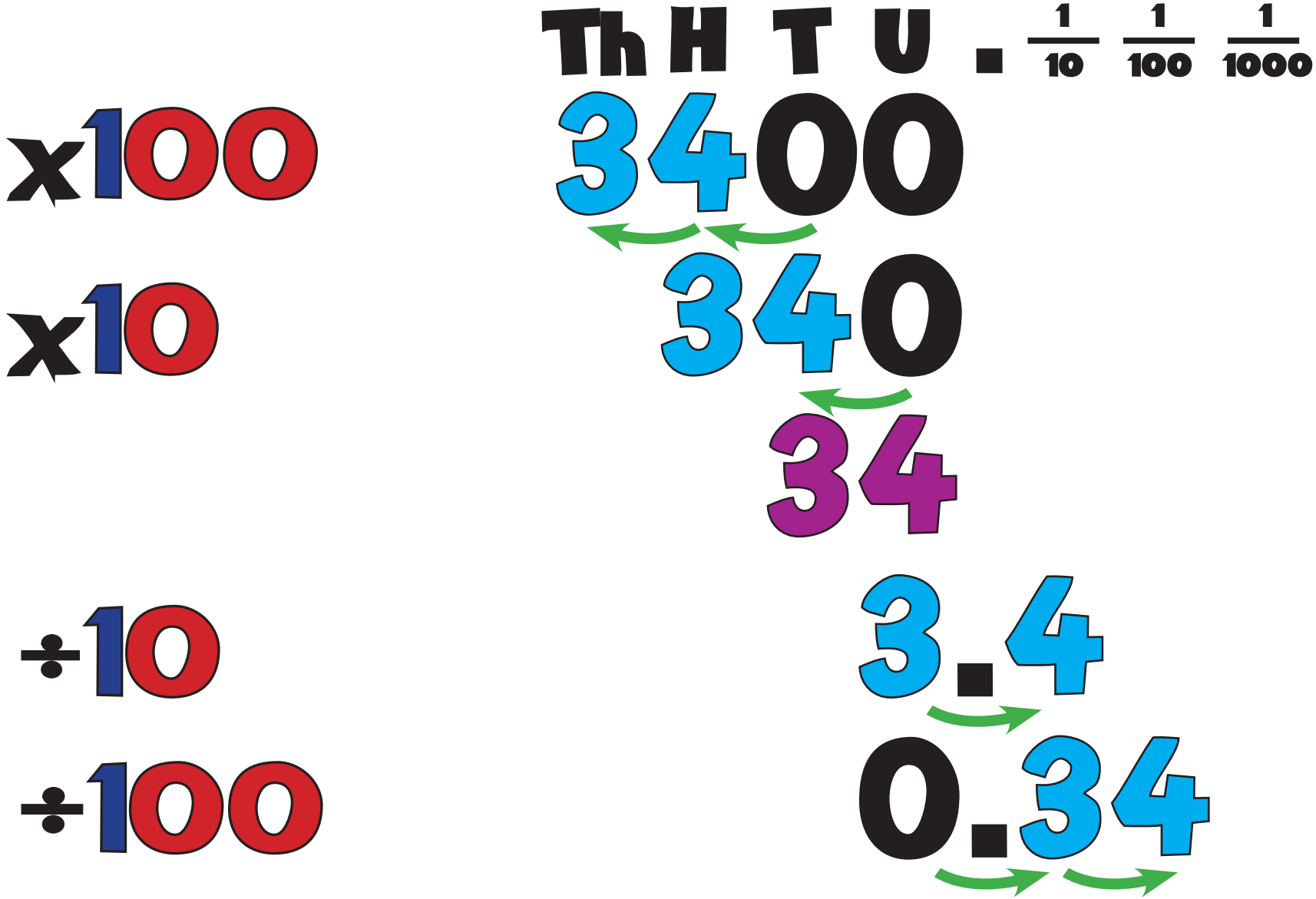
Column

Th	H	T	U	
	3	7	8	6
x			4	8
	3	0	2	8
		6	6	4
+	1	5	1	4
1		3	3	2
	1	8	1	7
			1	

(8 x 3786)

(40 x 3786)

MM1: Jump!



MM1a: Jump!

	TTh	Th	H	T	U	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10000}$
x1000	6	3	4	0	0					
x100		6	3	4	0					
x10			6	3	4					
			6	3	.	4				
÷10				6	.	3	4			
÷100				0	.	6	3	4		
÷1000				0	.	0	6	3	4	

MM2: Re-ordering

(9 x 2) x 5

18 x 5 = 90

(9 x 5) x 2

45 x 2 = 90

(2 x 5) x 9

10 x 9 = 90 *

MM2a: Re-ordering

$(7 \times 4) \times 5$

$28 \times 5 = 140$

$(7 \times 5) \times 4$

$35 \times 4 = 140$

$(4 \times 5) \times 7$

$20 \times 7 = 140$ *

MM2b: Re-ordering

$(9 \times 8) \times 6$

$72 \times 6 = 432$

$(9 \times 6) \times 8$

$54 \times 8 = 432$ *

$(8 \times 6) \times 9$

$48 \times 9 = 432$

MM3: Partitioning

15 x 5 = 75

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

MM3a: Partitioning

37 x 4 = 148

120 + 28 = 148

(30 x 4) (7 x 4)

MM4: Round & Adjust

49 x 3 = 147

(50 x 3) - (1 x 3)

150 - 3 = 147

MM4a: Round & Adjust

$$198 \times 4 = 792$$

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

$$800 - 8 = 792$$

MM4b: Round & Adjust

$$3.9 \times 5 = 19.5$$

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

$$20 - 0.5 = 19.5$$

MM4c: Round & Adjust

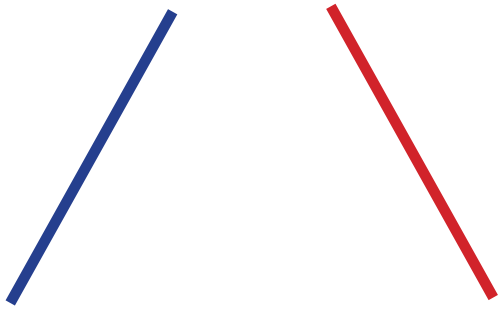
£5.99 x 6 = £35.94

(£6 x 6) - (1p x 6)

£36 - 6p = £35.94

MM5: Doubling

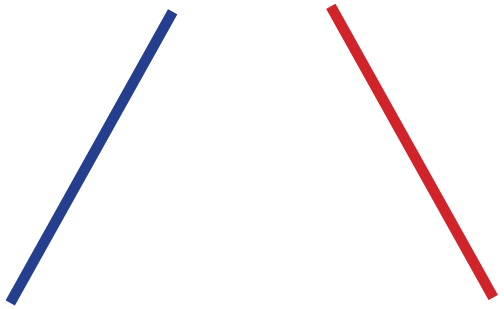
Double 17 = 34



20 + 14 = 34

MM5a: Doubling

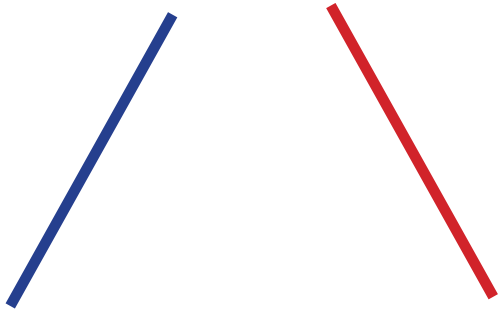
Double 37 = 74



60 + 14 = 74

MM5b: Doubling

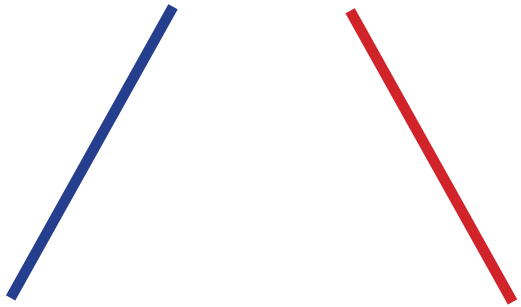
Double 78 = 156



140 + 16 = 156

MM5c: Doubling

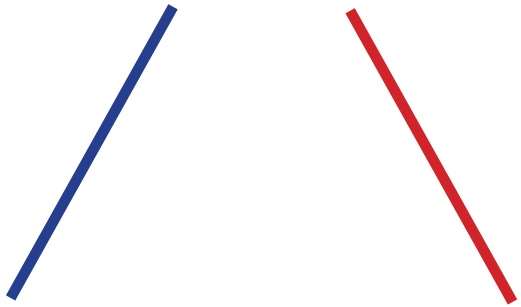
Double 340 = 680



600 + 80 = 680

MM5d: Doubling

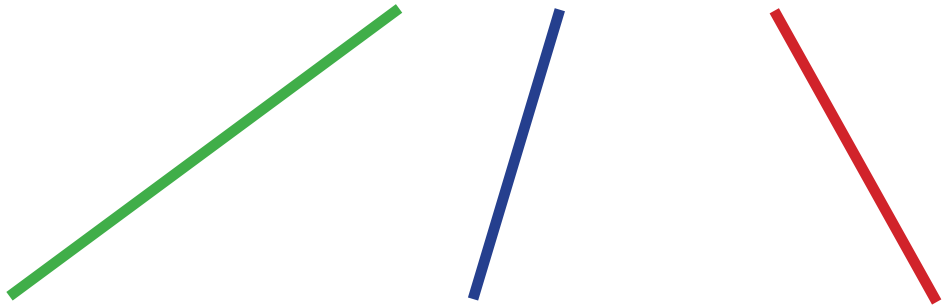
Double 480 = 960



800 + 160 = 960

MM5e: Doubling

Double 278 = 556



400 + 140 + 16 = 556

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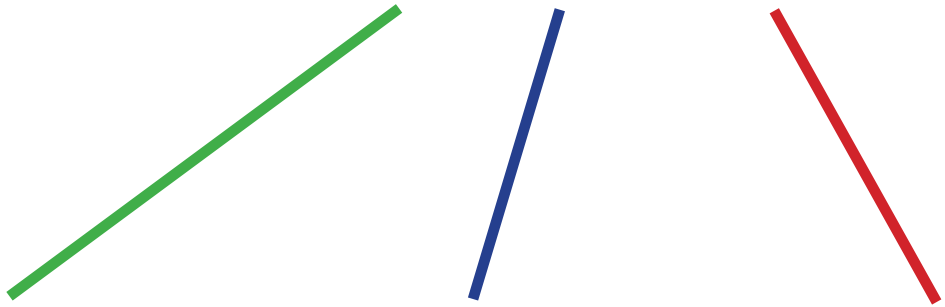
MM5f: Doubling

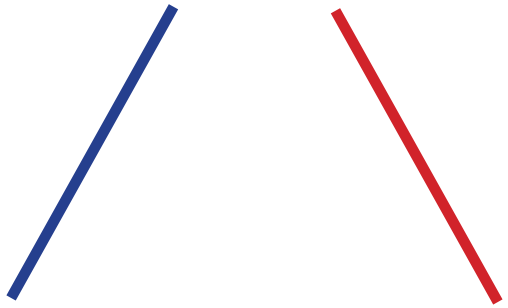
Double 768 = 1536



1400 + 120 + 16 = 1536

MM5g: Doubling

Double 3.7 = 7.4



6 + 1.4 = 7.4

MM6: Doubling Table Facts

16 x 7 = 112

(8 x 2)

8 x 7 = 56

↓ ↓ x 2

16 x 7 = 112

MM7: Doubling Up

36 x 8 = 112

Double 36 = 72 (36 x 2)

Double 72 = 144 (36 x 4)

Double 144 = 288 (36 x 8)

MM7a: Doubling Up

125 x 16 = 2000

Double 125 = 250 (125 x 2)

Double 250 = 500 (125 x 4)

Double 500 = 1000 (125 x 8)

Double 1000 = 2000 (125 x 16)

MM8: Mult by 10, 100 & 1000 then Halve

$$86 \times 5 = 430$$

$$86 \times 10 = 860$$

$$860 \div 2 = 430$$

MM8a: Mult by 10, 100 & 1000 then Halve

56 x 25 = 1400

56 x 100 = 5600

5600 ÷ 2 = 2800

2800 ÷ 2 = 1400

MM9: Doubling & Halving

45 x 14

90 x 7 = 630

MM9a: Doubling & Halving

36 x 25

18 x 50

9 x 100 = 900

MM9b: Doubling & Halving

26 x 32

52 x 16

104 x 8 = 832

208 x 4 etc.

