Sense of Number

Visual Calculation Policy

Basic Edition for

Naburn C.E. Primary School

January 2017

Graphic Design by Dave Godfrey

Compiled by the Sense of Number Maths Team

For sole use within Naburn C.E. Primary School.

‘A picture is worth 1000 words!’

www.senseofnumber.co.uk

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Guide to using a Visual Calculation Policy

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

Typical uses:

Classoom: 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 schools' maths webpages.

(Please note: the VCP should not be made available for download)

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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 x 2 = 16

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

Division

÷

8 ÷ 2 = 4

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

("8 shared into 2 sets is 4")

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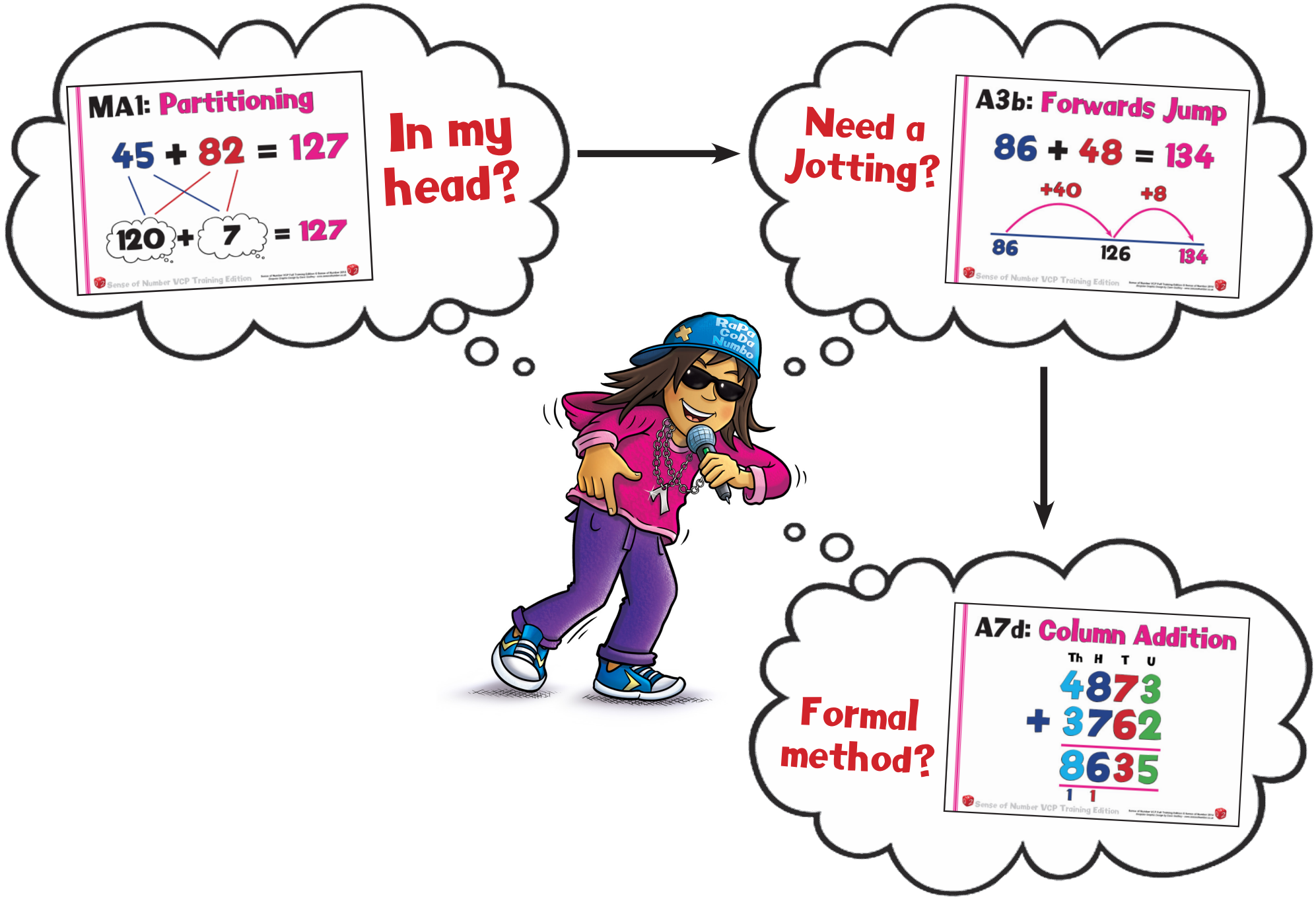

