

Sense of Number Visual Calculations Policy

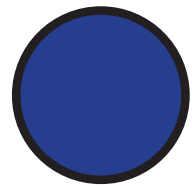
Full Training Edition for
Newchurch Community Primary School
July 2014

by Dave Godfrey, Anthony Reddy
& Laurence Hicks

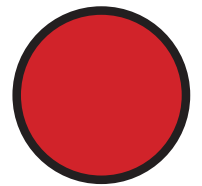
For sole use within Newchurch Community Primary School.

'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.

A bespoke VCP is created by Dave Godfrey when a school chooses the slides, including any alterations/additions, they require. The school logo and school name are added, and the sample edition watermarks are removed.

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

x

$$8 \times 2 = 16$$

“8 multiplied by 2” means
“8, 2 times” or
“2 groups of 8”

Division

÷

$$8 \div 2 = 4$$

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

(“8 shared into 2 sets is 4”)

MA1: Partitioning

$$45 + 82 = 127$$

$$120 + 7 = 127$$

In my head?

Formal method?

A7d: Column Addition

Th	H	T	U
4	8	7	3
+	3	7	6
<hr/>			
8	6	3	5
<hr/>			
1	1		

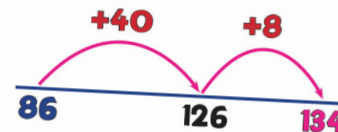
Need a calculator?



Need a Jotting?

A3b: Forwards Jump

$$86 + 48 = 134$$



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?**

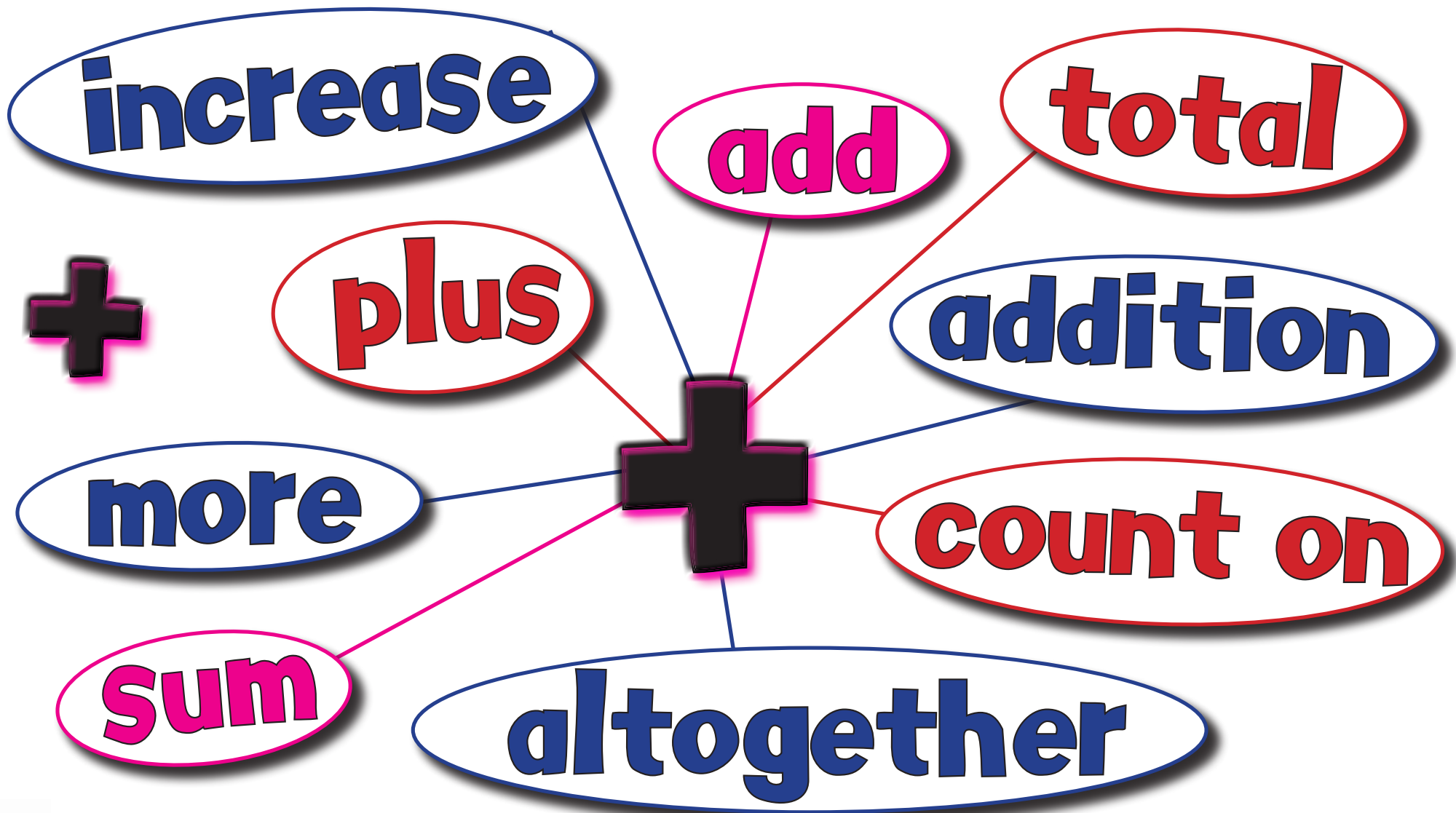
4

Do I need a
calculator?

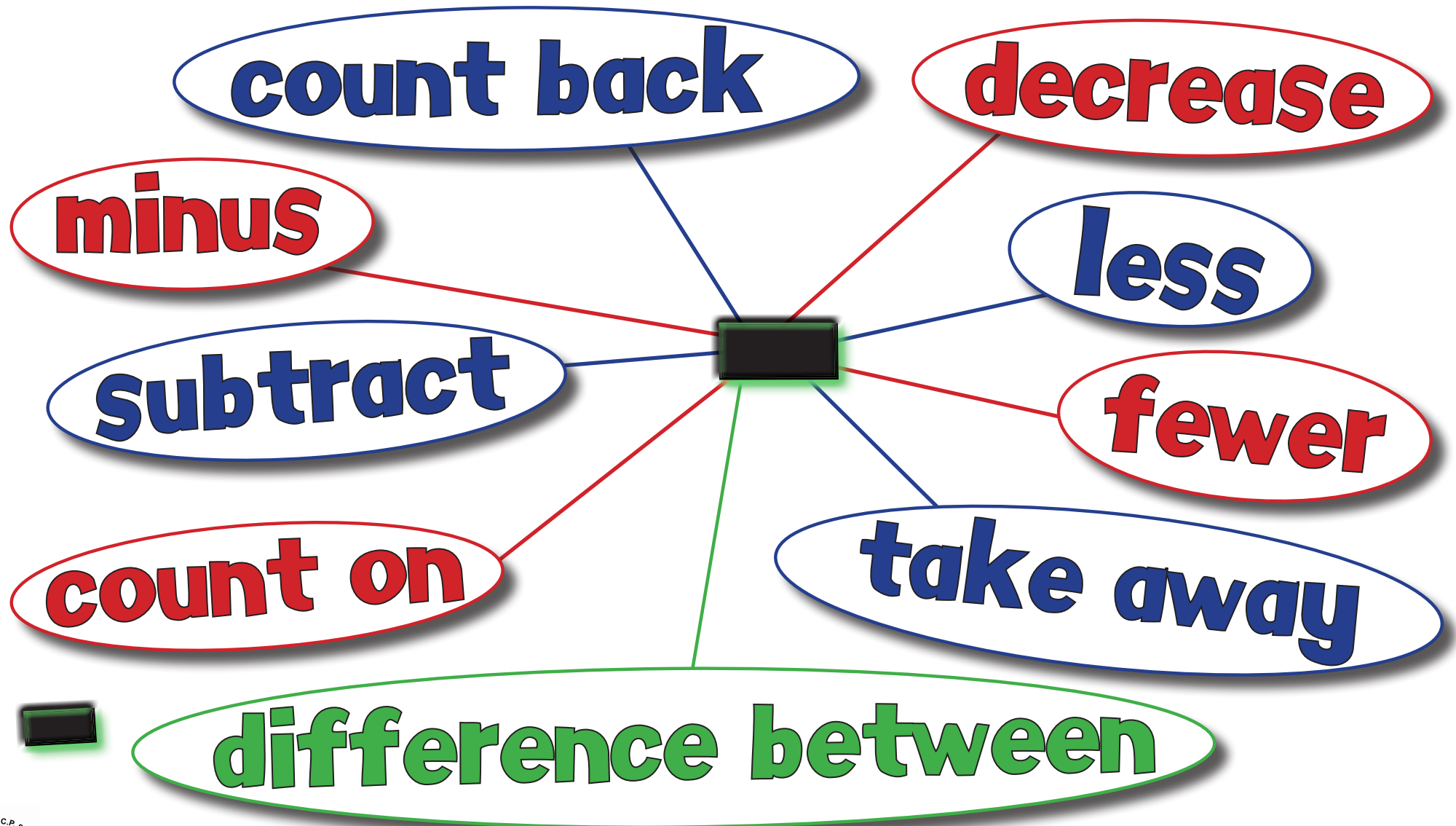
Calculation Vocabulary



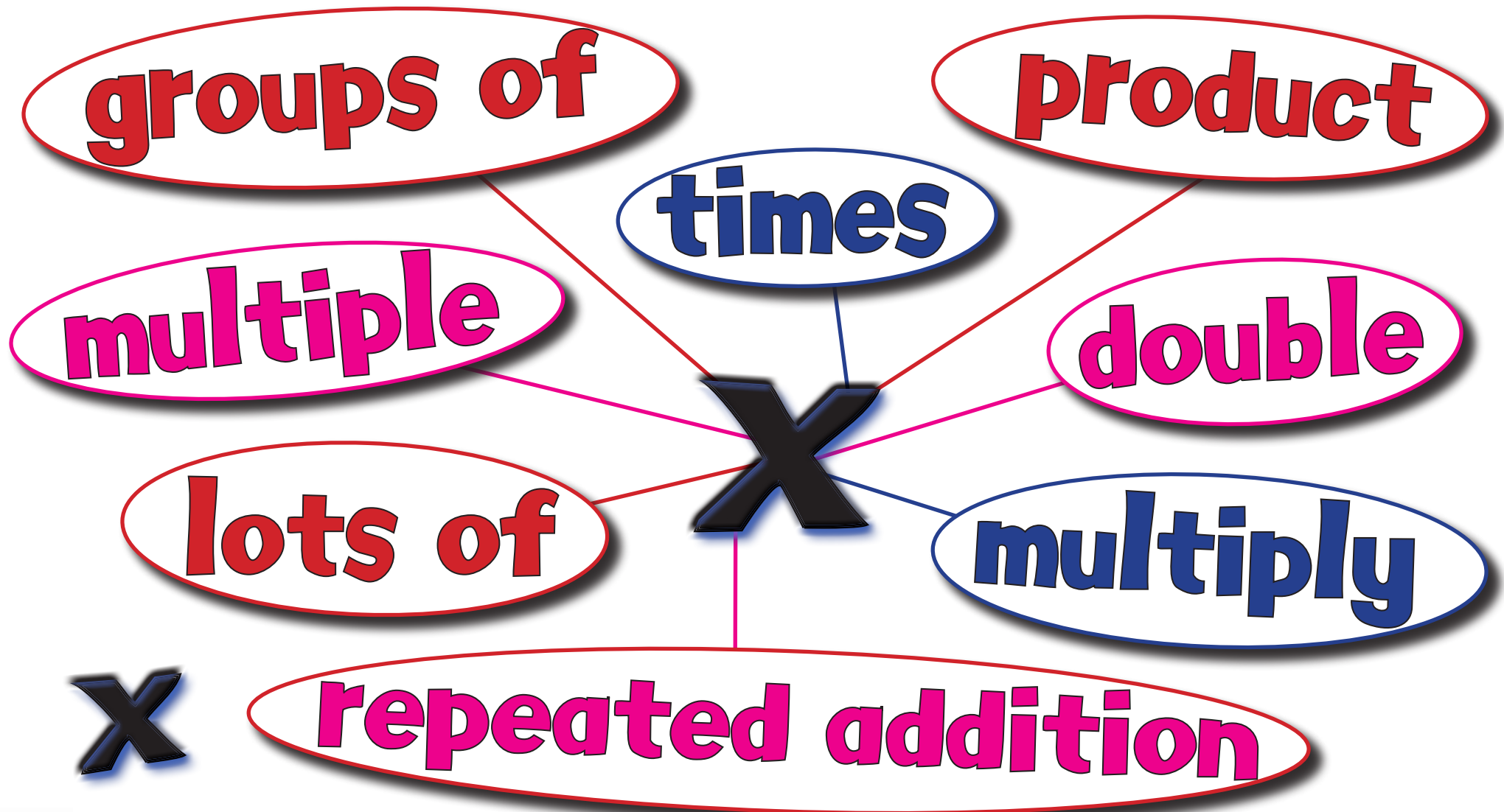
Addition Vocabulary



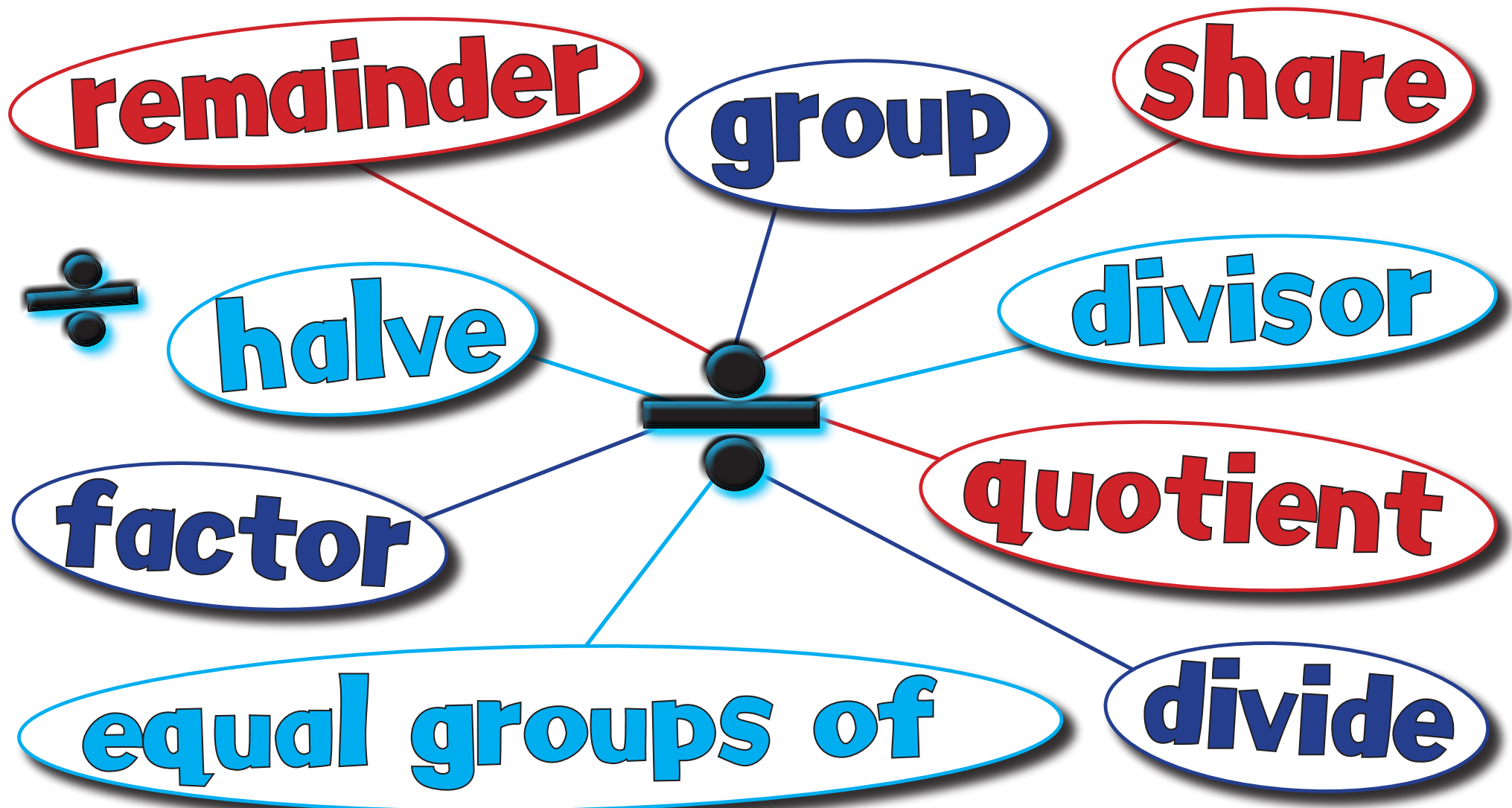
Subtraction Vocabulary



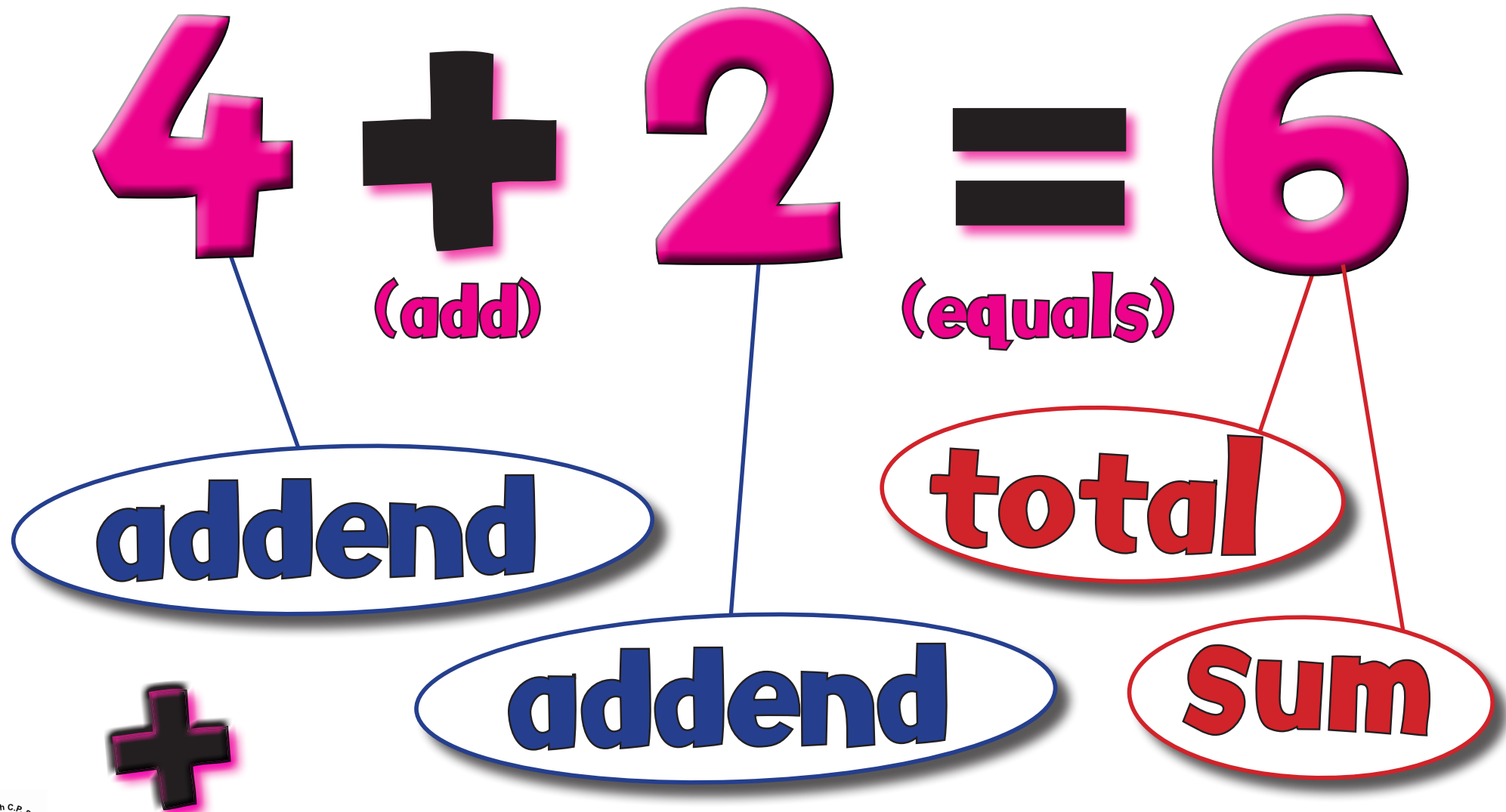
Multiplication Vocabulary



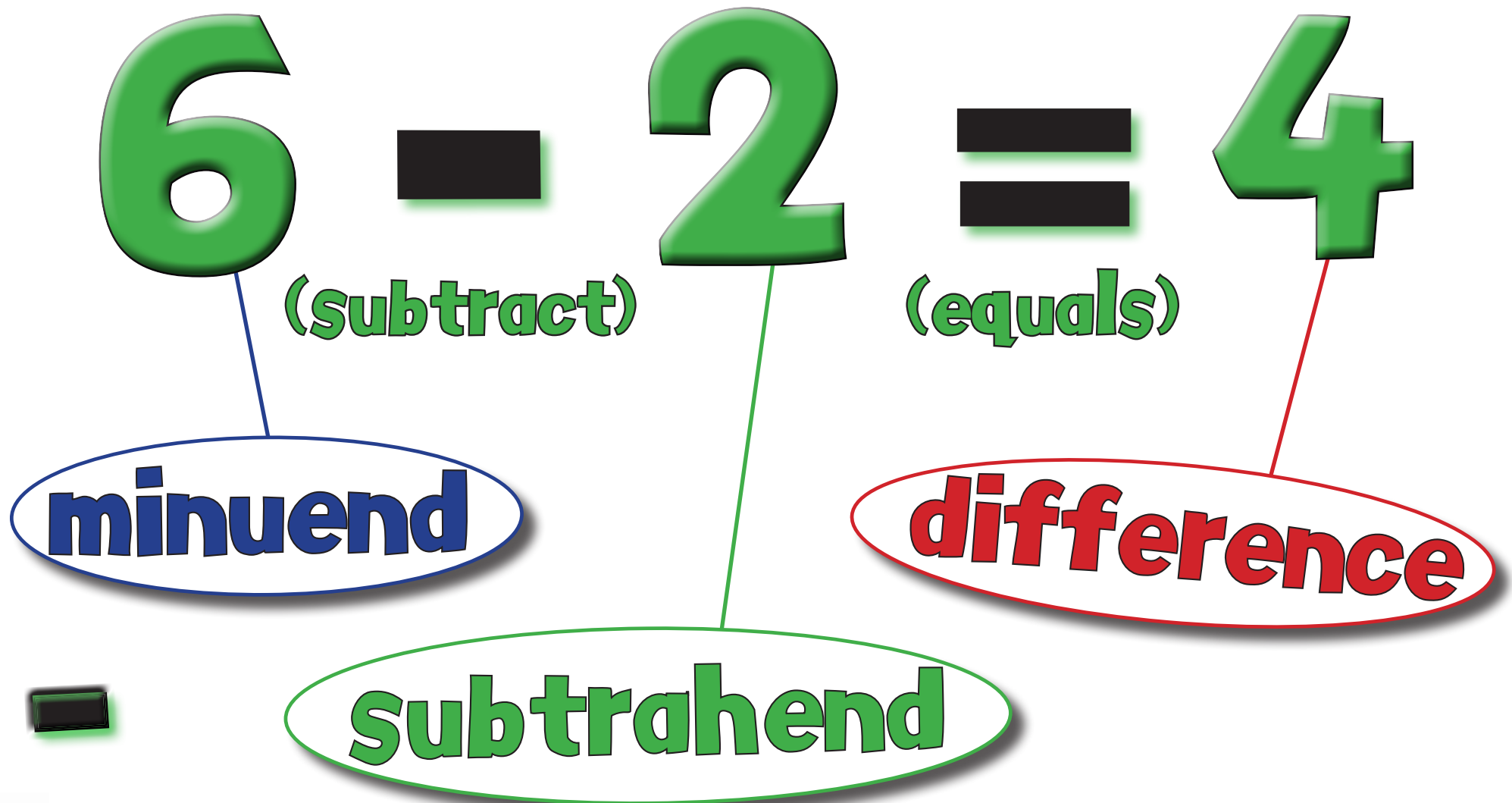
Division Vocabulary



Addition Calculation



Subtraction Calculation



Multiplication Calculation

$$4 \times 2 = 8$$

(multiplied by)

(equals)

multiplicand

product

multiplier

X

Division Calculation

$$8 \div 2 = 4$$

(divided by)

(equals)

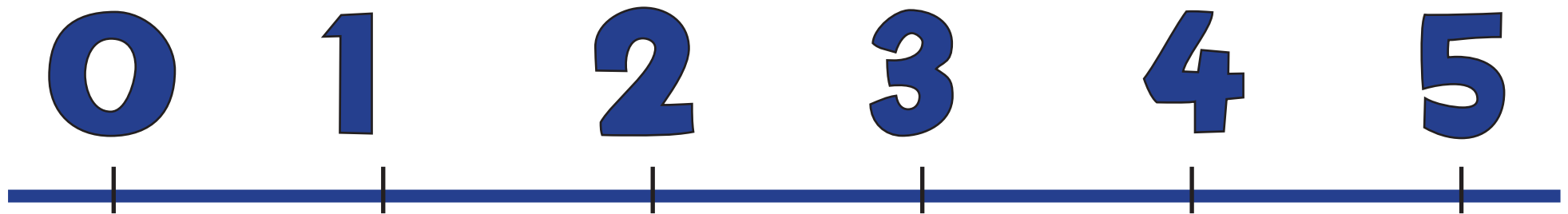
dividend

quotient

divisor



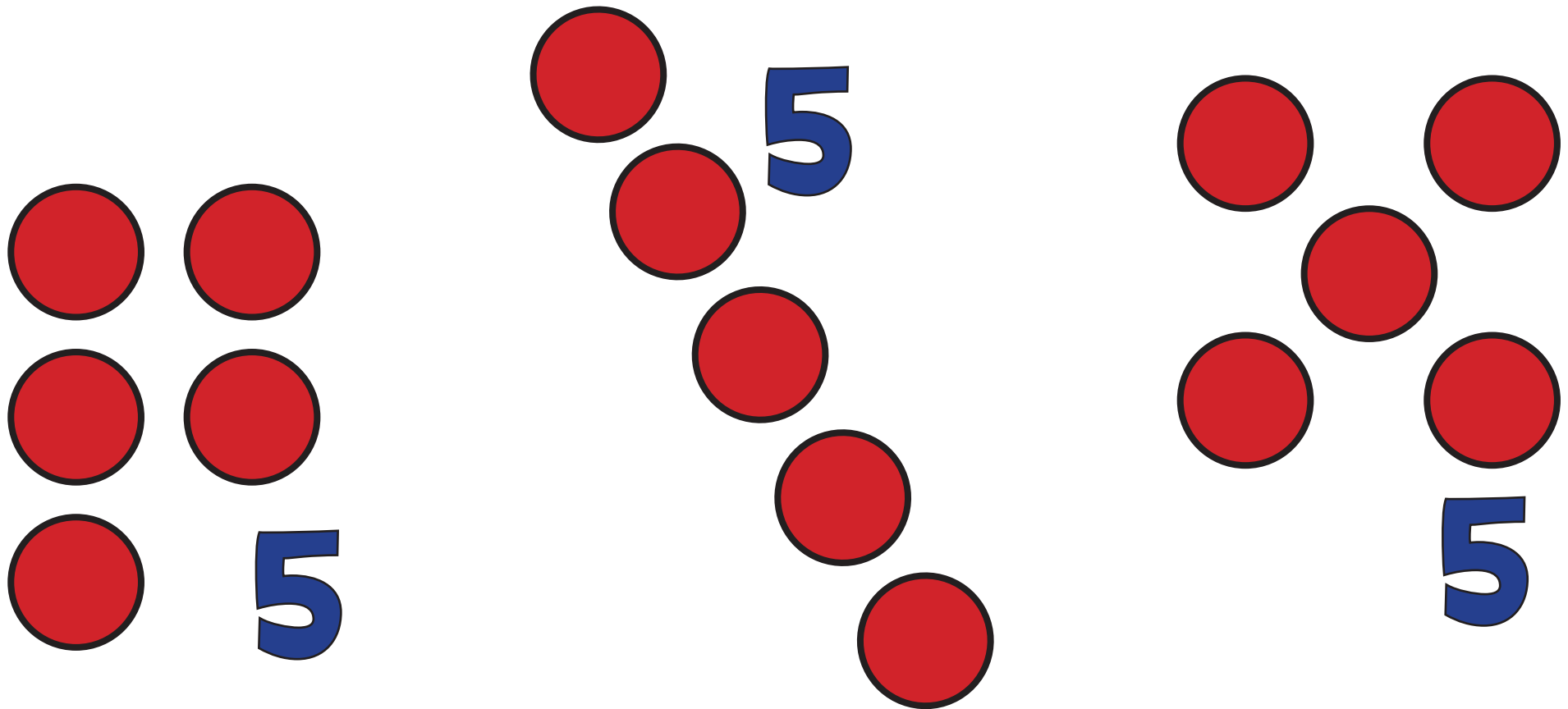
C1a: Number Order



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

C1b: At a Glance

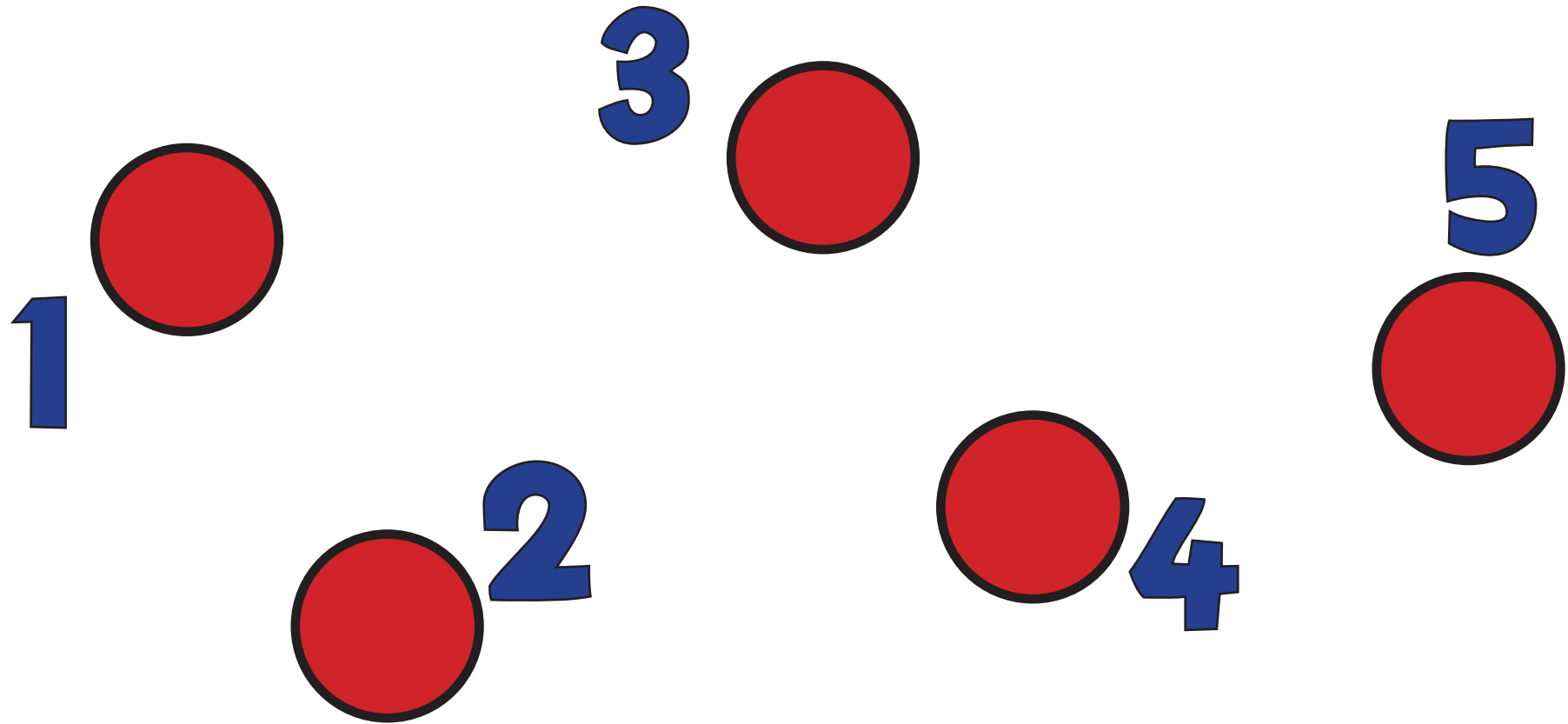
Subitising



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

C2a: Number Match

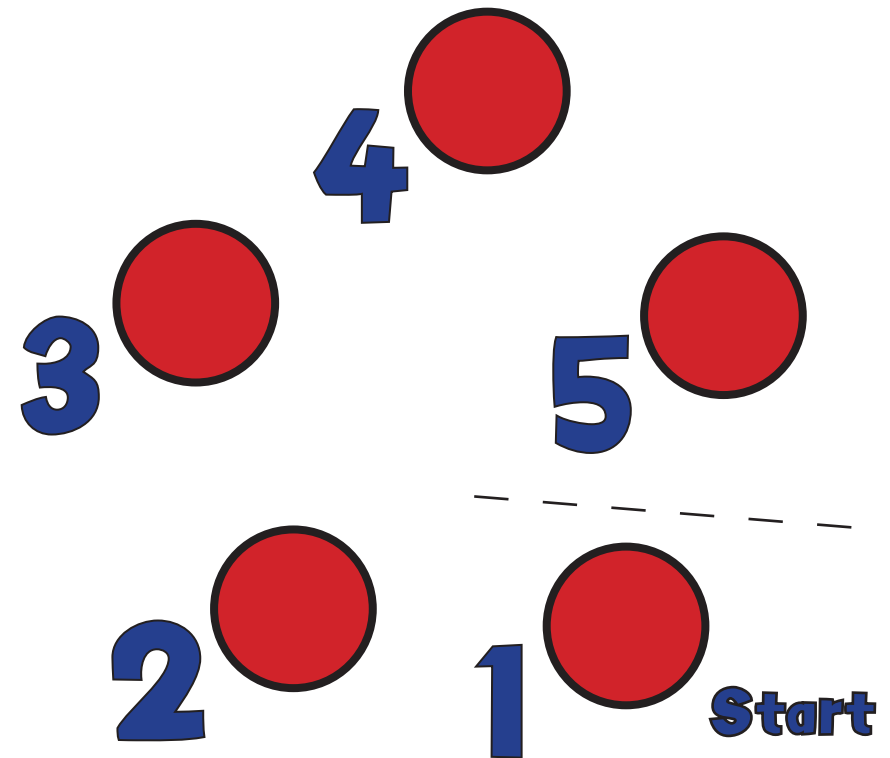
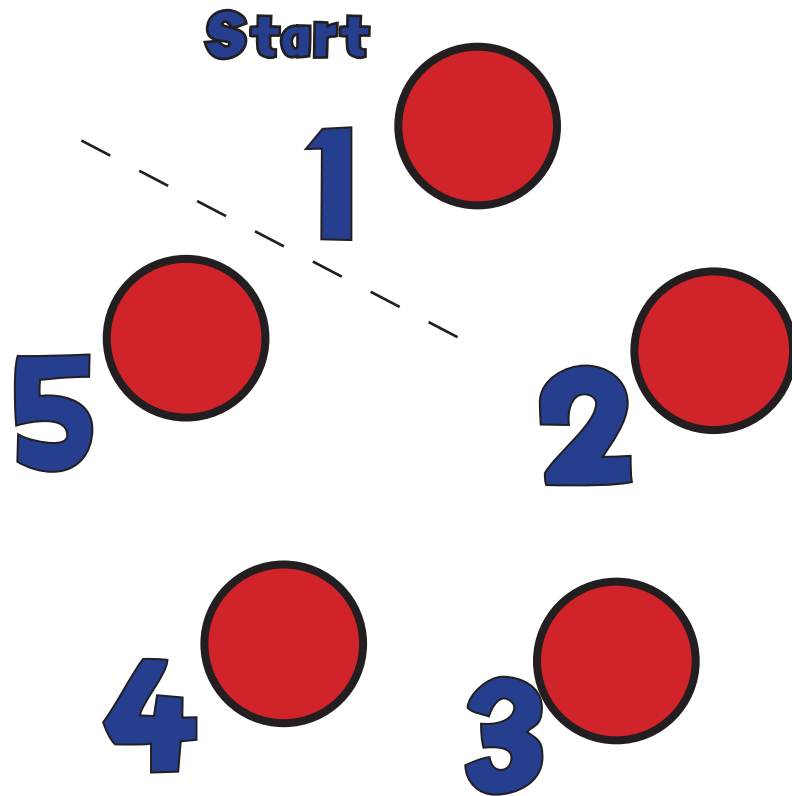
One to One Correspondence



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

C2b: Counting Objects

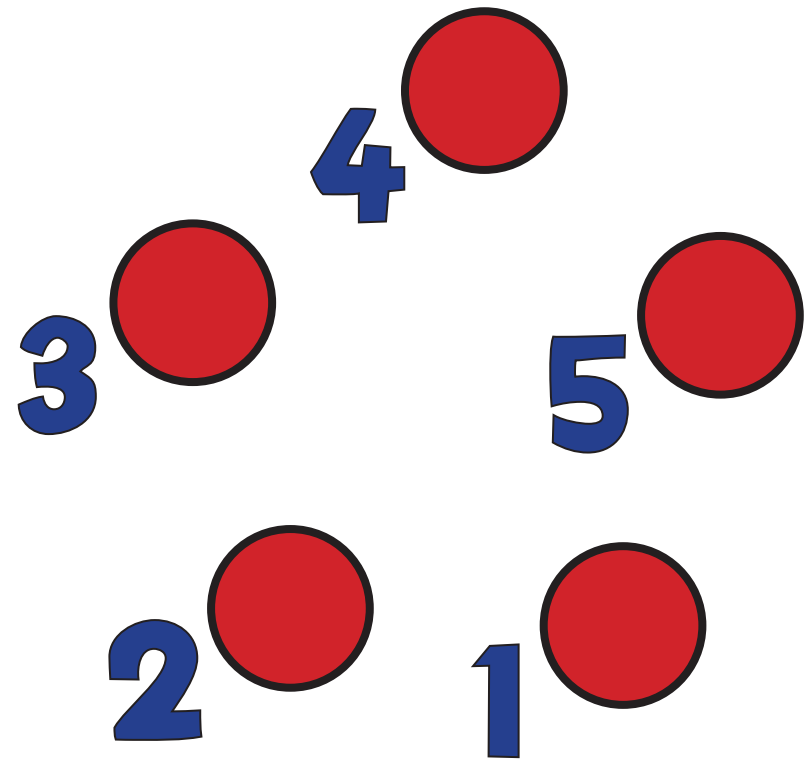
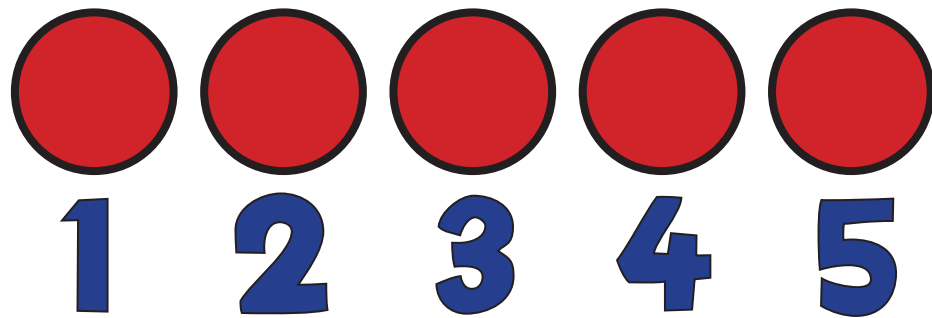
Starting Point and Order Irrelevance



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

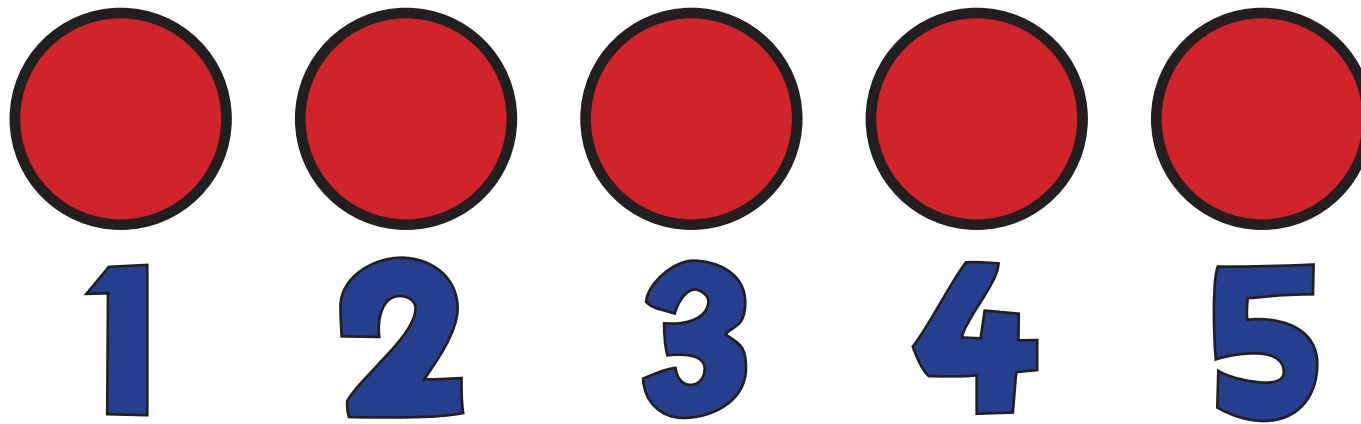
Arrangement Irrelevance



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

C3: How Many?