MM10: Factorising

$$32 \times 15 = 480$$

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

$$160 \times 3 = 480$$

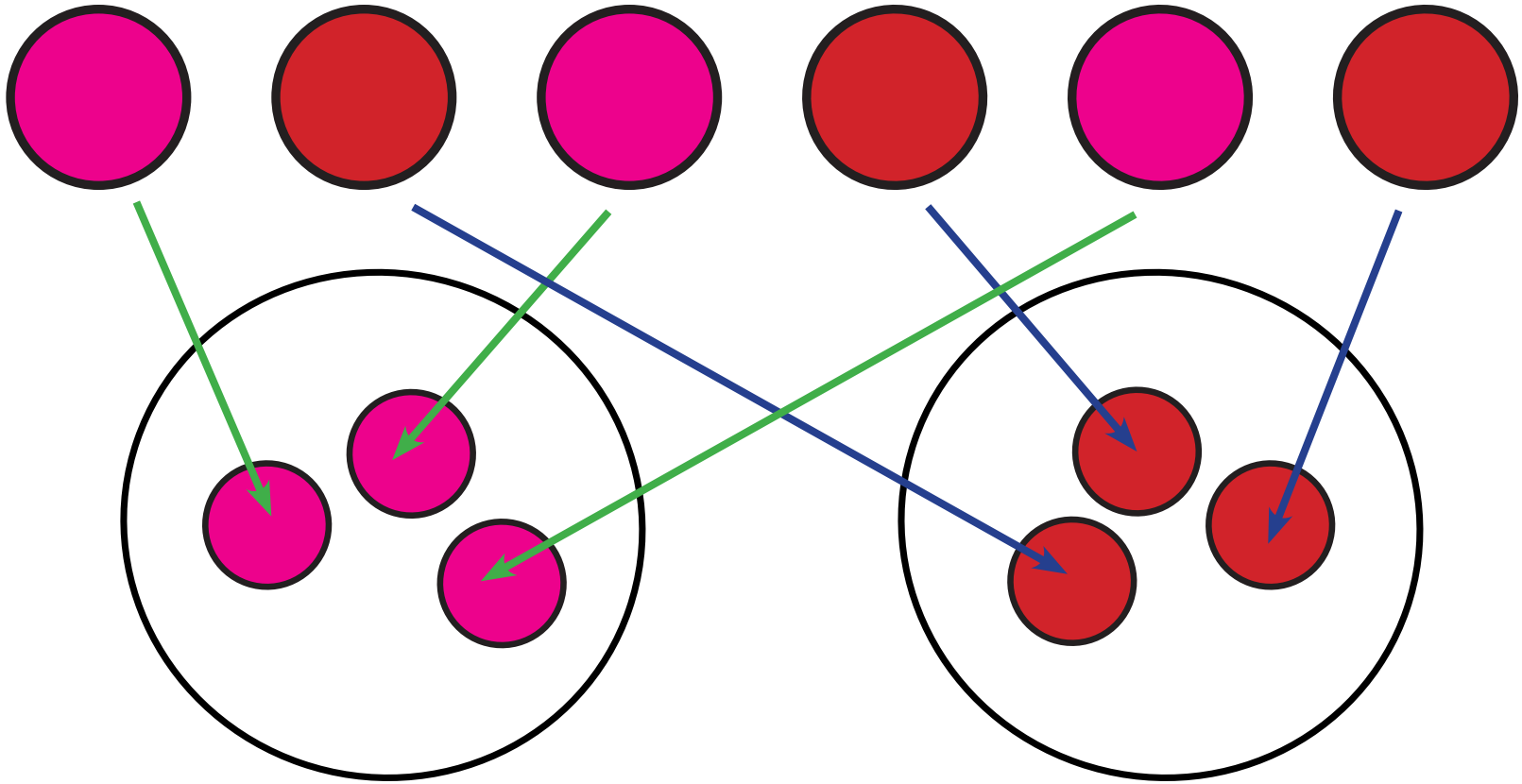
MM10a: Factorising

$$52 \times 24 = 1248$$

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

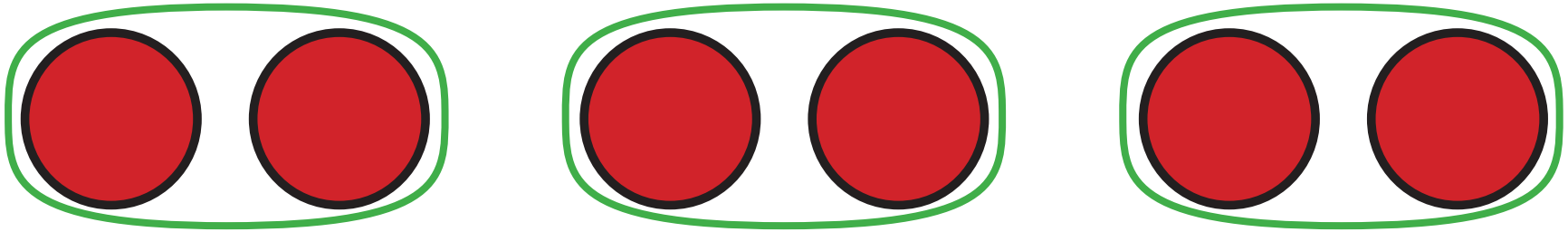
$$208 \times 6 = 1248$$

D1: Sharing (Concept)



"If I share 6 into 2 equal amounts, how many in each group?" Answer: 3

D2: Grouping (Concept)

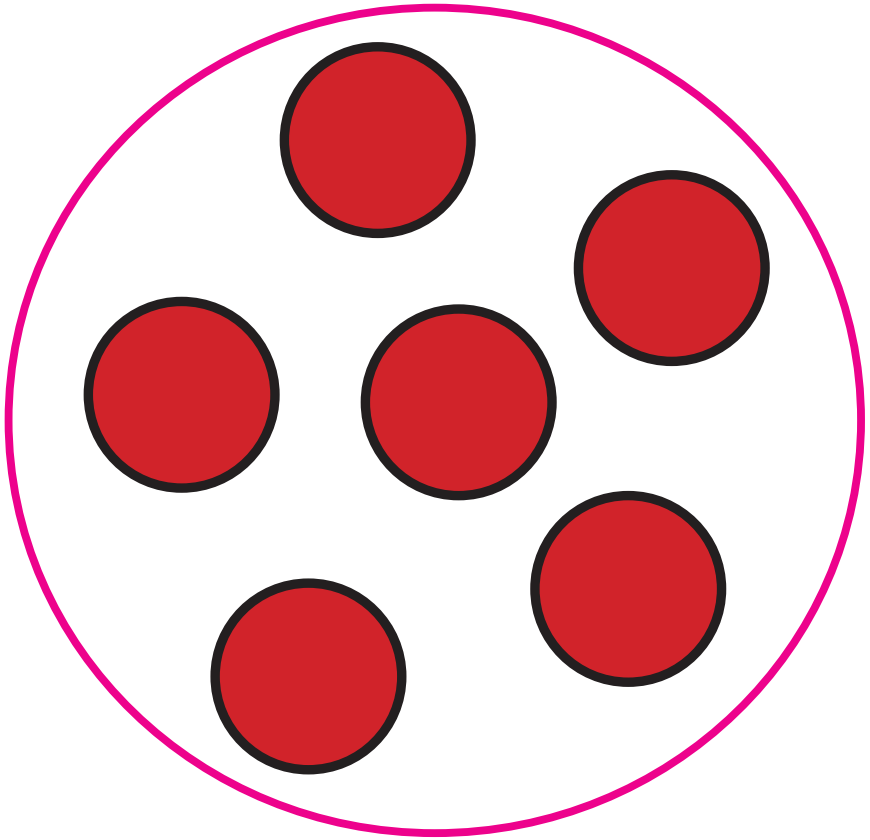


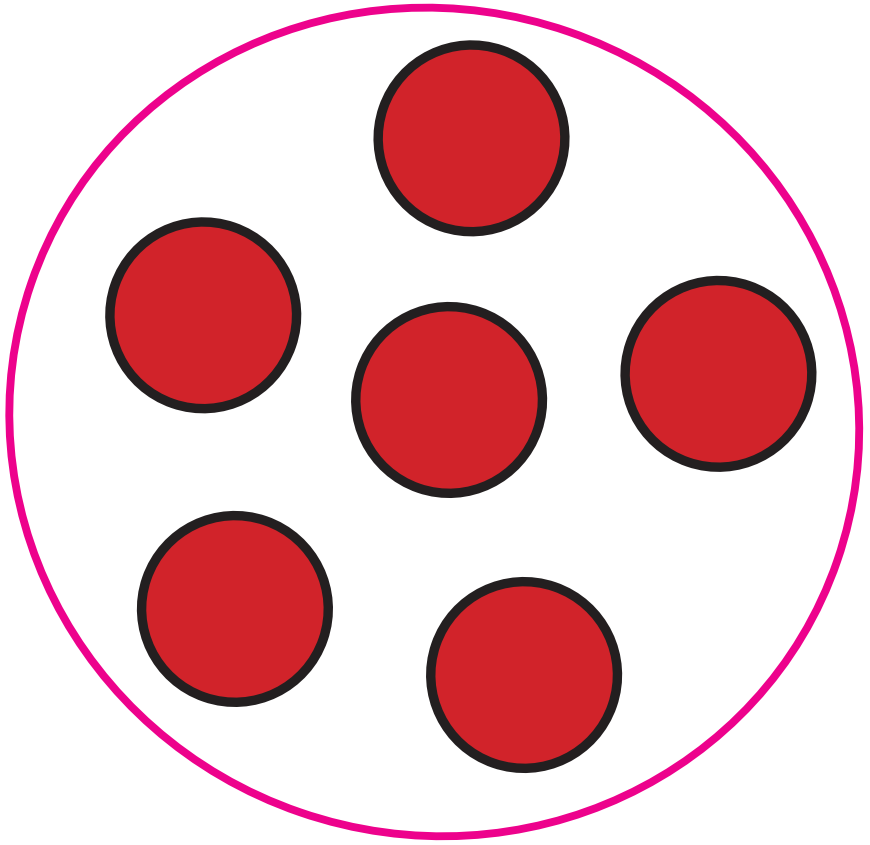
"How many groups of 2 can I make out of 6?
Answer: 3