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1

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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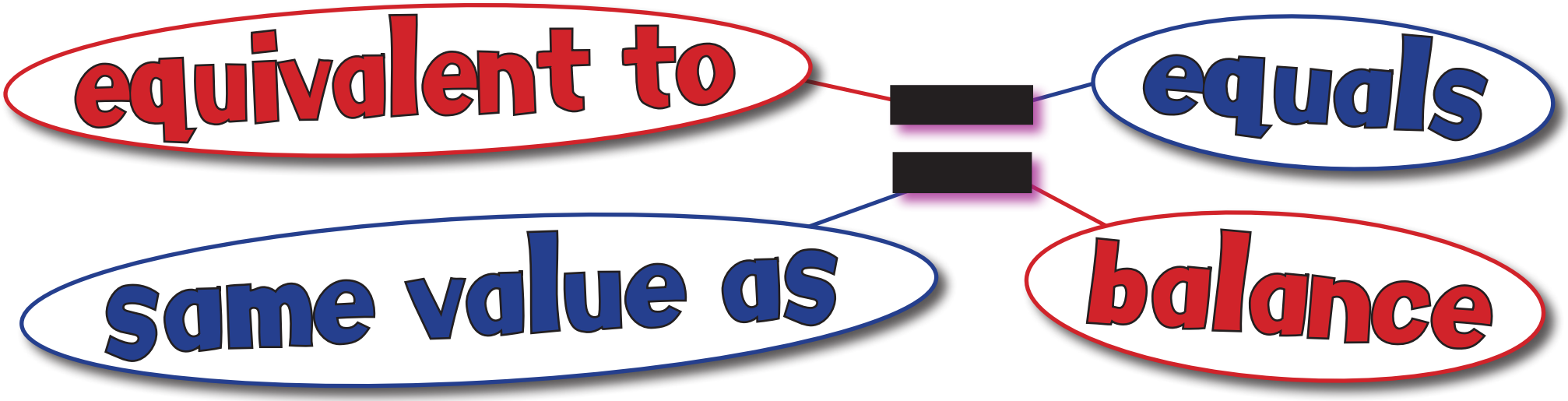
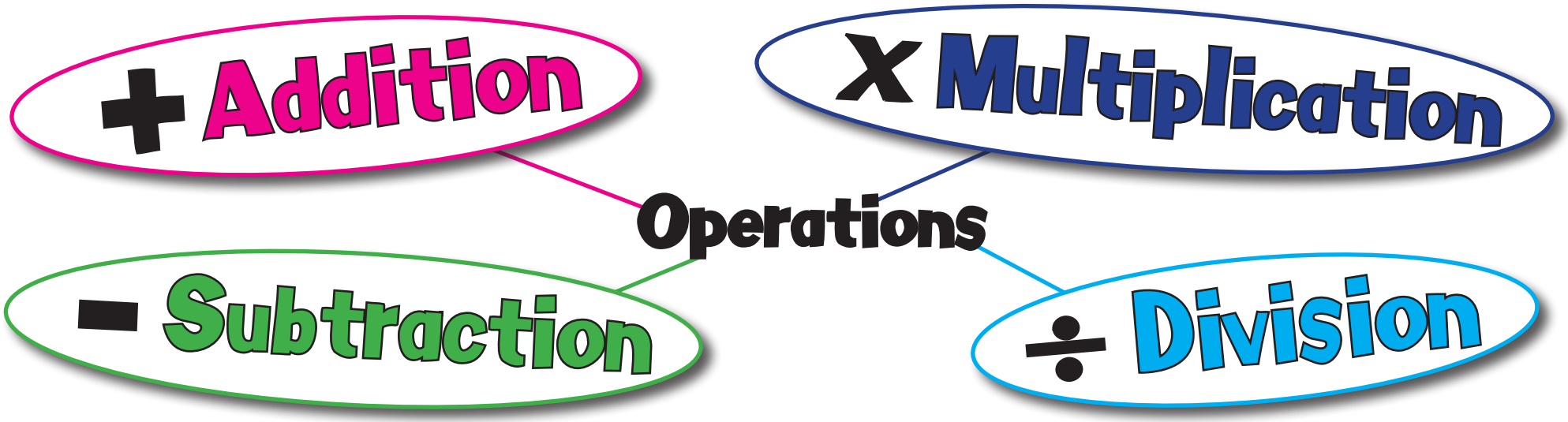
Calculation Vocabulary