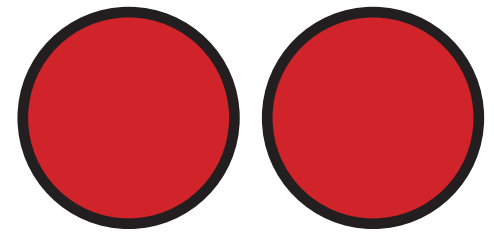
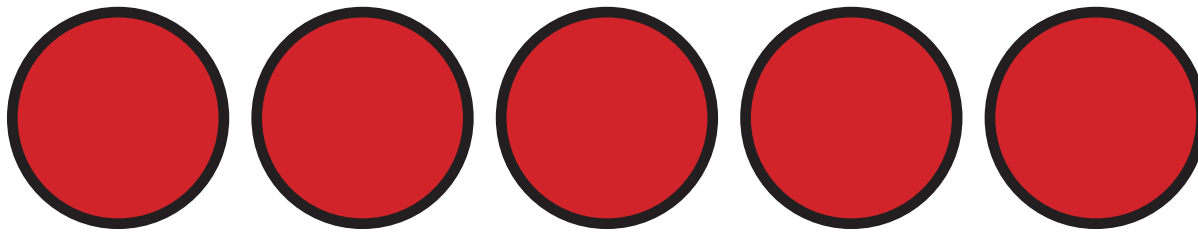
Final number is the total



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

C4: Arranging

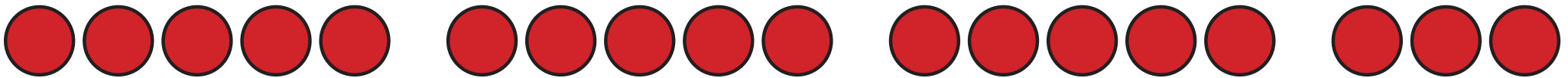
Sets of 5



7

C4a: Arranging

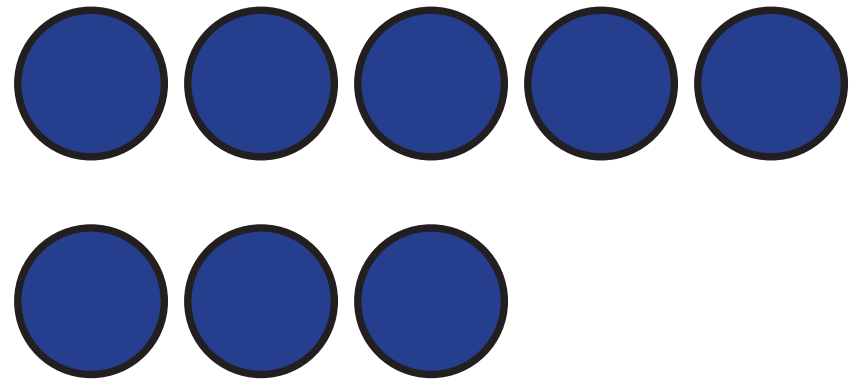
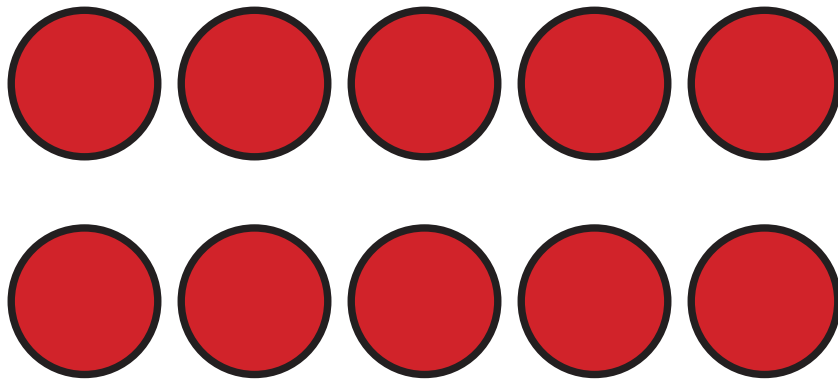
Sets of 5



18

C4b: Arranging

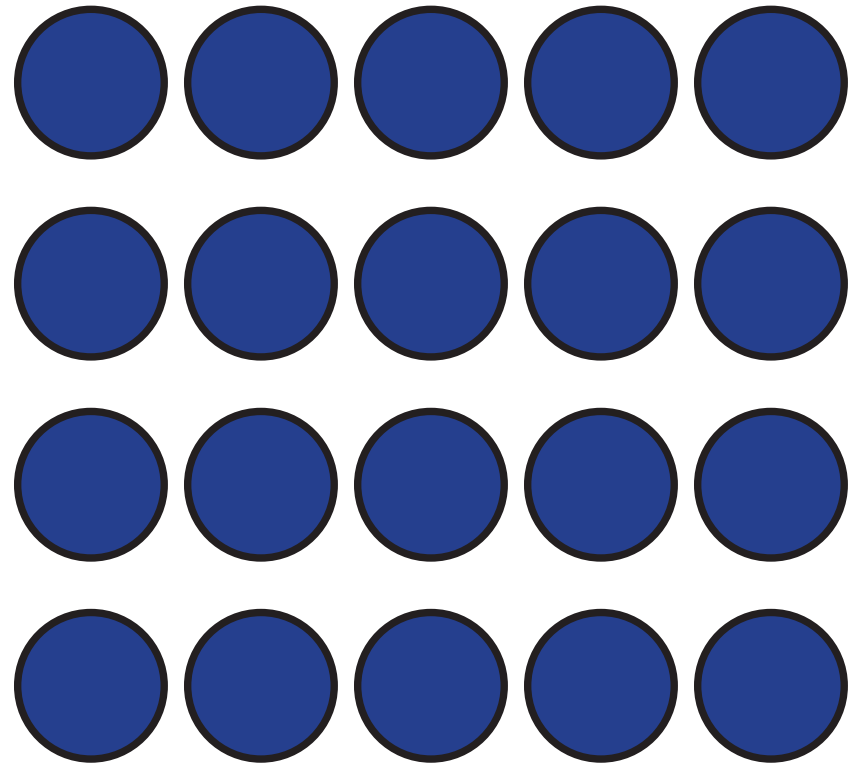
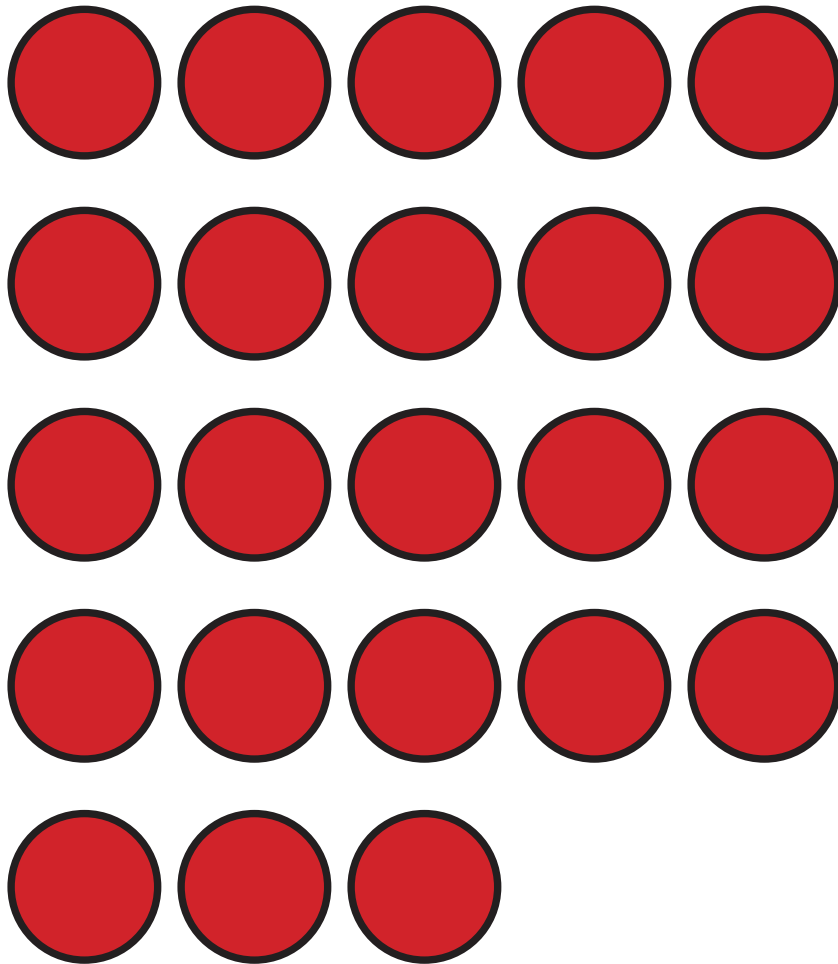
Sets of 5
(Non Linear)



18

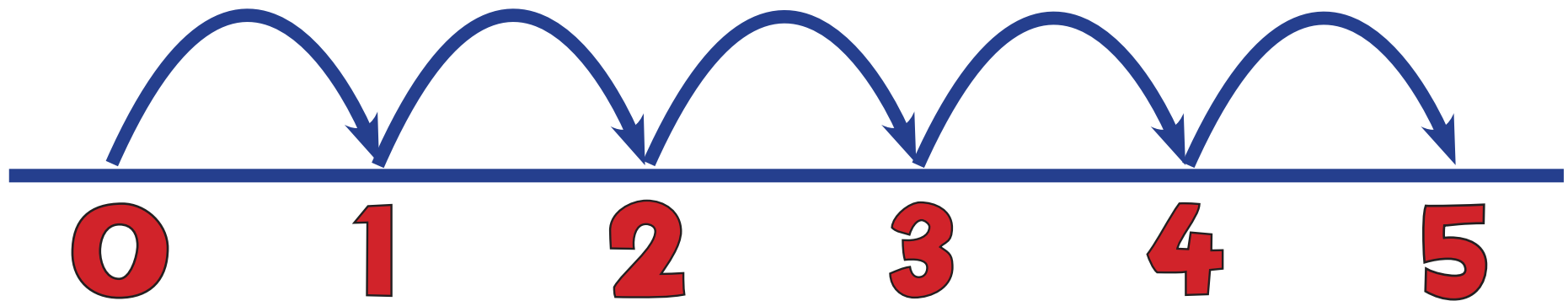
C4c: Arranging

Sets of 5
(Non Linear)

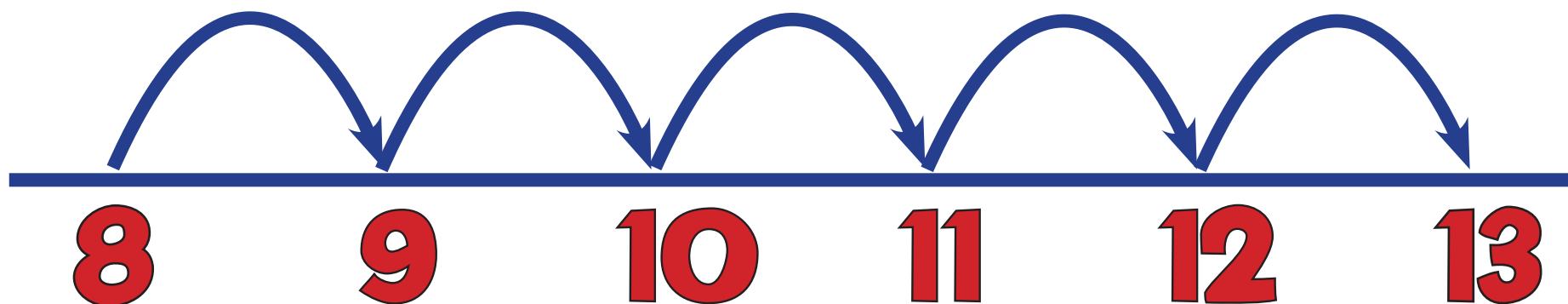


43

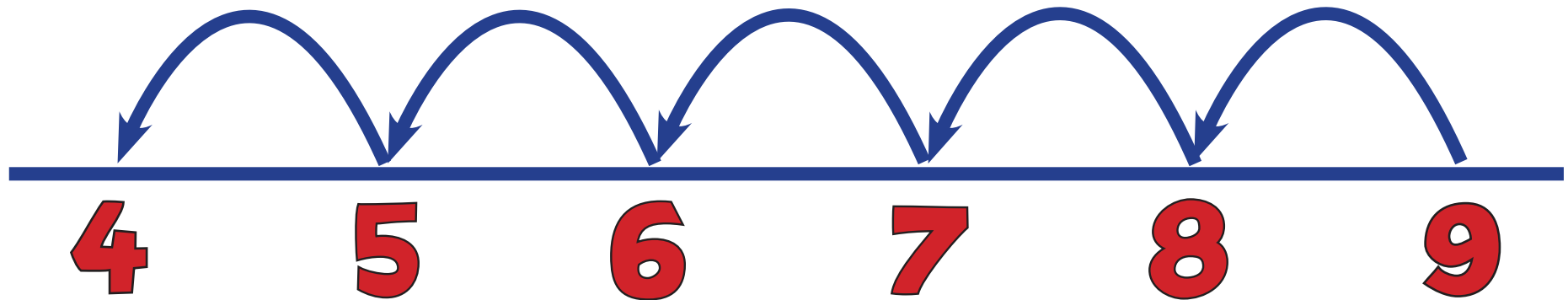
C5: Counting Forwards



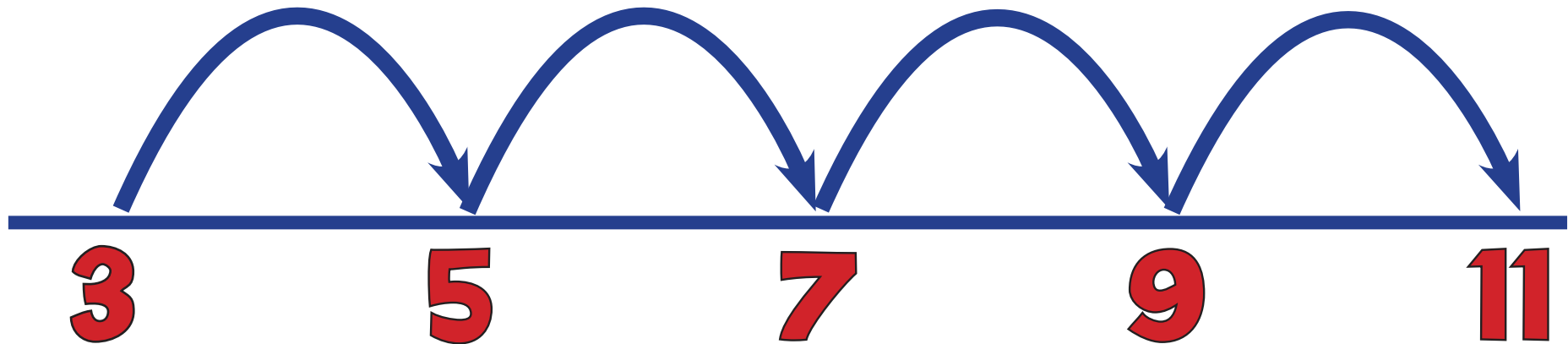
C6: Counting On



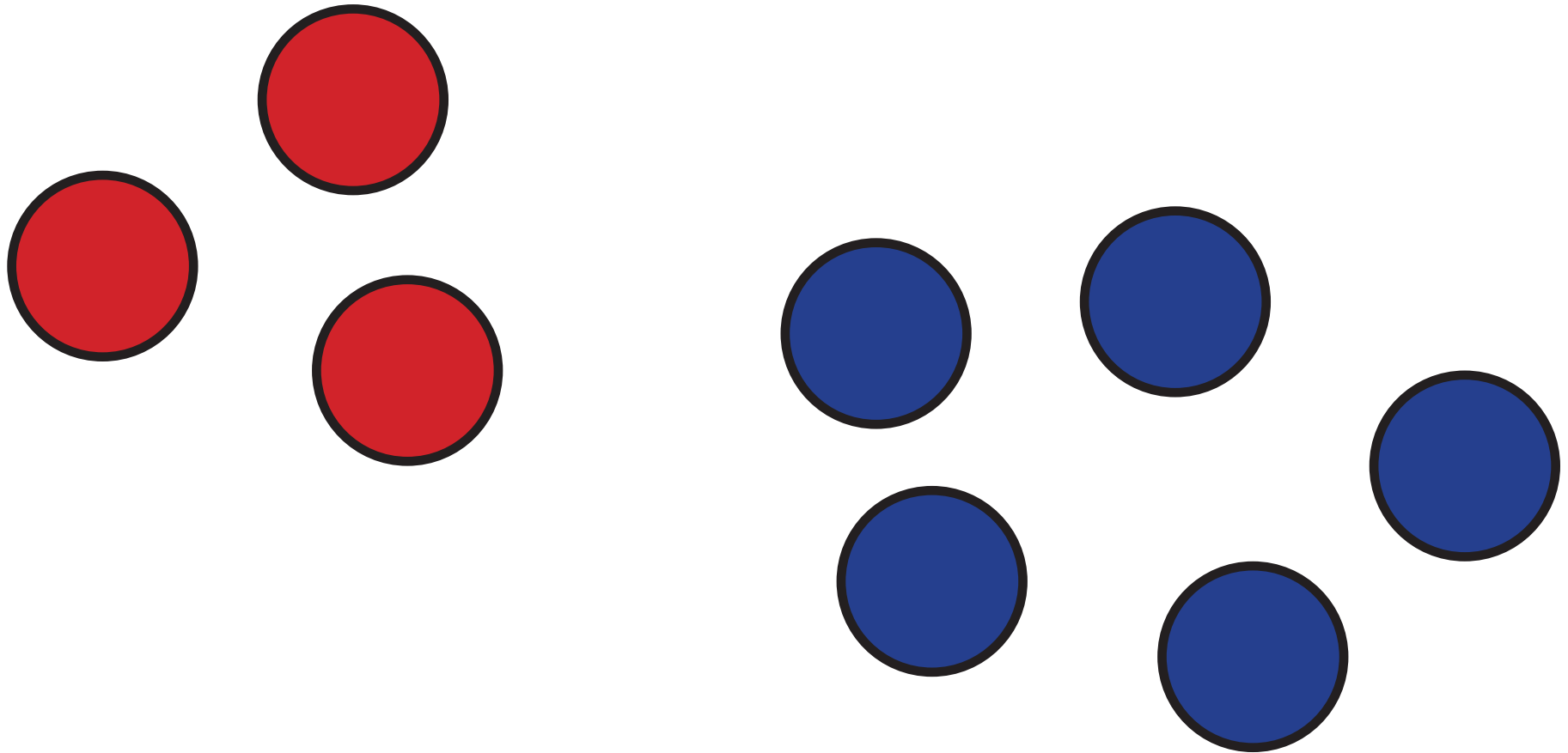
C7: Counting Back



C8: Counting in Steps

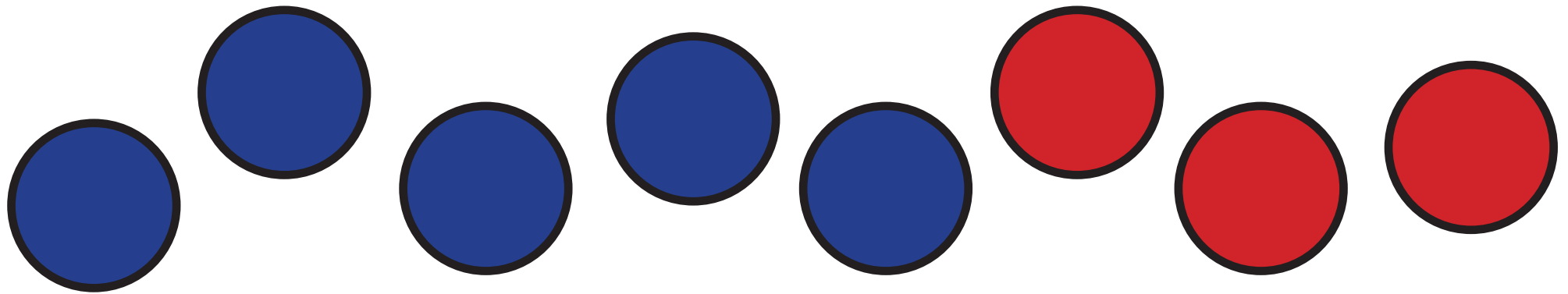


A1: Objects & Pictures



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

A1a: Largest Number 1st



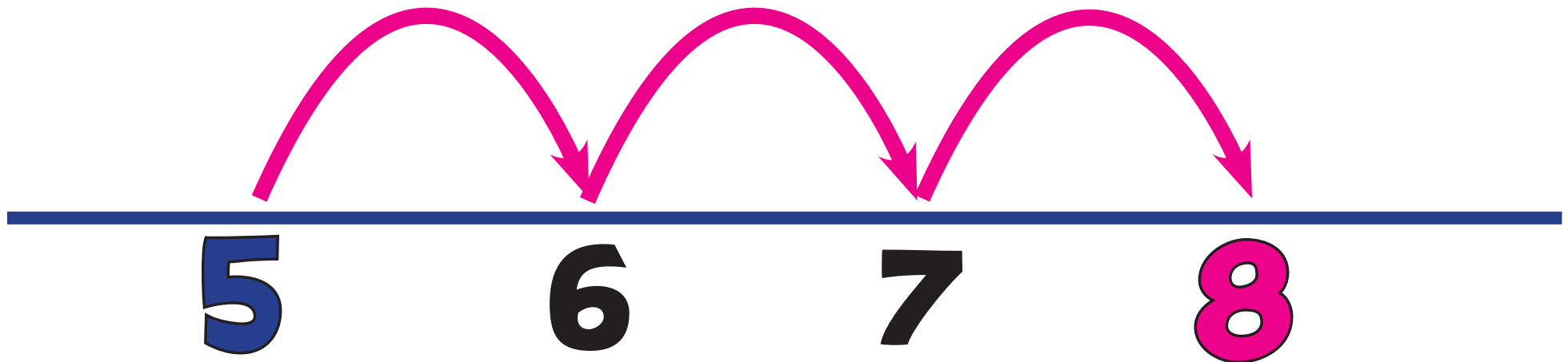
$$5 + 3 = 8$$

A2: Counting On

+1

+1

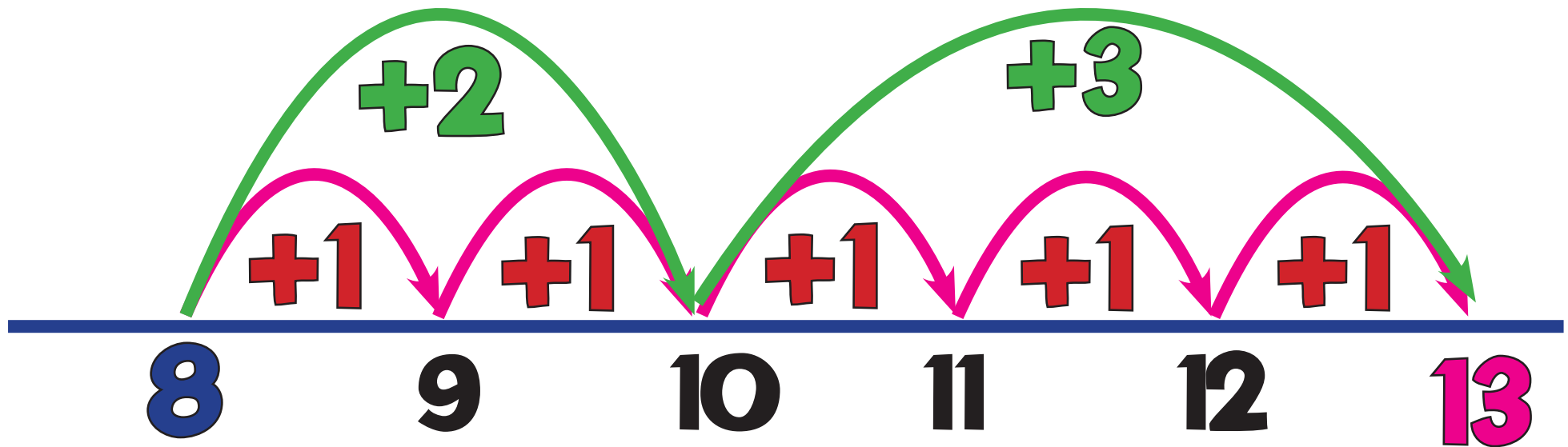
+1



$$5 + 3 = 8$$

A2a: Counting On

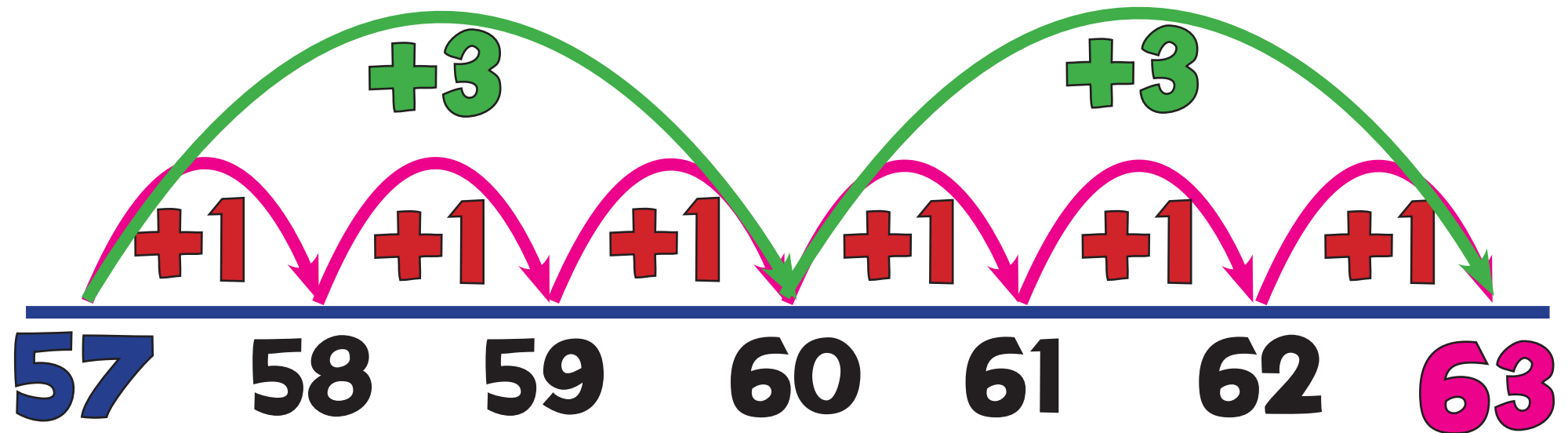
Bridging 10



$$8 + 5 = 13$$

A2b: Counting On

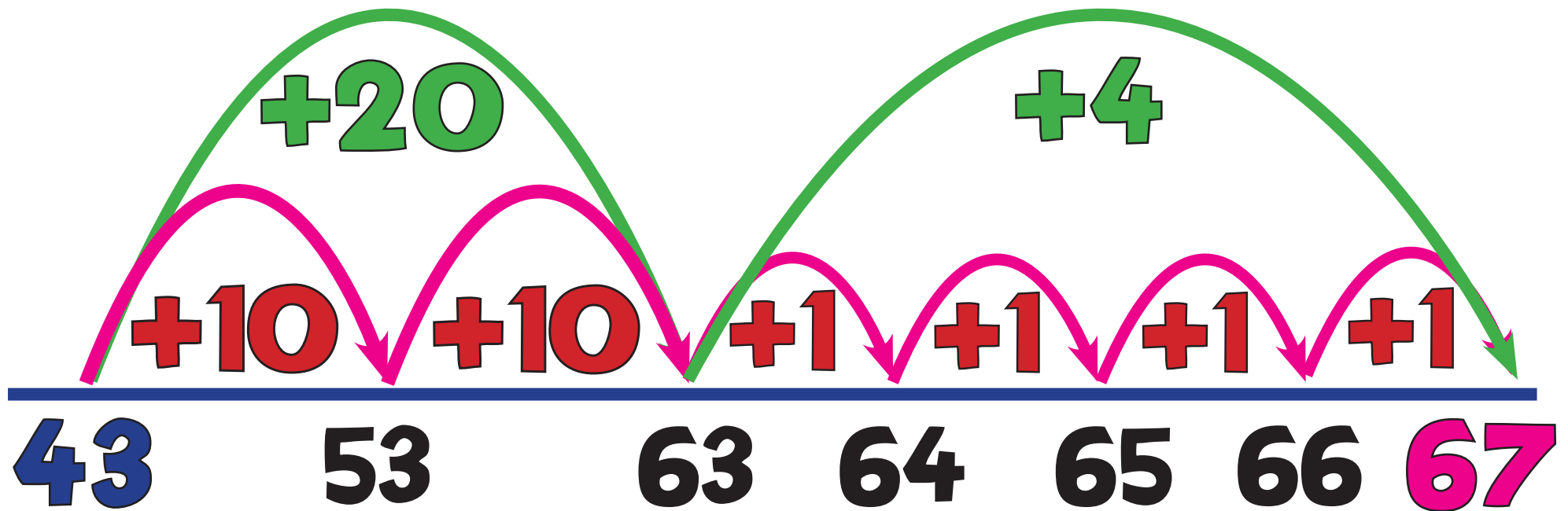
Bridging 10s Number



$$57 + 6 = 63$$

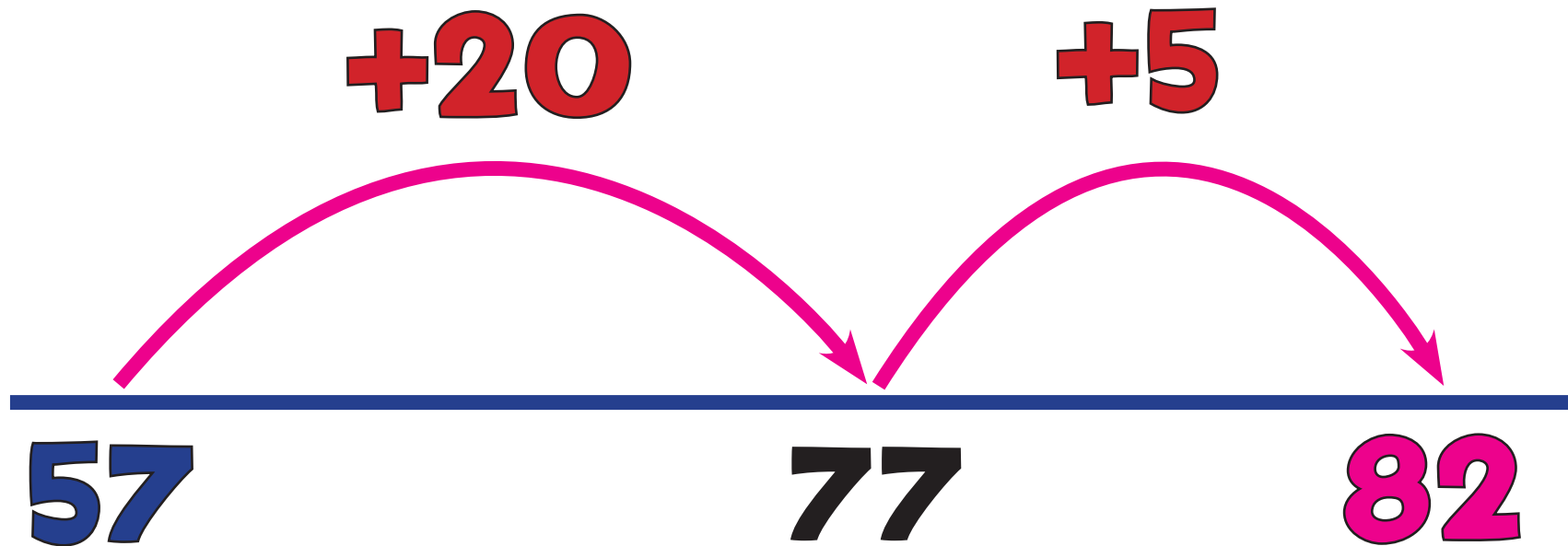
A3: Forwards Jump

$$43 + 24 = 67$$



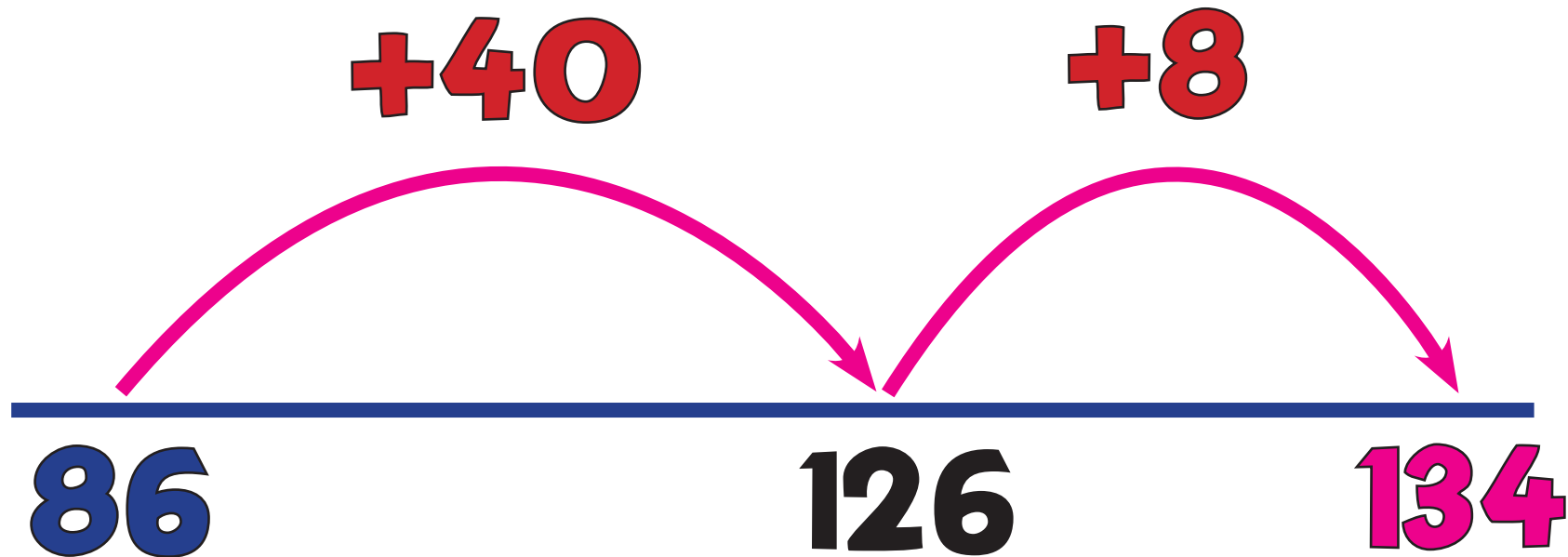
A3a: Forwards Jump

$$57 + 25 = 82$$



A3b: Forwards Jump

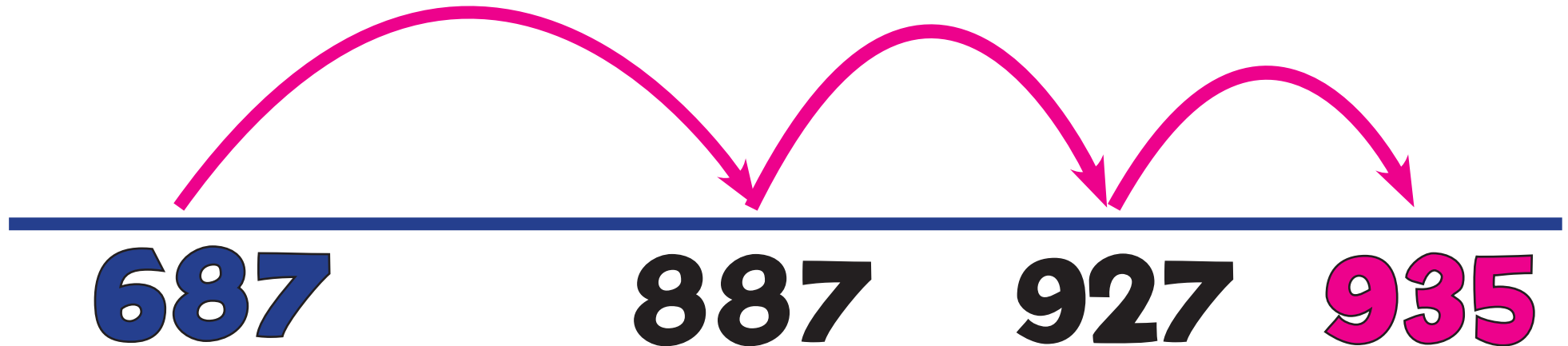
$$86 + 48 = 134$$



A3c: Forwards Jump

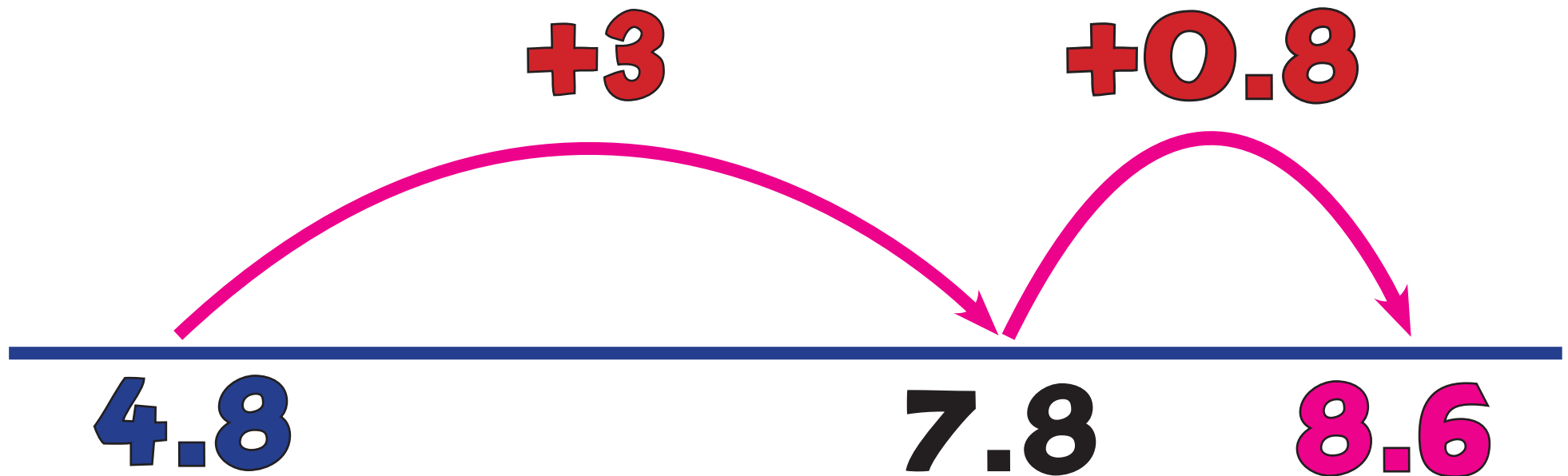
$$687 + 248 = 935$$

+200 **+40** **+8**



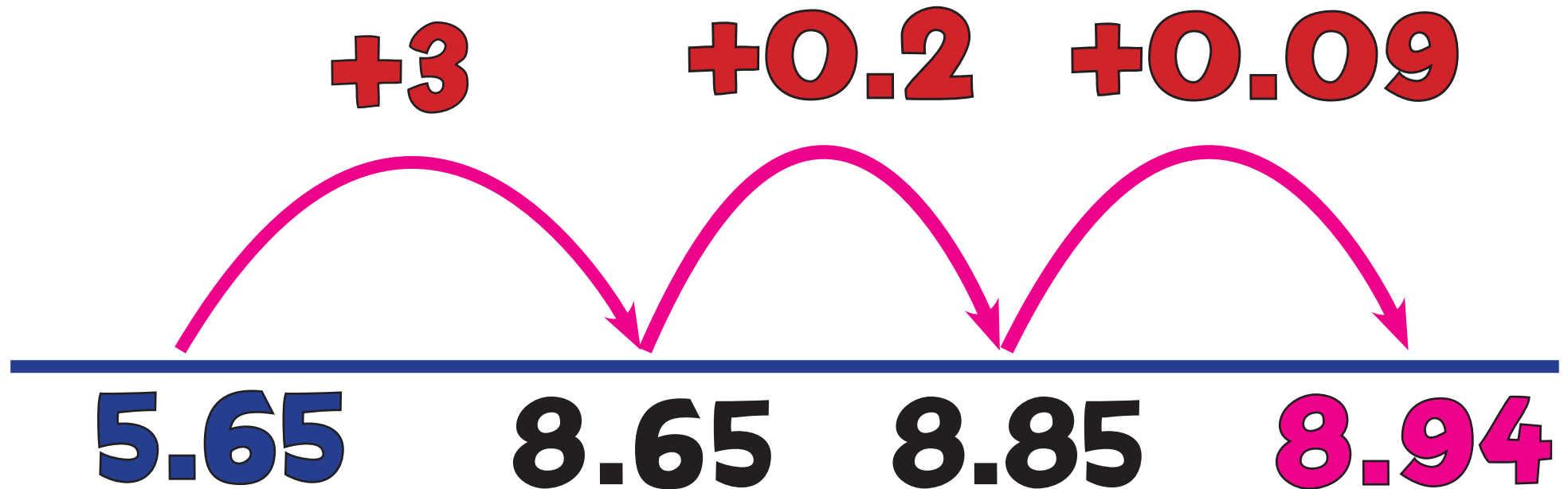
A3f: Decimal Jump

$$4.8 + 3.8 = 8.6$$



A3g: Decimal Jump

$$5.65 + 3.29 = 8.94$$



A4: Partitioning

$$43 + 24 = 67$$

$$40 + 20 = 60$$

$$3 + 4 = 7$$

$$67$$

A4a: Partitioning

$$57 + 25 = 82$$

$$50 + 20 = 70$$

$$7 + 5 = 12$$

$$82$$

A4b: Partitioning

$$86 + 48 = 134$$

$$80 + 40 = 120$$

$$6 + 8 = 14$$

$$134$$

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

$$\begin{array}{rcccl} 43 & + & 24 & = & 67 \\ \text{red} & & \text{red} & & \text{pink} \\ \text{green} & & \text{green} & & \\ \text{red} & & \text{green} & & \\ \text{green} & & \text{red} & & \end{array}$$