D3: Division as Sharing

12 ÷ 2 = 6

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

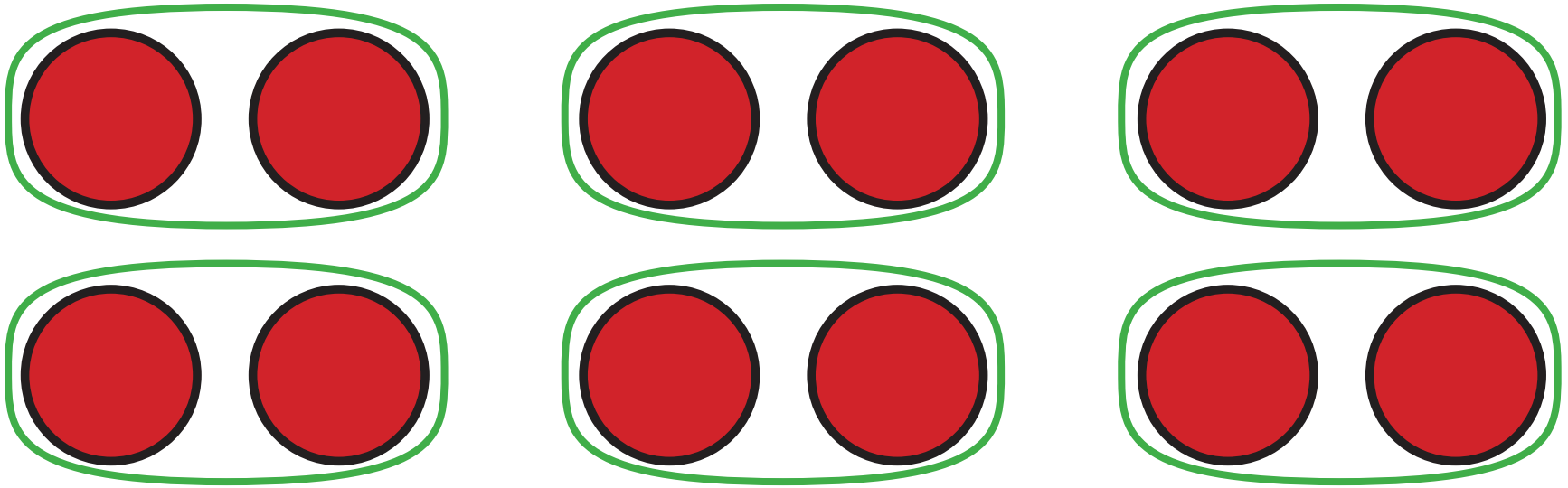




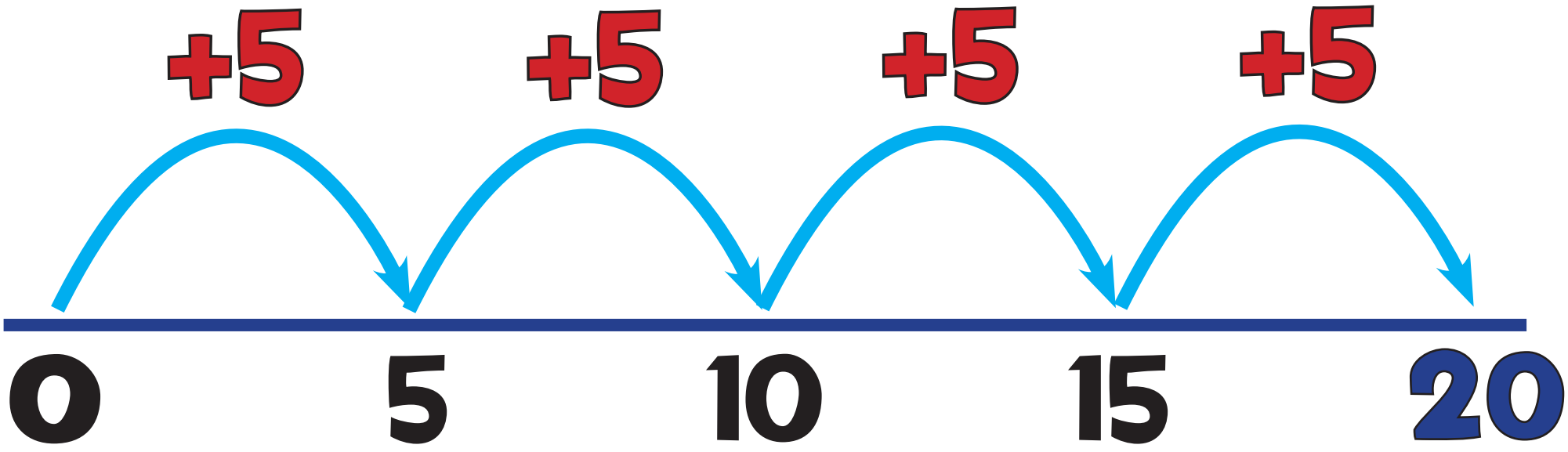
D4: Division as Grouping

12 ÷ 2 = 6

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



D5: Grouping on a Number Line

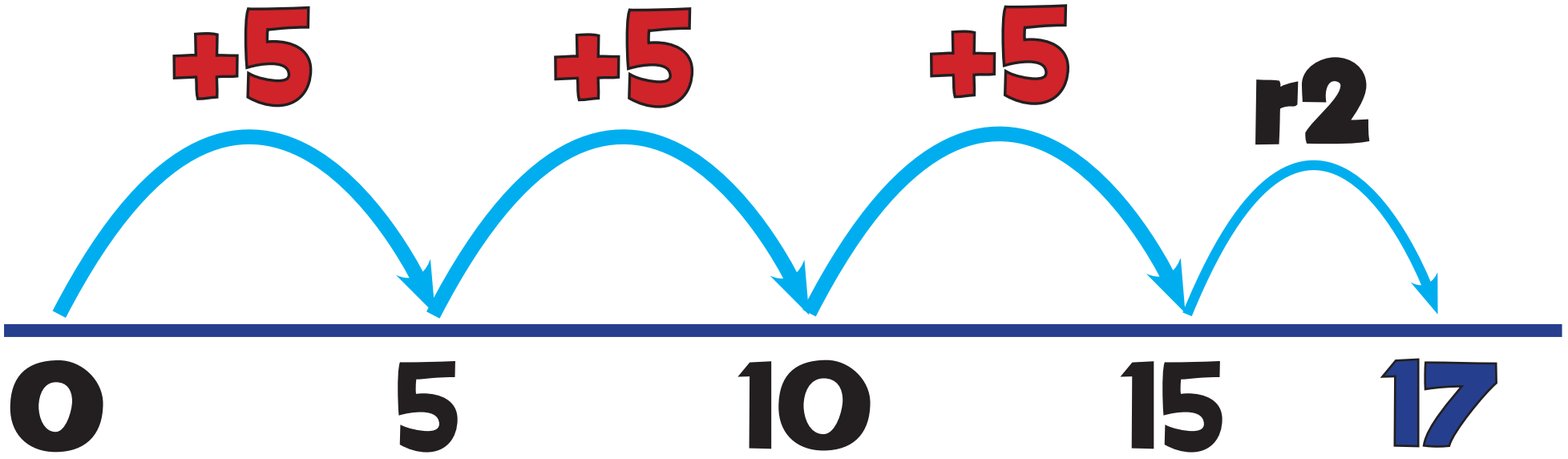


"How many 5s in 20?"
Answer: 4

$$20 \div 5 = 4$$

D5a: Grouping on a Number Line

Remainders



"How many 5s in 17?"
Answer: 3 remainder 2

$$17 \div 5 = 3r2$$

D6: Grouping Grid

4	4	4	4	4
4				3

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

27 ÷ 4 = 6r3

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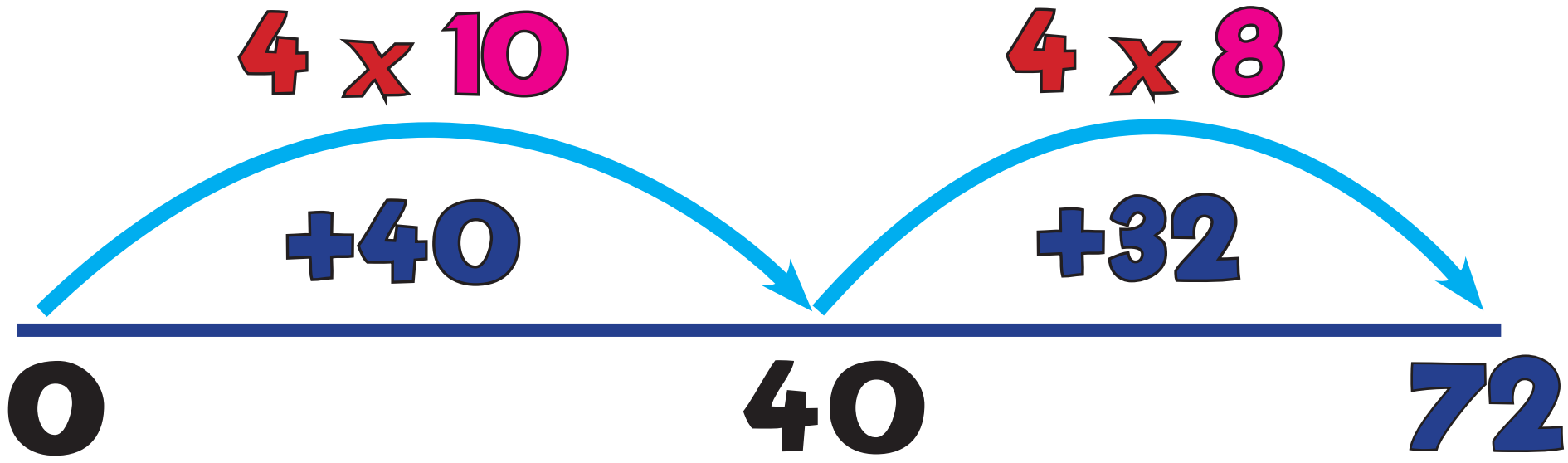
D7: Chunking Jump

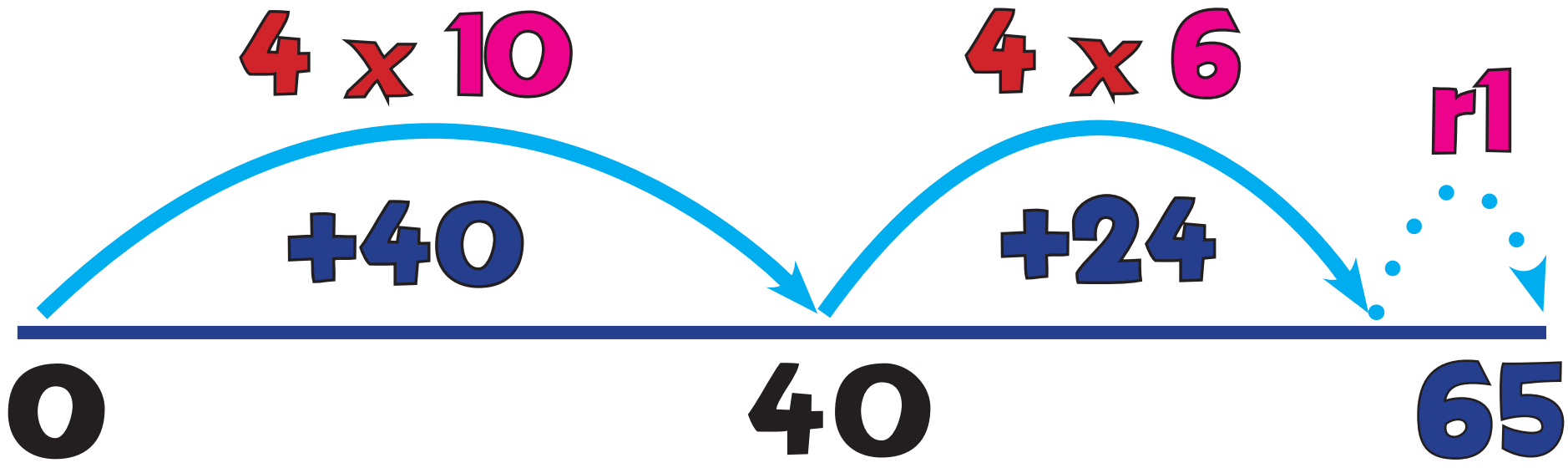


"How many 4s in 72?"
Answer: 18

$$72 \div 4 = 18$$

D7a: Chunking Jump

Remainders



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

$$65 \div 4 = 16r1$$

D8: Find the Hunk!