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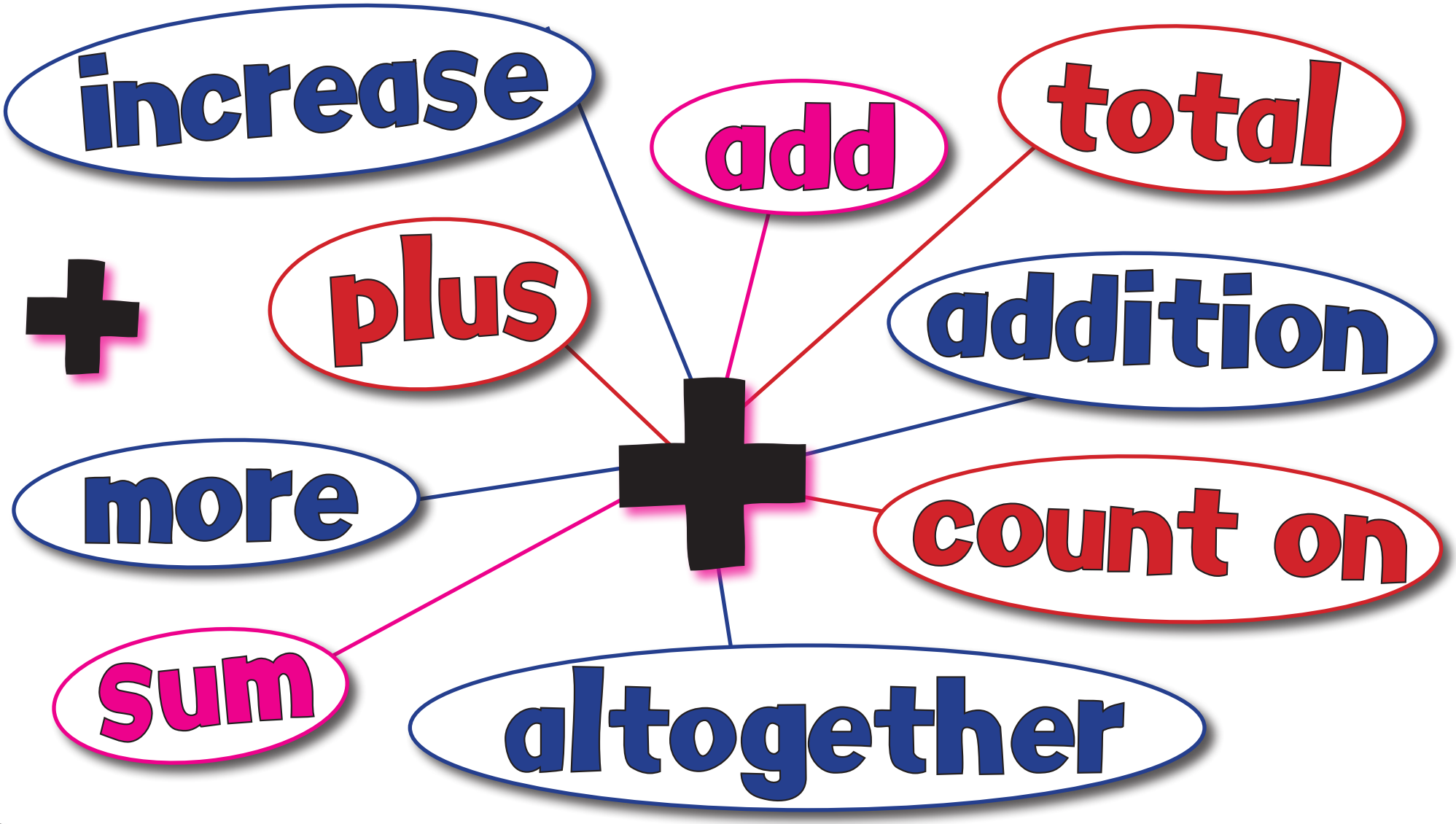
Addition Vocabulary



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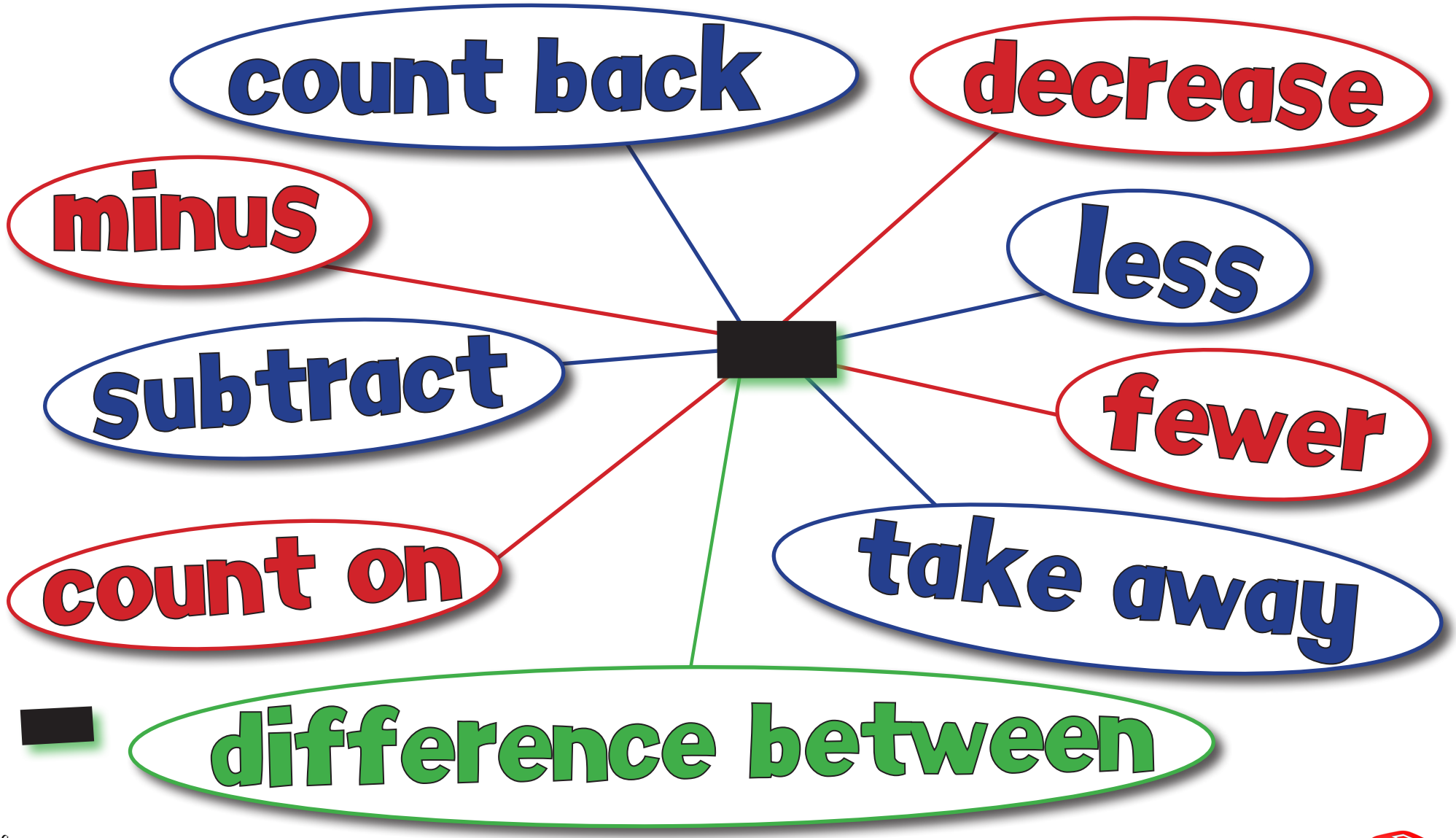
Subtraction Vocabulary