Diagram illustrating the partitioning of the addition 43 + 24 = 67. The numbers are color-coded: 4 (red), 3 (green), 2 (red), 4 (green), 6 (red), and 7 (green). Lines connect the digits to show the partitioning process: a red line from the 4 in 43 to the 6 in 60, a green line from the 3 in 43 to the 7 in 67, a red line from the 2 in 24 to the 6 in 60, and a green line from the 4 in 24 to the 7 in 67.

$$60 + 7$$

Diagram illustrating the partitioning of the addition 60 + 7. The numbers are color-coded: 6 (red), 0 (red), and 7 (green). Lines connect the digits to show the partitioning process: a red line from the 6 in 60 to the 6 in 60, and a green line from the 7 in 7 to the 7 in 67.

A5a: Partition Jot

$$57 + 25 = 82$$

A diagram illustrating the partitioning of the numbers 57 and 25. Red lines connect the '5' in 57 to the '70' in the second equation, and the '2' in 25 to the '12' in the second equation. Green lines connect the '7' in 57 to the '12' in the second equation, and the '5' in 25 to the '70' in the second equation. This shows that 57 is partitioned into 70 and 7, and 25 is partitioned into 12 and 13, with the 7 and 13 combining to form 20, which is then added to 70 to get 90. However, the final result shown is 82, suggesting a different partitioning strategy or a correction.

$$70 + 12$$

A5b: Partition Jot

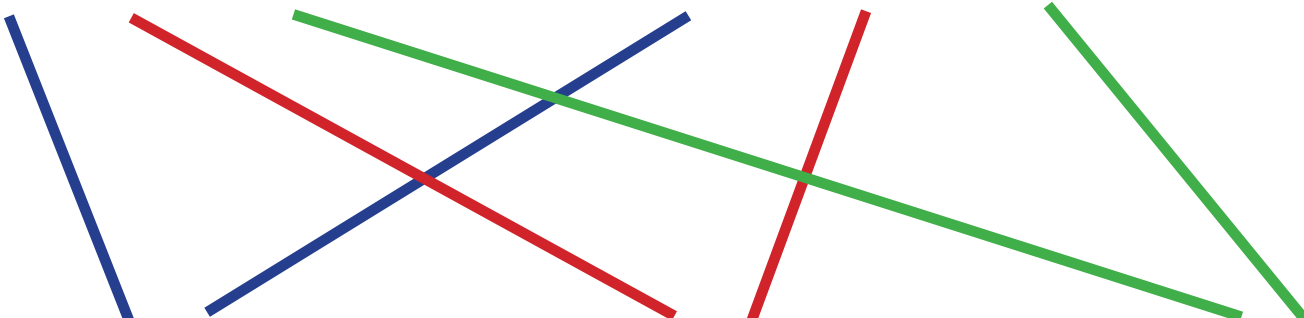
$$86 + 48 = 134$$

A diagram illustrating the partitioning of the numbers 86 and 48. Two lines connect the 8 in 86 to the 1 in 120 (a red line) and the 2 in 14 (a green line). Another two lines connect the 6 in 86 to the 4 in 48 (a red line) and the 0 in 120 (a green line). This shows that 86 is partitioned into 120 and 14, and 48 is partitioned into 120 and 14.

$$120 + 14$$

A5c: Partition Jot

$$687 + 248 = 935$$


$$800 + 120 + 15$$

A5d: Partition Jot

$$4873 + 3762 = 8635$$

$$7000 + 1500 + 130 + 5$$

A5f: Partition Jot

$$4.8 + 3.8 = 8.6$$

A diagram illustrating the partitioning of the numbers 4.8 and 3.8. Two green lines connect the '4' and the first '8' of '4.8' to the '7' in '7 + 1.6'. Two purple lines connect the '3' and the second '8' of '3.8' to the '1' and '6' of '1.6'. This shows that 4.8 is partitioned into 7 and 1.8, and 3.8 is partitioned into 1 and 2.8, but the diagram specifically shows the combination into 7 and 1.6.

$$7 + 1.6$$

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

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


$$\text{£}65.00 + \text{£}0.71$$

(A6: Expanded Column)

Additional Addition

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

(A6: Expanded Column) Addition

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

(A6: Expanded Column)

Additional:b Addition

	H	T	U
		8	6
+		4	8
<hr/>			
		1	4
	1	2	0
<hr/>			
	1	3	4
<hr/>			

A6: Expanded Column Addition

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

(A7: Column Addition)

Additional

$$\begin{array}{r} \text{T} \quad \text{U} \\ 43 \\ + 24 \\ \hline 67 \\ \hline \end{array}$$

(A7: Column Addition)

Additional:a

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

(A7: Column Addition)

Additional:b

	H	T	U
		8	6
+	4	8	
<hr/>			
	1	3	4
<hr/>			
	1	1	

A7: Column Addition

	H	T	U
	6	8	7
+	2	4	8
<hr/>			
	9	3	5
<hr/>			
	1	1	

A7d: Column Addition

	Th	H	T	U
	4	8	7	3
+	3	7	6	2
	<hr/>			
	8	6	3	5
	<hr/>			
	1	1		

A7e: Column Addition

M HTh TTh Th H T U

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

A7f: Column Addition

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

A7g: Column Addition

$$\begin{array}{r} \begin{array}{c} \text{U} \\ 5 \end{array} . \begin{array}{c} \frac{1}{10} \\ 6 \end{array} \begin{array}{c} \frac{1}{100} \\ 5 \end{array} \\ + \begin{array}{c} 3 \end{array} . \begin{array}{c} 2 \end{array} \begin{array}{c} 9 \end{array} \\ \hline \begin{array}{c} 8 \end{array} . \begin{array}{c} 9 \end{array} \begin{array}{c} 4 \end{array} \\ \hline 1 \end{array}$$

A7h: Column Addition

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

A7i: Column Addition

With Money

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

1 1

A7j: Column Addition

With Decimals

$$73.4 + 5.67 = 79.07$$

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

MA1: Partitioning

$$45 + 82 = 127$$

The diagram illustrates the partitioning of the numbers 45 and 82. Four lines connect the digits of 45 and 82 to the numbers 120 and 7 in the equation below. A blue line connects the '4' in 45 to the '1' in 120. A red line connects the '5' in 45 to the '2' in 120. A blue line connects the '8' in 82 to the '2' in 120. A red line connects the '2' in 82 to the '7' in 7. The numbers 120 and 7 are enclosed in thought bubbles.

$$120 + 7 = 127$$

MA1: Partitioning

Year 2

$$43 + 21 = 64$$

The diagram illustrates the partitioning of the numbers 43 and 21. A blue line connects the '4' in 43 to the '60' in the second equation. A red line connects the '21' in the first equation to the '4' in the second equation. Another blue line connects the '3' in 43 to the '4' in the second equation, and another red line connects the '1' in 21 to the '4' in the second equation. The second equation is shown inside two thought bubbles: the first bubble contains '60' and the second bubble contains '4'. The result '64' is shown to the right of the second bubble.

$$60 + 4 = 64$$

MA1: Partitioning

Year 3

$$57 + 25 = 82$$

$$70 + 12 = 82$$

MA1: Partitioning

Year 4

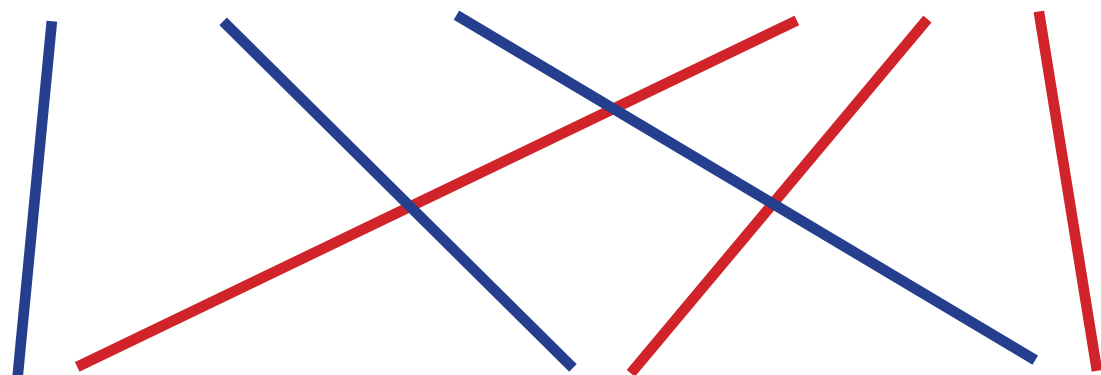
$$648 + 231 = 879$$

$$800 + 70 + 9 = 879$$

MA1: Partitioning

Year 5

$$576 + 258 = 834$$



$$700 + 120 + 14 = 834$$

MA1: Partitioning

Year 6

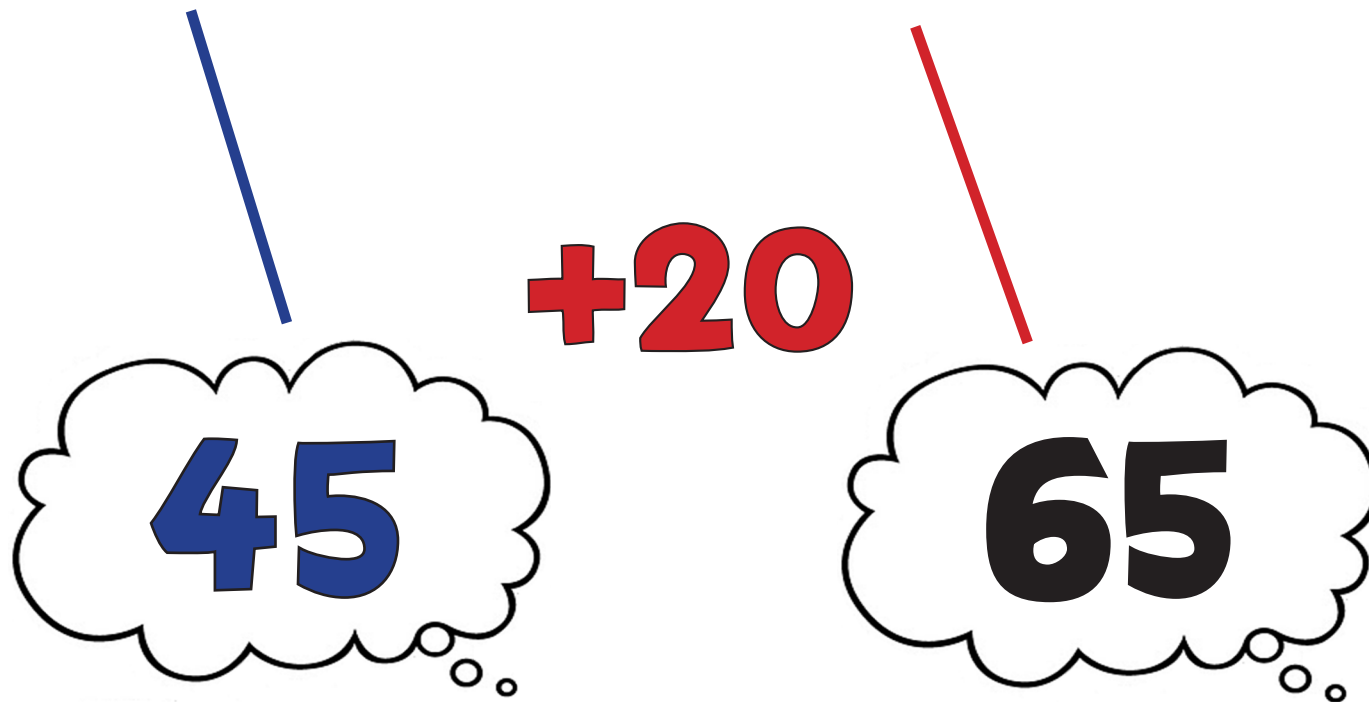
$$4.73 + 2.21 = 6.94$$

The diagram illustrates the partitioning of the numbers 4.73 and 2.21 into three components: 6, 0.9, and 0.44. Colored lines connect the digits of the original numbers to the components below. A blue line connects the '4' to the '6'. A red line connects the '2' to the '6'. A blue line connects the '7' to the '0.9'. A red line connects the '2' to the '0.9'. A blue line connects the '3' to the '0.44'. A red line connects the '1' to the '0.44'. The components are shown in thought bubbles, and the final sum is 6.94.