72 ÷ 4 = 18

The Hunk!

Chunk

40 + 32 ÷ 4

10 + 8 = 18

D8a: Find the Hunk!

Remainders

$$65 \div 4 = 16r1$$

The Hunk!

Chunk

$$40 + 25 \div 4$$

$$10 + 6r1 = 16r1$$

D9: Mega Hunk!

136 ÷ 4 = 34

Mega Hunk!

Chunk

120 + 16

÷ 4

30 + 4 = 34

D9c: Mega Hunk!

Remainders

394 ÷ 6 = 65r4

Mega Hunk!

Chunk

360 + 34

↓ ↓ ÷ 6

60 + 5r4 = 65r4

D9d: Mega Hunk!

591 ÷ 3 = 197

Mega Hunk! 300 + Mega Hunk! 270 + Chunk 21 ÷ 3

↓ ↓ ↓

100 + 90 + 7 = 197

D9e: Mega Hunk!

5978 ÷ 7 = 854

Mega Hunk!	Mega Hunk!	Chunk	
5600	+ 350	+ 28	÷ 7
↓	↓	↓	
800	+ 50	+ 4	= 854

D9f: Mega Hunk!

846 ÷ 5 = 169r1

Mega Hunk! + Mega Hunk! + Chunk

500 + 300 + 46

÷ 3

100 + 60 + 9r1 = 169r1

D9g: Mega Hunk!

Simple Long Division

480 ÷ 15 = 32

Mega Hunk!		Chunk	
450	+	30	÷ 15
↓		↓	
30	+	2	= 32

D9h: Decimal Hunk!

18 ÷ 1.5 = 12

The Hunk! — Chunk

15 + 3 ÷ 1.5

↓ ↓

10 + 2 = 12

D9i: Decimal Hunk!

87.5 ÷ 7 = 12.5

Mega Hunk! | Chunk | Chunk

70 + 14 + 3.5

÷ 7

10 + 2 + 0.5 = 12.5

(D10: Short Division)

Additional

$$72 \div 4 = 18$$

$$\begin{array}{r} 18 \\ 4\overline{)\,7^{3}2} \end{array}$$

(D10: Short Division)

Additional:a

65 ÷ 4 = 16r1

$$\begin{array}{r} 1\;6\,r1 \\ 4\overline{)\,6\,{}^{2}5} \end{array}$$

D10: Short Division

$$136 \div 4 = 34$$

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

D10c: Short Division

$$394 \div 6 = 65r4$$

$$\begin{array}{r} 65r4 \\ 6\overline{)\,3^{3}9^{3}4} \end{array}$$

D10d: Short Division

$$591 \div 3 = 197$$

$$\begin{array}{r} 197 \\ 3\overline{)\,5^{2}9^{2}1} \end{array}$$

D10e: Short Division

5978 ÷ 7 = 854

$$
\begin{array}{r}
854 \\
7\overline{)\,5^{5}9^{3}7^{2}8} \\
\end{array}
$$

D10f: Short Division

Different Remainders

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

$$846 \div 5$$

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

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

D10i: Short Division

87.5 ÷ 7 = 12.5

$$\begin{array}{r} 12.5 \\ 7\overline{)\,8{}^{1}7.{}^{3}5} \end{array}$$

(D11: Chunking)

Additional

18

4 ⟌ 72

- 40 (4 x 10)

32

- 32 (4 x 8)

0

72 ÷ 4 = 18

(D11: Chunking)

Additional:a

16 r 1

4 ⟌ 65

- 40 (4 x 10)

25

- 24 (4 x 6)

1

65 ÷ 4 = 16r1

D11: Chunking

$$
\begin{array}{r|l}
 & 34 \\
\hline
4 & 136 \\
-120 & (4 \times 30) \\
\hline
 & 16 \\
-\ 16 & (4 \times 4) \\
\hline
 & 0
\end{array}
$$

$$136 \div 4 = 34$$

D11b: Chunking

34

4) 136

- 40 (4 x 10)

96

- 40 (4 x 10)

56

- 40 (4 x 10)

16

- 16 (4 x 2)

0

136 ÷ 4 = 34

D11c: Chunking

Remainders

65r4

6 ⟌ 394

- 360 (6 x 60)

34

- 30 (6 x 5)

4

394 ÷ 6 = 65r4

D11d: Chunking

Mega Chunk

$$
\begin{array}{r}
197 \\
3\,\overline{)\,591} \\
-\ 300 \\ \hline
291 \\
-\ 270 \\ \hline
21 \\
-\ 21 \\ \hline
0
\end{array}
$$

(3 x 100)

(3 x 90)

(3 x 7)

591 ÷ 3 = 197

D11e: Chunking

Mega Chunk

```
      854
   ______
7 ) 5978
  - 5600   (7 x 800)
   ------
     378
  -  270   (7 x 50)
   ------
      28
  -   28   (7 x 4)
   ------
       0
```

$5978 \div 7 = 854$

D11f: Chunking

Mega Chunk

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

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

D11g1: Chunking

Long Division

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

$480 \div 15 = 32$

D11g2: Chunking

Long Division

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

$480 \div 15 = 32$

D12: Chunking

Long Division With Remainders

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

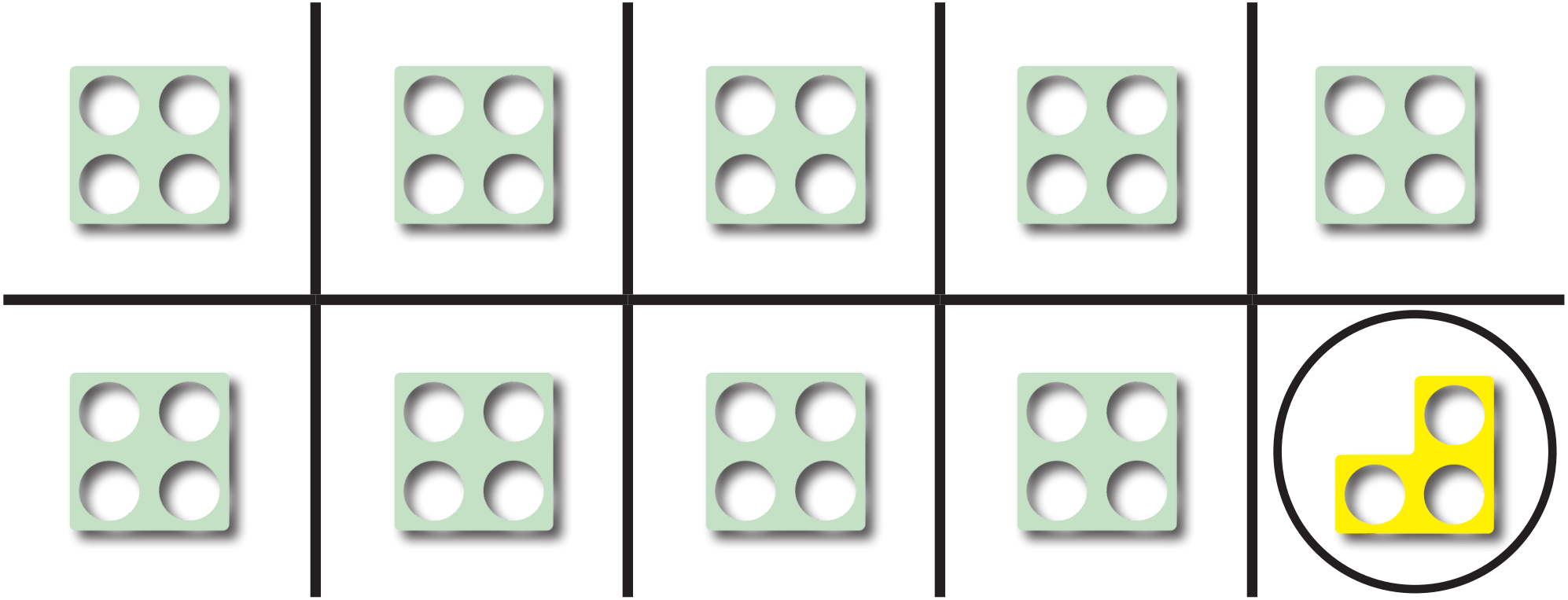
$983 \div 37 = 26 \text{ r } 21$

D13: Long Division

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

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

D6a: Grouping Grid



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

$$27 \div 4 = 6r3$$

Sense of Number
Calculation Cards

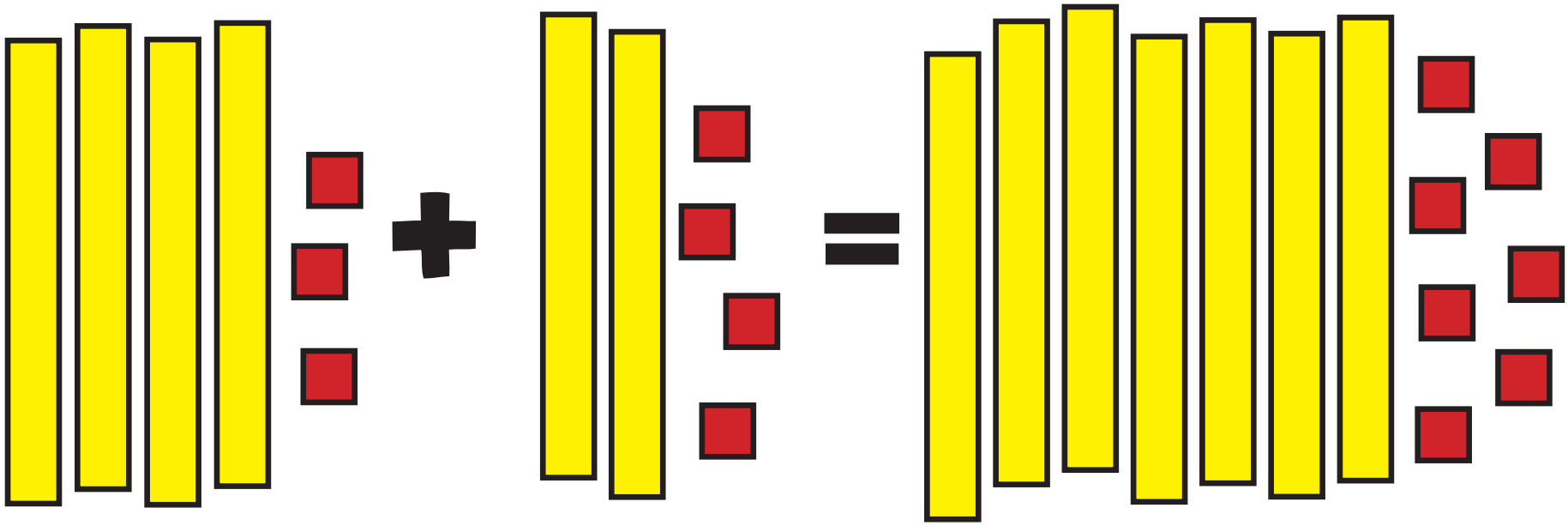
by Dave Godfrey

dave@senseofnumber.co.uk Tel: 01904 778848

The following slides show the calculation 43 + 24 using a variety of resources and manipulatives.