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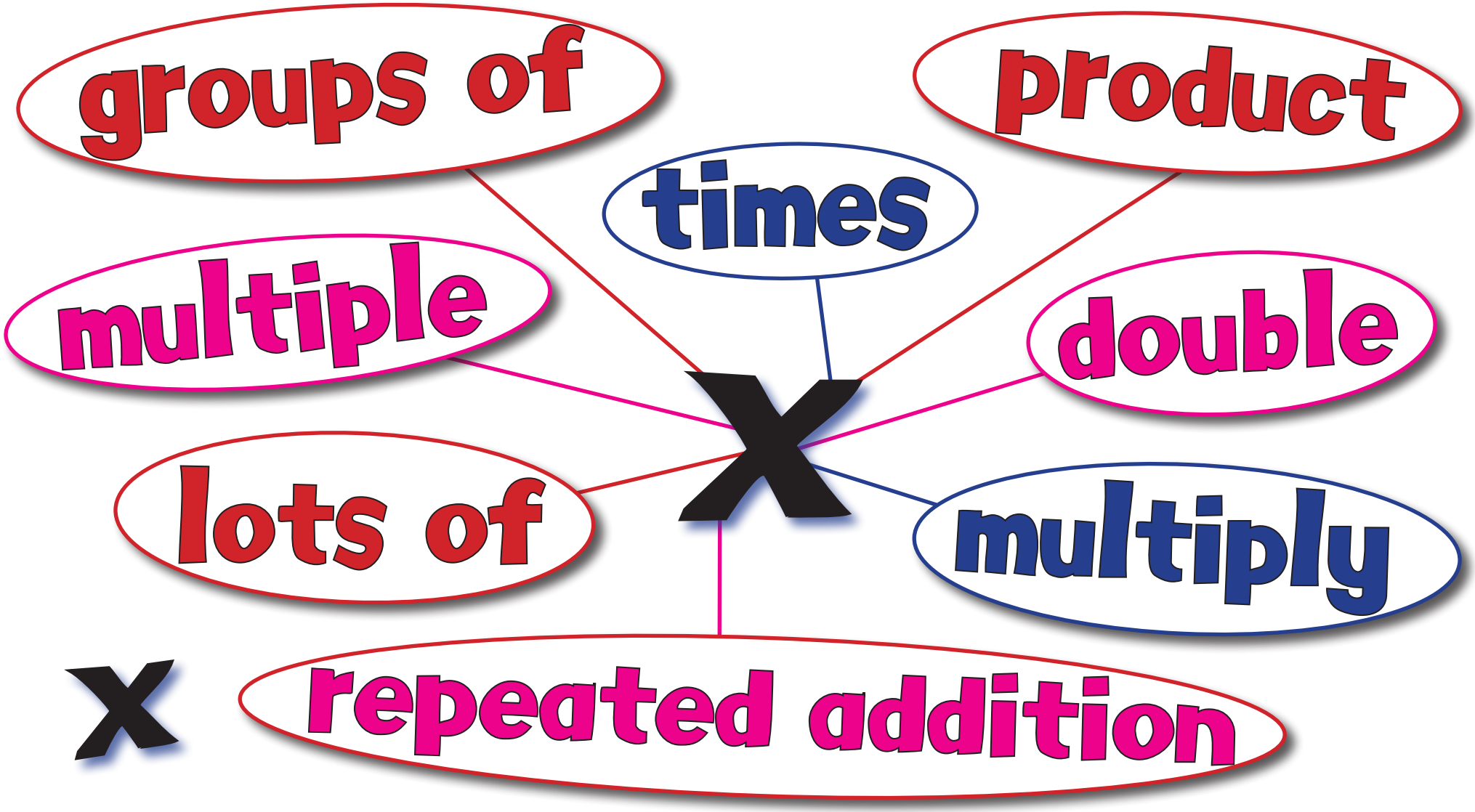
Multiplication Vocabulary