$$6 + 0.9 + 0.44 = 6.94$$

MA2: Counting On

$$45 + 20 = 68$$



MA2a: Counting On

Year 1

Ones

$$12 + 5 = 17$$



+5



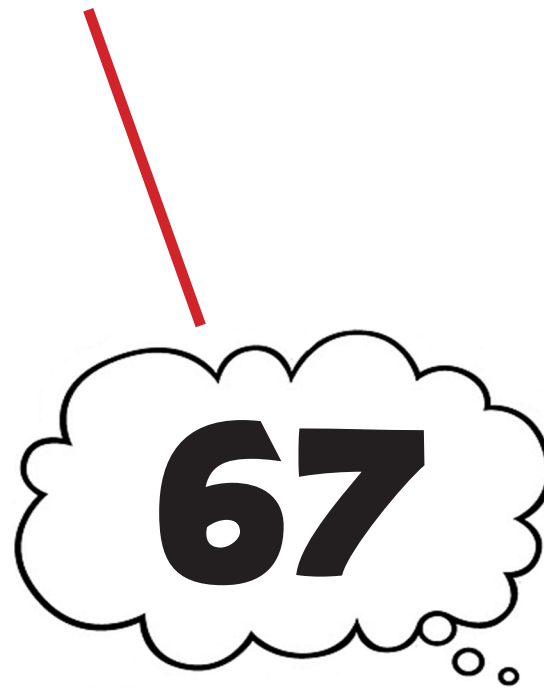
MA2b: Counting On

Year 1 Tens

$$57 + 10 = 67$$



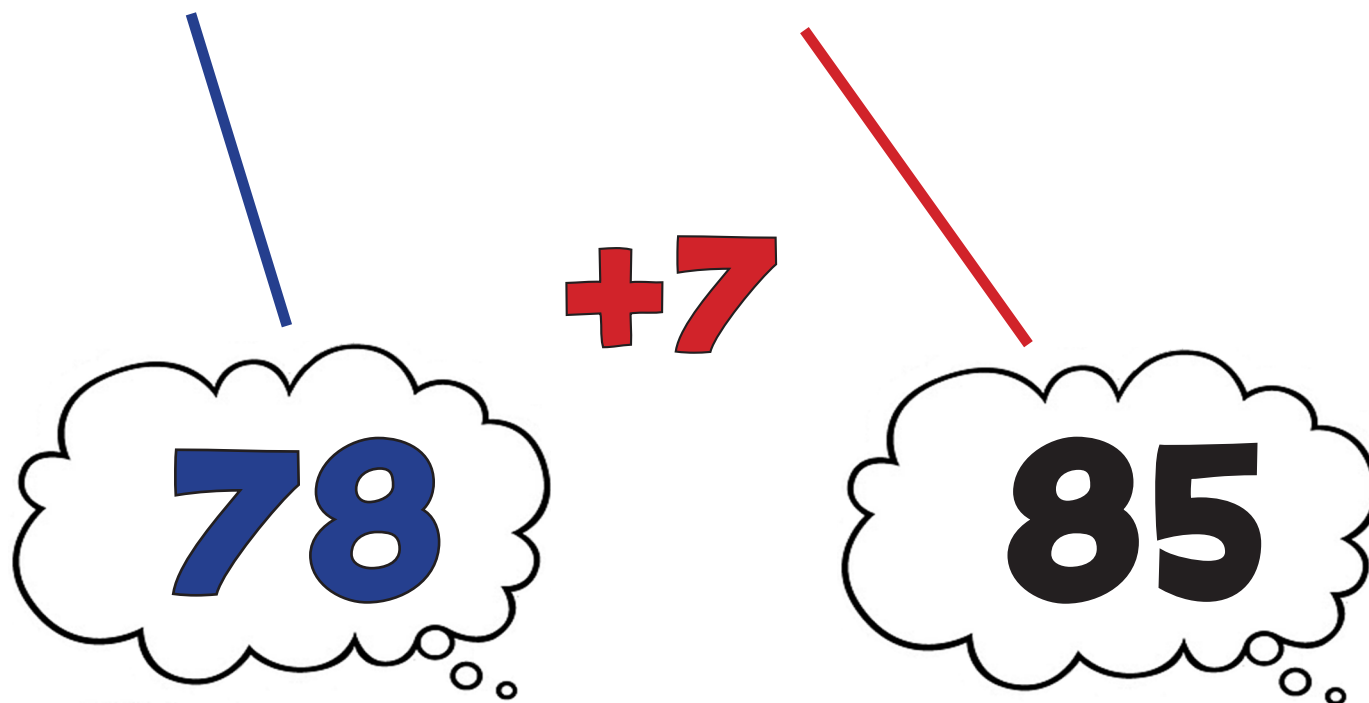
+10



MA2a: Counting On

Year 2 Ones

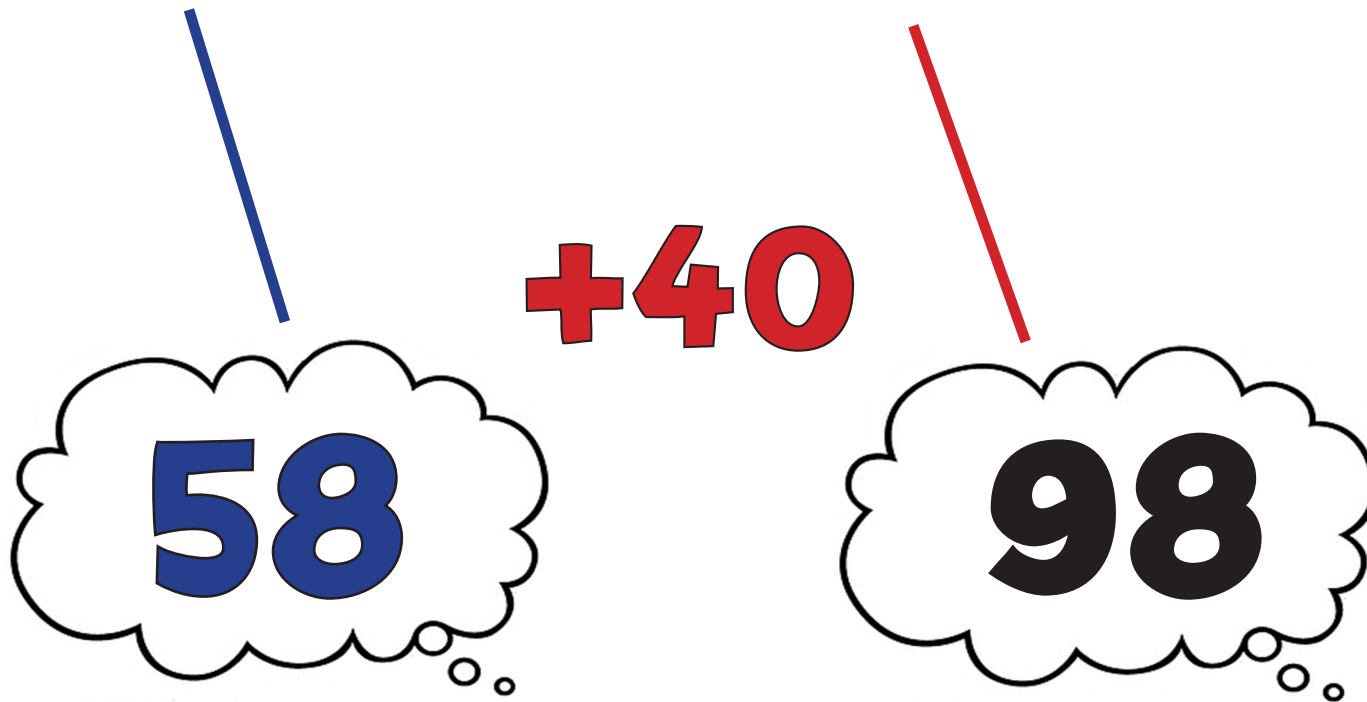
$$78 + 7 = 85$$



MA2b: Counting On

Year 2 Tens

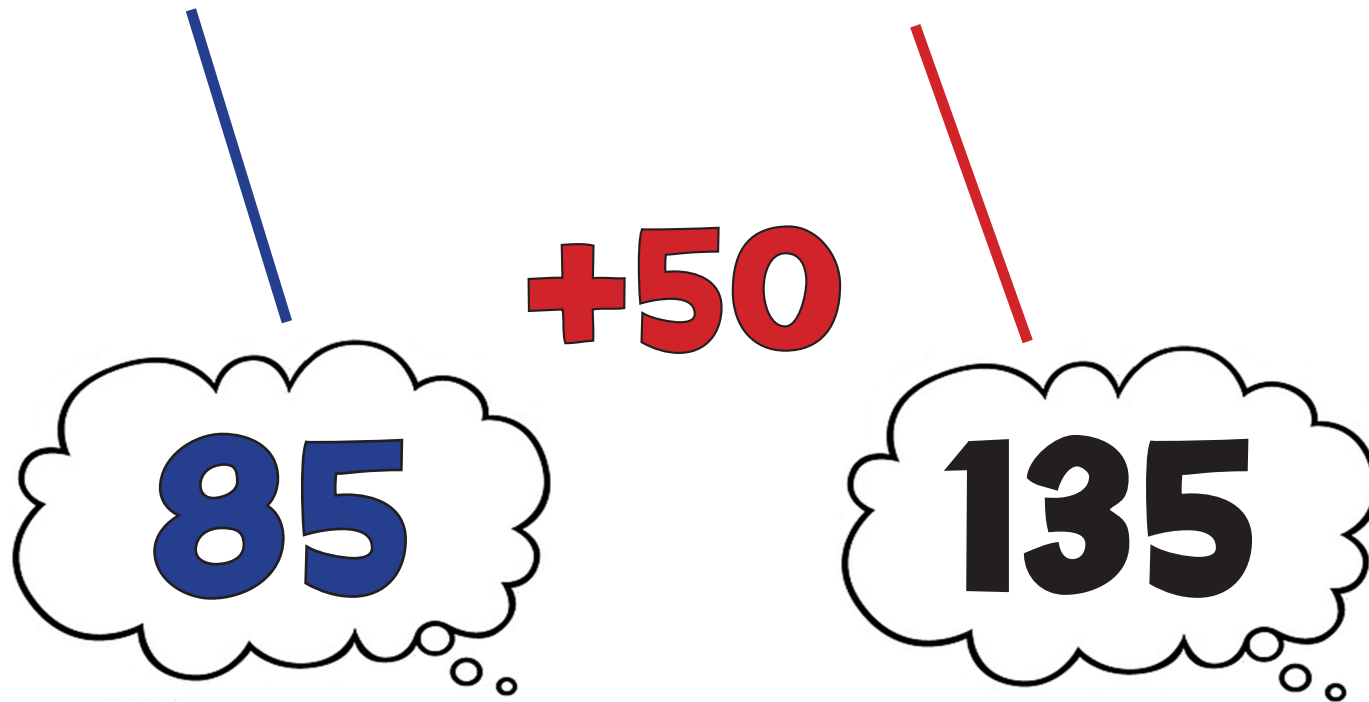
$$58 + 40 = 98$$



MA2a: Counting On

Year 3 Tens

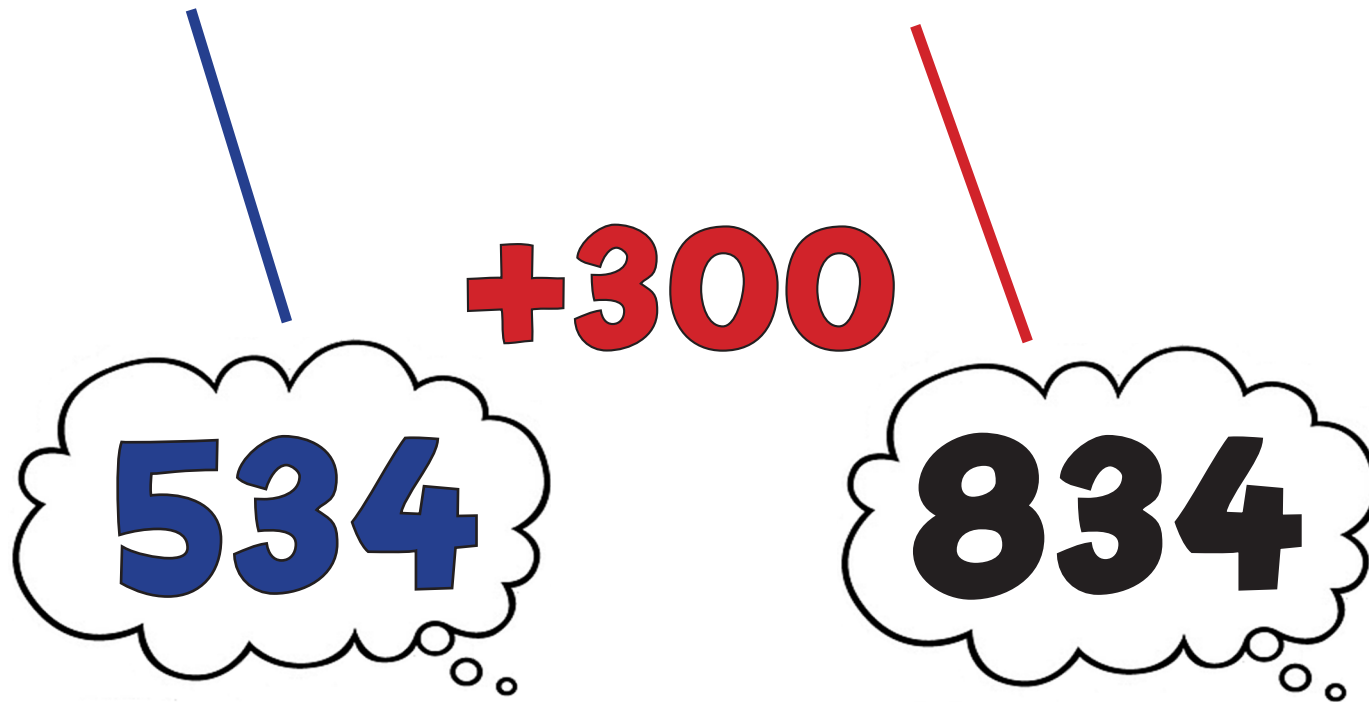
$$85 + 50 = 135$$



MA2b: Counting On

Year 3 Hundreds

$$534 + 300 = 834$$



MA2a: Counting On

Year 4 Tens

$$784 + 60 = 844$$

784

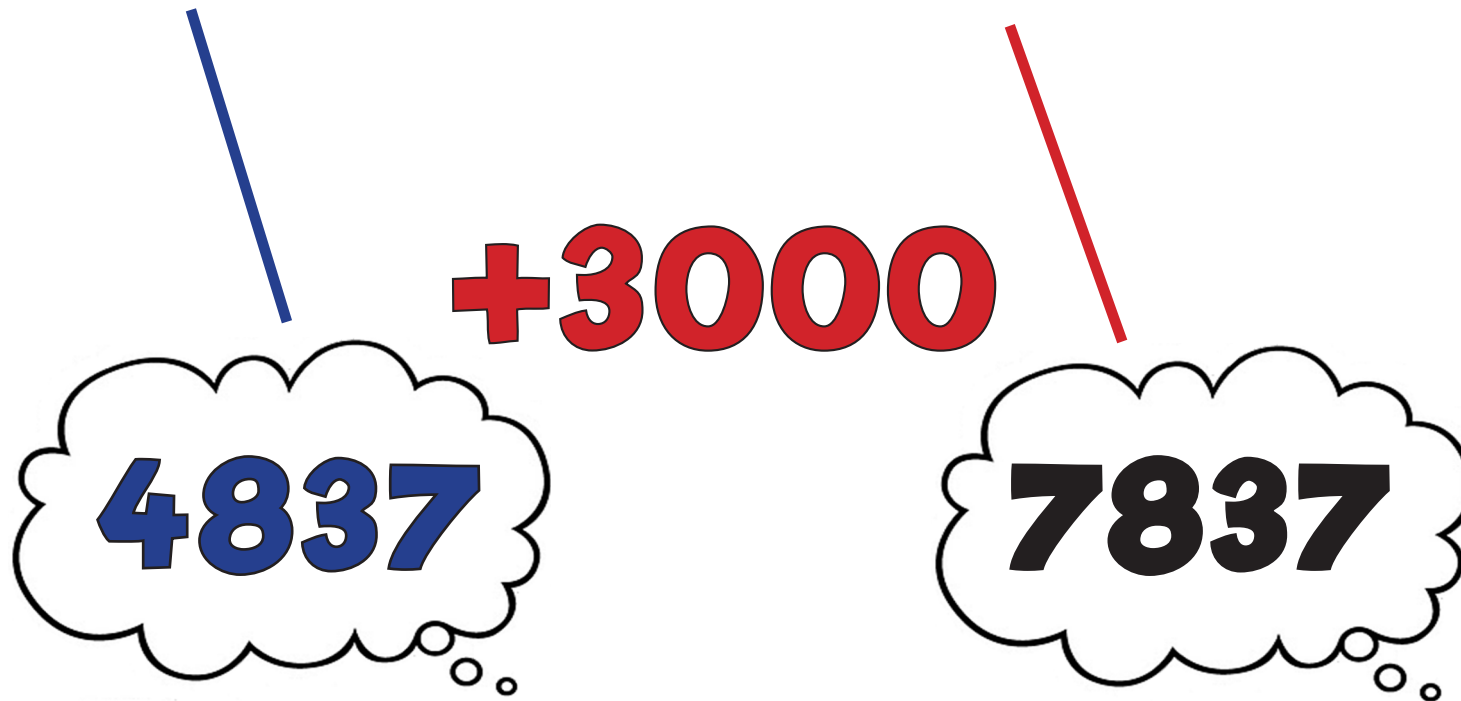
+60

844

MA2b: Counting On

Year 4 Hundreds

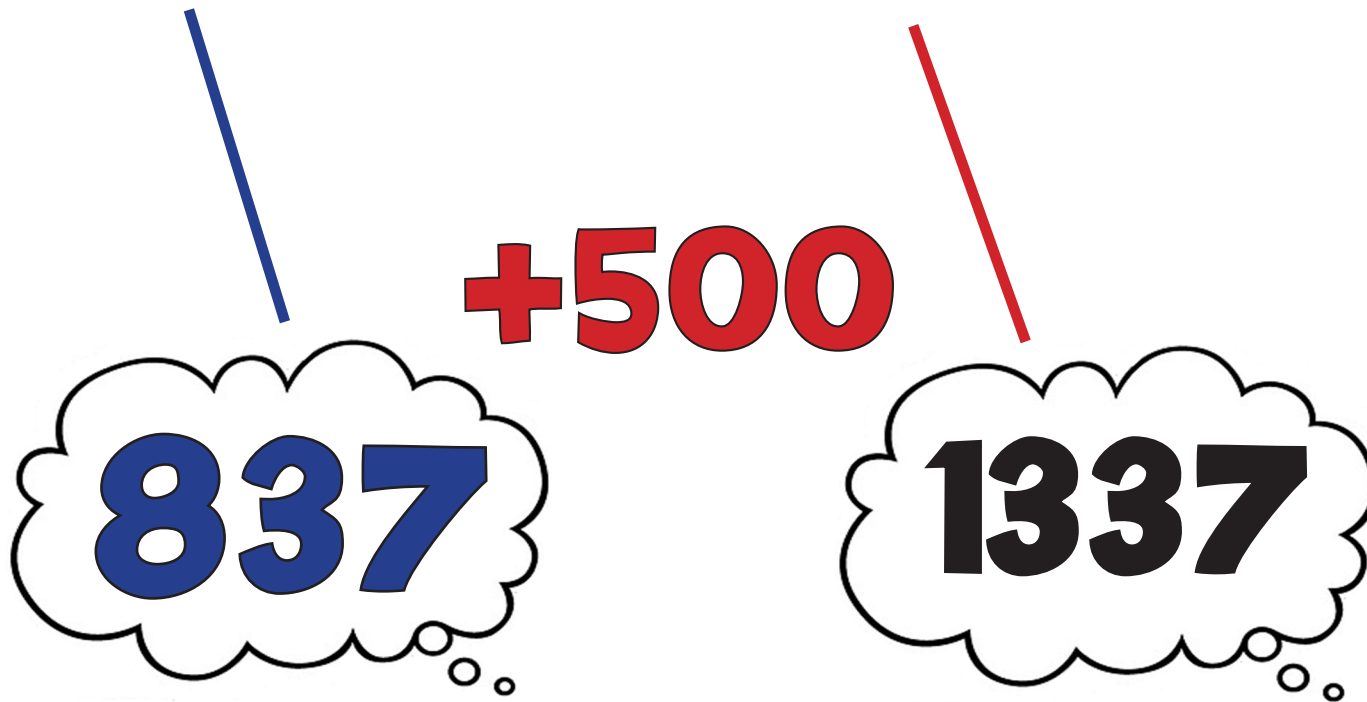
$$4837 + 3000 = 834$$



MA2a: Counting On

Year 5 Hundreds

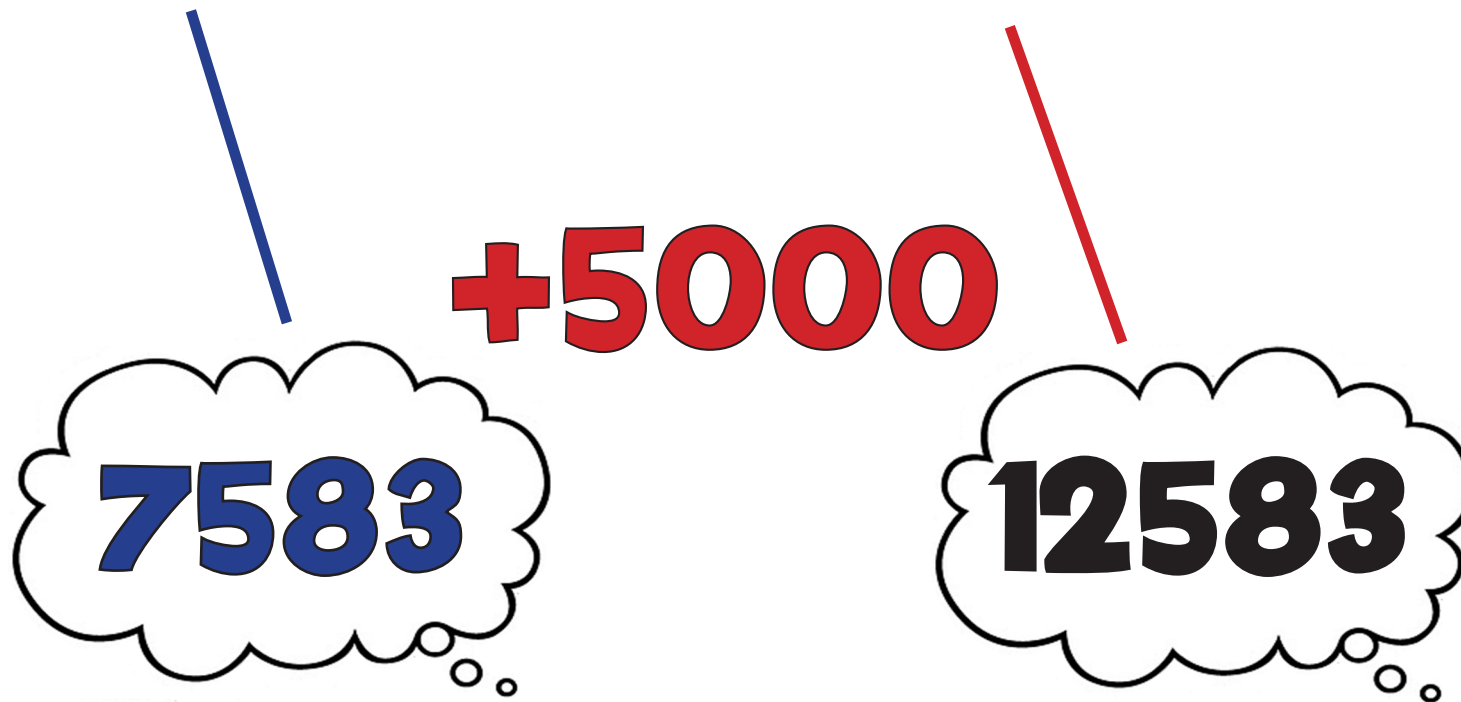
$$837 + 500 = 1337$$



MA2b: Counting On

Year 5 Thousands

$$7583 + 5000 = 12583$$



MA2a: Counting On

Year 6

Ten Thousands

$$43,826 + 30,000 = 73,826$$

+30,000

43,826

73,826

MA2b: Counting On

Year 6 Millions

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

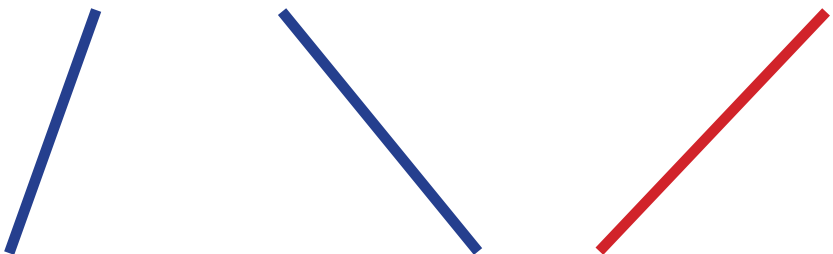
+4,000,000

5,763,947

9,763,947

MA3: Number Bonds

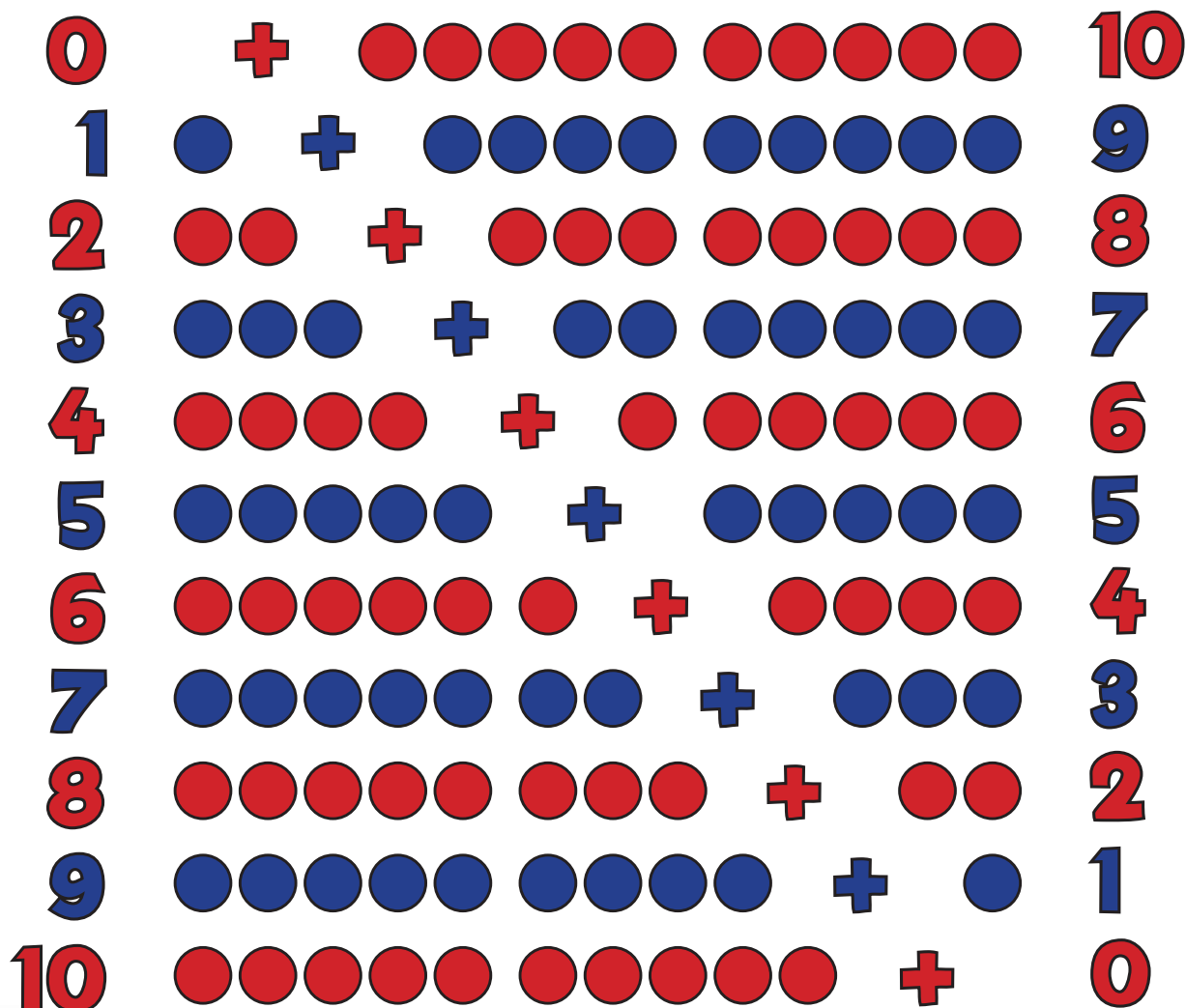
$$45 + 95 = 140$$


$$40 + 100 = 140$$

MA3: Number Bonds

Year 1

Learn Bonds



$$0 + 10 = 10$$

$$1 + 9 = 10$$

$$2 + 8 = 10$$

$$3 + 7 = 10$$

$$4 + 6 = 10$$

$$5 + 5 = 10$$

$$6 + 4 = 10$$

$$7 + 3 = 10$$

$$8 + 2 = 10$$

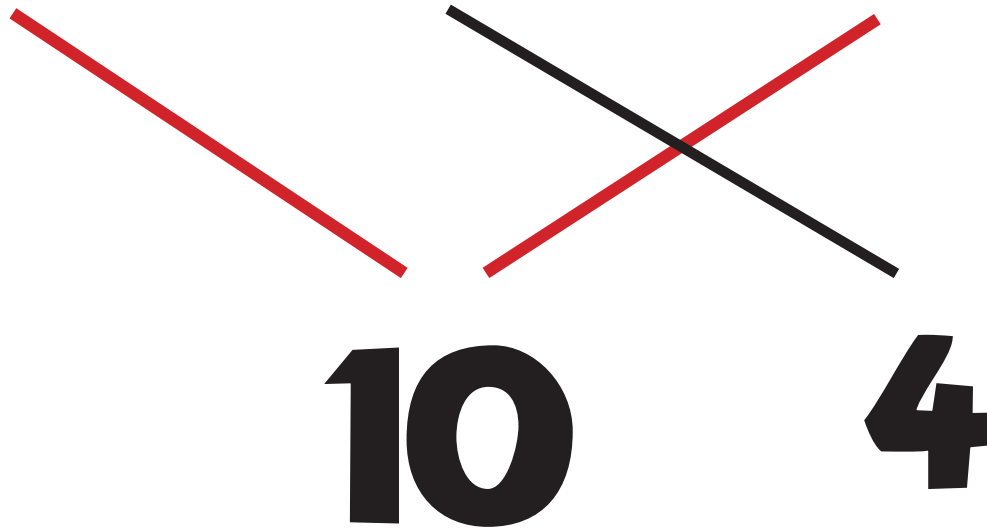
$$9 + 1 = 10$$

$$10 + 0 = 10$$

MA3: Number Bonds

Year 2

$$3 + 4 + 7 = 14$$



MA3: Number Bonds

Year 3

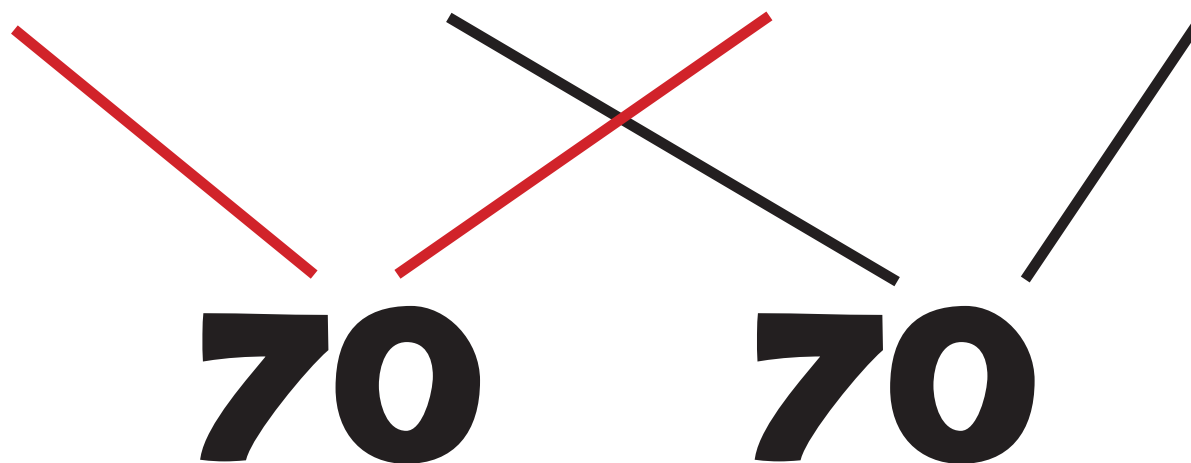
$$43 + 9 + 7 + 21 = 80$$

50 30

MA3: Number Bonds

Year 4

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



MA3: Number Bonds

Year 5

$$\text{£}4.56 + \text{£}3.27 + \text{£}1.44 = \text{£}9.27$$

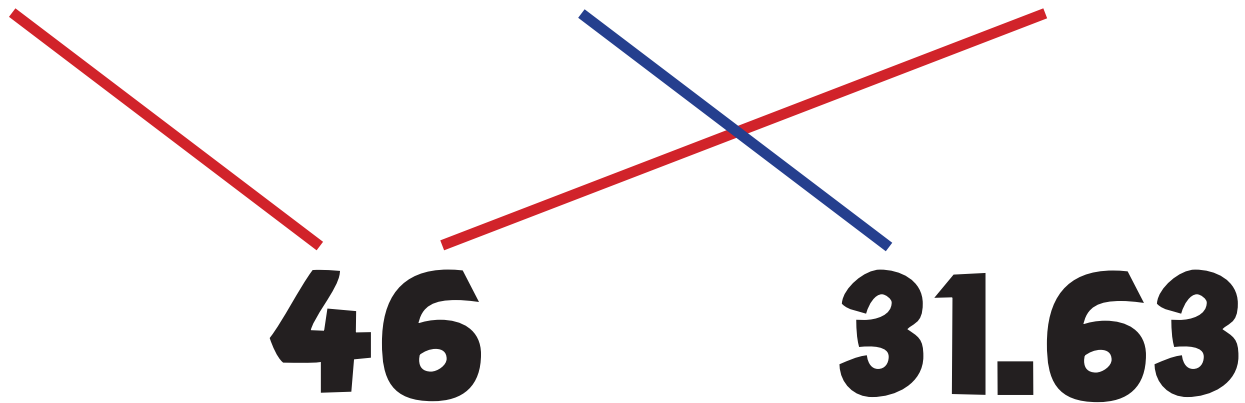
The diagram illustrates the calculation process. A red line connects the '£4.56' and '£1.44' terms of the equation to the result '£6.00' below them. Another red line connects the '£3.27' term to the final result '£9.27'. A blue line connects the '£6.00' result to the final result '£9.27'.

£6.00 **£3.27**

MA3: Number Bonds

Year 6

$$24.25 + 31.63 + 21.75 = 77.63$$



MA4: Double & Adjust

$$45 + 46 = 91$$

$$45 + 45 + 1$$

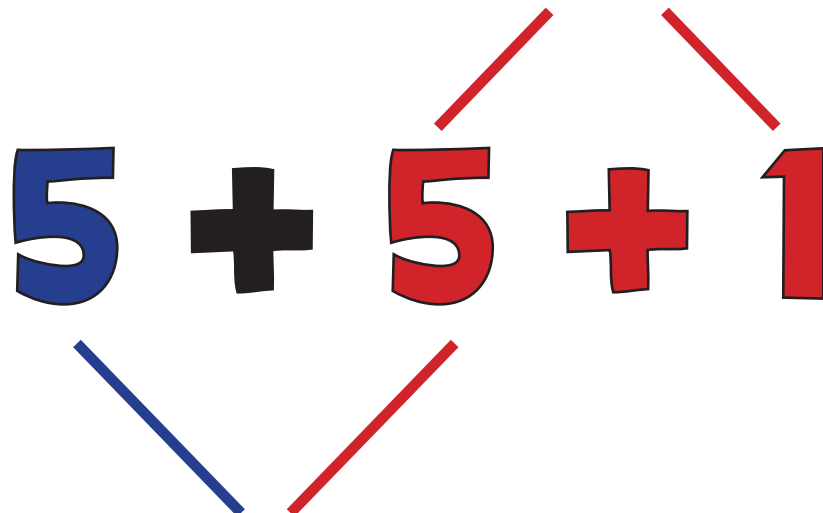

The diagram shows the decomposition of the numbers in the equation above. A red line connects the '4' of the second 45 to the '4' of the 46, and another red line connects the '5' of the second 45 to the '6' of the 46. A blue line connects the '4' of the first 45 to the '9' of the 90 in the final equation, and a red line connects the '5' of the second 45 to the '0' of the 90.

$$90 + 1 = 91$$

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

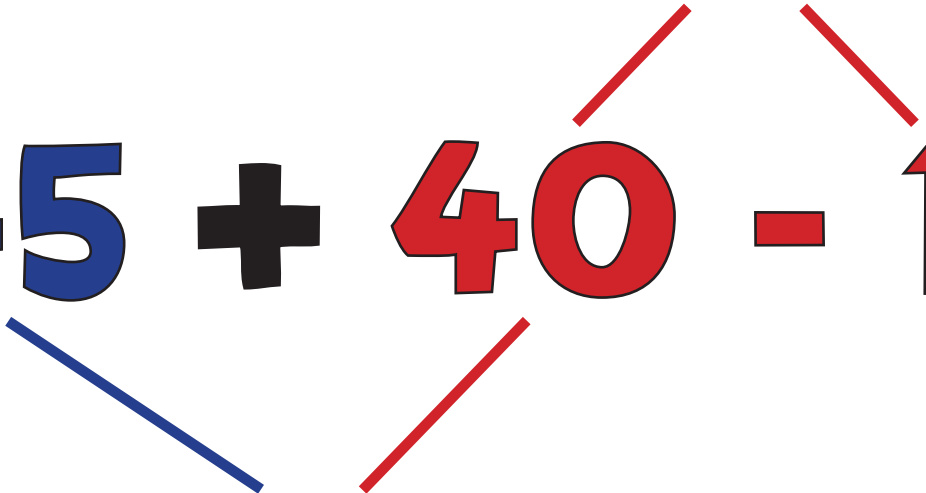
$$4.5 + 4.7 = 9.2$$


$$4.5 + 4.5 + 0.2$$


$$9 + 0.2 = 9.2$$

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

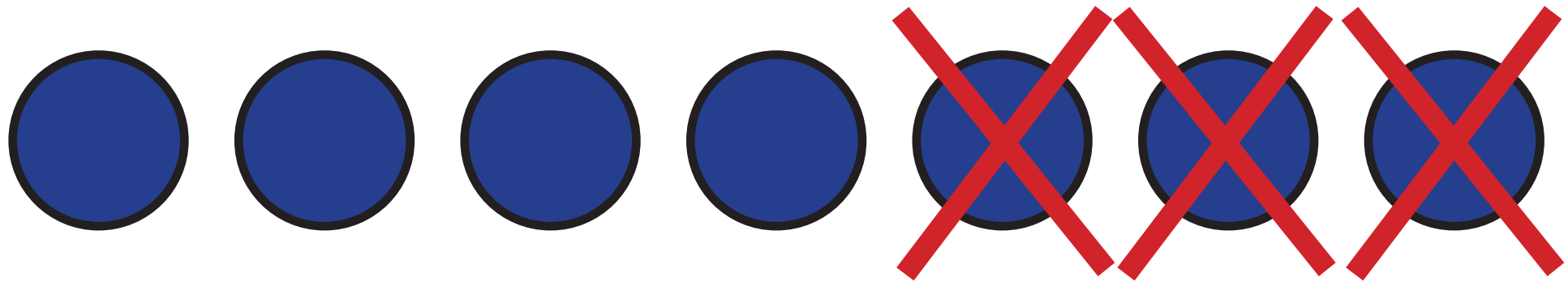
Year 6

$$45.2 + 49.9 = 95.1$$

$$45.2 + 50 - 0.1$$

$$95.2 - 0.1 = 95.1$$

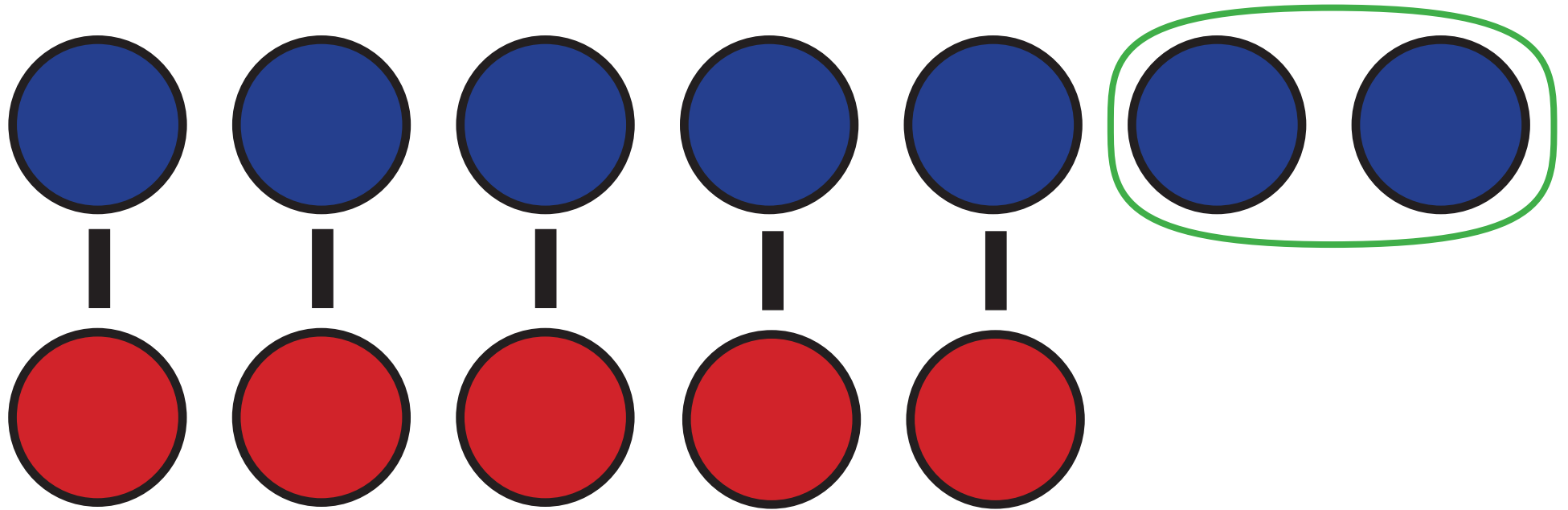
S1: Objects



$$7 - 3 = 4$$

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

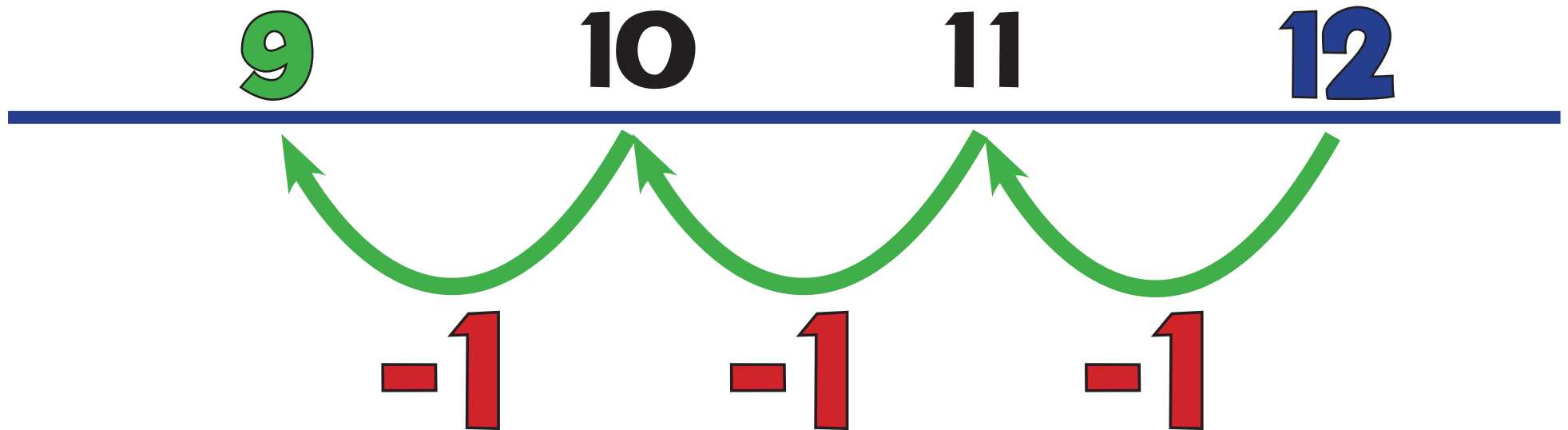
S2: What's the Difference?



$$7 - 5 = 2$$

“How many more is 7 than 5? What is the difference?”

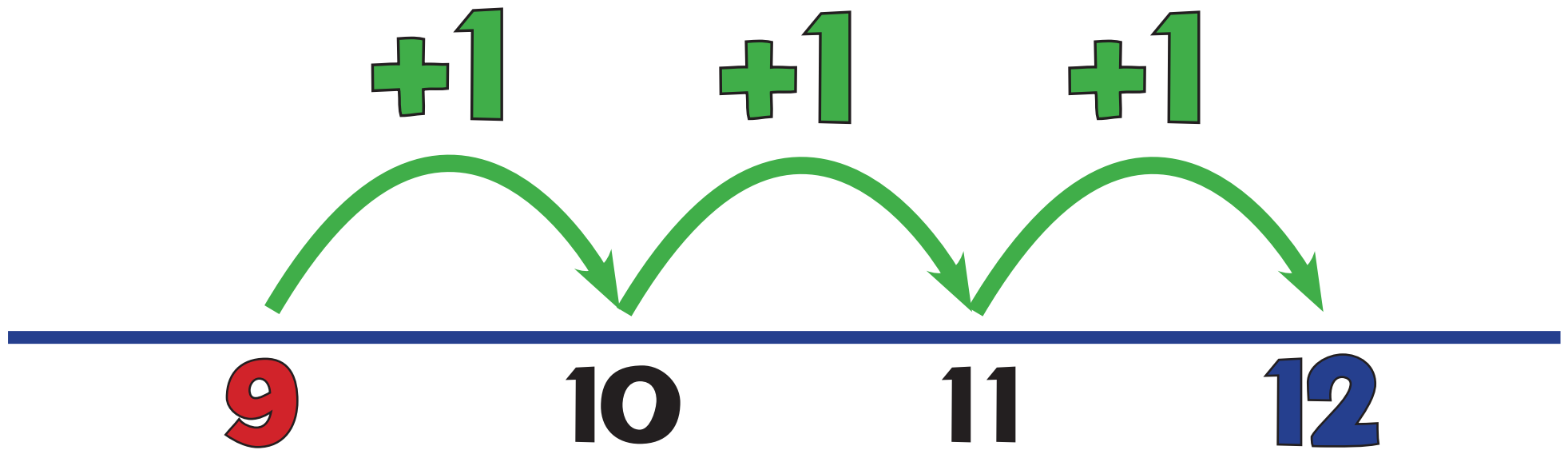
S3: Counting Back



$$12 - 3 = 9$$

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

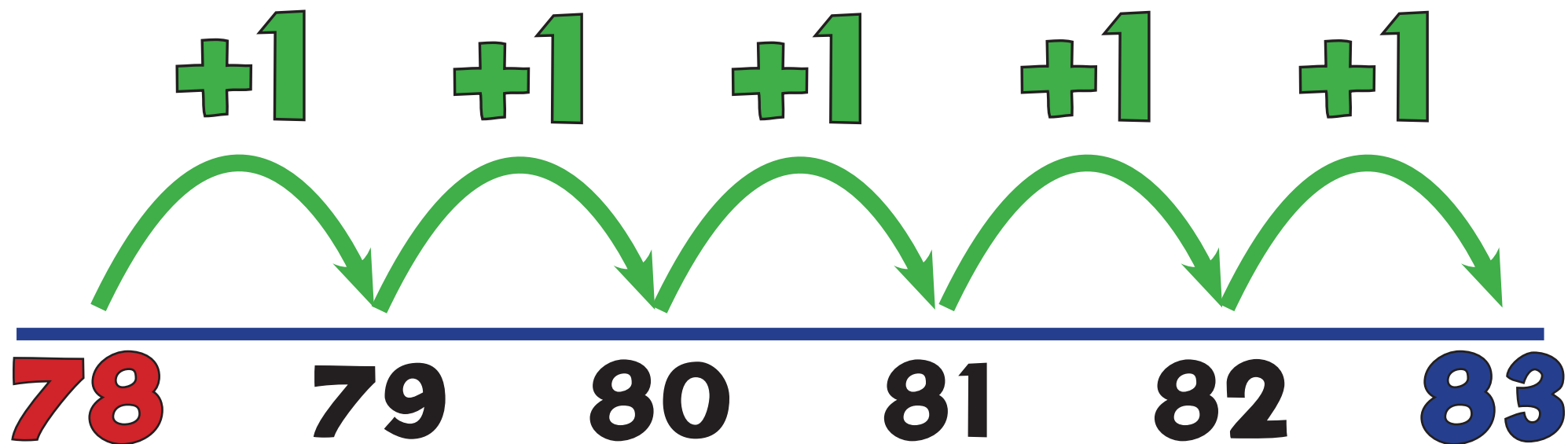
S4: Counting On



$$12 - 9 = 3$$

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

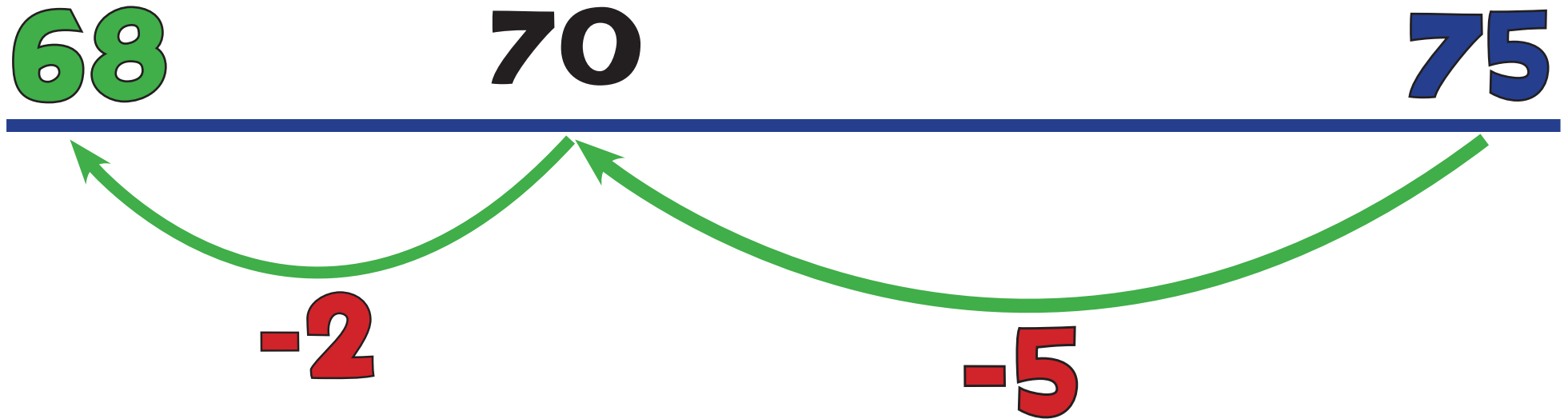
S4a: Counting On



$$83 - 78 = 5$$

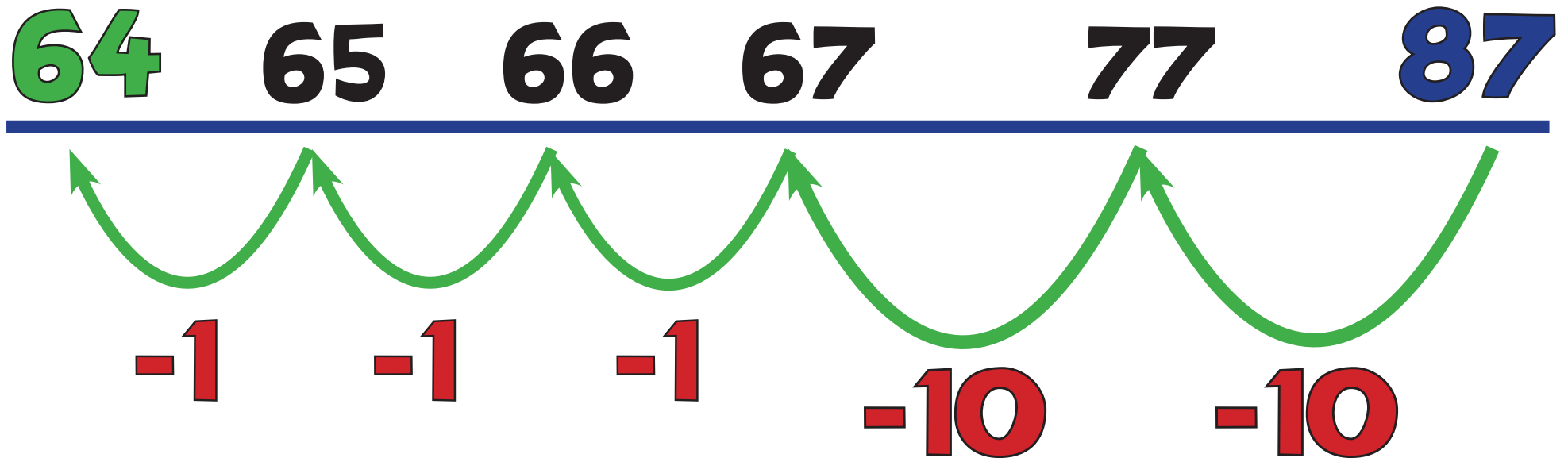
“How many more is **83** than **78**? What is the difference?”

S5: Backwards Boing



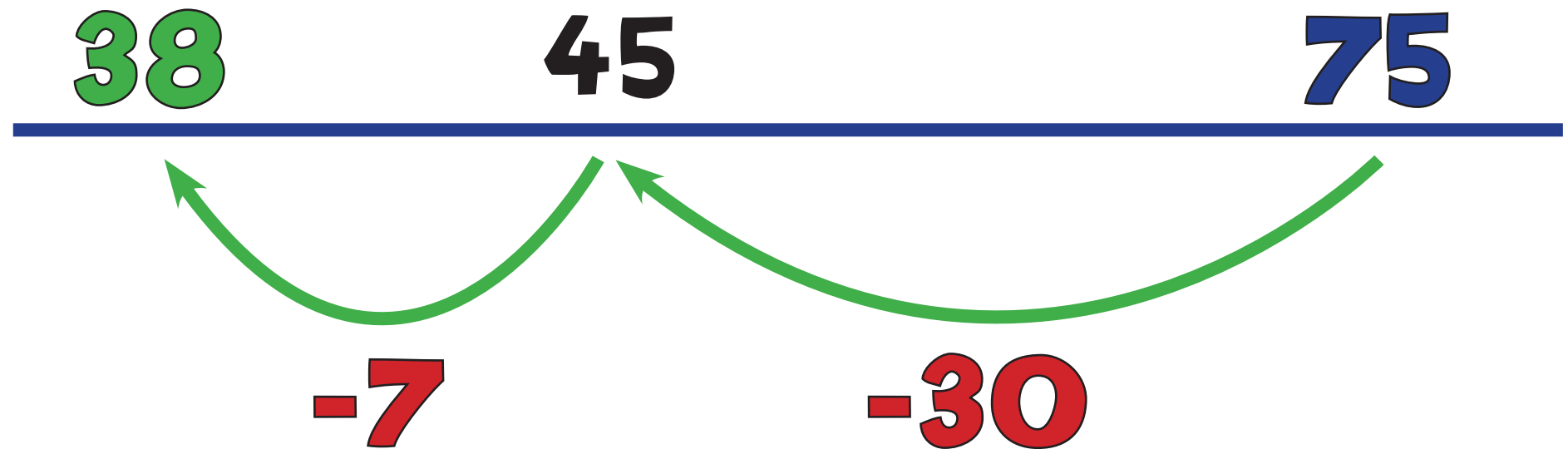
$$75 - 7 = 68$$

S6: Backwards Bounce



$$87 - 23 = 64$$

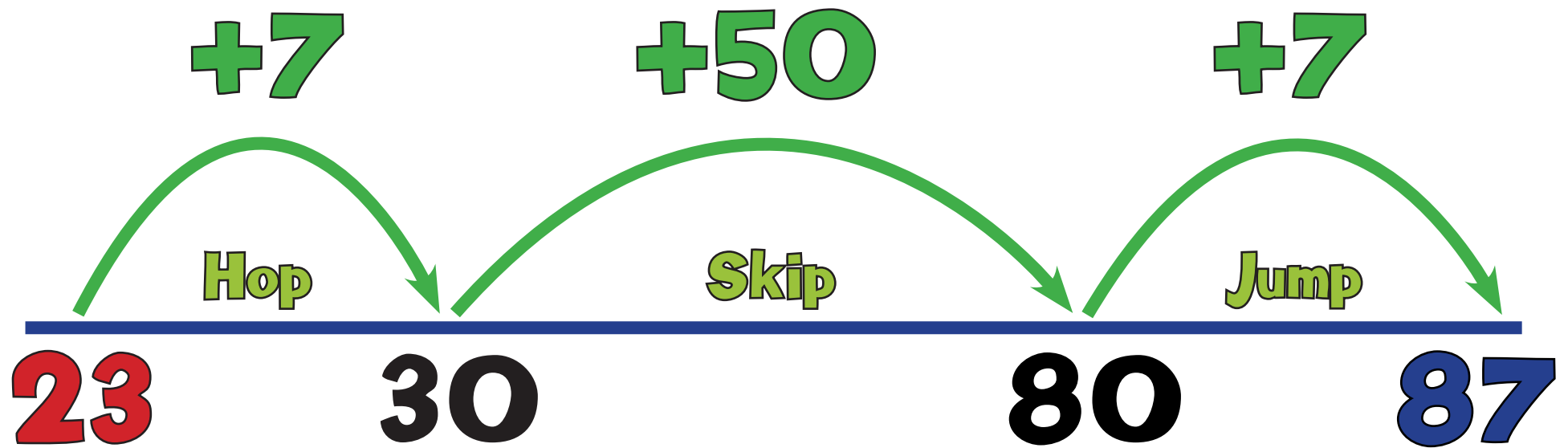
S7: Backwards Jump



$$75 - 37 = 38$$

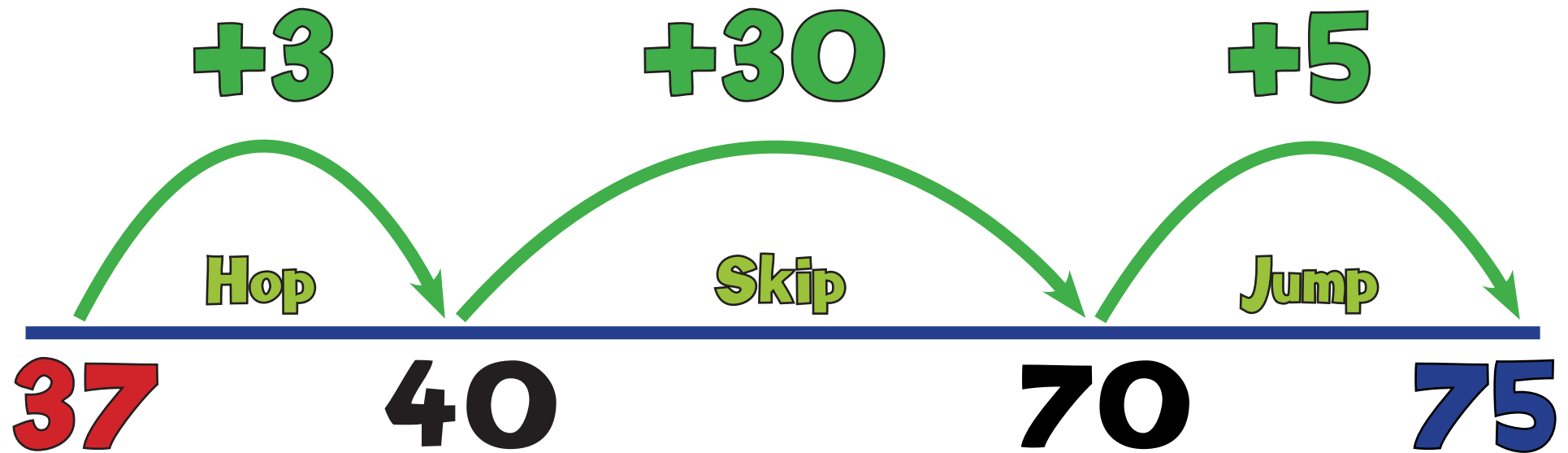
(S8: Triple Jump!)