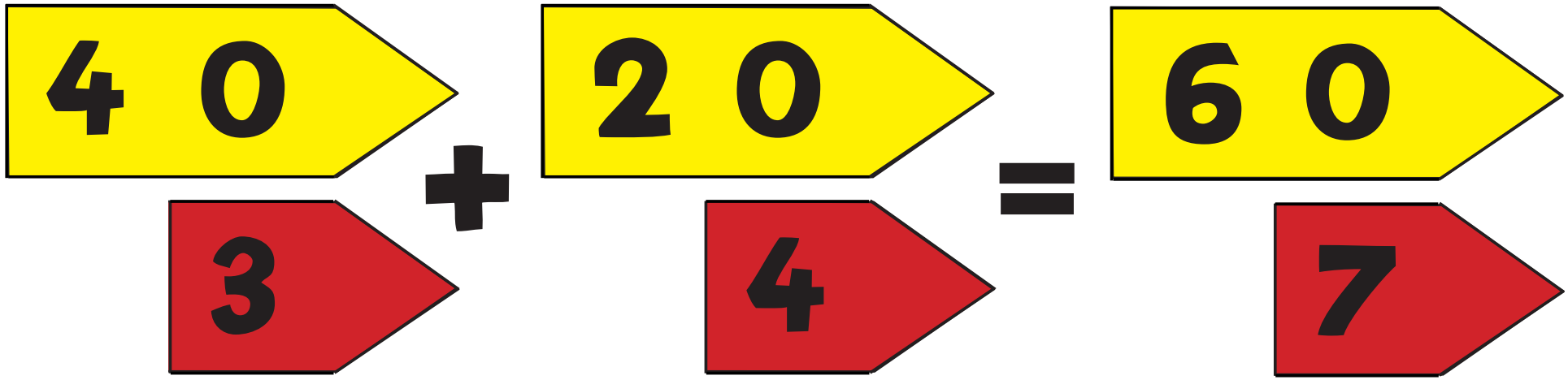
A: Base 10

43 + 24 = 67



B: Arrow Cards

43 + 24 = 67



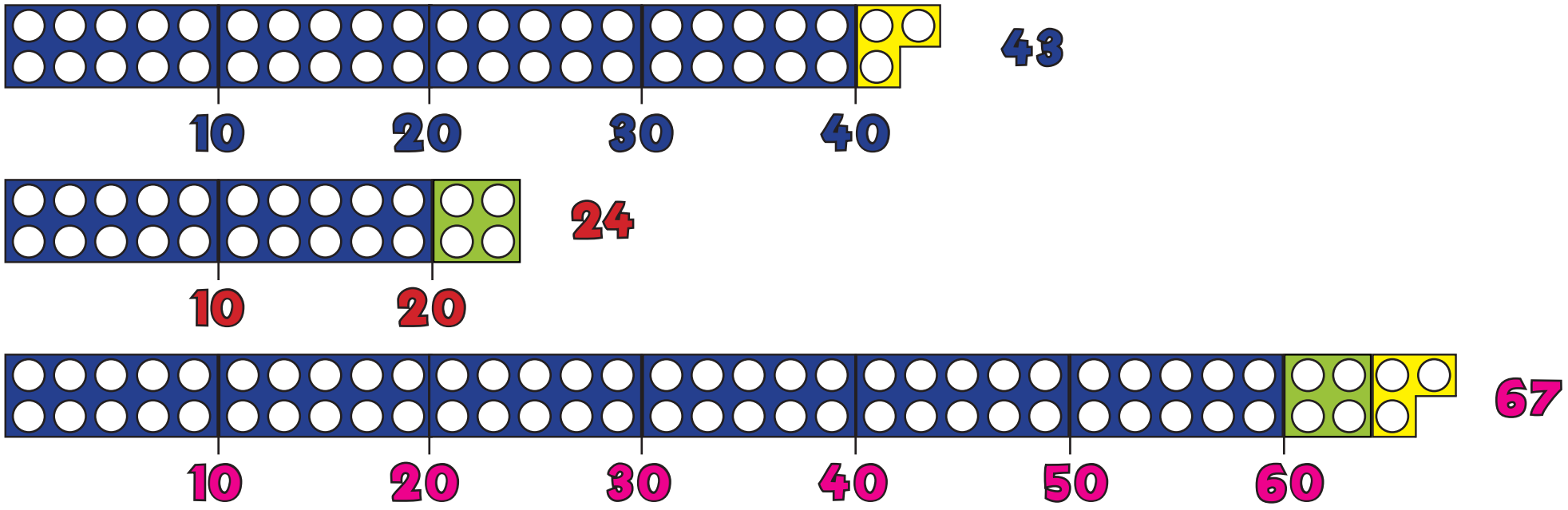
C: Hundred Square

43 + 24 = 67

41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

D: Numicon

43 + 24 = 67



E: Place Value Counters

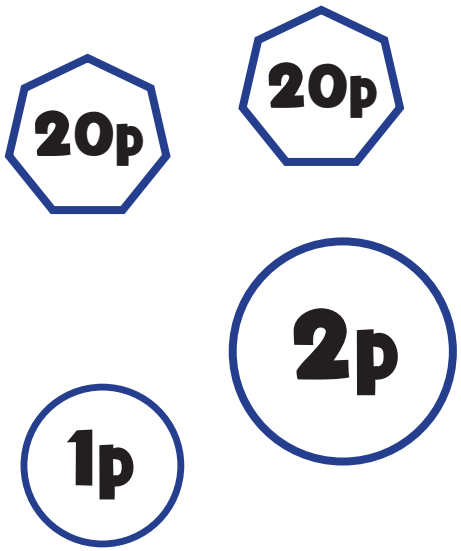
43 + 24 = 67

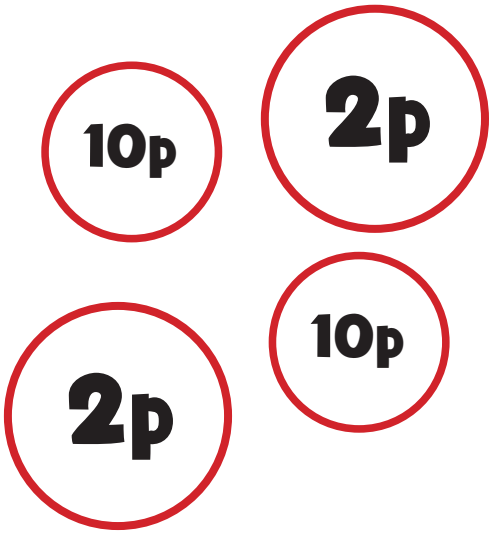
10s	1s
10 10 10 10	1 1 1
10 10	1 1 1 1
60	7