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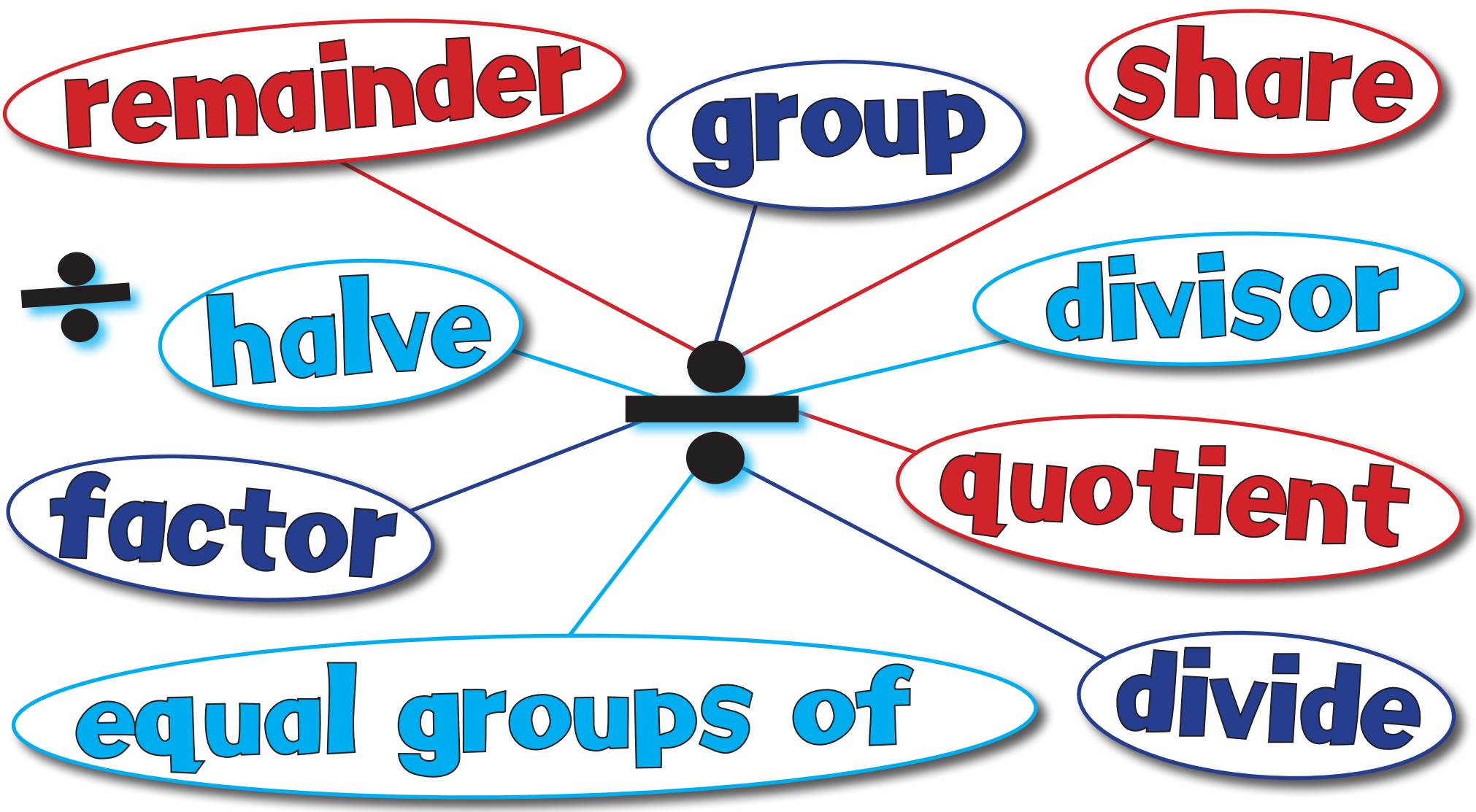
Division Vocabulary



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Addition Calculation

4 + 2 = 6

(add)

total

Sum

+

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Subtraction Calculation

-

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Multiplication Calculation

$4 \times 2 = 8$

(multiplied by)

product

x

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Division Calculation

$8 \div 2 = 4$

(divided by)