Additional



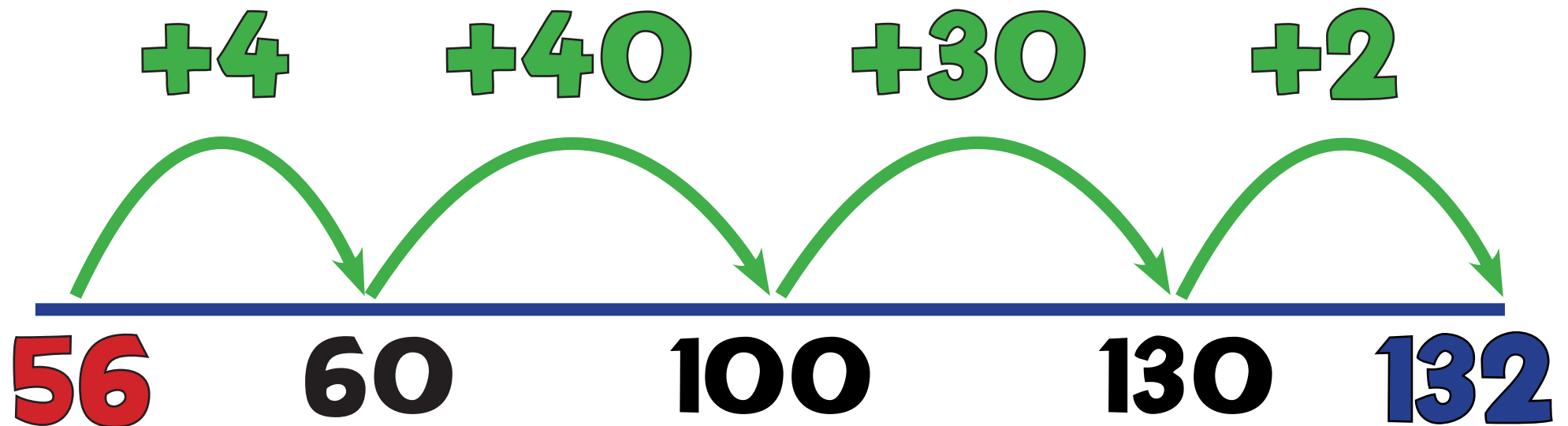
$$87 - 23 = 64$$

S8: Triple Jump!



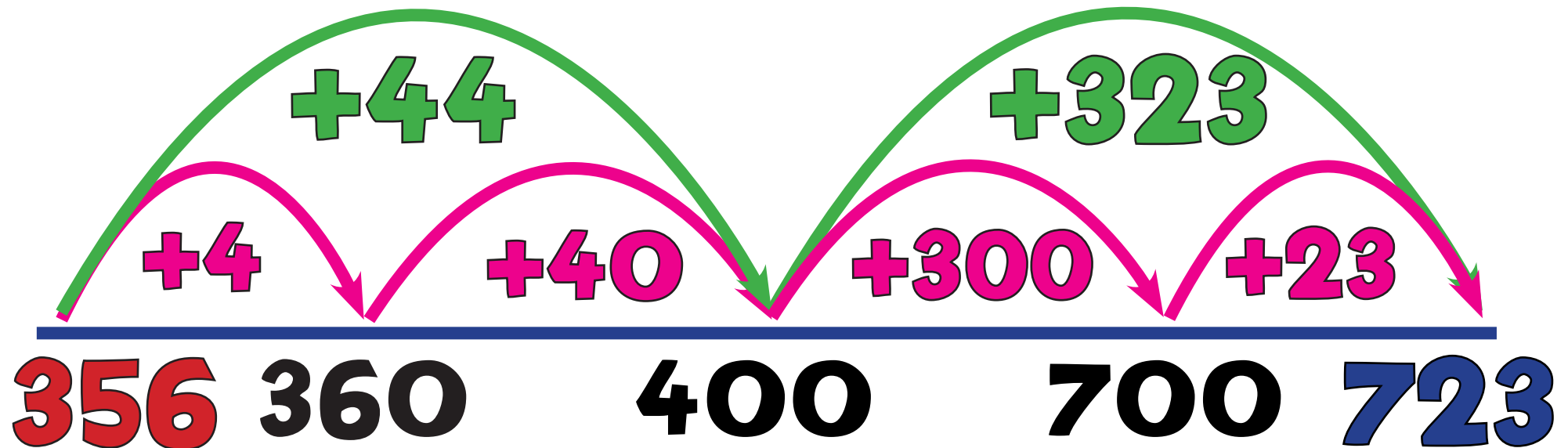
$$75 - 37 = 38$$

S8b: Quad Jump!



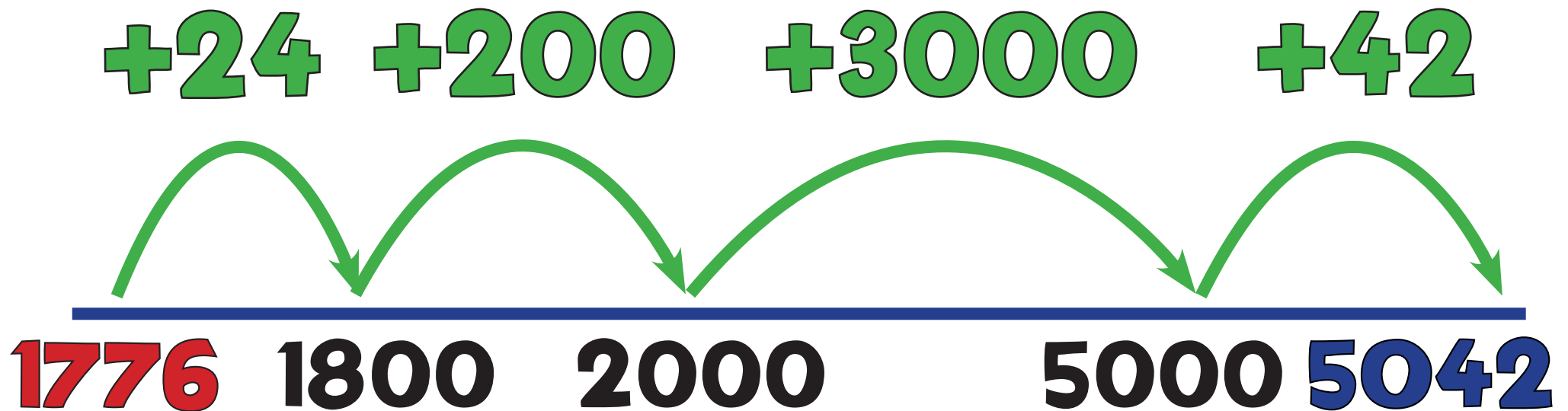
$$132 - 56 = 76$$

S8c: Big Jump!



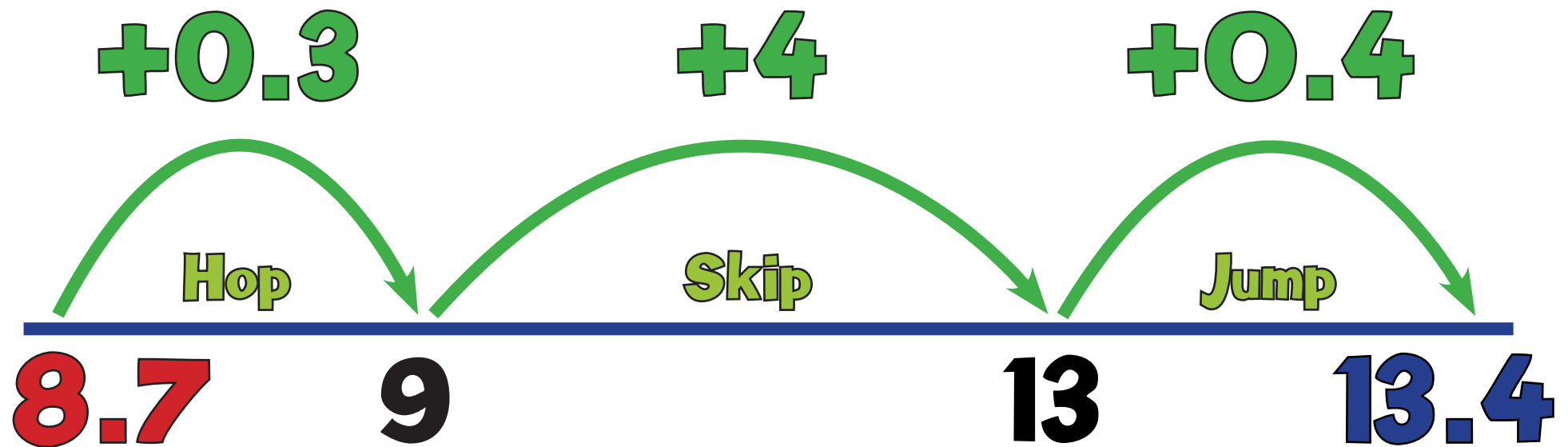
$$723 - 356 = 367$$

S8d: Quad Jump Extreme



$$5042 - 1776 = 3266$$

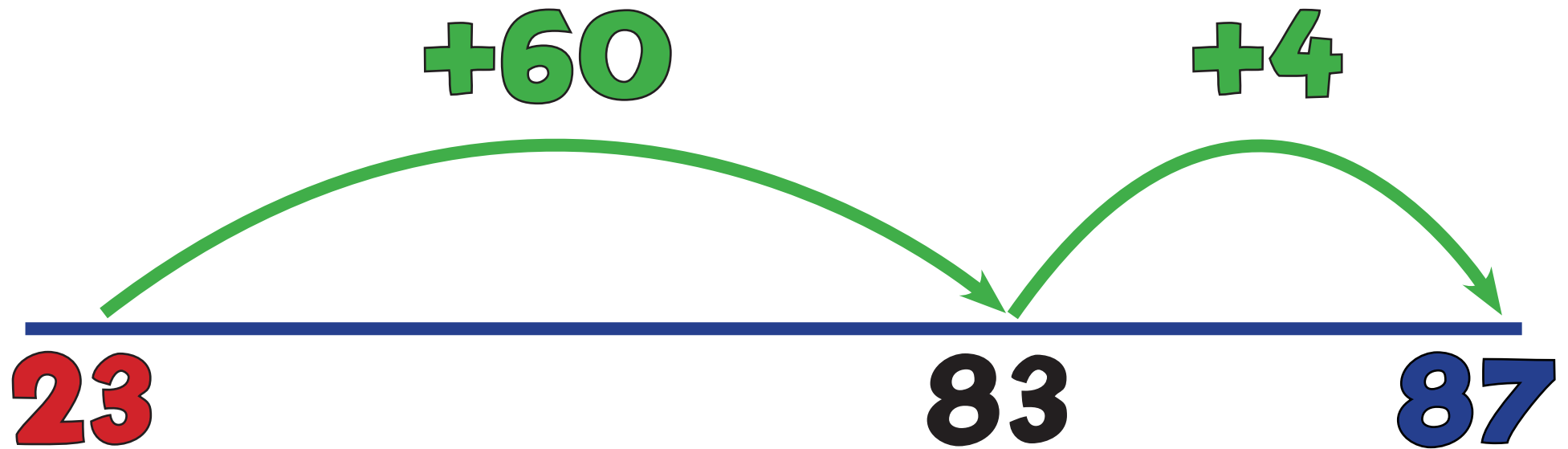
S8f: Decimal T-J!



$$13.4 - 8.7 = 4.7$$

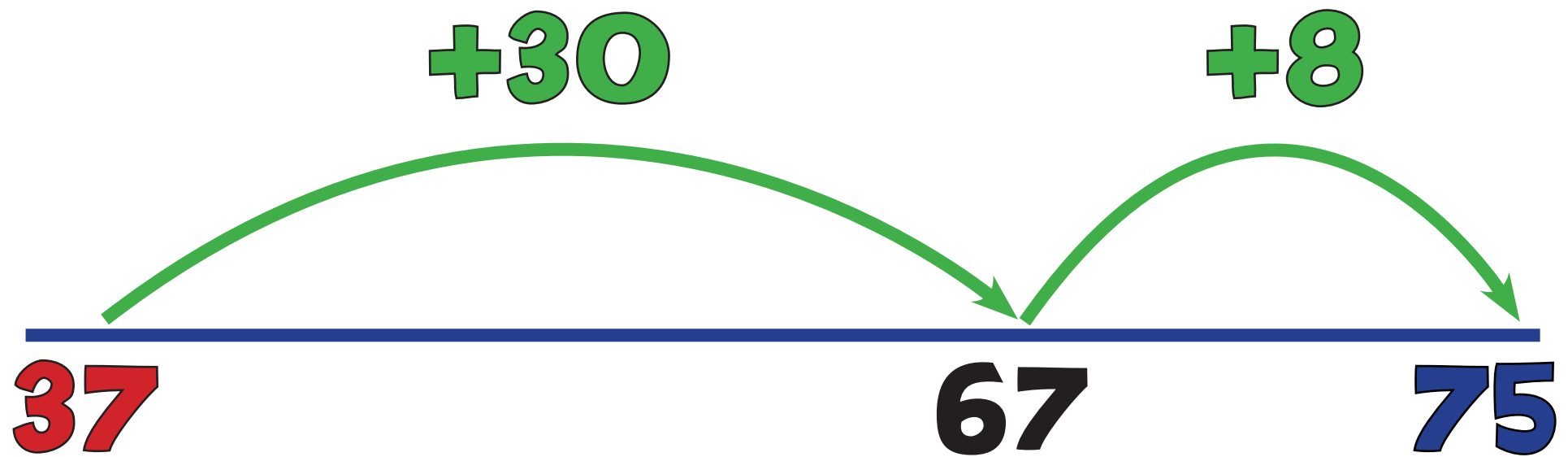
(S9: 10s Jump, 1s Jump!)

Additional



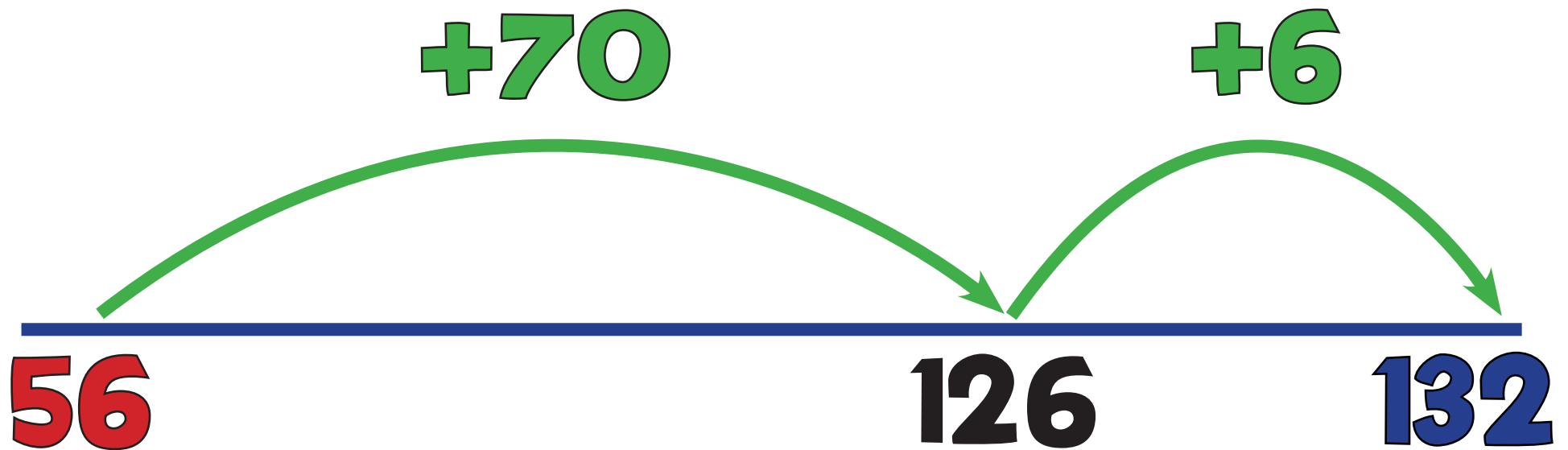
$$87 - 23 = 64$$

S9: 10s Jump, 1s Jump!



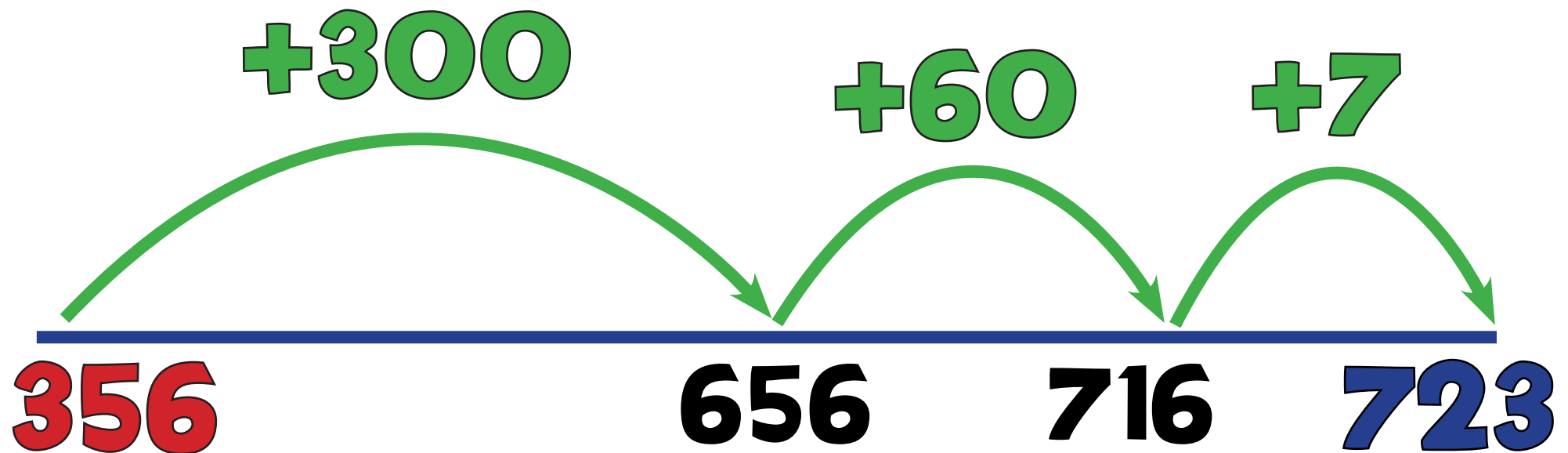
$$75 - 37 = 38$$

S9b: 10s Jump, 1s Jump!



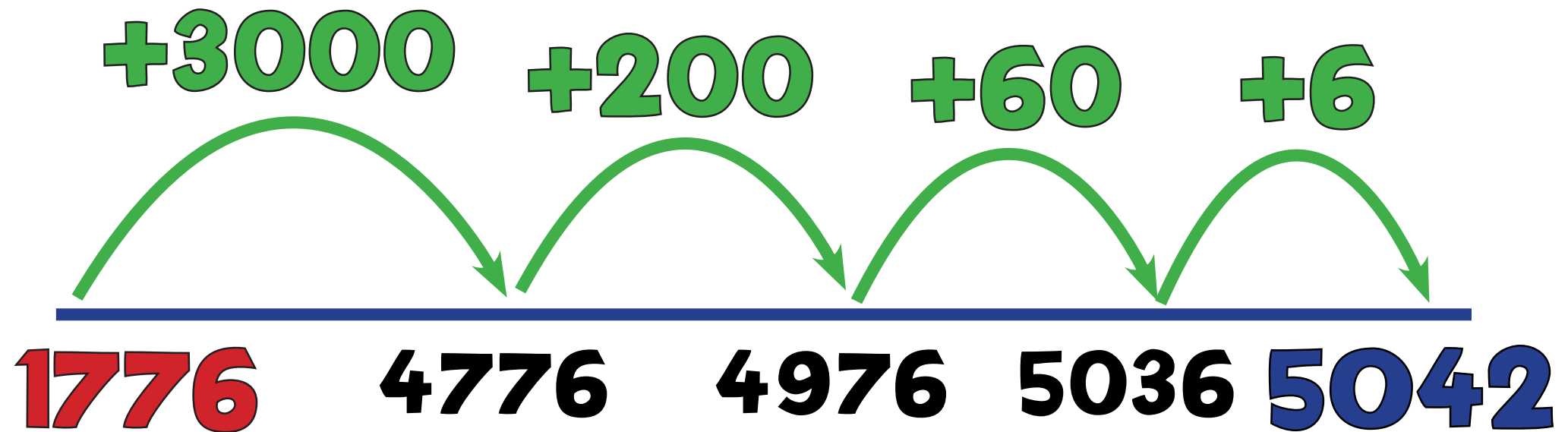
$$132 - 56 = 76$$

S9c: 100s, 10s, 1s Jump



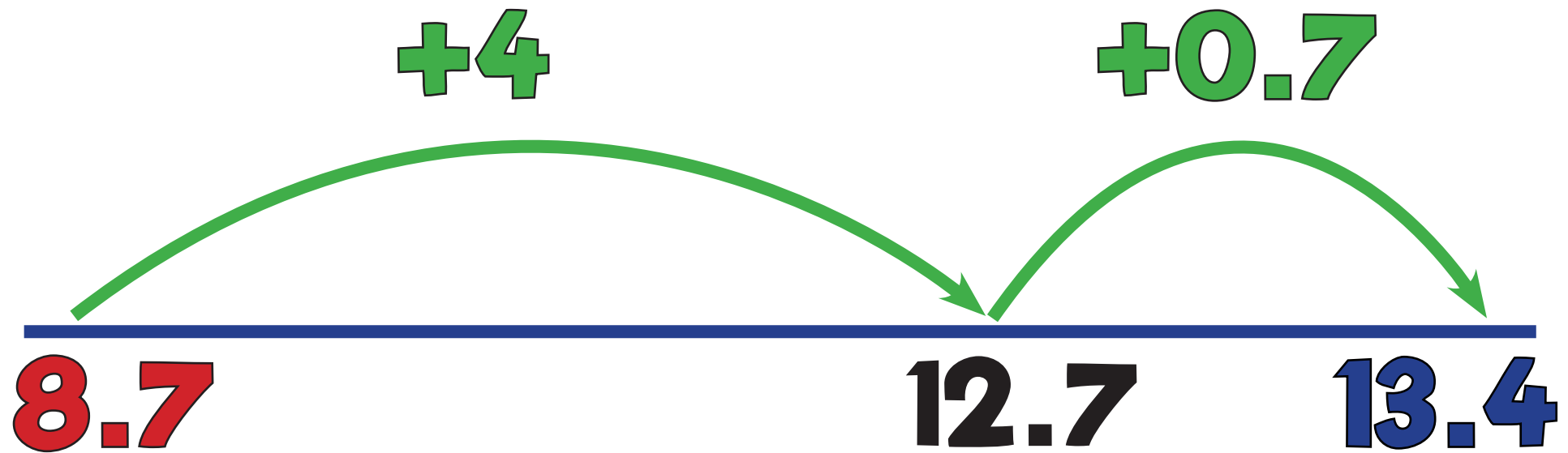
$$723 - 356 = 367$$

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
<hr/>	
60	4

(S10: Expanded Column)

Additional: a Subtraction

$$75 - 37 = 38$$

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

(S10: Expanded Column)

Additional:b Subtraction

$$132 - 56 = 38$$

⁰ 100	¹ 30	¹ 2
-	50	6
<hr/>		
	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

$$\begin{array}{r} \text{T} \quad \text{U} \\ 87 \\ - 23 \\ \hline 64 \end{array}$$

(S11: Column Subtraction)

Additional:a

$$\begin{array}{r} \text{T} \quad \text{U} \\ 6715 \\ - 37 \\ \hline 38 \end{array}$$

(S11: Column Subtraction)

Additional:b

	H	T	U
	0	12	1
	1	3	2
-		5	6
		7	6

S11: Column Subtraction

	H	T	U
	6	11	1
	7	2	3
-	3	5	6
	3	6	7

S11d: Column Subtraction

	Th	H	T	U
	4	19	13	1
	5	0	4	2
-	1	7	7	6
	3	2	6	6

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	
<hr/>							
	3	1	5	4	7	3	
<hr/>							

S11e: Column Subtraction

$$\begin{array}{r} \text{T} \quad \text{U} \quad \frac{1}{10} \\ 0 \quad 12 \quad 1 \\ \text{13.4} \\ - 8.7 \\ \hline 4.7 \end{array}$$

S11g: Column Subtraction

$$\begin{array}{r}
 \text{T} \quad \text{U} \quad \frac{1}{10} \quad \frac{1}{100} \\
 \begin{array}{r}
 \text{6} \quad \text{11} \quad \text{13} \quad \text{1} \\
 \text{72.43} \\
 \text{47.85} \\
 \hline
 \text{24.58}
 \end{array}
 \end{array}$$



S11h: Column Subtraction

With Decimals

$$12.4 - 5.97 = 6.43$$

	T	U	■	$\frac{1}{10}$	$\frac{1}{100}$
				13	1
	11				
	1	2	.	4	0
-		5	.	9	7
<hr style="border: 1px solid red;"/>					
6.43					
<hr style="border: 1px solid red;"/>					

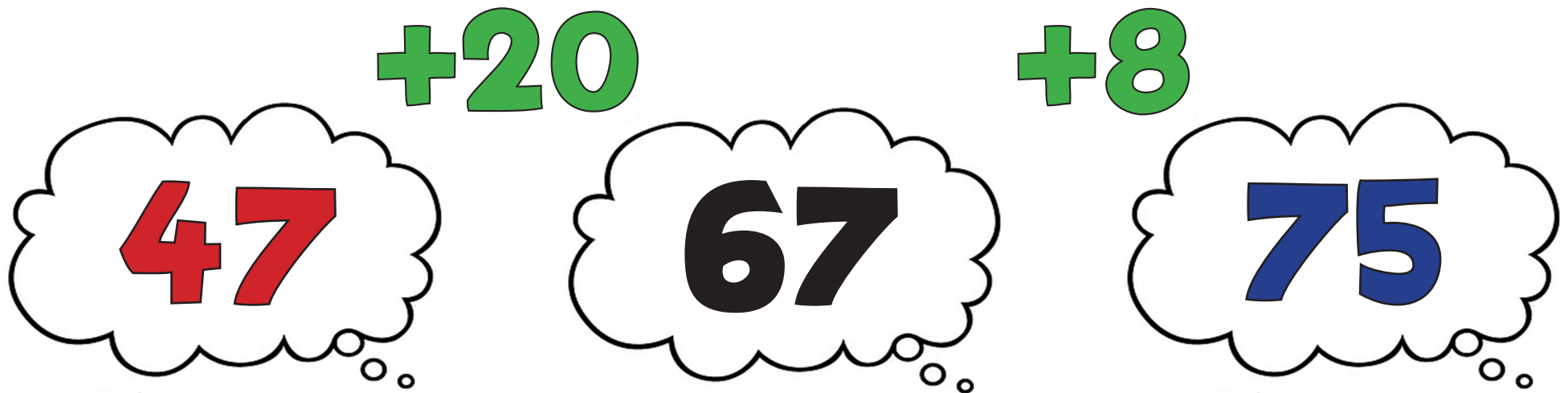
MS1: Counting Back

$$46 - 21 = 25$$



MS2: Counting On

$$75 - 47 = 28$$



MS2a: Counting On

$$75 - 47 = 28$$



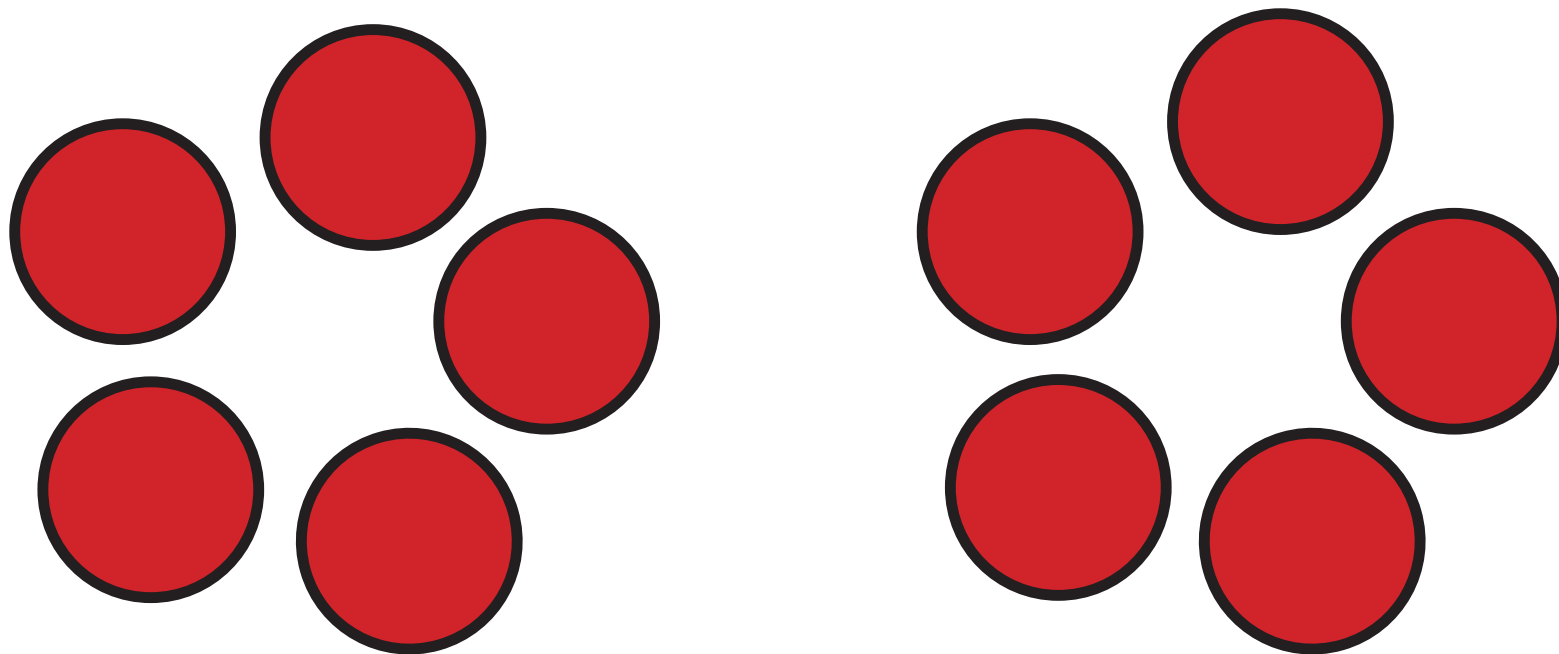
MS3: Round & Adjust

$$84 - 29 = 55$$

$$84 - 30 + 1$$

$$54 + 1 = 55$$

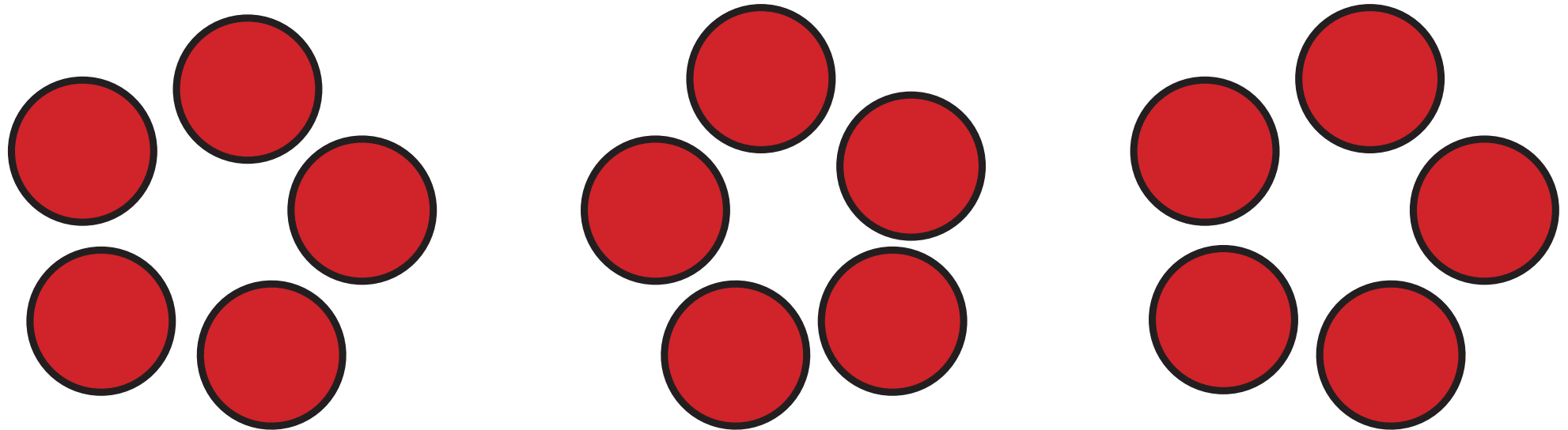
(M1: Groups)



“2 groups of 5 counters makes 10 counters altogether”

M1: Repeated Addition

(Groups)

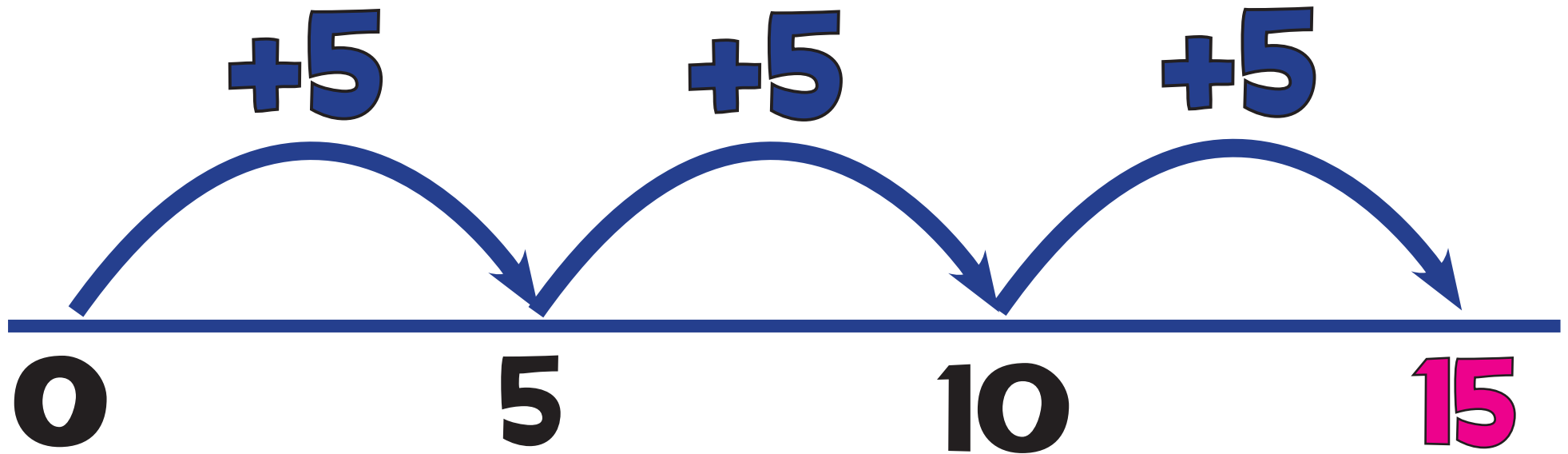


$$5 \times 3 = 5 + 5 + 5 = 15$$

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

M2: Repeated Addition

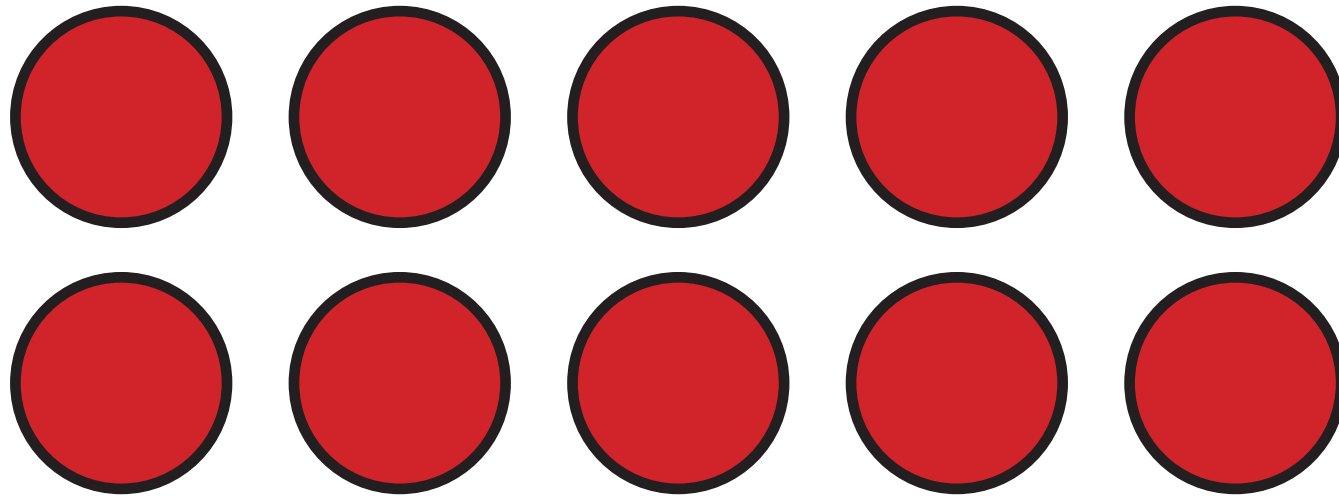
(Number Line)



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

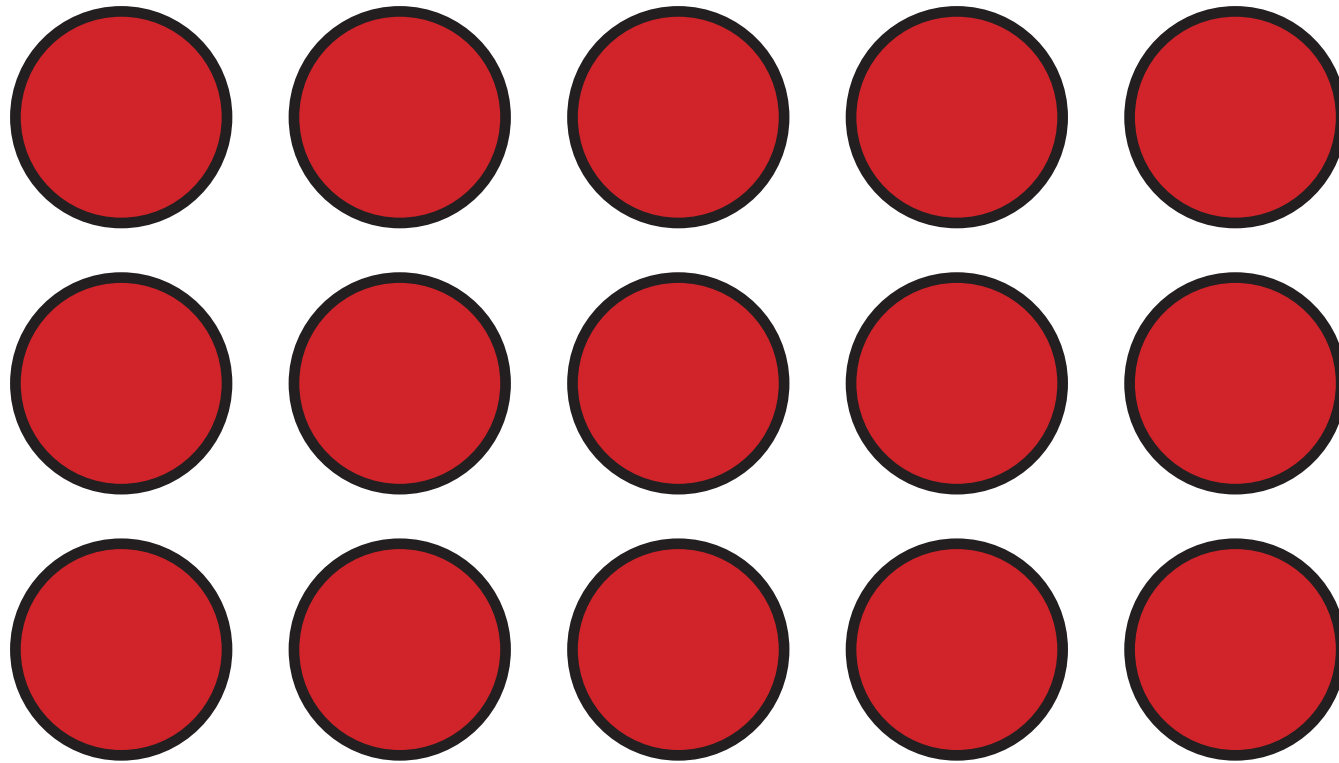
"5 times 3" means "5, 3 times!"