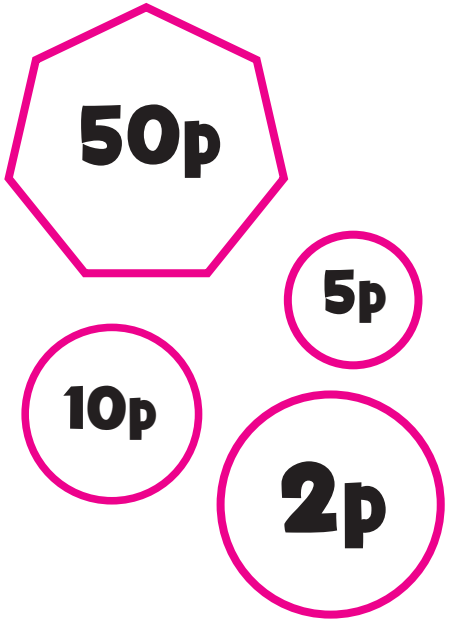
67

F: Money

43 + 24 = 67

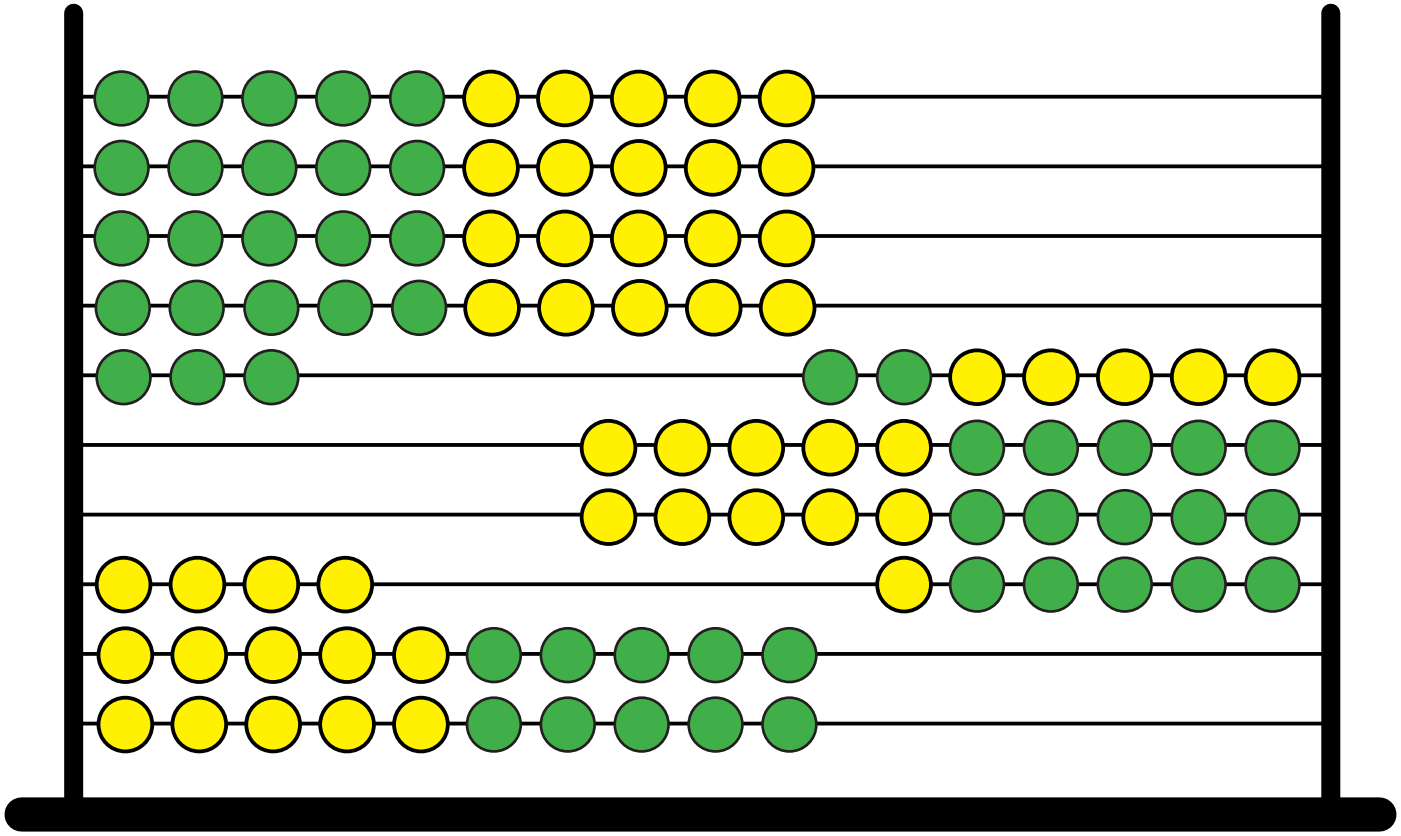






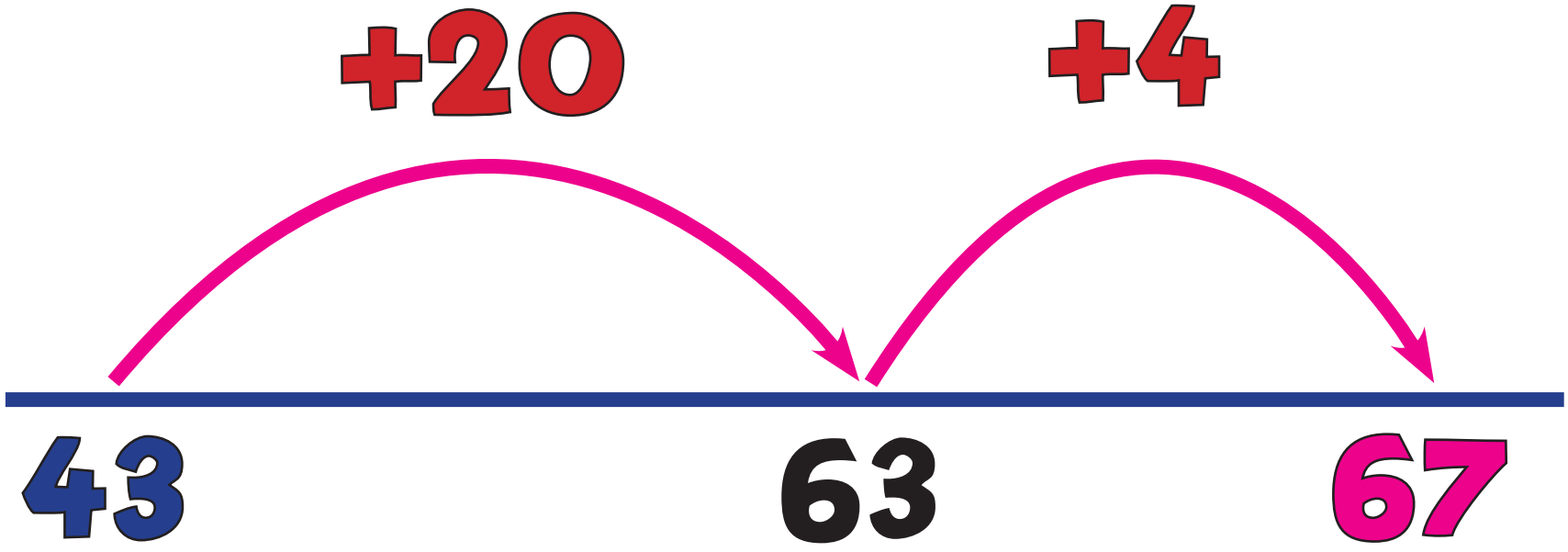
G: Abacus

43 + 24 = 67



H: Number Line

43 + 24 = 67



Mx2: Table Facts

2x table

2

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

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

Mx3: Table Facts

3x table

3

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

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

Mx4: Table Facts

4x table

4

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

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

Mx5: Table Facts

5x table

5

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

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

Mx6: Table Facts

6x table

6

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

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

Mx7: Table Facts

7x table

7

7 x 1 = **7**
7 x 2 = **14**
7 x 3 = **21**
7 x 4 = **28**
7 x 5 = **35**
7 x 6 = **42**
7 x 7 = **49**
7 x 8 = **56**
7 x 9 = **63**
7 x 10 = **70**
7 x 11 = **55**
7 x 12 = **60**

7 x 5 = 35
7 x 3 = 21
7 x 9 = 63
7 x 11 = 55
7 x 6 = 42
7 x 10 = 70
7 x 1 = 7
7 x 12 = 60
7 x 4 = 28
7 x 8 = 56
7 x 2 = 14
7 x 7 = 49

Mx8: Table Facts

8x table

8

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

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

Mx9: Table Facts

9x table

9

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

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

Mx10: Table Facts

10x table

10

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

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

Mx11: Table Facts

11x table

11

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

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

Mx12: Table Facts

12x table

12

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

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

Y1	A1: Objects & Pictures					A	Addition Calculation 4 + 2 = 6 addend addend total sum	Addition Vocabulary increase add total plus addition more count on sum altogether
1	2	3	4	5	6	7	8	9
Y1	A1a: Largest Number 1st 5 + 3 = 8	A2: Counting On +1 +1 +1 5 6 7 8 5 + 3 = 8						
10	11	12	13	14	15	16	17	18
Y1		A2a: Counting On +2 +3 +1 +1 +1 +1 +1 8 9 10 11 12 13 8 + 5 = 13						
19	20	21	22	23	24	25	26	27
Y2		A2b: Counting On +3 +3 +1 +1 +1 +1 +1 +1 57 58 59 60 61 62 63 57 + 6 = 63						
28	29	30	31	32	33	34	35	36
Y2		A3: Forwards Jump 43 + 24 = 67 +20 +4 +10 +10 +1 +1 +1 +1 43 53 63 64 65 66 67	A4: Partitioning 43 + 24 = 67 40 + 20 = 60 3 + 4 = 7 67	A5: Partition Jot 43 + 24 = 67 60 + 7	(A6: Expanded Column) 43 + 24 7 60 67	(A7: Column Addition) T U 43 + 24 67		
37	38	39	40	41	42	43	44	45
Y2		A3a: Forwards Jump 57 + 25 = 82 +20 +5 57 77 82	A4a: Partitioning 57 + 25 = 82 50 + 20 = 70 7 + 5 = 12 82	A5a: Partition Jot 57 + 25 = 82 70 + 12	(A6: Expanded Column) 57 + 25 12 70 82	(A7: Column Addition) T U 57 + 25 82 1		

Y2/3		**A3b: Forwards Jump** 86 + 48 = 134 +40 +8 86 126 134	**A4b: Partitioning** 86 + 48 = 134 80 + 40 = 120 6 + 8 = 14 134	**A5b: Partition Jot** 86 + 48 = 134 120 + 14	**(A6: Expanded Column)** H T U 86 + 48 14 120 134	**(A7: Column Addition)** H T U 86 + 48 134 1 1		
55	56	57	58	59	60	61	62	63
Y3		**A3c: Forwards Jump** 687 + 248 = 935 +200 +40 +8 687 887 927 935	**A4c: Partitioning** 687 + 248 = 935 600 + 200 = 800 80 + 40 = 120 7 + 8 = 15 935	**A5c: Partition Jot** 687 + 248 = 935 800 + 120 + 15	**A6: Expanded Column** H T U 687 + 248 15 120 800 935	**A7: Column Addition** H T U 687 + 248 935 1 1		
64	65	66	67	68	69	70	71	72
Y4				**A5d: Partition Jot** 4873 + 3762 = 8635 7000 + 1500 + 130 + 5		**A7d: Column Addition** Th H T U 4873 + 3762 8635 1 1		
73	74	75	76	77	78	79	80	81
Y5						**A7e: Column Addition** M HTh TTh Th H T U 787567 + 446278 1233845 1 1 1 1 1		
82	83	84	85	86	87	88	89	90
Y5		**A3f: Decimal Jump** 4.8 + 3.8 = 8.6 +3 +0.8 4.8 7.8 8.6	**A4f: Partitioning** 4.8 + 3.8 = 8.6 4 + 3 = 7 0.8 + 0.8 = 1.6 8.6	**A5f: Partition Jot** 4.8 + 3.8 = 8.6 7 + 1.6		**A7f: Column Addition** U . 4.8 + 3.8 8.6 1		
91	92	93	94	95	96	97	98	99
Y5		**A3g: Decimal Jump** 5.65 + 3.29 = 8.94 +3 +0.2 +0.09 5.65 8.65 8.85 8.94		**A5g: Partition Jot** 5.65 + 3.29 = 8.94 8 + 0.8 + 0.14		**A7g: Column Addition** U . . 5.65 + 3.29 8.94 1		

Y5				A5h: Partition Jot 76.7 + 58.5 = 135.2 120 + 14 + 1.2		A7h: Column Addition 76.7 + 58.5 135.2		
109	110	111	112	113	114	115	116	117
Y5				A5i: Partition Jot £38.25 + £27.46 = £65.71 £65.00 + £0.71		A7i: Column Addition £38.25 + £27.46 £65.71		
118	119	120	121	122	123	124	125	126
Y5						A7j: Column Addition 78.4 + 5.67 = 79.07 78.4 + 5.67 79.07		

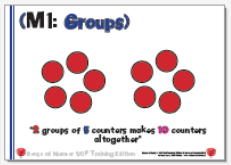
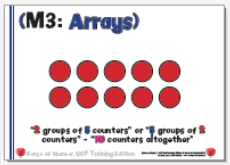
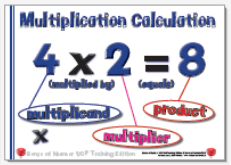
MA	MA1: Partitioning 45 + 82 = 127 120 + 7 = 127	MA2: Counting On 45 + 20 = 68 +20		MA3: Number Bonds 45 + 95 = 140 40 + 100 = 140	MA4: Double & Adjust 45 + 46 = 91 45 + 45 + 1 90 + 1 = 91	MA5: Round & Adjust 45 + 39 = 84 45 + 40 - 1 85 - 1 = 84		
1	2	3	4	5	6	7	8	9
Y1		MA2a: Counting On 12 + 5 = 17 +5	MA2b: Counting On 57 + 10 = 67 +10	MA3: Number Bonds	MA4: Double & Adjust 5 + 6 = 11 5 + 5 + 1 10 + 1 = 11	MA5: Round & Adjust 45 + 9 = 54 45 + 10 - 1 55 - 1 = 54		
10	11	12	13	14	15	16	17	18
Y2	MA1: Partitioning 43 + 21 = 64 60 + 4 = 64	MA2a: Counting On 78 + 7 = 85 +7	MA2b: Counting On 58 + 40 = 98 +40	MA3: Number Bonds 3 + 4 + 7 = 14 10 4	MA4: Double & Adjust 7 + 8 = 15 7 + 7 + 1 14 + 1 = 15	MA5: Round & Adjust 45 + 19 = 64 45 + 20 - 1 65 - 1 = 64		
19	20	21	22	23	24	25	26	27
Y3	MA1: Partitioning 57 + 25 = 82 70 + 12 = 82	MA2a: Counting On 85 + 50 = 135 +50	MA2b: Counting On 534 + 300 = 834 +300	MA3: Number Bonds 43 + 9 + 7 + 21 = 80 50 30	MA4: Double & Adjust 16 + 17 = 33 16 + 16 + 1 32 + 1 = 33	MA5: Round & Adjust 45 + 97 = 142 45 + 100 - 3 145 - 3 = 142		