quotient

÷

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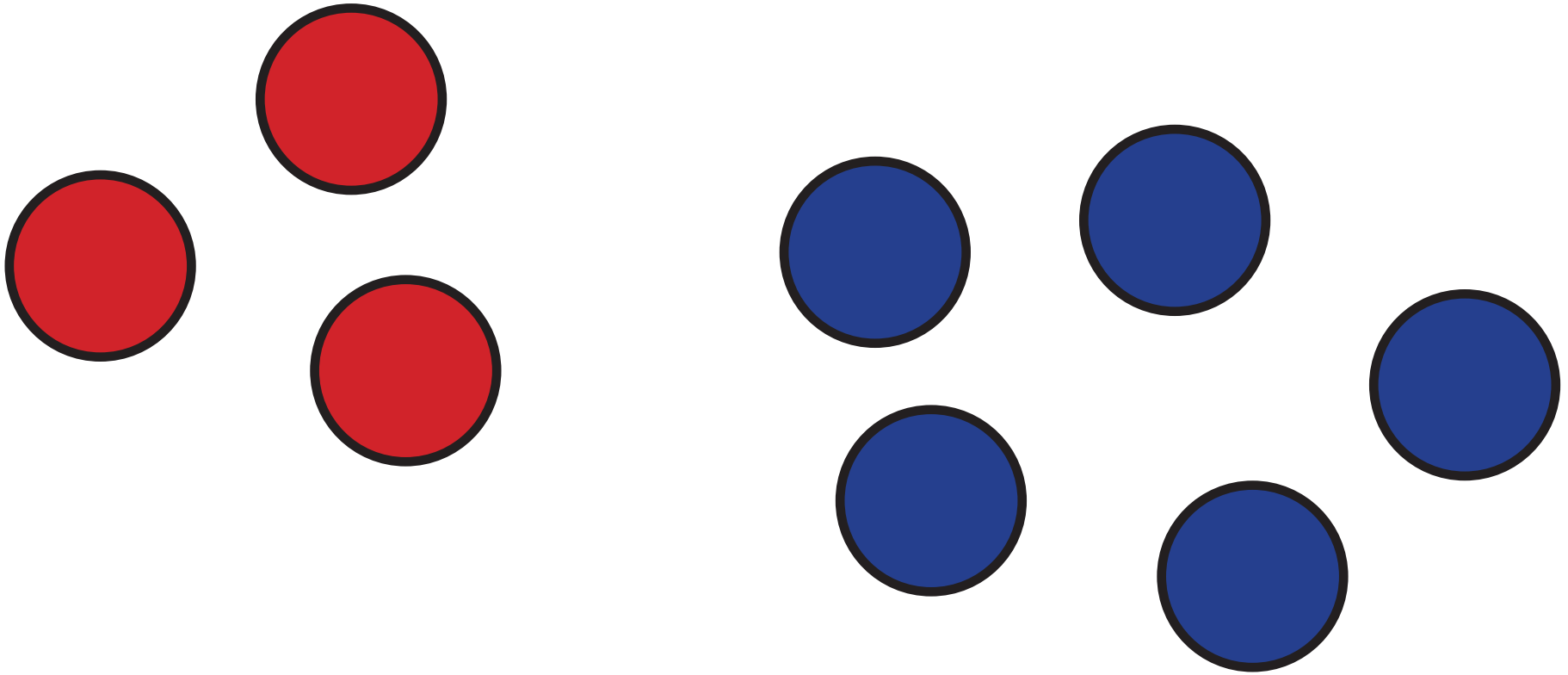
A1: Objects & Pictures



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

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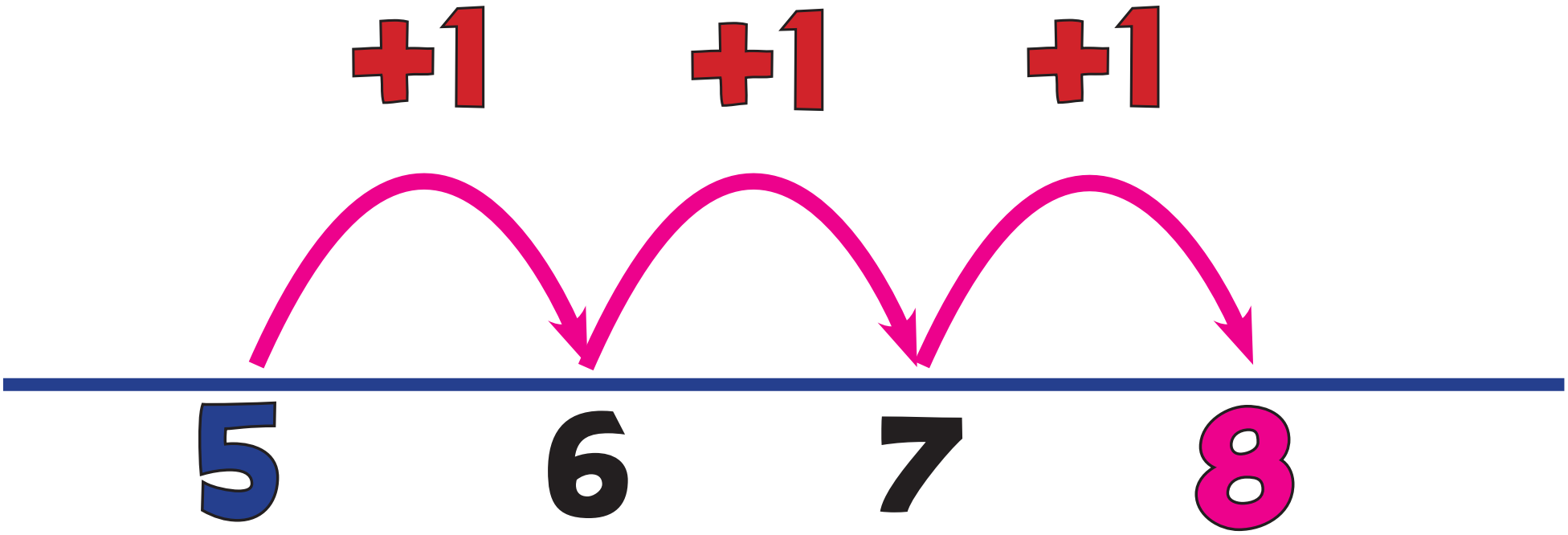
A2: Counting On