(M3: Arrays)



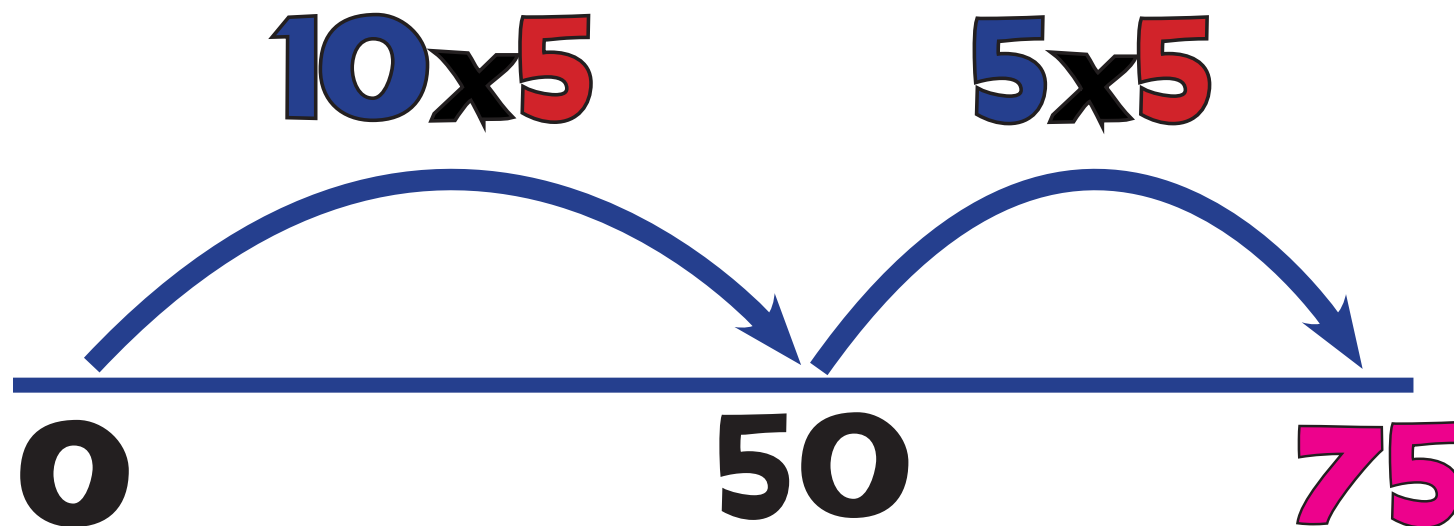
“2 groups of 5 counters” or “5 groups of 2 counters” - “10 counters altogether”

M3: Arrays



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

M4: Multi Boing!



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

$$15 \times 5 = 75$$

M4a: Partitioning

$$15 \times 5 = 75$$

$$10 \times 5 = 50$$

$$5 \times 5 = 25$$

$$50 + 25 = 75$$

M5: Grid Method

Short Multiplication

$$15 \times 5 = 75$$

x	10	5
5	50	25

$$50 + 25 = 75$$

M5a: Grid Method

Short Multiplication

$$43 \times 6 = 258$$

x	40	3
6	240	18

$$240 + 18 = 258$$

M5b: Grid Method

Short Multiplication

$$147 \times 4 = 588$$

x	100	40	7
4	400	160	28

$$400 + 160 + 28 = 588$$

M6: Expanded Column

Additional

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \\ 15 \\ \times \quad 5 \\ \hline 25 \\ 50 \\ \hline 75 \end{array}$$

(5 x 5)

(5 x 10)

M6: Expanded Column

Additional a

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \\ 43 \\ \times \quad 6 \\ \hline 18 \quad (6 \times 3) \\ 240 \quad (6 \times 40) \\ \hline 258 \end{array}$$

M6: Expanded Column

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \\ 1 \quad 4 \quad 7 \\ \times \quad \quad 4 \\ \hline \end{array}$$

$$\begin{array}{r} 28 \\ 160 \\ 400 \\ \hline 588 \end{array} \quad \begin{array}{l} (4 \times 7) \\ (4 \times 40) \\ (4 \times 100) \end{array}$$

(M7: Column Multiplication)

Additional

H	T	U
	1	5
x		5
<hr/>		
	7	5
<hr/>		
		2

(M7: Column Multiplication)

Additional:a

H	T	U
	4	3
x		6
<hr/>		
2	5	8
<hr/>		
	1	

M7: Column Multiplication

	H	T	U
	1	4	7
x			4
<hr/>			
	5	8	8
<hr/>			
	1	2	

M8: Grid Method

Long Multiplication

$$43 \times 65 = 2795$$

x	40	3
60	2400	180
5	200	15

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

M8a: Grid Method

Long Multiplication

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

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

$$14580 + 1944 = 16,524$$

M8b: Grid Method

Long Multiplication

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

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

$$= 12,180$$

$$= 1,624$$

$$12180 + 1624 = 13,804$$

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

$$47.2 \times 3 = 141.6$$

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

$$24.3 \times 2.5 = 60.75$$

x	20	4	0.3
2	40	8	0.6
0.5	10	2	0.15

$$= 48.6$$

$$= 12.15$$

$$48.6 + 12.15 = 60.75$$

M9: Long Multiplication

Column

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

(5 x 43)

(60 x 43)

M9a: Long Multiplication Column

	Th	H	T	U	
		2	4	3	
		x			
			6	8	
		<hr/>			
		1	9	4	4
		1	3	2	
	1	4	5	8	0
	1	2	1		
	<hr/>				
	1	6	5	2	4
	<hr/>				
			1		

(8 x 243)

(60 x 243)

M9b: Long Multiplication

Column

	Th	H	T	U	
		2	0	3	
x			6	8	
		<hr/>			
		1	6	2	4
		1		2	
+	1	2	1	8	0
	1		1		
	<hr/>				
	1	3	8	0	4
			1		

(8 x 203)

(60 x 203)

M9c: Column Multiplication

$$\begin{array}{r} \text{T} \quad \text{U} \quad \frac{1}{10} \\ 3.6 \\ \times 4 \\ \hline 14.4 \\ \hline 2 \end{array}$$

M9d: Column Multiplication

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \quad \frac{1}{10} \\ 47.2 \\ \times 3 \\ \hline 141.6 \\ \hline 2 \end{array}$$

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		
	<hr/>					
	1	2	.	1	5	(0.5 x 24.3)
	1	2		1		
+	4	8	.	6	0	(2 x 24.3)
	<hr/>					
	6	0	.	7	5	
	<hr/>					
	1					

M9g Long Multiplication

Column

	Th	H	T	U	
	3	7	8	6	
x			4	8	
	<hr/>				
	3	0	2	8	8
		6	6	4	
+	1	5	1	4	4
	1	3	3	2	
	<hr/>				
	1	8	1	7	2
	<hr/>				
			1		

(8 x 3786)

(40 x 3786)

MM1: Jump!

x100

x10

÷10

÷100

Th H T U ■ $\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$

3400

340

34

3.4

0.34

MM1a: Jump!

TTh Th H T U ■ $\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$ $\frac{1}{10000}$

x1000

63400

x100

6340

x10

634

63.4

÷10

6.34

÷100

0.634

÷1000

0.0634

MM2: Re-ordering

$$\begin{array}{rcl} (9 \times 2) & \times & 5 \\ 18 & \times & 5 = 90 \end{array}$$

$$\begin{array}{rcl} (9 \times 5) & \times & 2 \\ 45 & \times & 2 = 90 \end{array}$$

$$\begin{array}{rcl} (2 \times 5) & \times & 9 \\ 10 & \times & 9 = 90 \end{array} *$$

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

$$15 \times 5 = 75$$

$$\begin{array}{c} \text{50} \\ (10 \times 5) \end{array} + \begin{array}{c} \text{25} \\ (5 \times 5) \end{array} = 75$$

MM3a: Partitioning

$$37 \times 4 = 148$$

$$\begin{array}{c} \text{120} \\ (30 \times 4) \end{array} + \begin{array}{c} \text{28} \\ (7 \times 4) \end{array} = 148$$

MM4: Round & Adjust

$$49 \times 3 = 147$$

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

$$150 - 3 = 147$$

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

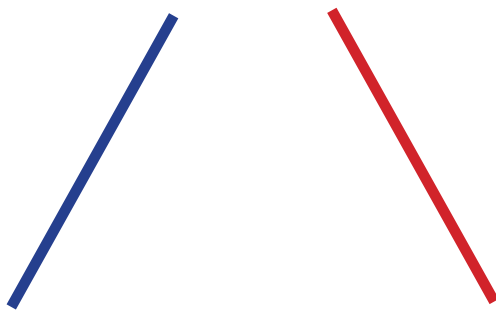
$$£5.99 \times 6 = £35.94$$

$$(£6 \times 6) - (1p \times 6)$$

$$£36 - 6p = £35.94$$

MM5: Doubling

$$\text{Double } 17 = 34$$


$$20 + 14 = 34$$

MM5a: Doubling

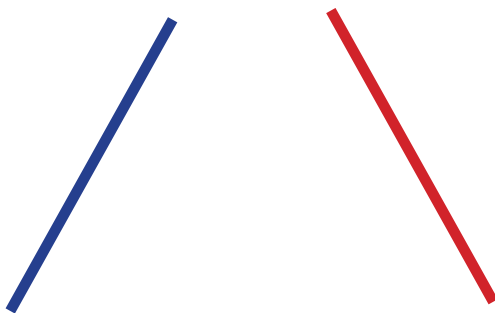
$$\text{Double } 37 = 74$$

A diagram illustrating the doubling of 37. A blue line connects the '3' in '37' to the '6' in '60'. A red line connects the '7' in '37' to the '14' in '14'. The equation $60 + 14 = 74$ is shown below, with '60' in blue, '+' in black, '14' in red, '=' in black, and '74' in pink.

$$60 + 14 = 74$$

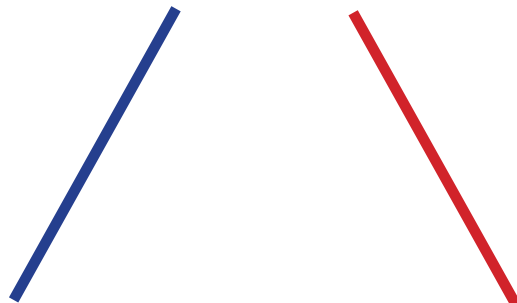
MM5b: Doubling

$$\text{Double } 78 = 156$$


$$140 + 16 = 156$$

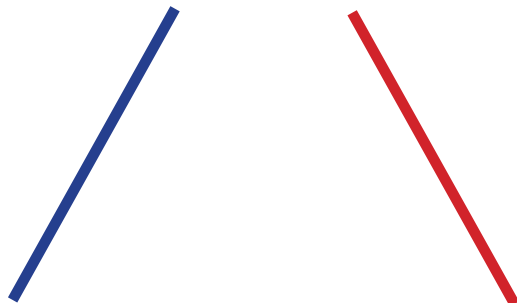
MM5c: Doubling

$$\text{Double } 340 = 680$$


$$600 + 80 = 680$$

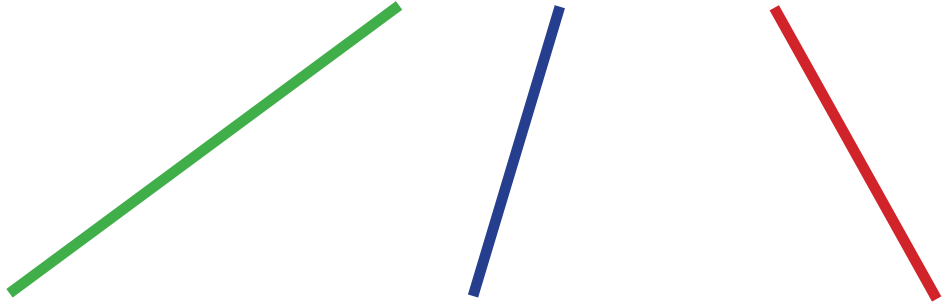
MM5d: Doubling

$$\text{Double } 480 = 960$$


$$800 + 160 = 960$$

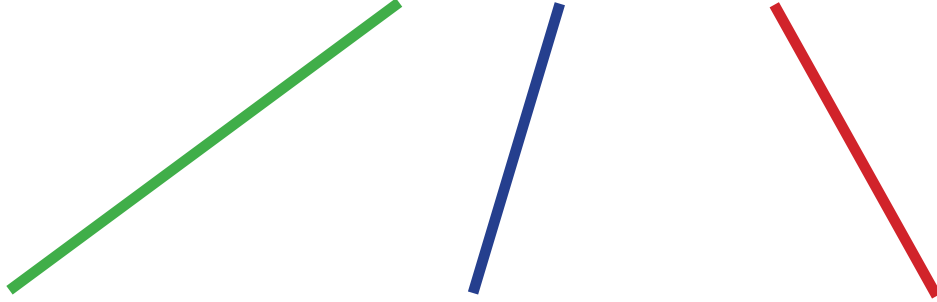
MM5e: Doubling

$$\text{Double } 278 = 556$$


$$400 + 140 + 16 = 556$$

MM5f: Doubling

$$\text{Double } 768 = 1536$$

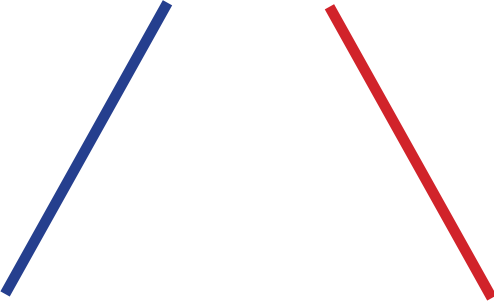


A diagram consisting of three colored lines (green, blue, and red) that originate from the digits 7, 6, and 8 of the number 768 in the equation above. The green line points to the green number 1400, the blue line points to the blue number 120, and the red line points to the red number 16 in the equation below.

$$1400 + 120 + 16 = 1536$$

MM5g: Doubling

Double **3.7** = **7.4**


$$\mathbf{6} + \mathbf{1.4} = \mathbf{7.4}$$

MM6: Doubling Table Facts

$$\begin{array}{l} 16 \times 7 = 112 \\ (8 \times 2) \end{array}$$

$$\begin{array}{ccc} 8 \times 7 = 56 & & \\ \downarrow & & \downarrow \times 2 \\ 16 \times 7 = 112 & & \end{array}$$

MM7: Doubling Up

$$36 \times 8 = 112$$

$$\text{Double } 36 = 72 \quad (36 \times 2)$$

$$\text{Double } 72 = 144 \quad (36 \times 4)$$

$$\text{Double } 144 = 288 \quad (36 \times 8)$$

MM7a: Doubling Up

$$125 \times 16 = 2000$$

$$\text{Double } 125 = 250 \quad (125 \times 2)$$

$$\text{Double } 250 = 500 \quad (125 \times 4)$$

$$\text{Double } 500 = 1000 \quad (125 \times 8)$$

$$\text{Double } 1000 = 2000 \quad (125 \times 16)$$

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

$$56 \times 25 = 1400$$

$$56 \times 100 = 5600$$

$$5600 \div 2 = 2800$$

$$2800 \div 2 = 1400$$

MM9: Doubling & Halving

$$45 \times 14$$

$$90 \times 7 = 630$$

MM9a: Doubling & Halving

$$36 \times 25$$

$$18 \times 50$$

$$9 \times 100 = 900$$

MM9b: Doubling & Halving

$$26 \times 32$$

$$52 \times 16$$

$$104 \times 8 = 832$$

$$208 \times 4 \text{ etc.}$$

MM10: Factorising

$$32 \times 15 = 480$$

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

$$160 \times 3 = 480$$

MM10a: Factorising

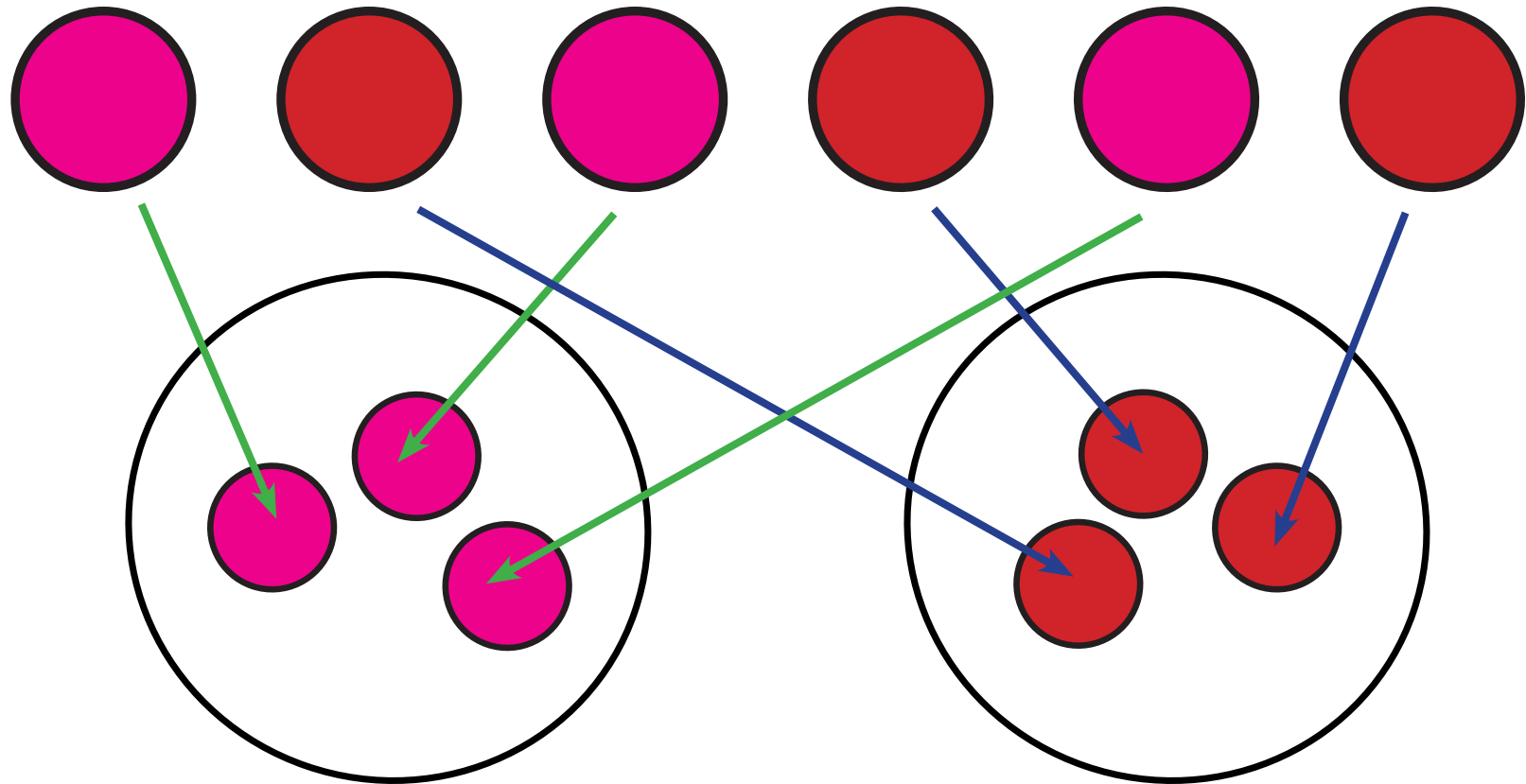
$$52 \times 24 = 1248$$

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

The diagram shows the factorization of 24 into 4 and 6, and the multiplication of 52 by 4 to get 208. Lines connect the 24 in the first equation to the 4 and 6 in the second equation. Lines also connect the 52 in the second equation to the 208 in the third equation.

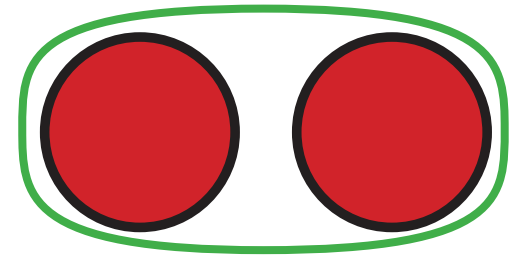
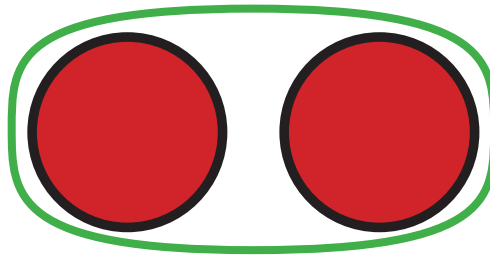
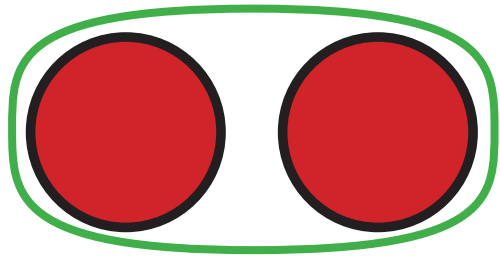
$$208 \times 6 = 1248$$

D1: Sharing (Concept)



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

D2: Grouping (Concept)



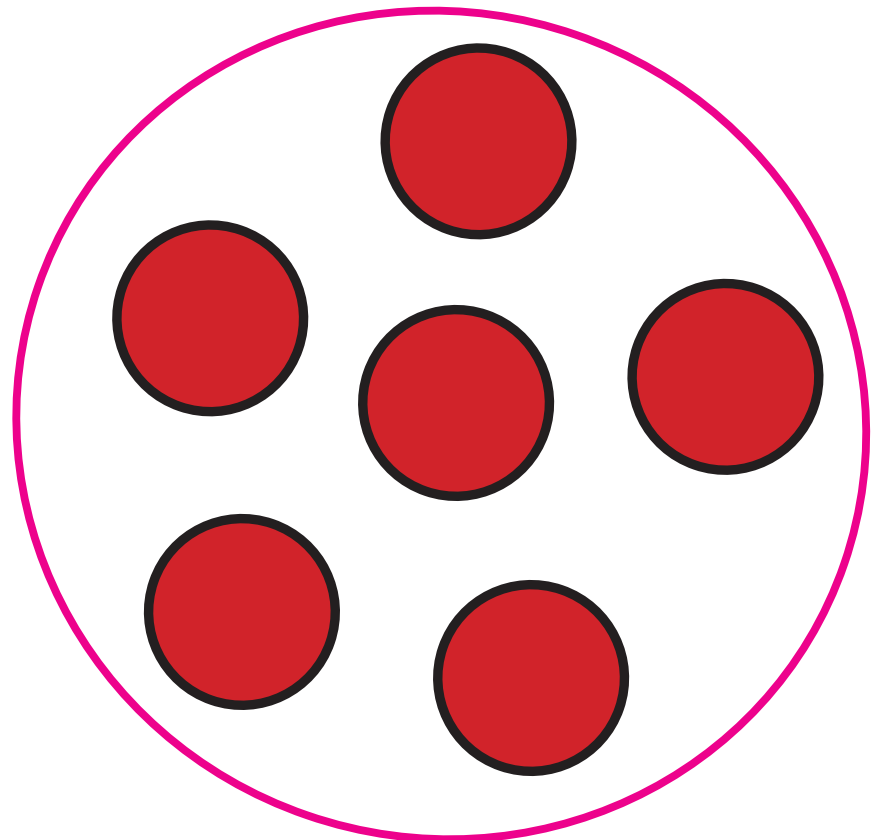
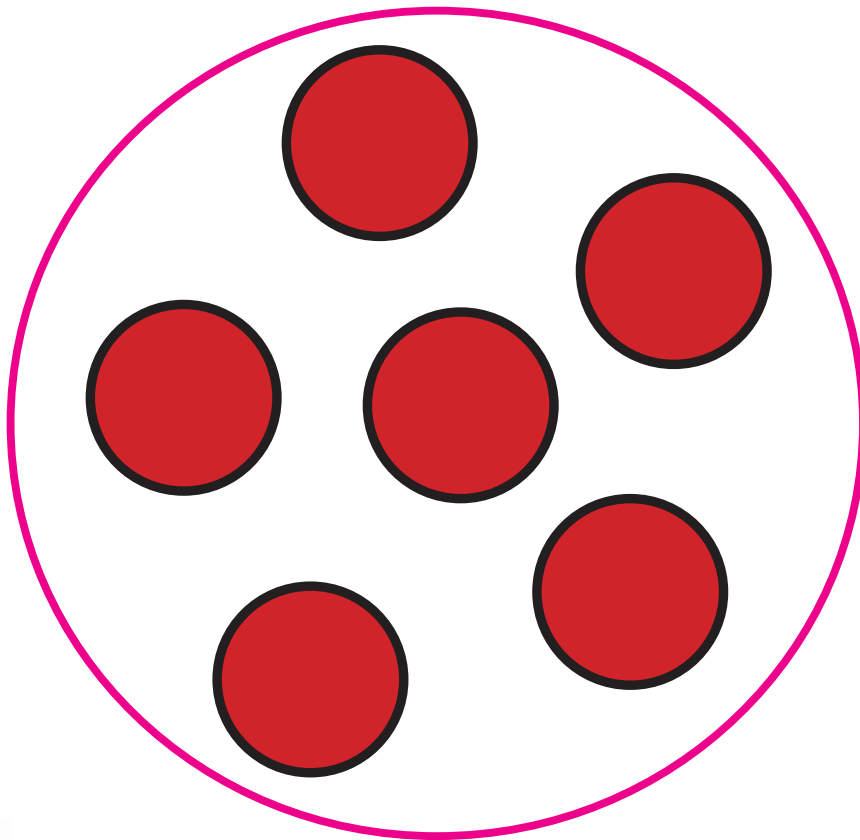
“How many groups of 2 can I make out of 6?”

Answer: 3

D3: Division as Sharing

$$12 \div 2 = 6$$

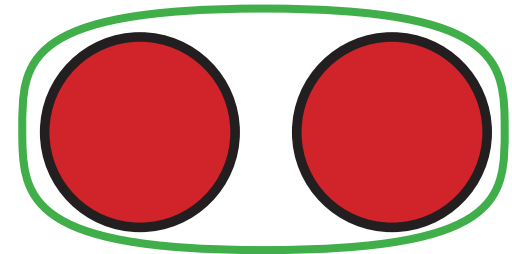
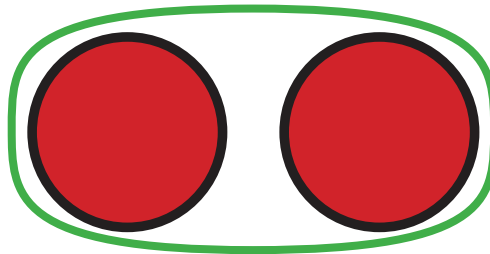
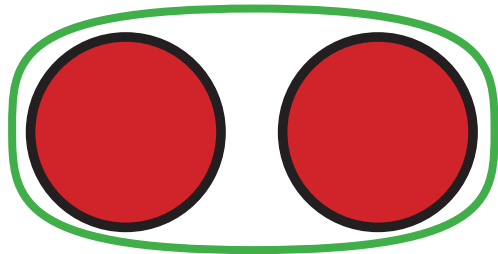
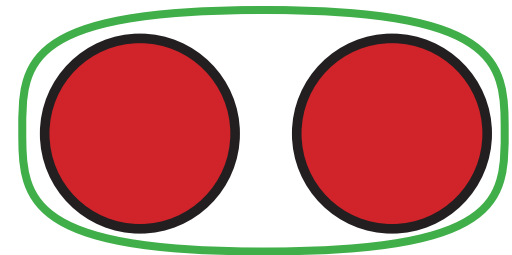
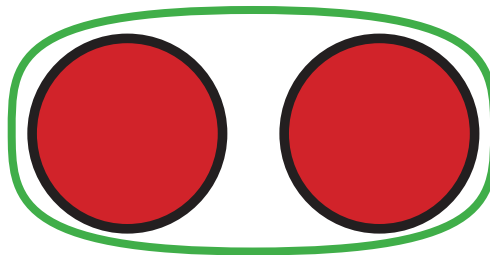
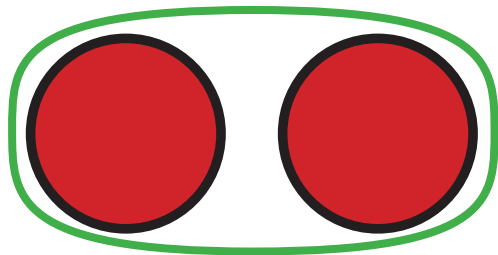
"If I share 12 into 2 equal amounts, how many in each group?" Answer: 6



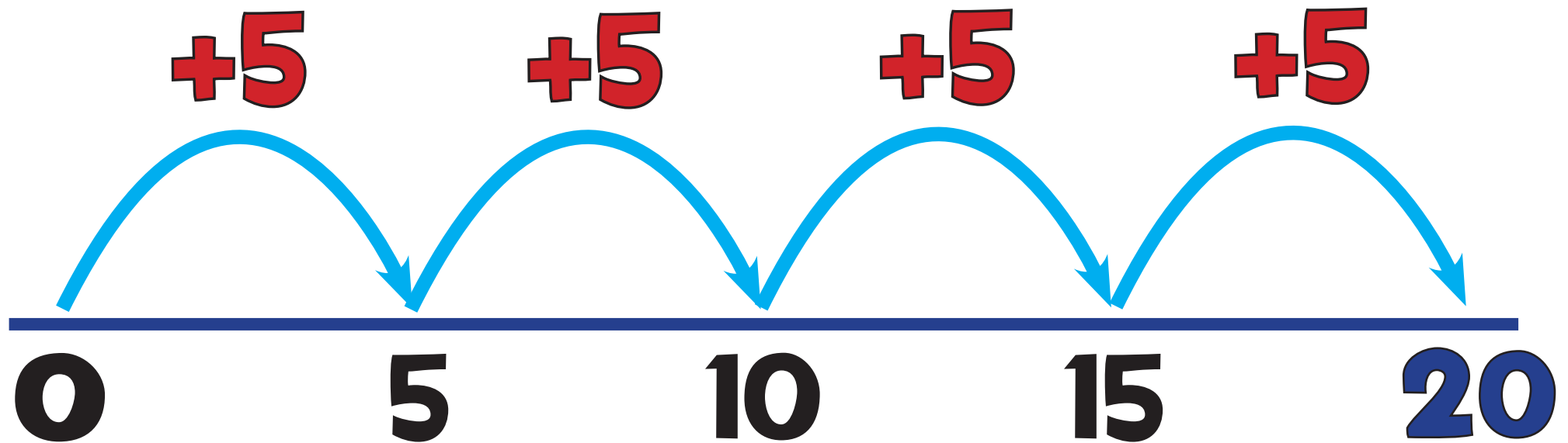
D4: Division as Grouping

$$12 \div 2 = 6$$

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



D5: Grouping on a Number Line



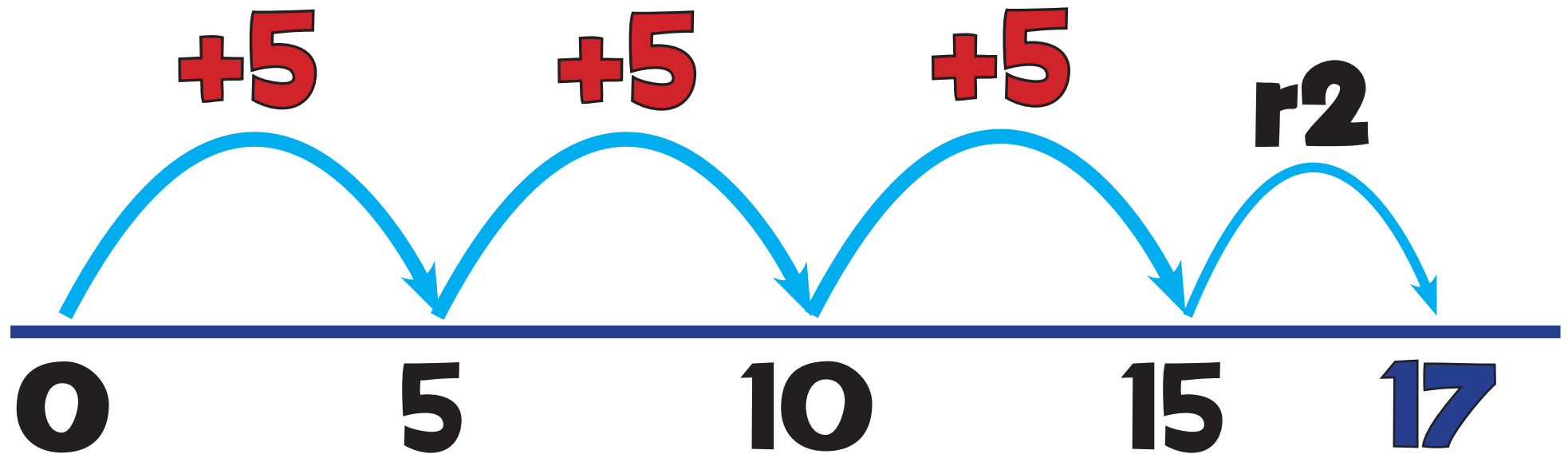
"How many 5s in 20?"

Answer: 4

$$20 \div 5 = 4$$

D5a: Grouping on a Number Line

Remainders



$$17 \div 5 = 3r2$$

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

D6: Grouping Grid

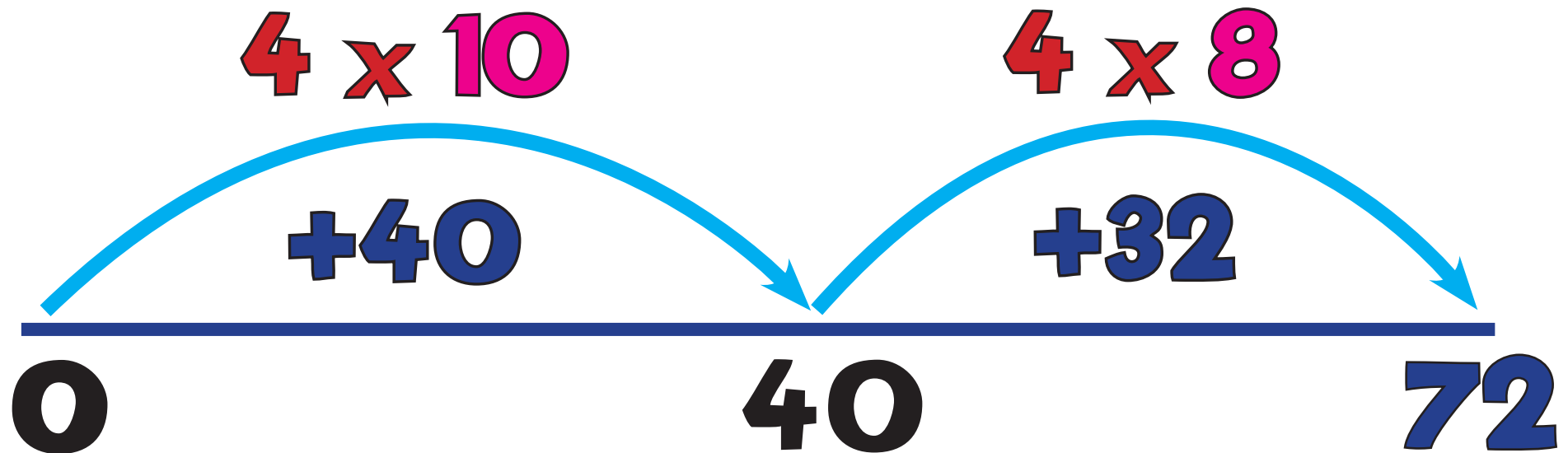
4	4	4	4	4
4				3

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

Answer: 6r3

$$27 \div 4 = 6r3$$

D7: Chunking Jump

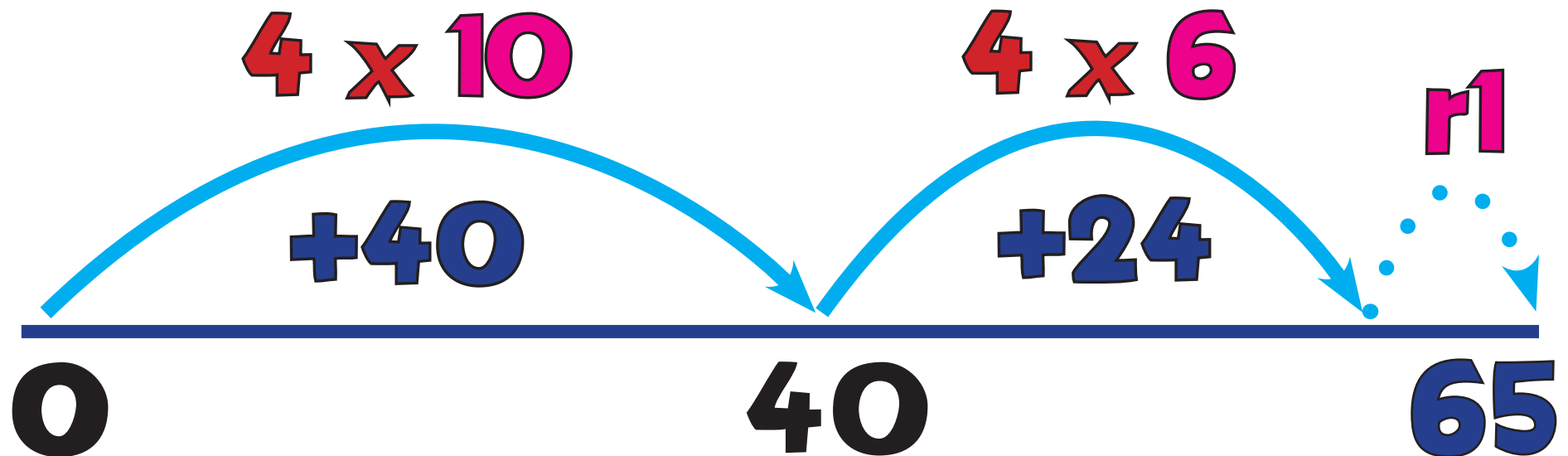


"How many 4s in 72?"
Answer: 18

$$72 \div 4 = 18$$

D7a: Chunking Jump

Remainders



“How many **4s** in **65**?”
Answer: **16r1**

$$65 \div 4 = 16r1$$

D8: Find the Hunk!

$$72 \div 4 = 18$$

The
Hunk!