Y4	MA1: Partitioning 648 + 231 = 879 800 + 70 + 9 = 879	MA2a: Counting On 784 + 60 = 844 +60 784 844	MA2b: Counting On 4837 + 3000 = 834 +3000 4837 7837	MA3: Number Bonds 42 + 16 + 28 + 54 = 140 70 70	MA4: Double & Adjust 37 + 38 = 75 37 + 37 + 1 74 + 1 = 75	MA5: Round & Adjust 345 + 298 = 643 345 + 300 - 2 645 - 2 = 643		
37	38	39	40	41	42	43	44	45
Y5	MA1: Partitioning 576 + 258 = 834 700 + 120 + 14 = 834	MA2a: Counting On 837 + 500 = 1337 +500 837 1337	MA2b: Counting On 7583 + 5000 = 12583 +5000 7583 12583	MA3: Number Bonds £4.56 + £3.27 + £1.44 = £9.27 £6.00 £3.27	MA4: Double & Adjust 125 + 127 = 251 125 + 125 + 2 250 + 2 = 252	MA5: Round & Adjust 4645 + 1996 = 6641 4645 + 2000 - 4 6645 - 4 = 6641		
46	47	48	49	50	51	52	53	54
Y6	MA1: Partitioning 4.73 + 2.21 = 6.94 6 + 0.9 + 0.44 = 6.94	MA2a: Counting On 43,826 + 30,000 = 73,826 +30,000 43,826 73,826	MA2b: Counting On 5,763,947 + 4,000,000 = 9,763,947 +4,000,000 5,763,947 9,763,947	MA3: Number Bonds 24.25 + 31.63 + 21.75 = 77.63 46 31.63	MA4: Double & Adjust 4.5 + 4.7 = 9.2 4.5 + 4.5 + 0.2 9 + 0.2 = 9.2	MA5: Round & Adjust 45.2 + 49.9 = 95.1 45.2 + 50 - 0.1 95.2 - 0.1 = 95.1		

Y1	S1: Objects 7 - 3 = 4					S	Subtraction Calculation 6 - 2 = 4 minuend subtrahend difference	Subtraction Vocabulary count back, decrease, minus, less, subtract, fewer, count on, take away, difference between
1	2	3	4	5	6	7	8	9
Y1		S2: What's the Difference? 7 - 5 = 2	S3: Counting Back 9 10 11 12 -1 -1 -1 12 - 3 = 9	S4: Counting On +1 +1 +1 9 10 11 12 12 - 9 = 3				
10	11	12	13	14	15	16	17	18
Y2			S5: Backwards Boing 68 70 75 -2 -5 75 - 7 = 68	S4a: Counting On +1 +1 +1 +1 +1 78 79 80 81 82 83 83 - 78 = 5				
19	20	21	22	23	24	25	26	27
Y2			S6: Backwards Bounce 64 65 66 67 77 87 -1 -1 -1 -10 -10 87 - 23 = 64	(S8: Triple Jump!) +7 +50 +7 23 30 80 87 87 - 23 = 64	(S9: 10s Jump, 1s Jump!) +60 +4 23 83 87 87 - 23 = 64	(S10: Expanded Column) 87 - 23 = 64 80 7 20 3 60 4	(S11: Column Subtraction) T U 87 - 23 64	
28	29	30	31	32	33	34	35	36
Y2			S7: Backwards Jump 38 45 75 -7 -30 75 - 37 = 38	S8: Triple Jump! +3 +30 +5 37 40 70 75 75 - 37 = 38	S9: 10s Jump, 1s Jump! +30 +8 37 67 75 75 - 37 = 38	(S10: Expanded Column) 75 - 37 = 38 60 70 15 30 7 30 8	(S11: Column Subtraction) T U 6 7 15 - 3 7 38	
37	38	39	40	41	42	43	44	45
Y3				S8b: Quad Jump! +4 +40 +80 +2 56 60 100 130 132 132 - 56 = 76	S9b: 10s Jump, 1s Jump! +70 +6 56 126 132 132 - 56 = 76	(S10: Expanded Column) 132 - 56 = 76 100 120 12 - 50 6 70 6	(S11: Column Subtraction) H T U 0 12 12 1 3 2 - 5 6 7 6	

Y3				S8c: Big Jump!	S9c: 100s, 10s, 1s Jump	S10: Expanded Column	S11: Column Subtraction		
55	56	57	58	59	60	61	62	63	
Y4				S8d: Quad Jump Extreme	S9d: 1000s, 100s, 10s, 1s Jump		S11d: Column Subtraction		
64	65	66	67	68	69	70	71	72	
Y5							S11e: Column Subtraction		
73	74	75	76	77	78	79	80	81	
Y5				S8f: Decimal T-J!	S9f: 1s Jump, Tenths Jump!		S11f: Column Subtraction		
82	83	84	85	86	87	88	89	90	
Y5							S11g: Column Subtraction		
91	92	93	94	95	96	97	98	99	
Y5							S11g: Column Subtraction		

Y5							S11h: Column Subtraction 12.4 - 5.97 = 6.43 12.40 - 5.97 6.43	
109	110	111	112	113	114	115	116	117
MS	MS1: Counting Back 46 - 21 = 25 -20 -1 46 26 25	MS2: Counting On 75 - 47 = 28 +20 +8 47 67 75	MS3: Round & Adjust 84 - 29 = 55 84 - 30 + 1 54 + 1 = 55					
118	119	120	121	122	123	124	125	126
		MS2a: Counting On 75 - 47 = 28 +3 +25 47 50 75						

Y1						**M**		
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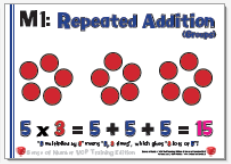
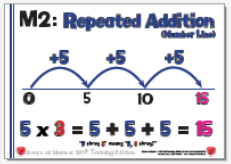
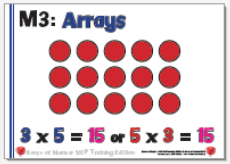
Y2								
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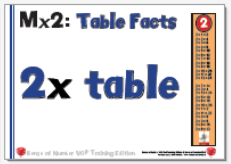
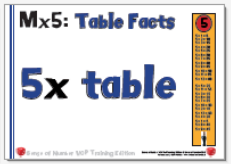
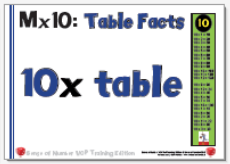
Y2								
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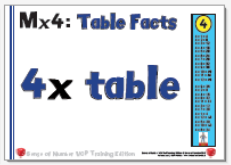
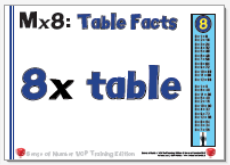
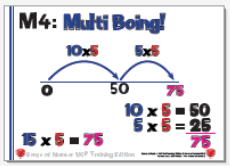
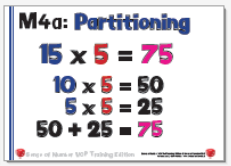
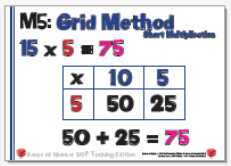
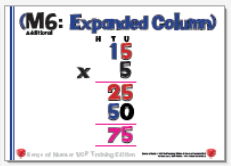
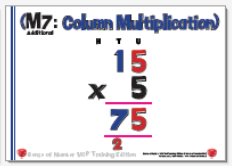
Y3								
28	29	30	31	32	33	34	35	36
Y3								
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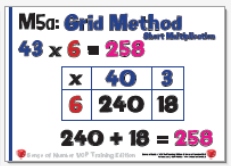
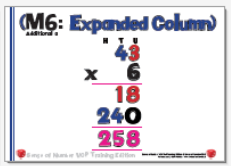
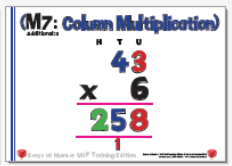
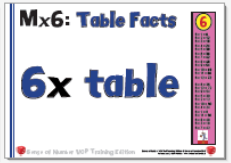
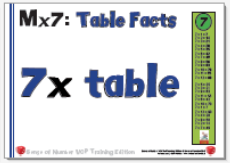
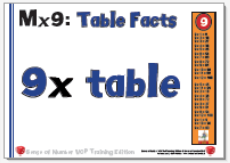
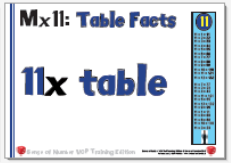
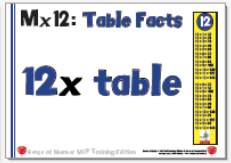
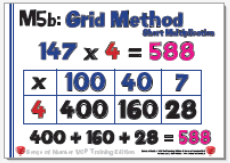
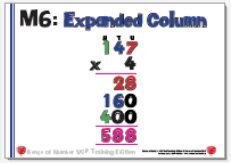
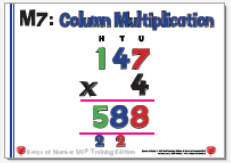
Y4								

Y4								
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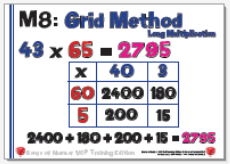
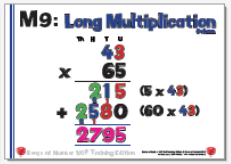
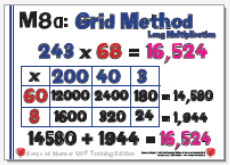
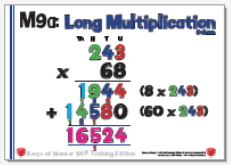
Y5								
64	65	66	67	68	69	70	71	72
Y5								
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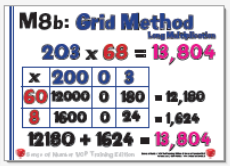
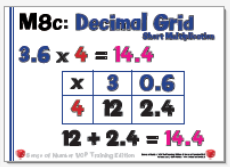
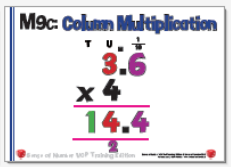
Y5								
82	83	84	85	86	87	88	89	90
Y5								
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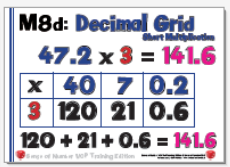
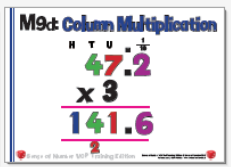
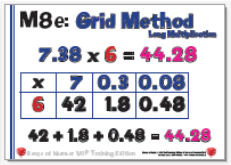
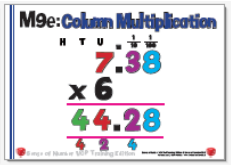
Y6								

Y6								
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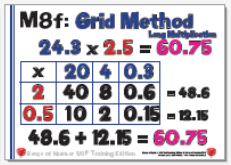
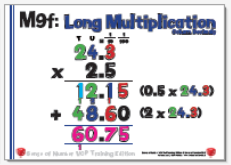
Y6								
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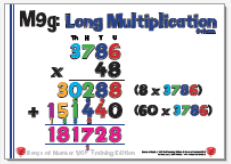
Y6								
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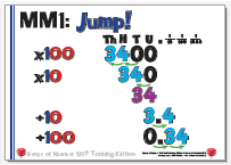
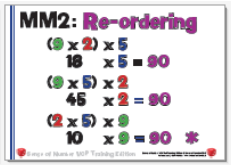
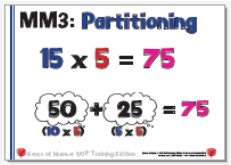
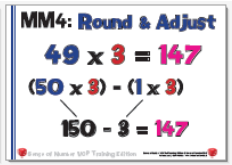
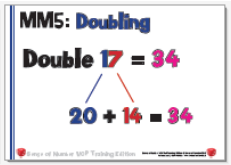
MM