$$5 + 3 = 8$$

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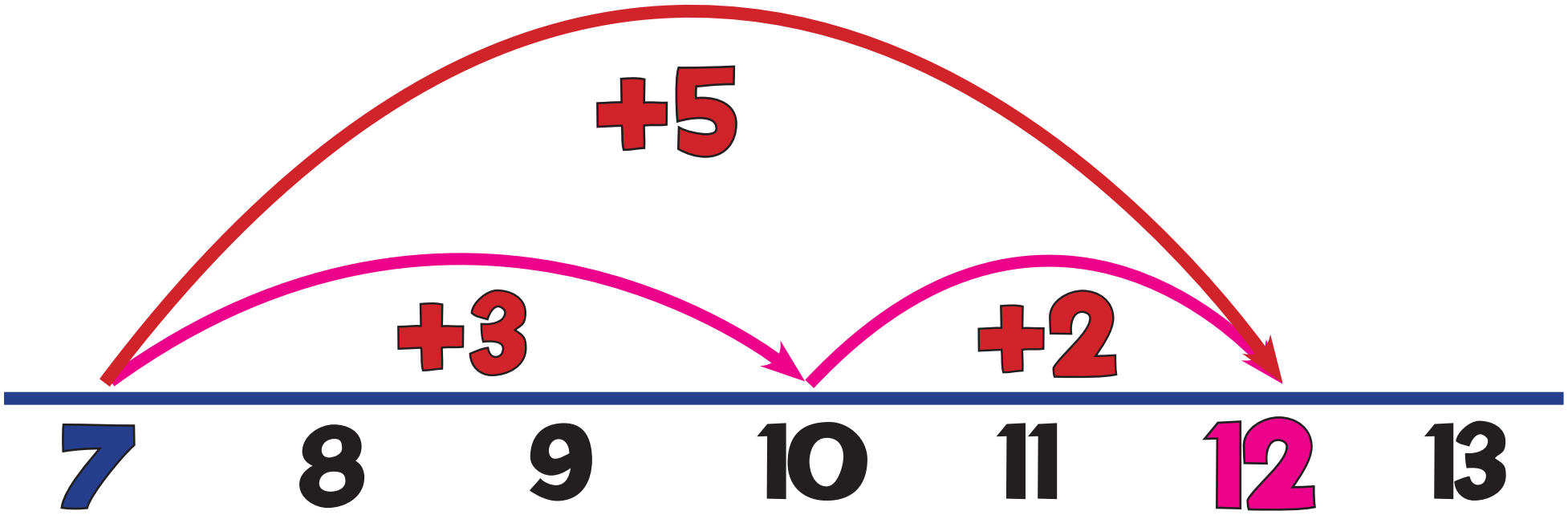
A3: Bridging through 10



$$7 + 5 = 12$$

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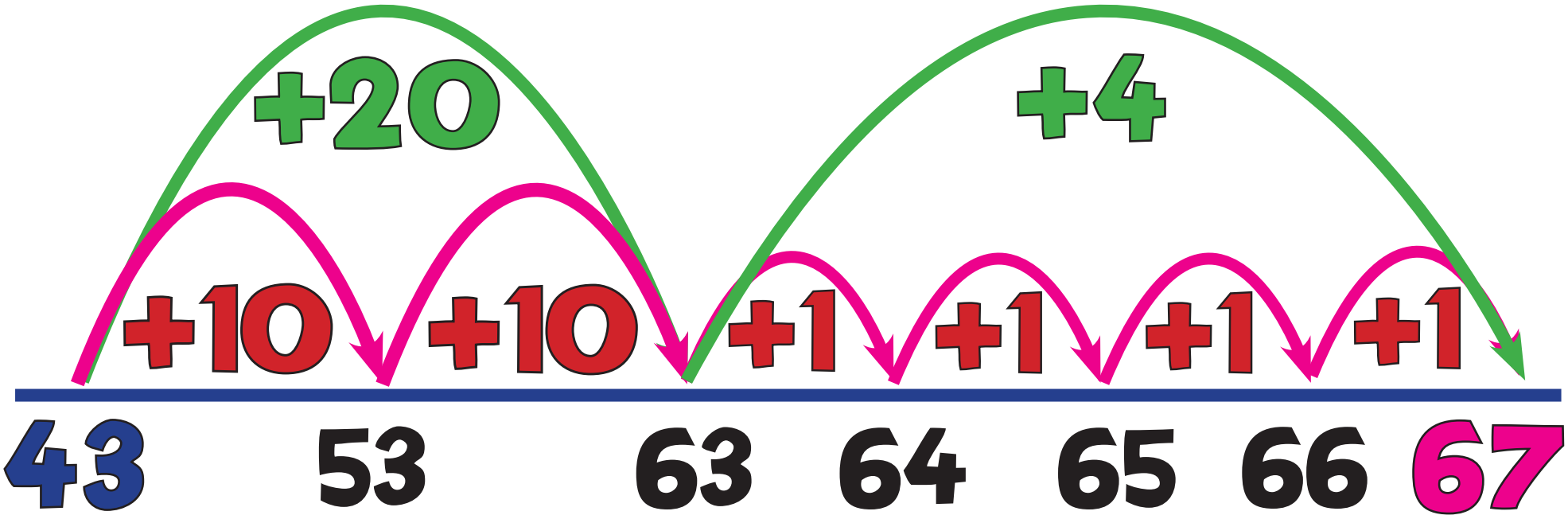
A4: Forwards Jump