40

+

Chunk

32



10

+



8

$\div 4$

= 18

D8a: Find the Hunk!

Remainders

$$65 \div 4 = 16r1$$

The
Hunk!

40



10

Chunk

+ 25



+ 6r1

$\div 4$

= 16r1

D9: Mega Hunk!

$$136 \div 4 = 34$$

Mega
Hunk!

120

+

16



30

+

4

=

34

Chunk

$\div 4$

D9c: Mega Hunk!

Remainders

$$394 \div 6 = 65r4$$

Mega
Hunk!

Chunk

360

+

34



60

+

5r4

÷ 6

= 65r4

D9d: Mega Hunk!

$$591 \div 3 = 197$$

Mega Hunk!		Mega Hunk!		Chunk		
300	+	270	+	21		
↓		↓		↓		÷ 3
100	+	90	+	7	=	197

D9e: Mega Hunk!

$$5978 \div 7 = 854$$

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

D9f: Mega Hunk!

$$846 \div 5 = 169r1$$

Mega Hunk!		Mega Hunk!		Chunk		
500	+	300	+	46		
↓		↓		↓		
100	+	60	+	9r1	÷ 3	= 169r1

D9g: Mega Hunk!

Simple Long Division

$$480 \div 15 = 32$$

Mega
Hunk!

Chunk

450

+

30



÷ 15

30

+

2

=

32

D9h: Decimal Hunk!

$$18 \div 1.5 = 12$$

The
Hunk!

15



10

Chunk

+

3



+

2

$\div 1.5$

= 12

D9i: Decimal Hunk!

$$87.5 \div 7 = 12.5$$

Mega
Hunk!

70

Chunk

+ 14

Chunk

+ 3.5



10



2



÷ 7

+ 0.5 = 12.5

(D10: Short Division)

Additional

$$72 \div 4 = 18$$

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

(D10: Short Division)

Additional:a

$$65 \div 4 = 16r1$$

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

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

$$591 \div 3 = 197$$

$$\begin{array}{r} 197 \\ 3 \overline{) 591} \end{array}$$

D10e: Short Division

$$5978 \div 7 = 854$$

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

Diagram illustrating the short division process for $5978 \div 7$. The divisor 7 is shown on the left. The dividend 5978 is shown with place value markers: 5 is in the thousands place (labeled 5), 9 is in the hundreds place (labeled 3), 7 is in the tens place (labeled 2), and 8 is in the units place. The quotient 854 is shown above the dividend, aligned with the hundreds, tens, and units places respectively.

D10f: Short Division

Different Remainders

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

3 4 1

$$846 \div 5$$

$$\begin{array}{r} 169r1 \\ 5 \overline{) 846} \end{array}$$

3 4

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

3 4

D10i: Short Division

$$87.5 \div 7 = 12.5$$

$$\begin{array}{r} 12.5 \\ 7 \overline{) 87.5} \end{array}$$

Visual representation of short division for $87.5 \div 7$. The divisor 7 is shown on the left. The dividend 87.5 is shown below the division bar. The quotient 12.5 is shown above the division bar. The division process is indicated by a pink bracket and the numbers 1 and 3 above the 8 and 7 respectively, showing that 7 goes into 87 one time and three times.

(D11: Chunking)

Additional

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

$$72 \div 4 = 18$$

(D11: Chunking)

Additional:a

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

$$65 \div 4 = 16r1$$

D11: Chunking

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

$$136 \div 4 = 34$$

D11b: Chunking

$$\begin{array}{r} 34 \\ 4 \overline{) 136} \\ - 40 \quad (4 \times 10) \\ \hline 96 \\ - 40 \quad (4 \times 10) \\ \hline 56 \\ - 40 \quad (4 \times 10) \\ \hline 16 \\ - 16 \quad (4 \times 2) \\ \hline 0 \end{array}$$

$$136 \div 4 = 34$$

D11c: Chunking

Remainders

$$\begin{array}{r} 65r4 \\ 6 \overline{) 394} \\ \underline{- 360} \quad (6 \times 60) \\ 34 \\ \underline{- 30} \quad (6 \times 5) \\ 4 \end{array}$$

$$394 \div 6 = 65r4$$

D11d: Chunking

Mega Chunk

$$\begin{array}{r} 197 \\ 3 \overline{) 591} \\ - 300 \quad (3 \times 100) \\ \hline 291 \\ - 270 \quad (3 \times 90) \\ \hline 21 \\ - 21 \quad (3 \times 7) \\ \hline 0 \end{array}$$

$$591 \div 3 = 197$$

D11e: Chunking

Mega Chunk

$$\begin{array}{r} 854 \\ 7 \overline{) 5978} \\ - 5600 \quad (7 \times 800) \\ \hline 378 \\ - 270 \quad (7 \times 50) \\ \hline 28 \\ - 28 \quad (7 \times 4) \\ \hline 0 \end{array}$$

$$5978 \div 7 = 854$$

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

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

$$480 \div 15 = 32$$

D11g2: Chunking

Long Division

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

$$480 \div 15 = 32$$

D12: Chunking

Long Division
With Remainders

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

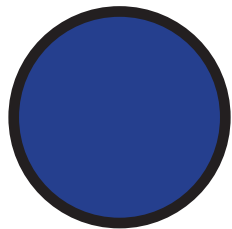
$$983 \div 37 = 26 \text{ r}21$$



D13: Long Division

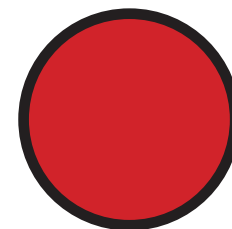
$$\begin{array}{r} 26 \text{ r}21 \\ 37 \overline{) 983} \\ \underline{- 74} \\ 243 \\ \underline{- 222} \\ 21 \end{array}$$

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



Sense of Number Calculation Cards

by Dave Godfrey

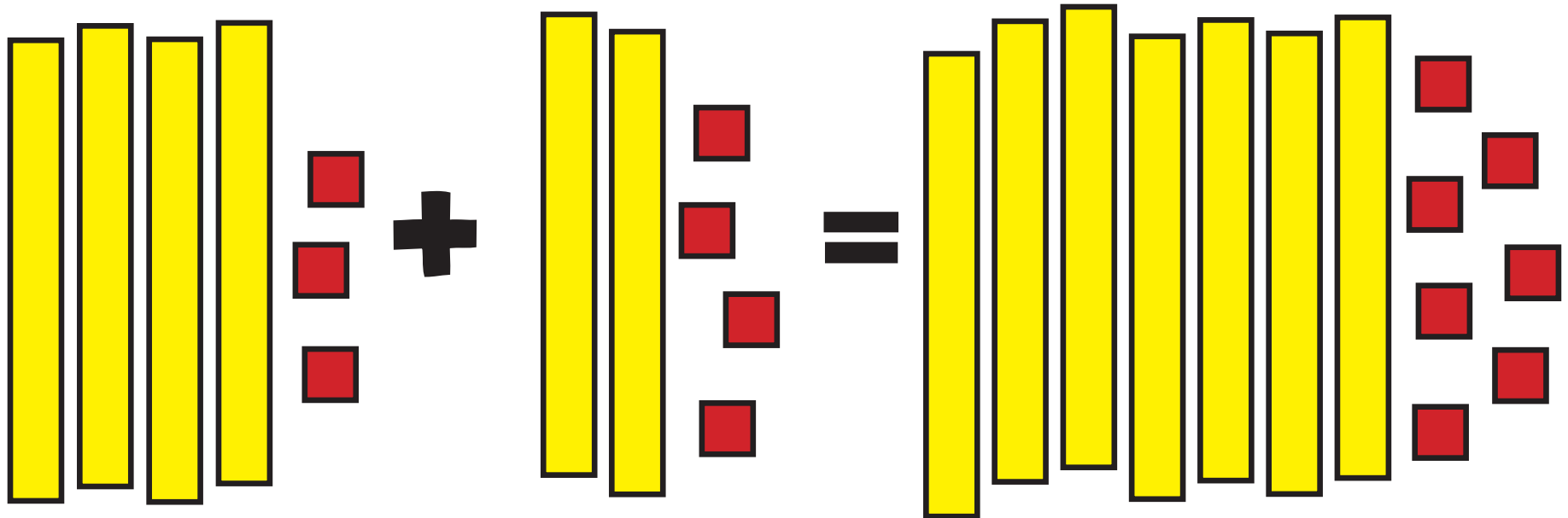


dave@senseofnumber.co.uk Tel: 01904 778848

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

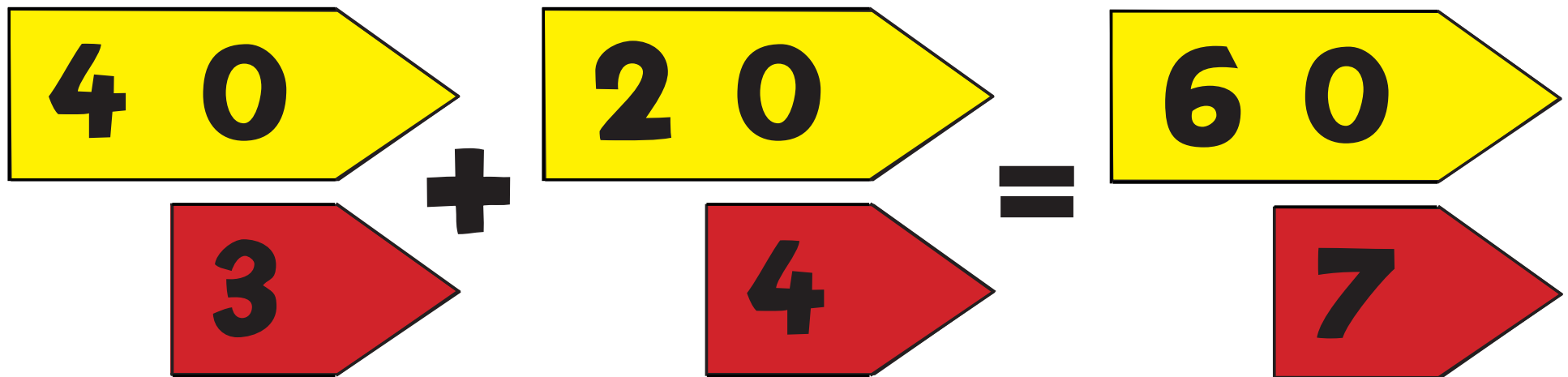
A: Base 10

$$43 + 24 = 67$$



B: Arrow Cards

$$43 + 24 = 67$$



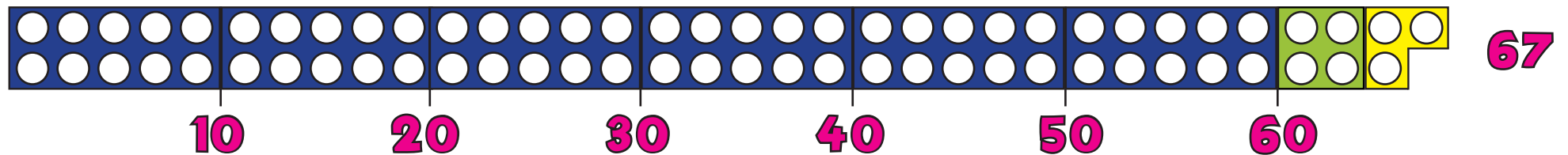
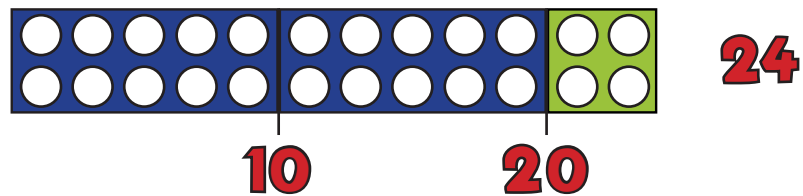
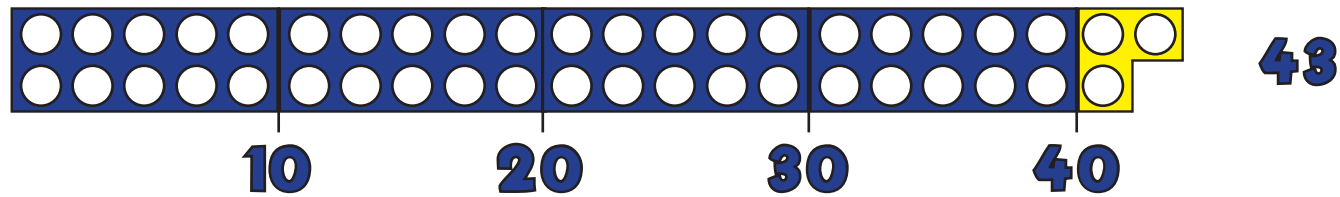
C: Hundred Square

$$43 + 24 = 67$$

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

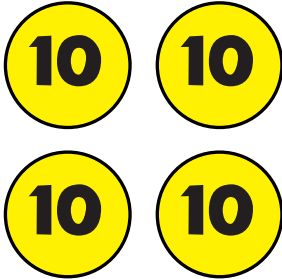
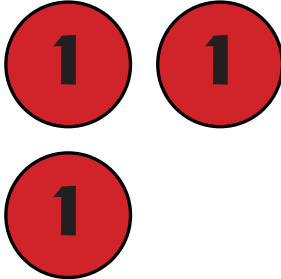

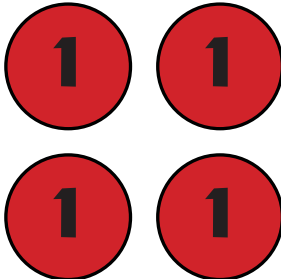
D: Numicon

$$43 + 24 = 67$$



E: Place Value Counters

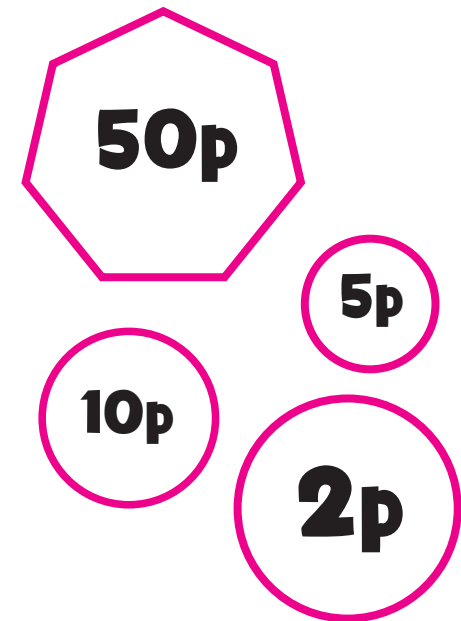
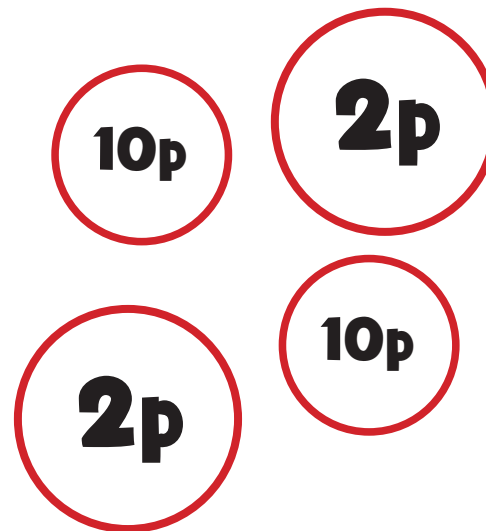
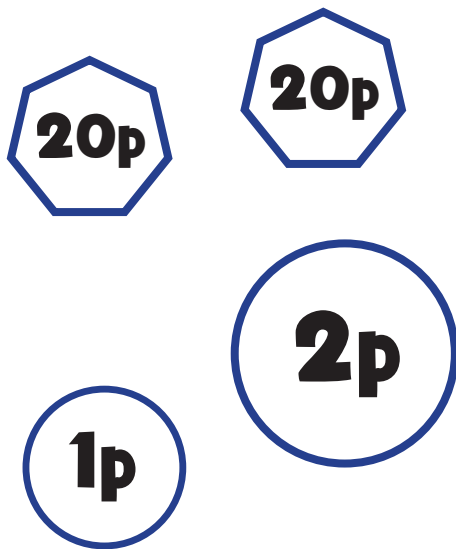
$$43 + 24 = 67$$

10s	1s
	
	
60	7

67

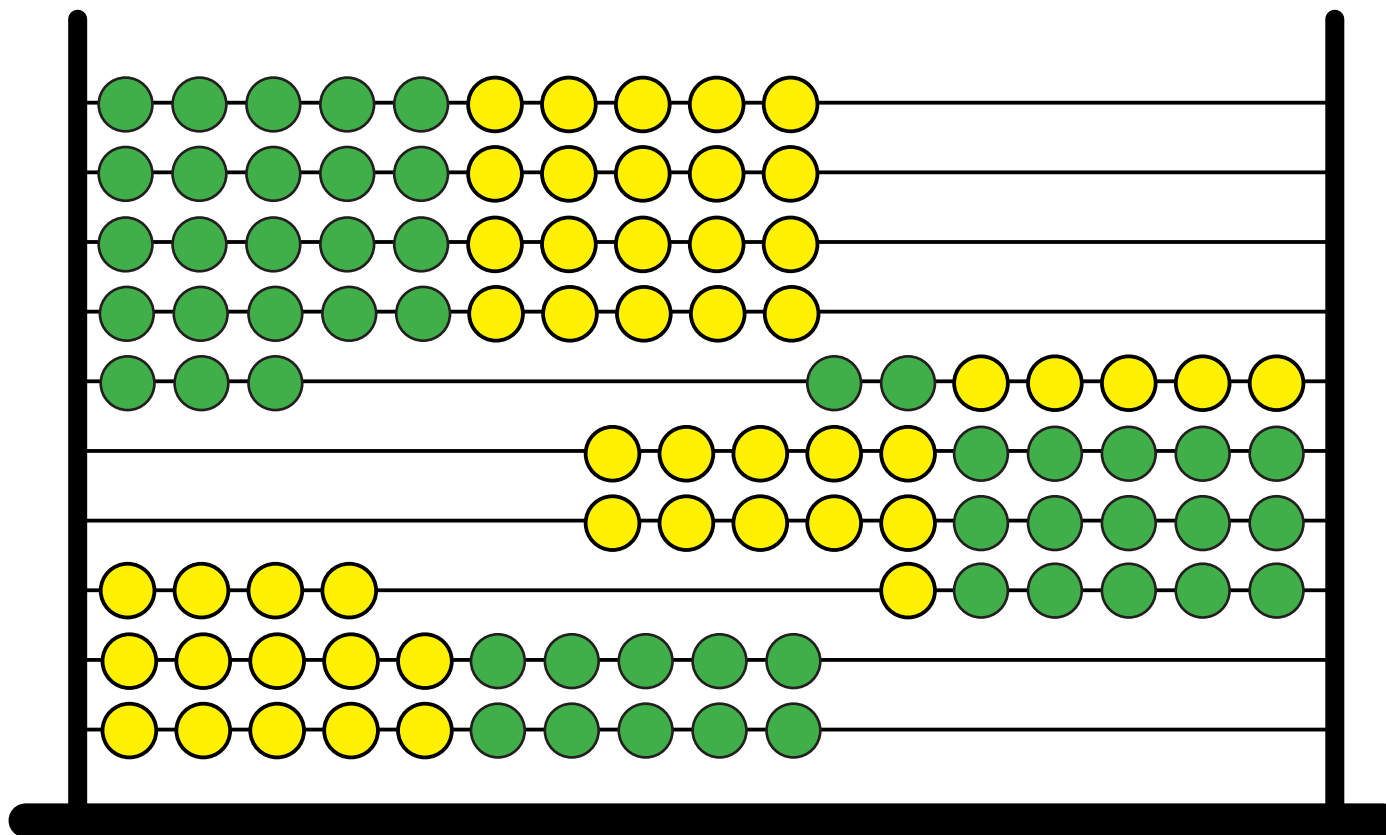
F: Money

$$43 + 24 = 67$$



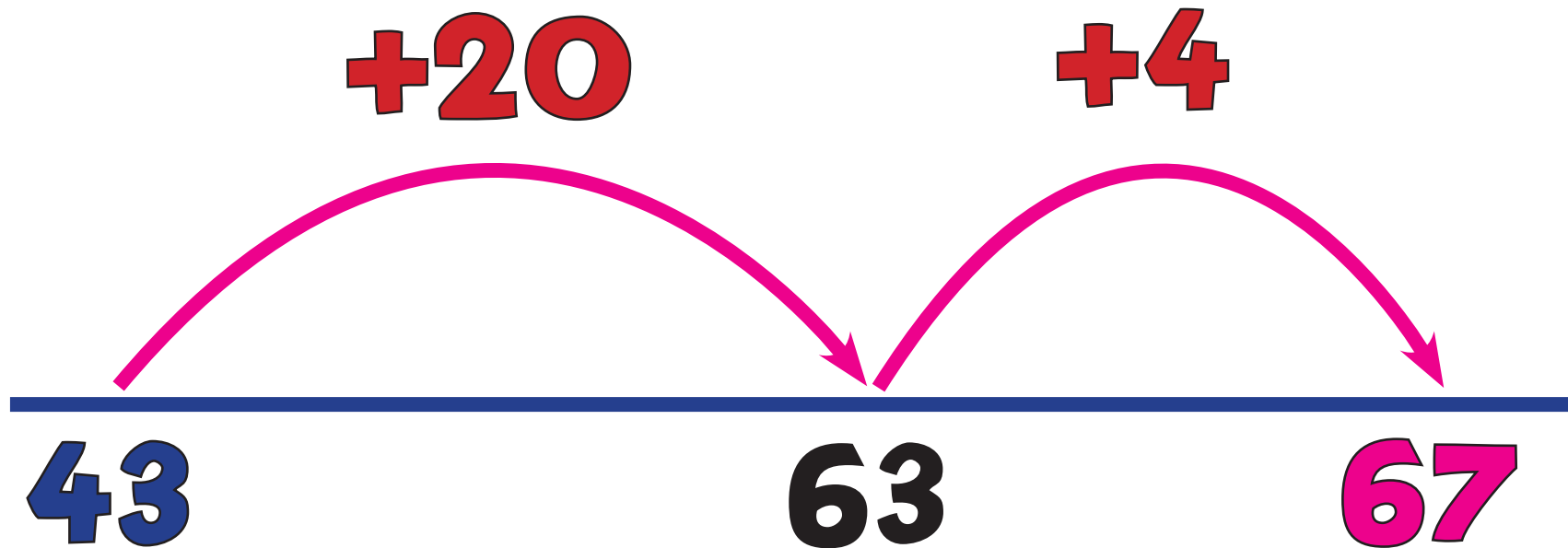
G: Abacus

$$43 + 24 = 67$$

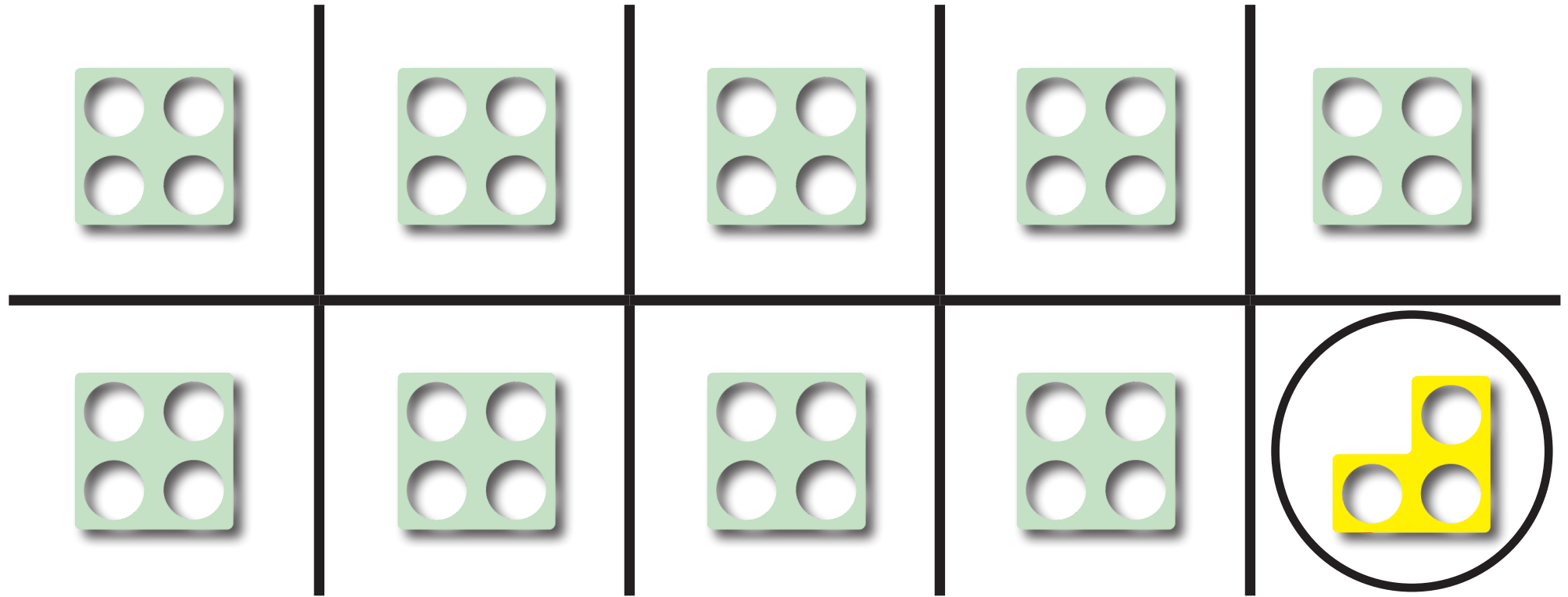


H: Number Line

$$43 + 24 = 67$$



D6a: Grouping Grid



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

Answer: **6r3**

$$27 \div 4 = 6r3$$

Mx2: Table Facts

2x table

2

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

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



Biff

Mx3: Table Facts

3x table

3

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

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



Biff

Mx4: Table Facts

4x table



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

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



Bob

Mx5: Table Facts

5x table

5

$5 \times 1 = 5$

$5 \times 2 = 10$

$5 \times 3 = 15$

$5 \times 4 = 20$

$5 \times 5 = 25$

$5 \times 6 = 30$

$5 \times 7 = 35$

$5 \times 8 = 40$

$5 \times 9 = 45$

$5 \times 10 = 50$

$5 \times 11 = 55$

$5 \times 12 = 60$

$5 \times 5 = 25$

$5 \times 11 = 55$

$5 \times 3 = 15$

$5 \times 6 = 30$

$5 \times 7 = 35$

$5 \times 10 = 50$

$5 \times 2 = 10$

$5 \times 12 = 60$

$5 \times 4 = 20$

$5 \times 1 = 5$

$5 \times 8 = 40$

$5 \times 9 = 45$



Mx6: Table Facts

6x table



$6 \times 1 = 6$

$6 \times 2 = 12$

$6 \times 3 = 18$

$6 \times 4 = 24$

$6 \times 5 = 30$

$6 \times 6 = 36$

$6 \times 7 = 42$

$6 \times 8 = 48$

$6 \times 9 = 54$

$6 \times 10 = 60$

$6 \times 11 = 66$

$6 \times 12 = 72$

$6 \times 6 = 36$

$6 \times 12 = 72$

$6 \times 9 = 54$

$6 \times 5 = 30$

$6 \times 2 = 12$

$6 \times 10 = 60$

$6 \times 4 = 24$

$6 \times 1 = 6$

$6 \times 11 = 66$

$6 \times 8 = 48$

$6 \times 3 = 18$

$6 \times 7 = 42$



Jo

Mx7: Table Facts

7x table

7

$7 \times 1 = 7$

$7 \times 2 = 14$

$7 \times 3 = 21$

$7 \times 4 = 28$

$7 \times 5 = 35$

$7 \times 6 = 42$

$7 \times 7 = 49$

$7 \times 8 = 56$

$7 \times 9 = 63$

$7 \times 10 = 70$

$7 \times 11 = 55$

$7 \times 12 = 60$

$7 \times 5 = 35$

$7 \times 3 = 21$

$7 \times 9 = 63$

$7 \times 11 = 55$

$7 \times 6 = 42$

$7 \times 10 = 70$

$7 \times 1 = 7$

$7 \times 12 = 60$

$7 \times 4 = 28$

$7 \times 8 = 56$

$7 \times 2 = 14$

$7 \times 7 = 49$



Usif

Mx8: Table Facts

8x table

8

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

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



Mx9: Table Facts

9x table



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

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



Biff

Mx10: Table Facts

10x table

10

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

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



Jo

Mx11: Table Facts

11x table

11

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

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



Mx12: Table Facts

12x table

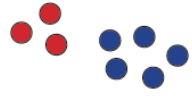

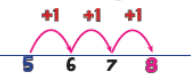
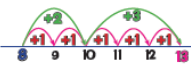
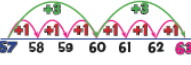
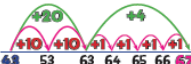

12

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

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



Biff

Y1	A1: Objects & Pictures  5 + 3 = 8					A	Addition Calculation $4 + 2 = 6$ addend, total, sum, plus, together	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  $5 + 3 = 8$						
10	11	12	13	14	15	16	17	18
Y1		A2a: Counting On  $8 + 5 = 13$						
19	20	21	22	23	24	25	26	27
Y2		A2b: Counting On  $57 + 6 = 63$						
28	29	30	31	32	33	34	35	36
Y2		A3: Forwards Jump  $43 + 24 = 67$	A4: Partitioning $43 + 24 = 67$ $40 + 20 = 60$ $3 + 4 = 7$ $60 + 7 = 67$	A5: Partition Jot $43 + 24 = 67$ $60 + 7$	(A6: Expanded Column) $\begin{array}{r} 43 \\ + 24 \\ \hline 67 \end{array}$	(A7: Column Addition) $\begin{array}{r} 43 \\ + 24 \\ \hline 67 \end{array}$		
37	38	39	40	41	42	43	44	45
Y2		A3a: Forwards Jump  $57 + 25 = 82$	A4a: Partitioning $57 + 25 = 82$ $50 + 20 = 70$ $7 + 5 = 12$ $70 + 12 = 82$	A5a: Partition Jot $57 + 25 = 82$ $70 + 12$	(A6: Expanded Column) $\begin{array}{r} 57 \\ + 25 \\ \hline 82 \end{array}$	(A7: Column Addition) $\begin{array}{r} 57 \\ + 25 \\ \hline 82 \end{array}$		

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

Y5				A5h: Partition Jot $76.7 + 58.5 = 135.2$ $120 + 14 + 1.2$		A7h: Column Addition $\begin{array}{r} \text{T} \quad \text{U} \quad \text{p} \\ 76.7 \\ + 58.5 \\ \hline 135.2 \end{array}$		
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 $\begin{array}{r} £38.25 \\ + £27.46 \\ \hline £65.71 \end{array}$		
118	119	120	121	122	123	124	125	126
Y5						A7j: Column Addition $73.4 + 5.67 = 79.07$ $\begin{array}{r} \text{T} \quad \text{U} \quad \text{p} \\ 73.4 \\ + 5.67 \\ \hline 79.07 \end{array}$		



1

Y1

10

Y2

19

Y3

MA5: Round & Adjust

$45 + 39 = 84$

$45 + 40 - 1$

$85 - 1 = 84$

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10

Y2

19

Y3

MA5: Round & Adjust

Year 1

$45 + 9 = 54$

$45 + 10 - 1 =$

$55 - 1 = 54$

Group of Numbers VOP Teaching Edition

Y3

MA5: Round & Adjust
Year 5

$45 + 19 = 64$

$45 + 20 - 1$

$65 - 1 = 64$

Group of Home VOF Training Edition

MA5: Round & Adjust
Year 5

$45 + 97 = 142$

$45 + 100 - 3 = 142$

$145 - 3 = 142$

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Y4

MA1: Partitioning
Year 4

$$648 + 231 = 879$$

$$800 + 70 + 9 = 879$$

MA2a: Counting On
Year 4

$$784 + 60 = 844$$

$$784 \xrightarrow{+60} 844$$

MA2b: Counting On
Year 4

$$4837 + 3000 = 8837$$

$$4837 \xrightarrow{+3000} 8837$$

MA3: Number Bonds
Year 4

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

$$70 + 70 = 140$$

MA4: Double & Adjust
Year 4

$$37 + 38 = 75$$

$$37 + 37 + 1 = 75$$

$$74 + 1 = 75$$

MA5: Round & Adjust
Year 4

$$345 + 298 = 643$$

$$345 + 300 - 2 = 643$$

$$645 - 2 = 643$$

37

38

39

40

41

42

43

44

45

Y5

MA1: Partitioning
Year 5

$$576 + 258 = 834$$

$$700 + 120 + 14 = 834$$

MA2a: Counting On
Year 5

$$837 + 500 = 1337$$

$$837 \xrightarrow{+500} 1337$$

MA2b: Counting On
Year 5

$$7583 + 5000 = 12583$$

$$7583 \xrightarrow{+5000} 12583$$

MA3: Number Bonds
Year 5

$$£4.56 + £3.27 + £1.44 = £9.27$$

$$£6.00 + £3.27 = £9.27$$

MA4: Double & Adjust
Year 5

$$125 + 127 = 251$$

$$125 + 125 + 2 = 251$$

$$250 + 2 = 252$$

MA5: Round & Adjust
Year 5

$$4645 + 1996 = 6641$$

$$4645 + 2000 - 4 = 6641$$

$$6645 - 4 = 6641$$

46

47

48

49

50

51

52

53

54

Y6

MA1: Partitioning
Year 6

$$4.73 + 2.21 = 6.94$$

$$6 + 0.9 + 0.44 = 6.94$$

MA2a: Counting On
Year 6

$$43,826 + 30,000 = 73,826$$

$$43,826 \xrightarrow{+30,000} 73,826$$

MA2b: Counting On
Year 6

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

$$5,763,947 \xrightarrow{+4,000,000} 9,763,947$$

MA3: Number Bonds
Year 6

$$24.25 + 31.63 + 31.75 = 77.63$$

$$46 + 31.63 = 77.63$$

MA4: Double & Adjust
Year 6

$$4.5 + 4.7 = 9.2$$

$$4.5 + 4.5 + 0.2 = 9.2$$

$$9 + 0.2 = 9.2$$

MA5: Round & Adjust
Year 6

$$45.2 + 49.9 = 95.1$$

$$45.2 + 50 - 0.1 = 95.1$$

$$95.2 - 0.1 = 95.1$$



Y1	S1: Objects $7 - 3 = 4$ "What did you do? How many from 7? Answer: 4"					S	Subtraction Calculation $6 - 2 = 4$ (minuend) (subtrahend) (difference) = (subtrahend)	Subtraction Vocabulary count back, decrease, subtract, less, count on, take away, difference between	
1	2	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 did you do? How many from 12? Answer: 9"	S4: Counting On $12 - 9 = 3$ "How many more is 12 than 9? What is the difference?"	6	7	8	9	
10	11	12	S5: Backwards Bounce $75 - 7 = 68$ "How many more is 75 than 68? What is the difference?"	S4a: Counting On $83 - 78 = 5$ "How many more is 83 than 78? What is the difference?"	15	16	17	18	
Y2	19	20	21	S6: Backwards Bounce $87 - 23 = 64$ "How many more is 87 than 64? What is the difference?"	(S8: Triple Jump!) $87 - 23 = 64$ "How many more is 87 than 23? What is the difference?"	(S9: 10s Jump, 1s Jump!) $87 - 23 = 64$ "How many more is 87 than 23? What is the difference?"	(S10: Expanded Column) $87 - 23 = 64$ 	(S11: Column Subtraction) $87 - 23 = 64$ 	27
28	29	30	31	S7: Backwards Jump $75 - 37 = 38$ "How many more is 75 than 38? What is the difference?"	S8: Triple Jump! $75 - 37 = 38$ "How many more is 75 than 37? What is the difference?"	S9: 10s Jump, 1s Jump! $75 - 37 = 38$ "How many more is 75 than 37? What is the difference?"	(S10: Expanded Column) $75 - 37 = 38$ 	(S11: Column Subtraction) $75 - 37 = 38$ 	36
37	38	39	40	S8b: Quad Jump! $132 - 56 = 76$ "How many more is 132 than 56? What is the difference?"	S9b: 10s Jump, 1s Jump! $132 - 56 = 76$ "How many more is 132 than 56? What is the difference?"	(S10: Expanded Column) $132 - 56 = 76$ 	(S11: Column Subtraction) $132 - 56 = 76$ 	45	



Y3				S8c: Big Jump! $723 - 356 = 367$	S9c: 100s, 10s, 1s Jump $723 - 356 = 367$	S10: Expanded Column $723 - 356 = 367$	S11: Column Subtraction $723 - 356 = 367$	
55	56	57	58	59	60	61	62	63
Y4				S8d: Quad Jump Extreme $5042 - 1776 = 3266$	S9d: 1000s, 100s, 10s, 1s Jump $5042 - 1776 = 3266$		S11d: Column Subtraction $5042 - 1776 = 3266$	
64	65	66	67	68	69	70	71	72
Y5							S11e: Column Subtraction $72831 + 427358 = 500189$	
73	74	75	76	77	78	79	80	81
Y5				S8f: Decimal T-J! $13.4 - 8.7 = 4.7$	S9f: 1s Jump, Tenths Jump! $13.4 - 8.7 = 4.7$		S11f: Column Subtraction $13.4 - 8.7 = 4.7$	
82	83	84	85	86	87	88	89	90
Y5							S11g: Column Subtraction $12.4 - 5.97 = 6.43$	
91	92	93	94	95	96	97	98	99
Y5							S11g: Column Subtraction $72.43 - 47.85 = 24.58$	