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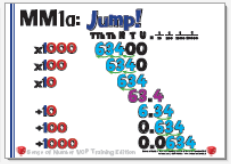

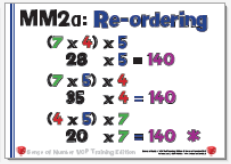

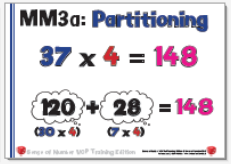

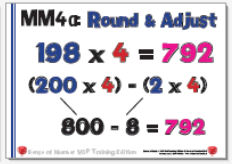

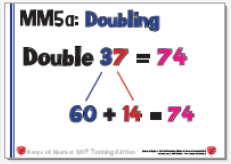

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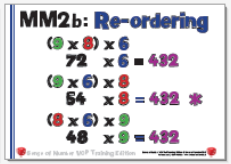
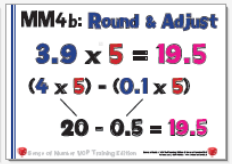
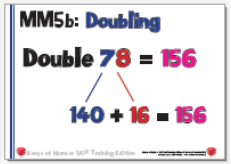
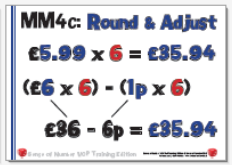
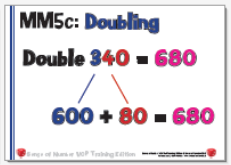






19 20 21 22 23 24 25 26 27





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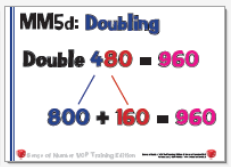

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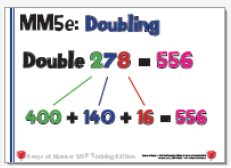

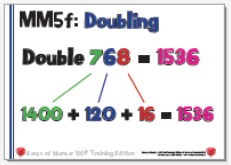

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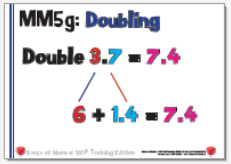

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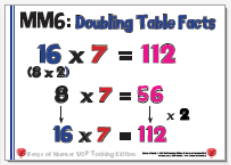

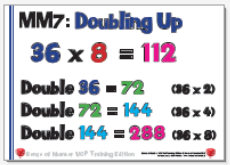

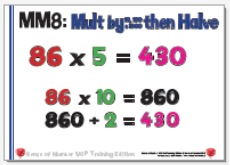

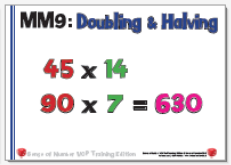

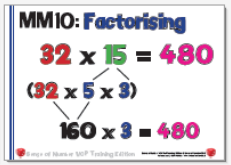

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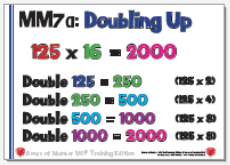

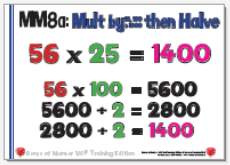

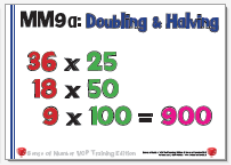

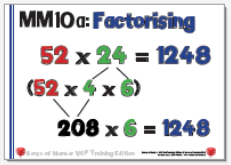

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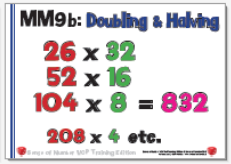
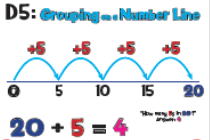
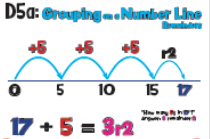
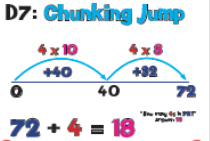
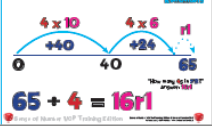
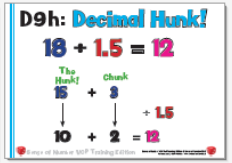
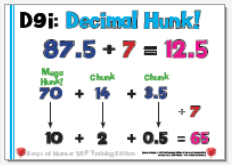
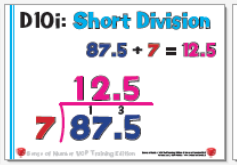
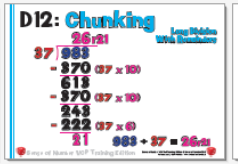
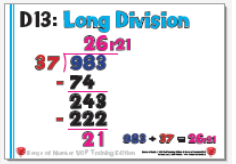
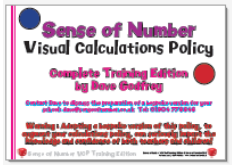
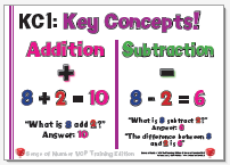


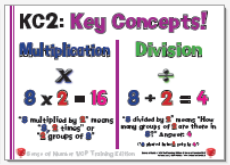
Y1	**D1: Sharing** (Concept)  "If I share 6 into 2 equal amounts, how many in each group?" Answer: 3	**D2: Grouping** (Concept)  "How many groups of 2 can I make out of 6?" Answer: 3				**D**	**Division Calculation** 8 ÷ 2 = 4 (dividend) (divisor) (equals) dividend, divisor, quotient	**Division Vocabulary** remainder, group, share, divisor, halve, factor, quotient, equal groups of, divide
1	2	3	4	5	6	7	8	9
Y2	**D3: Division as Sharing** 12 ÷ 2 = 6 	**D4: Division as Grouping** 12 ÷ 2 = 6 	**D5: Grouping on a Number Line**  20 ÷ 5 = 4					
10	11	12	13	14	15	16	17	18
Y2			**D5a: Grouping on a Number Line** (Remainders)  17 ÷ 5 = 3r2					
19	20	21	22	23	24	25	26	27
Y3		**D6: Grouping Grid**  27 ÷ 4 = 6r3						
28	29	30	31	32	33	34	35	36
Y3			**D7: Chunking Jump**  72 ÷ 4 = 18	**D8: Find the Hunk!** 72 ÷ 4 = 18 The Hunk! 40 + Chunk 32 ÷ 4 10 + 8 = 18	**(D10: Short Division)** 72 ÷ 4 = 18 18 4) 7 2	**(D11: Chunking)** 18 4) 72 - 40 (4 x 10) 32 - 32 (4 x 8) 0 72 ÷ 4 = 18		
37	38	39	40	41	42	43	44	45
Y3			**D7a: Chunking Jump** (Remainders)  65 ÷ 4 = 16r1	**D8a: Find the Hunk!** (Remainders) 65 ÷ 4 = 16r1 The Hunk! 40 + Chunk 25 ÷ 4 10 + 6r1 = 16r1	**(D10: Short Division)** 65 ÷ 4 = 16r1 16r1 4) 6 5	**(D11: Chunking)** 16r1 4) 65 - 40 (4 x 10) 25 - 24 (4 x 6) 1 65 ÷ 4 = 16r1		

Y4				D9: Mega Hunk! 136 ÷ 4 = 34	D10: Short Division 136 ÷ 4 = 34	D11: Chunking	D11b: Chunking		
55	56	57	58	59	60	61	62	63	
Y5				D9c: Mega Hunk! 394 ÷ 6 = 65r4	D10c: Short Division 394 ÷ 6 = 65r4	D11c: Chunking			
64	65	66	67	68	69	70	71	72	
Y5				D9d: Mega Hunk! 591 ÷ 3 = 197	D10d: Short Division 591 ÷ 3 = 197	D11d: Chunking			
73	74	75	76	77	78	79	80	81	
Y5				D9e: Mega Hunk! 5978 ÷ 7 = 854	D10e: Short Division 5978 ÷ 7 = 854	D11e: Chunking			
82	83	84	85	86	87	88	89	90	
Y5				D9f: Mega Hunk! 846 ÷ 5 = 169r1	D10f: Short Division 169.2 / 169r1 / 169 1/5	D11f: Chunking			
91	92	93	94	95	96	97	98	99	
Y6				D9g: Mega Hunk! 480 ÷ 15 = 32		D11g1: Chunking	D11g2: Chunking		

Y6								
109	110	111	112	113	114	115	116	117	
Y6									
118	119	120	121	122	123	124	125	126	
Y6									







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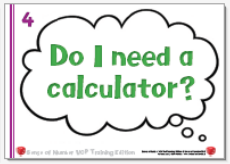

5 6 7 8 9 10 11 12 13 14 15 16 17 18

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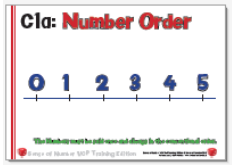

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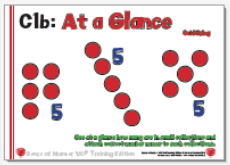

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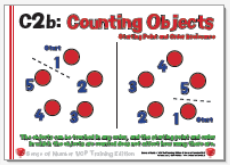

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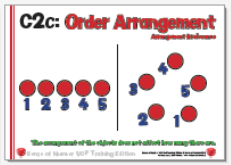

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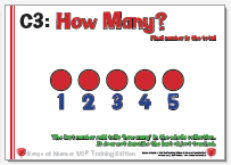

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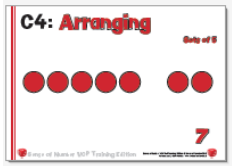

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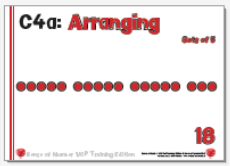

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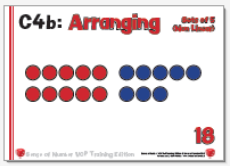

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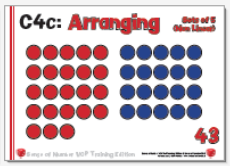

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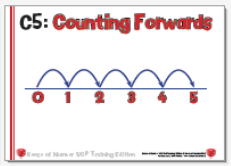

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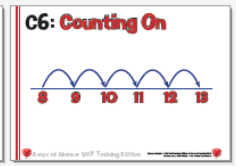

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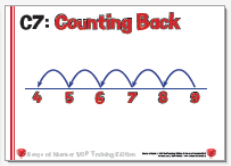

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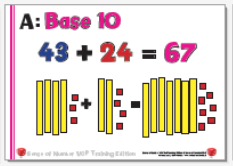

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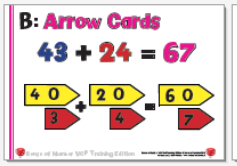

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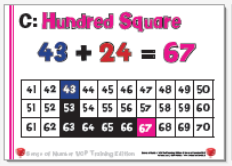

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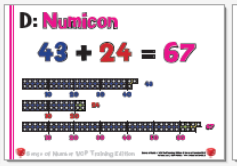

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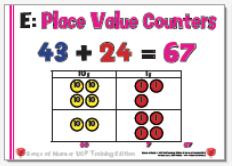

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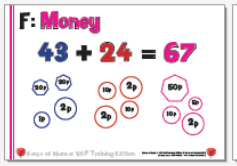

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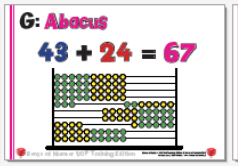

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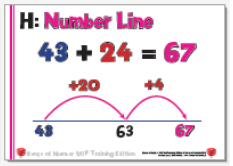

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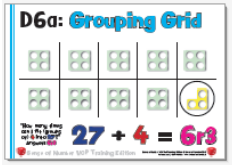

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