Y5

S11h: Column Subtraction
 12.4 - 5.97 = 6.43

109

110

111

112

113

114

115

116

117

MS

MS1: Counting Back

$$46 - 21 = 25$$



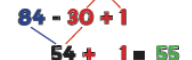
MS2: Counting On

$$75 - 47 = 28$$



MS3: Round & Adjust

$$84 - 29 = 55$$



118

119

120

121

122

123

124

125

126

MS2a: Counting On

$$75 - 47 = 28$$



Y1	(M1: Groups) "3 groups of 5 counters make 15 counters altogether"	(M3: Arrays) "3 groups of 5 counters" or "5 groups of 3 counters" - "15 counters altogether"			M	Multiplication Calculation $4 \times 2 = 8$ (multiplied by) (equals) multiplicand product multiplier	Multiplication Vocabulary groups of, multiple, times, product, double, lots of, multiply, repeated addition		
Y2	1	2 M1: Repeated Addition $5 \times 3 = 5 + 5 + 5 = 15$ "5 multiplied by 3 means '5, 5, 5', which gives '15' altogether"	3 M2: Repeated Addition $5 \times 3 = 5 + 5 + 5 = 15$ "5 times 3 means '5, 5, 5'"	4 M3: Arrays $3 \times 5 = 15$ or $5 \times 3 = 15$	5	6	7	8	9
Y2	10	11 Mx2: Table Facts 2x table 	12 Mx5: Table Facts 5x table 	13 Mx10: Table Facts 10x table 	14	15	16	17	18
Y3	19	20 Mx3: Table Facts 3x table 	21 Mx4: Table Facts 4x table 	22 Mx8: Table Facts 8x table 	23	24	25	26	27
Y3	28	29	30	31	32 M4: Multi Boing! $15 \times 5 = 75$	33 M4a: Partitioning $15 \times 5 = 75$ $10 \times 5 = 50$ $5 \times 5 = 25$ $50 + 25 = 75$	34 M5: Grid Method $15 \times 5 = 75$	35 M6: Expanded Column $15 \times 5 = 75$	36 M7: Column Multiplication $15 \times 5 = 75$
Y4	37	38	39	40	41	42	43 M5a: Grid Method $43 \times 6 = 258$	44 M6: Expanded Column $43 \times 6 = 258$	45 M7: Column Multiplication $43 \times 6 = 258$

Y4	Mx6: Table Facts 6x table	Mx7: Table Facts 7x table	Mx9: Table Facts 9x table	Mx11: Table Facts 11x table	Mx12: Table Facts 12x table	M5b: Grid Method Short Multiplication $147 \times 4 = 588$ <table border="1"> <tr><td>x</td><td>100</td><td>40</td><td>7</td></tr> <tr><td>4</td><td>400</td><td>160</td><td>28</td></tr> </table> $400 + 160 + 28 = 588$	x	100	40	7	4	400	160	28	M6: Expanded Column $\begin{array}{r} 147 \\ \times 4 \\ \hline 28 \\ 160 \\ 400 \\ \hline 588 \end{array}$	M7: Column Multiplication $\begin{array}{r} \text{H T U} \\ 147 \\ \times 4 \\ \hline 588 \\ 1 \end{array}$			
x	100	40	7																
4	400	160	28																
Y5						M8: Grid Method Long Multiplication $43 \times 65 = 2795$ <table border="1"> <tr><td>x</td><td>40</td><td>5</td></tr> <tr><td>60</td><td>2400</td><td>180</td></tr> <tr><td>5</td><td>200</td><td>15</td></tr> </table> $2400 + 180 + 200 + 15 = 2795$	x	40	5	60	2400	180	5	200	15	M9: Long Multiplication $\begin{array}{r} \text{H T U} \\ 43 \\ \times 65 \\ \hline 215 \quad (5 \times 43) \\ + 2580 \quad (60 \times 43) \\ \hline 2795 \end{array}$			
x	40	5																	
60	2400	180																	
5	200	15																	
Y5						M8a: Grid Method Long Multiplication $243 \times 68 = 16,524$ <table border="1"> <tr><td>x</td><td>200</td><td>40</td><td>3</td></tr> <tr><td>60</td><td>12000</td><td>2400</td><td>180</td></tr> <tr><td>8</td><td>1600</td><td>320</td><td>24</td></tr> </table> $12000 + 2400 + 1600 + 320 + 180 + 24 = 16524$	x	200	40	3	60	12000	2400	180	8	1600	320	24	M9a: Long Multiplication $\begin{array}{r} \text{H T U} \\ 243 \\ \times 68 \\ \hline 1944 \quad (8 \times 243) \\ + 14580 \quad (60 \times 243) \\ \hline 16524 \end{array}$
x	200	40	3																
60	12000	2400	180																
8	1600	320	24																
Y5						M8b: Grid Method Long Multiplication $203 \times 68 = 13,804$ <table border="1"> <tr><td>x</td><td>200</td><td>0</td><td>3</td></tr> <tr><td>60</td><td>12000</td><td>0</td><td>180</td></tr> <tr><td>8</td><td>1600</td><td>0</td><td>24</td></tr> </table> $12000 + 1624 = 13804$	x	200	0	3	60	12000	0	180	8	1600	0	24	M9b: Long Multiplication $\begin{array}{r} \text{H T U} \\ 203 \\ \times 68 \\ \hline 1624 \quad (8 \times 203) \\ + 12180 \quad (60 \times 203) \\ \hline 13804 \end{array}$
x	200	0	3																
60	12000	0	180																
8	1600	0	24																
Y5						M8c: Decimal Grid Short Multiplication $3.6 \times 4 = 14.4$ <table border="1"> <tr><td>x</td><td>3</td><td>0.6</td></tr> <tr><td>4</td><td>12</td><td>2.4</td></tr> </table> $12 + 2.4 = 14.4$	x	3	0.6	4	12	2.4	M9c: Column Multiplication $\begin{array}{r} \text{H T U} \\ 3.6 \\ \times 4 \\ \hline 14.4 \end{array}$						
x	3	0.6																	
4	12	2.4																	
Y6						M8d: Decimal Grid Short Multiplication $47.2 \times 3 = 141.6$ <table border="1"> <tr><td>x</td><td>40</td><td>7</td><td>0.2</td></tr> <tr><td>3</td><td>120</td><td>21</td><td>0.6</td></tr> </table> $120 + 21 + 0.6 = 141.6$	x	40	7	0.2	3	120	21	0.6	M9d: Column Multiplication $\begin{array}{r} \text{H T U} \\ 47.2 \\ \times 3 \\ \hline 141.6 \end{array}$				
x	40	7	0.2																
3	120	21	0.6																

Y6

M8e: Grid Method
Long Multiplication

$$7.38 \times 6 = 44.28$$

x	7	0.3	0.08
6	42	1.8	0.48

$$42 + 1.8 + 0.48 = 44.28$$

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M9e: Column Multiplication

$$\begin{array}{r} \text{H T U} \\ 7.38 \\ \times 6 \\ \hline 44.28 \end{array}$$

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109

110

111

112

113

114

115

116

117

Y6

M8f: Grid Method
Long Multiplication

$$24.3 \times 2.5 = 60.75$$

x	20	4	0.3
2	40	8	0.6
0.5	10	2	0.15

$$40.6 + 12.15 = 52.75$$

$$52.75 + 8.0 = 60.75$$

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M9f: Long Multiplication

$$\begin{array}{r} \text{H T U} \\ 24.3 \\ \times 2.5 \\ \hline 121.5 \quad (0.5 \times 24.3) \\ + 48.60 \quad (2 \times 24.3) \\ \hline 60.75 \end{array}$$

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118

119

120

121

122

123

124

125

126

Y6

M9g: Long Multiplication

$$\begin{array}{r} \text{H T U} \\ 3786 \\ \times 48 \\ \hline 30288 \quad (8 \times 3786) \\ + 151440 \quad (60 \times 3786) \\ \hline 181728 \end{array}$$

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127

128

129

130

131

132

133

134

135



MM	MM1: Jump! $\times 100$ 3400 $\times 10$ 340 $\times 1$ 34 $\times 0.1$ 3.4 $\times 0.01$ 0.34 $\div 10$ 34 $\div 100$ 3.4 $\div 1000$ 0.34	MM2: Re-ordering $(9 \times 2) \times 5 = 90$ $18 \times 5 = 90$ $(9 \times 5) \times 2 = 90$ $45 \times 2 = 90$ $(2 \times 5) \times 9 = 90$ $10 \times 9 = 90$ *	MM3: Partitioning $15 \times 5 = 75$ $50 + 25 = 75$ $(10 \times 5) + (5 \times 5)$	MM4: Round & Adjust $49 \times 3 = 147$ $(50 \times 3) - (1 \times 3)$ $150 - 3 = 147$	MM5: Doubling Double 17 = 34 $20 + 14 = 34$			
1	2	3	4	5	6	7	8	9
MM1a: Jump! $\times 1000$ 63400 $\times 100$ 6340 $\times 10$ 634 $\times 1$ 63.4 $\times 0.1$ 6.34 $\times 0.01$ 0.634 $\div 10$ 634 $\div 100$ 63.4 $\div 1000$ 6.34	MM2a: Re-ordering $(7 \times 4) \times 5 = 140$ $28 \times 5 = 140$ $(7 \times 5) \times 4 = 140$ $35 \times 4 = 140$ $(4 \times 5) \times 7 = 140$ $20 \times 7 = 140$ *	MM3a: Partitioning $37 \times 4 = 148$ $120 + 28 = 148$ $(30 \times 4) + (7 \times 4)$	MM4a: Round & Adjust $198 \times 4 = 792$ $(200 \times 4) - (2 \times 4)$ $800 - 8 = 792$	MM5a: Doubling Double 37 = 74 $60 + 14 = 74$				
10	11	12	13	14	15	16	17	18
		MM2b: Re-ordering $(9 \times 8) \times 6 = 432$ $72 \times 6 = 432$ $(9 \times 6) \times 8 = 432$ $54 \times 8 = 432$ * $(6 \times 6) \times 9 = 432$ $48 \times 9 = 432$		MM4b: Round & Adjust $3.9 \times 5 = 19.5$ $(4 \times 5) - (0.1 \times 5)$ $20 - 0.5 = 19.5$	MM5b: Doubling Double 78 = 156 $140 + 16 = 156$			
19	20	21	22	23	24	25	26	27
				MM4c: Round & Adjust $\pounds 5.99 \times 6 = \pounds 35.94$ $(\pounds 6 \times 6) - (1p \times 6)$ $\pounds 36 - 6p = \pounds 35.94$	MM5c: Doubling Double 340 = 680 $600 + 80 = 680$			
28	29	30	31	32	33	34	35	36
					MM5d: Doubling Double 480 = 960 $800 + 160 = 960$			
37	38	39	40	41	42	43	44	45
					MM5e: Doubling Double 278 = 556 $400 + 140 + 16 = 556$			

					MM5f: Doubling Double 768 = 1536 $1400 + 120 + 16 = 1536$			
55	56	57	58	59	MM5g: Doubling Double 3.7 = 7.4 $6 + 1.4 = 7.4$	61	62	63
64	65	66	67	68		69	70	71
72	73	74	75	76	77	78	79	80
	MM6: Doubling Table Facts $16 \times 7 = 112$ (8×2) $8 \times 7 = 56$ $16 \times 7 = 112$	MM7: Doubling Up $36 \times 8 = 112$ Double 36 = 72 (36×2) Double 72 = 144 (36×4) Double 144 = 288 (36×8)	MM8: Mult by 5 then Halve $86 \times 5 = 430$ $86 \times 10 = 860$ $860 \div 2 = 430$	MM9: Doubling & Halving 45×14 $90 \times 7 = 630$	MM10: Factorising $32 \times 15 = 480$ $(32 \times 5 \times 3)$ $160 \times 3 = 480$			
82	83	84	85	86	87	88	89	90
		MM7a: Doubling Up $125 \times 16 = 2000$ Double 125 = 250 (125×2) Double 250 = 500 (125×4) Double 500 = 1000 (125×8) Double 1000 = 2000 (125×16)	MM8a: Mult by 5 then Halve $56 \times 25 = 1400$ $56 \times 100 = 5600$ $5600 \div 2 = 2800$ $2800 \div 2 = 1400$	MM9a: Doubling & Halving 36×25 $18 \times 50 = 900$ $9 \times 100 = 900$	MM10a: Factorising $52 \times 24 = 1248$ $(52 \times 4 \times 6)$ $208 \times 6 = 1248$			
91	92	93	94	95	96	97	98	99
				MM9b: Doubling & Halving 26×32 52×16 $104 \times 8 = 832$ 208×4 etc.				

Y1	D1: Sharing (Concept) "If I share 8 into 2 equal amounts, how many in each group?" Answer: 4 Sense of Number VSP Teaching Edition	D2: Grouping (Concept) "How many groups of 4 can I make out of 8?" Answer: 2 Sense of Number VSP Teaching Edition				D	Division Calculation $8 \div 2 = 4$ (divided by) (equals) dividend divisor quotient + divisor Sense of Number VSP Teaching Edition	Division Vocabulary remainder group share + have factor equal groups of divide quotient divisor Sense of Number VSP Teaching Edition
Y2	D3: Division as Sharing $12 \div 2 = 6$ "If I share 12 into 2 equal amounts, how many in each group?" Answer: 6 Sense of Number VSP Teaching Edition	D4: Division as Grouping $12 \div 2 = 6$ "How many groups of 2 are there in 12?" Answer: 6 Sense of Number VSP Teaching Edition	D5: Grouping on a Number Line $20 \div 5 = 4$ Sense of Number VSP Teaching Edition					
Y2			D5a: Grouping on a Number Line $17 \div 5 = 3r2$ Sense of Number VSP Teaching Edition					
Y3		D6: Grouping Grid "How many groups of 4 are there in 27?" Answer: 6r3 Sense of Number VSP Teaching Edition						
Y3			D7: Chunking Jump $72 \div 4 = 18$ Sense of Number VSP Teaching Edition	D8: Find the Hunk! $72 \div 4 = 18$ $10 + 8 = 18$ Sense of Number VSP Teaching Edition	D10: Short Division $72 \div 4 = 18$ Sense of Number VSP Teaching Edition	D11: Chunking $72 \div 4 = 18$ Sense of Number VSP Teaching Edition		
Y3			D7a: Chunking Jump $65 \div 4 = 16r1$ Sense of Number VSP Teaching Edition	D8a: Find the Hunk! $65 \div 4 = 16r1$ $10 + 6r1 = 16r1$ Sense of Number VSP Teaching Edition	D10: Short Division $65 \div 4 = 16r1$ Sense of Number VSP Teaching Edition	D11: Chunking $65 \div 4 = 16r1$ Sense of Number VSP Teaching Edition		

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

Y6

D9h: Decimal Hunk!
 $18 + 1.5 = 12$
 The Hunk! chunk
 $\begin{array}{r} 15 \\ + 3 \\ \hline 18 \end{array}$ $+ 1.5$
 \downarrow \downarrow
 $10 + 2 = 12$

109

110

111

112

113

114

115

116

117

Y6

D9i: Decimal Hunk!
 $87.5 + 7 = 12.5$
 Mega Hunk! chunk chunk
 $\begin{array}{r} 70 \\ + 14 \\ \hline 84 \end{array}$ $+ 3.5$ $+ 7$
 \downarrow \downarrow \downarrow
 $10 + 2 + 0.5 = 65$

D10i: Short Division
 $87.5 + 7 = 12.5$
 12.5
 $7 \overline{) 87.5}$

118

119

120

121

122

123

124

125

126

Y6

D12: Chunking
 $37 \overline{) 983}$
 $\begin{array}{r} 26 \\ 37 \overline{) 983} \\ \underline{- 870} \\ 113 \\ \underline{- 111} \\ 23 \\ \underline{- 22} \\ 1 \end{array}$
 $983 - 37 \times 26 = 1$

D13: Long Division
 $37 \overline{) 983}$
 $\begin{array}{r} 26 \\ 37 \overline{) 983} \\ \underline{- 870} \\ 113 \\ \underline{- 111} \\ 23 \\ \underline{- 22} \\ 1 \end{array}$
 $983 - 37 \times 26 = 1$



Sense of Number
Visual Calculations Policy
Complete Training Edition
by Dave Godfrey

Students may be given the opportunity of a number sentence for your school's own use.

Remember: Anything a number sentence of this policy, to ensure your understanding policy, you will need to ensure the knowledge and understanding of this policy for the school.

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Calculation Vocabulary

Equivalent to = equals
Is the same as = balance

+ Addition
- Subtraction
x Multiplication
÷ Division

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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"

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KC2: Key Concepts!

Multiplication
 $8 \times 2 = 16$
"8 multiplied by 2" means "8 is taken 2 times" or "2 groups of 8"

Division
 $8 \div 2 = 4$
"8 divided by 2" means "How many groups of 2 are there in 8?" Answer: 4
"8 shared into 2 is 4"

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1
Can I do this in my head?

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2
Do I need to use a drawing or a jotting?

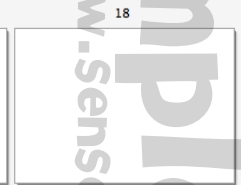
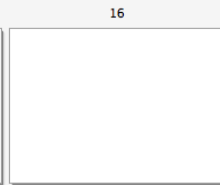
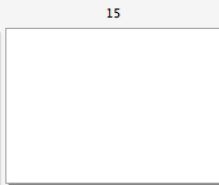
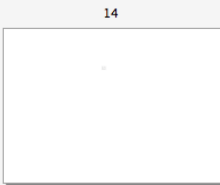
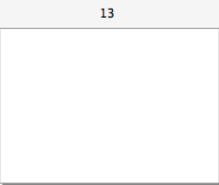
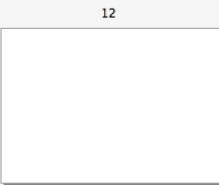
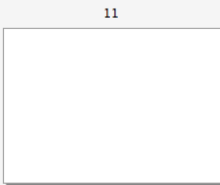
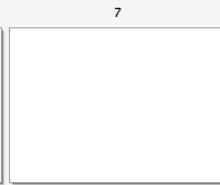
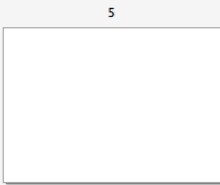
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3
Do I need an expanded or a standard method?

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4
Do I need a calculator?

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19
C1a: Number Order

0 1 2 3 4 5

"The number line is a good way to check the order of numbers."

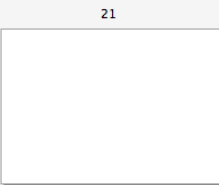
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20
C1b: At a Glance

5 5 5 5 5

"Use the dots to show how many are in each set and then add them all together to find the total."

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22
C2a: Number Match

1 2 3 4 5

"Use the dots to show how many are in each set and then match them to the number on the line."

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23
C2b: Counting Objects

Start 1 2 3 4 5

"The objects can be counted in any order, and the starting point and order to count the objects are marked with arrows on the line."

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24
C2c: Order Arrangement

1 2 3 4 5

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

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26
C3: How Many?

1 2 3 4 5

"The total number of dots is the same as the number on the line."

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28
C4: Arranging

7

"Use the dots to show how many are in each set and then arrange them in a row or column to find the total."

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29
C4a: Arranging

18

"Use the dots to show how many are in each set and then arrange them in a row or column to find the total."

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30
C4b: Arranging

18

"Use the dots to show how many are in each set and then arrange them in a row or column to find the total."

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31
C4c: Arranging

43

"Use the dots to show how many are in each set and then arrange them in a row or column to find the total."

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33
C5: Counting Forwards

0 1 2 3 4 5

"Count the dots in order from the starting point to find the total."

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34
C6: Counting On

8 9 10 11 12 13

"Count the dots in order from the starting point to find the total."

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35
C7: Counting Back

4 5 6 7 8 9

"Count the dots in order from the starting point to find the total."

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36
C8: Counting in Steps

3 5 7 9 11

"Count the dots in order from the starting point to find the total."

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Sense of Number
Calculation Cards

by Dave Godfrey

0203 2940000

The following cards show the calculation 43 + 24 = 67 using a variety of resources and representations.

Sense of Number VSP Teaching Edition

A: Base 10

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

B: Arrow Cards

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

C: Hundred Square

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

D: Numicon

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

E: Place Value Counters

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

F: Money

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

G: Abacus

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

H: Number Line

$43 + 24 = 67$

Sense of Number VSP Teaching Edition

55

D6a: Grouping Grid

Sense of Number VSP Teaching Edition

56

57

58

59

60

61

62

63

64

65

66

67

68

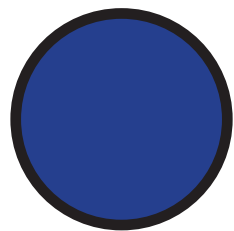
69

70

71

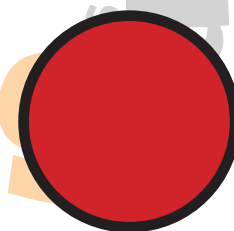
72





Sense of Number Standard Alternative Slides

by Dave Godfrey



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



New Church Community Primary

New Church Community Primary School Visual Calculations Policy © Sense of Number 2014
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(A7: Column Addition)

Additional: a

$$\begin{array}{r} \text{T} \quad \text{U} \\ 57 \\ + 25 \\ \hline 82 \end{array}$$

1



(A7: Column Addition)

Additional:b

H T U

86

+ 48

1 1

134

Sample Edition
(www.senseofnumber.co.uk)

Sample Edition
(www.senseofnumber.co.uk)



A7: Column Addition

Sample Edition
(www.senseofnumber.co.uk)

Sample Edition
(www.senseofnumber.co.uk)

	H	T	U
	6	8	7
+	2	4	8
	1	1	
<hr/>			
	9	3	5
<hr/>			



A7d: Column Addition

Sample Edition
(www.senseofnumber.co.uk)

Sample Edition
(www.senseofnumber.co.uk)

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



A7e: Column Addition

M H Th T Th Th H T U

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

1 1 1 1 1

A7f: Column Addition

Sample Edition
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Sample Edition
(www.senseofnumber.co.uk)

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

Alternative Layout



A7g: Column Addition

Sample Edition
(www.senseofnumber.co.uk)

Sample Edition
(www.senseofnumber.co.uk)

$$\begin{array}{r} \text{U} \qquad \frac{1}{10} \qquad \frac{1}{100} \\ 5.65 \\ + 3.29 \\ \hline 8.94 \end{array}$$

1



A7h: Column Addition

Sample Edition
(www.senseofnumber.co.uk)

Sample Edition
(www.senseofnumber.co.uk)

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



A7i: Column Addition

With Money

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

1 1

A7j: Column Addition

With Decimals

$$73.4 + 5.67 = 79.07$$

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

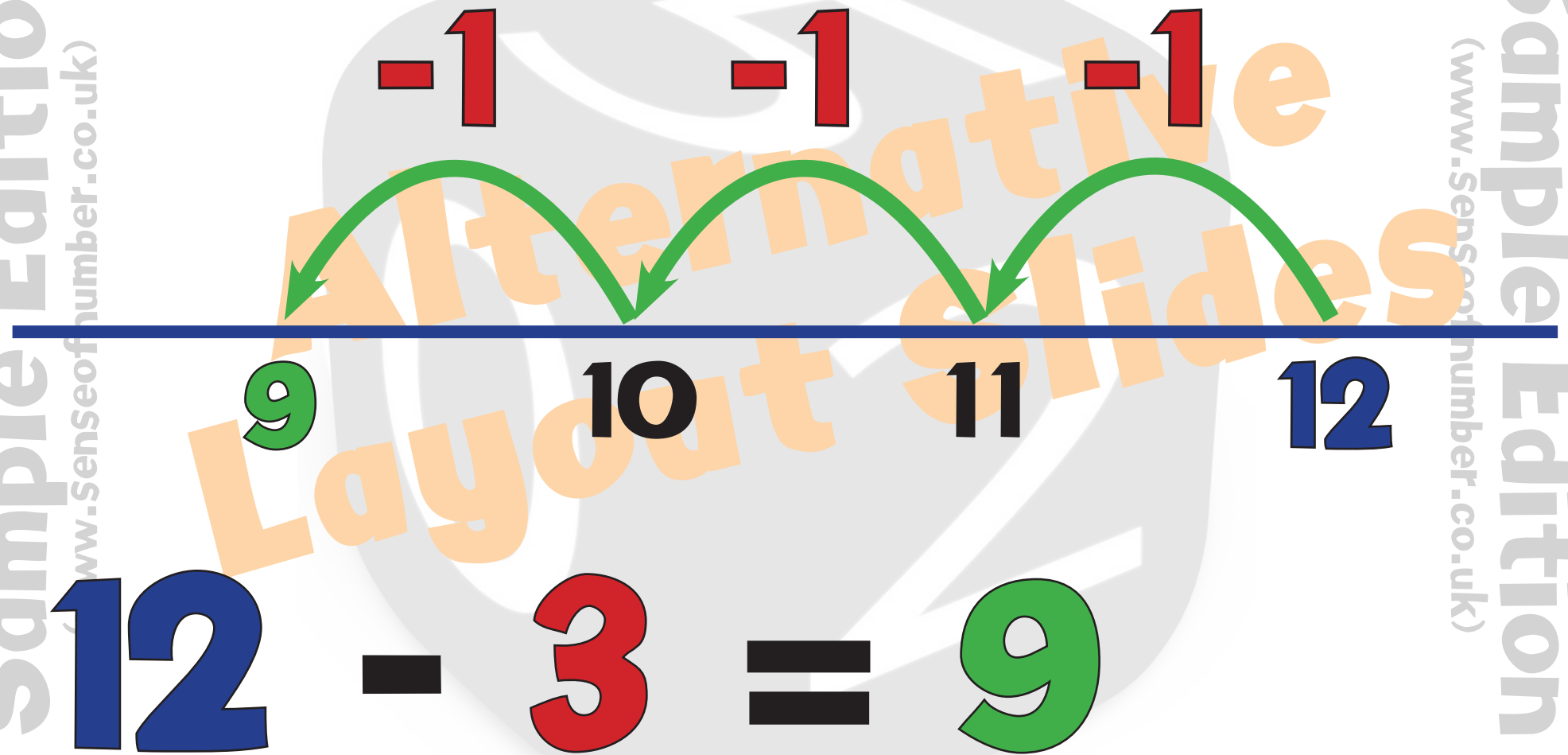
73.4

+ 5.67

1

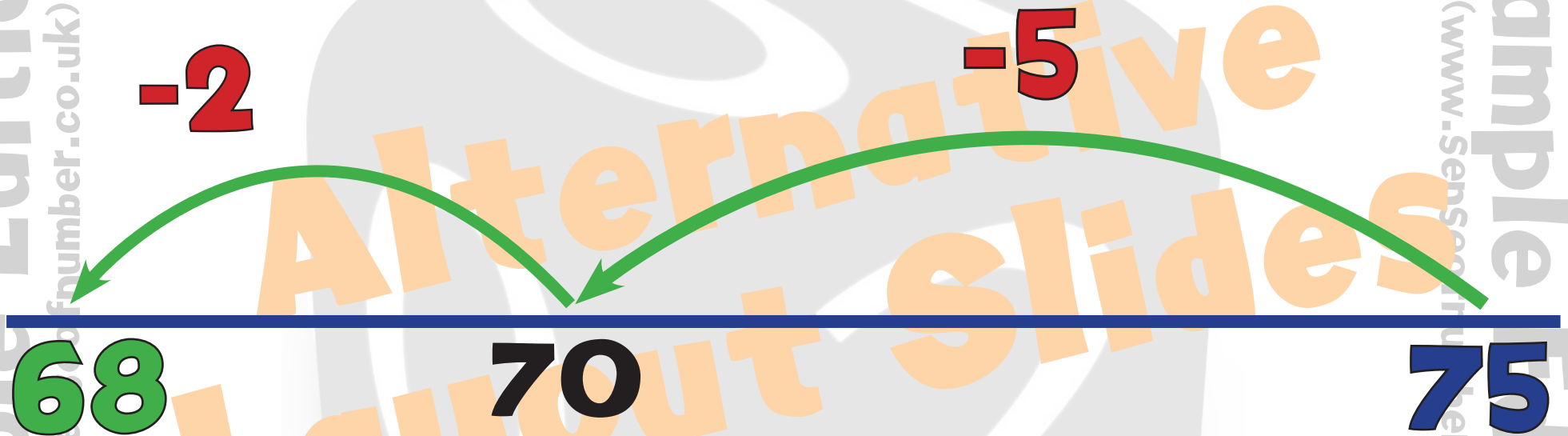
79.07

s3a: Counting Back



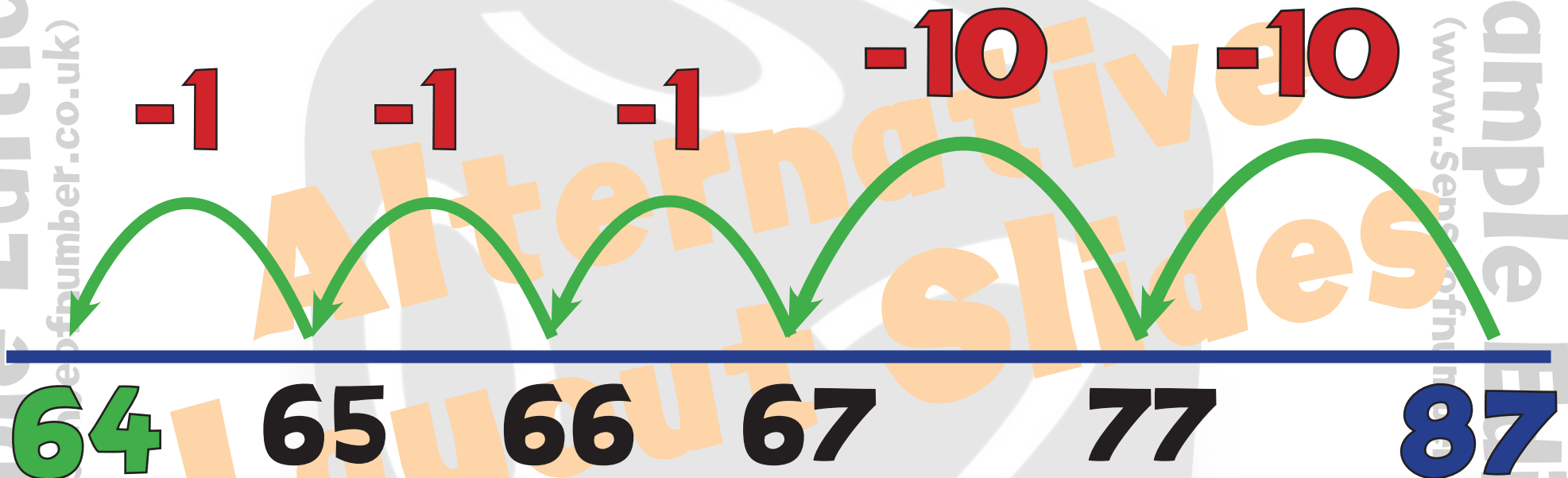
“What do I get if I take 3 away from 12? Answer: 9”

s5a: Backwards Boing



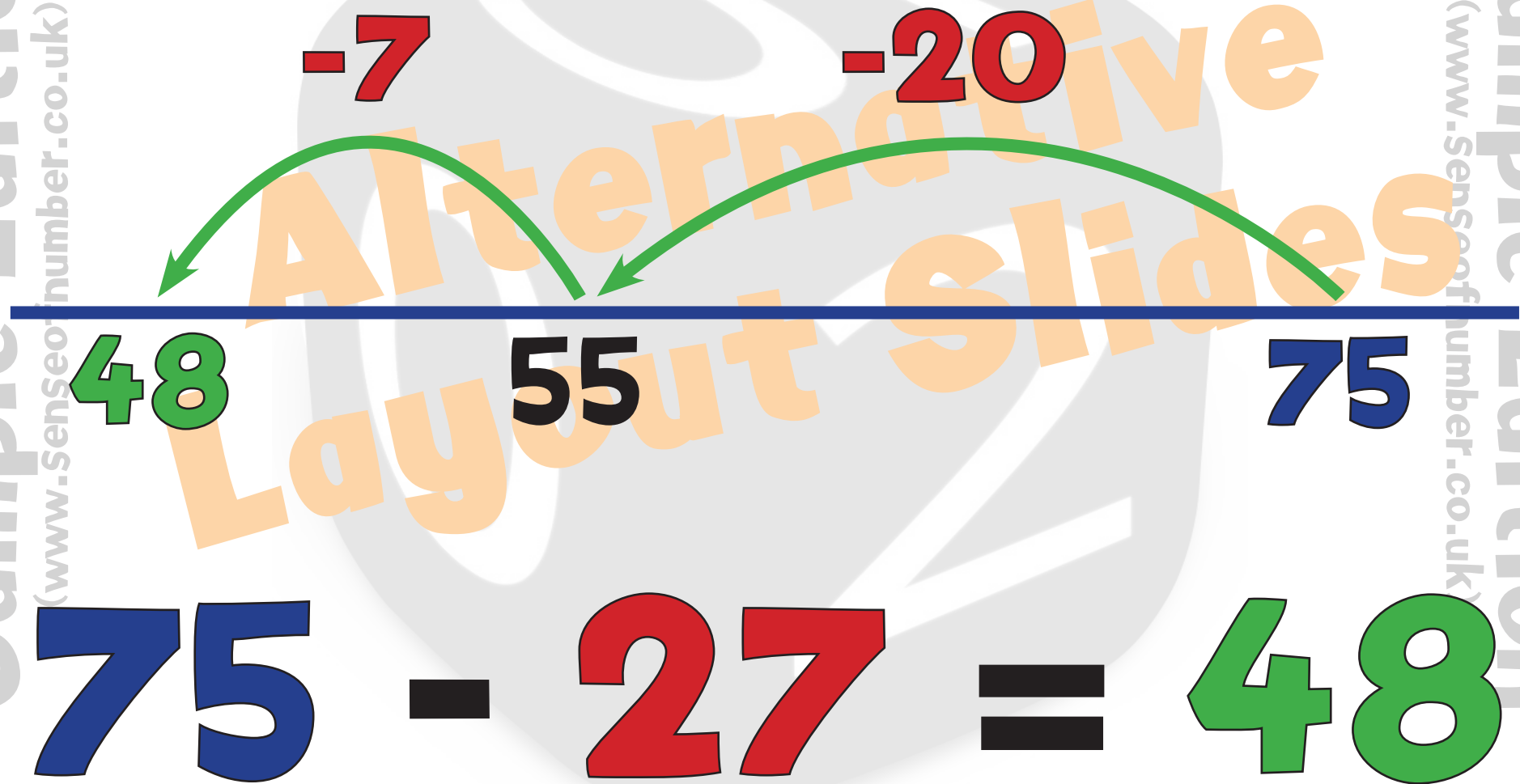
$$75 - 7 = 68$$

s6a: Backwards Bounce



$$87 - 23 = 64$$

s7a: Backwards Jump



(M7: Column Multiplication)

Additional

H T U

15

x 5

2

75

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(M7: Column Multiplication)

Additional:a

H T U

43

x 6

1

258

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M7: Column Multiplication

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$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{U} \\ 147 \\ \times 4 \\ \hline 588 \end{array}$$

The diagram illustrates the column multiplication of 147 by 4. The numbers are aligned by place value: Hundreds (H), Tens (T), and Units (U). The multiplier 4 is placed below the units column. The product 588 is shown below a pink horizontal line, with its digits aligned under the hundreds, tens, and units columns respectively. A second pink horizontal line is positioned below the product.



M9: Long Multiplication

Column

	Th	H	T	U
			4	3
x			6	5
		2	1	
		<hr/>		
		2	1	5
+		2	5	8
		0		
		<hr/>		
		2	7	9
		5		
		<hr/>		

(5 x 43)

(60 x 43)

2795



M9a: Long Multiplication

Column

	Th	H	T	U	
		2	4	3	
x		6	8		
	1	3	2		
	1	9	4	4	(8 x 243)
+	1	4	5	8	0
	1	6	5	2	4
					1

Column

(www.senseofnumber.co.uk)

M9c: Column Multiplication

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$$\begin{array}{r} \text{T} \quad \text{U} \quad \frac{1}{10} \\ 3 \quad \cdot \quad 6 \\ \times 4 \\ 2 \\ \hline 1 \quad 4 \quad \cdot \quad 4 \\ \hline \end{array}$$

M9d: Column Multiplication

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Sample Edition
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H T U . $\frac{1}{10}$

4 7 . 2

x 3

2

1 4 1 . 6



M9e: Column Multiplication

H T U $\frac{1}{10}$ $\frac{1}{100}$

7.38

x 6

4

2

4

44.28



M9f: Long Multiplication

Column Decimals

T U ■ $\frac{1}{10}$ $\frac{1}{100}$

24.3

x 2.5

1 2 1

12.15

(0.5 x 24.3)

+ 48.60

(2 x 24.3)

1
60.75

M9g Long Multiplication

Column

	Th	H	T	U
	3	7	8	6
x			4	8

6 6 4

+

	3	0	2	8	8
1	5	1	4	4	0

(8 x 3786)

(40 x 3786)

181728

Y1

S1: Objects

●●●●●●●
~~●●●●~~
 $7 - 3 = 4$

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

S

Subtraction Calculation

$6 - 2 = 4$
 (minuend) (subtrahend) (difference)
 (subtraction)

Subtraction Vocabulary

count back, decrease, minus, subtract, take away, difference between

Y1

S2: What's the Difference?

●●●●●●●
~~●●●●~~
 $7 - 5 = 2$

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

S3a: Counting Back

-1 -1 -1
 9 10 11 12
 $12 - 3 = 9$

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

S4: Counting On

+1 +1 +1
 9 10 11 12
 $12 - 9 = 3$

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

Y2

S5a: Backwards Bounce

-1 -1 -1 -10 -10
 70 71 72 73 74 75 76 77 78 79 80 81 82
 $87 - 25 = 62$

How many more is 87 than 25? What is the difference?

S6: Backwards Bounce

-1 -1 -1 -10 -10
 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82
 $87 - 25 = 62$

How many more is 87 than 25? What is the difference?

S7: Triple Jump!

+7 +7 +7
 30 37 44 51 58 65 72 79 86 93
 $87 - 25 = 62$

How many more is 87 than 25? What is the difference?

S8: Triple Jump!

+7 +7 +7
 30 37 44 51 58 65 72 79 86 93
 $87 - 25 = 62$

How many more is 87 than 25? What is the difference?

S9: 10s Jump, 1s Jump!

+30 +30 +30 +7 +7 +7
 37 67 97 104 111 118 125 132
 $75 - 37 = 38$

How many more is 75 than 37? What is the difference?

S10: Expanded Column

$75 - 37 = 38$

S11: Column Subtraction

$75 - 37 = 38$

Y2

S12: Expanded Column

$75 - 37 = 38$

S13: Column Subtraction

$75 - 37 = 38$

Y3

S14: Expanded Column

$132 - 56 = 76$

S15: Column Subtraction

$132 - 56 = 76$

Y3

55 56 57 58 59 60 61 62 63

Y4

64 65 66 67 68 69 70 71 72

Y5

73 74 75 76 77 78 79 80 81

Y5

82 83 84 85 86 87 88 89 90

Y5

91 92 93 94 95 96 97 98 99

S8c: Big Jump!

$356 + 360 + 400 + 700 = 723$

$723 - 356 = 367$

S9c: 100s, 10s, 1s Jump

$356 + 300 + 60 + 7 = 723$

$723 - 356 = 367$

S10: Expanded Column

$723 - 356 = 367$

S11: Column Subtraction

$723 - 356 = 367$

S8d: Quad Jump Extreme

$1776 + 24 + 200 + 2000 + 5000 = 5042$

$5042 - 1776 = 3266$

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

$1776 + 3000 + 200 + 60 + 6 = 5042$

$5042 - 1776 = 3266$

S11d: Column Subtraction

$5042 - 1776 = 3266$

S11e: Column Subtraction

$742831 + 427358 = 315178$

S8f: Decimals

$13.4 - 8.7 = 4.7$

S9f: Decimals

$13.4 - 8.7 = 4.7$

Column Subtraction

$13.4 - 8.7 = 4.7$





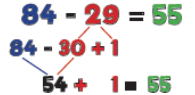

S11g: Column Subtraction

$12.4 - 5.97 = 6.43$

S11g: Column Subtraction

$72.43 - 47.85 = 24.58$



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

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