43 + 24 = 67



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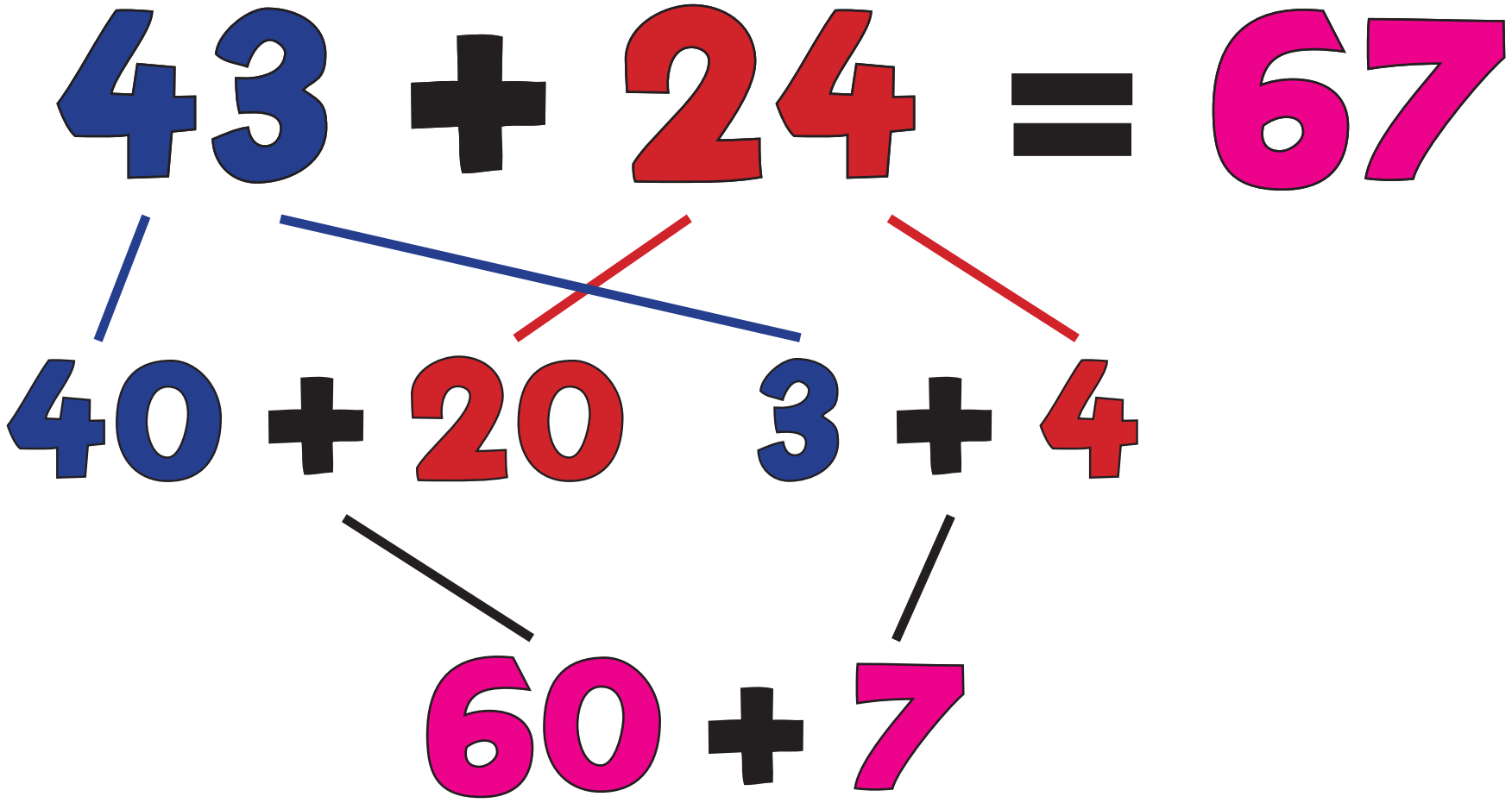
A5: Partition Jot 1



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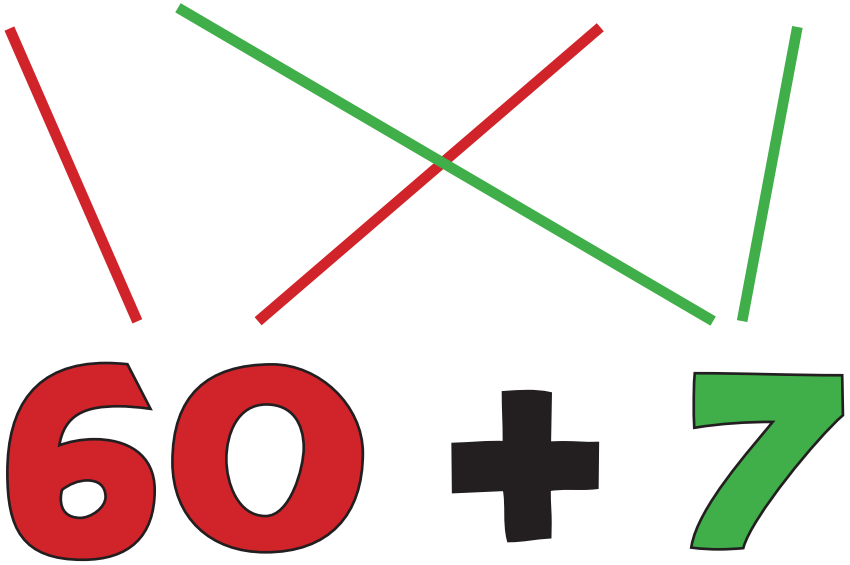
A6: Partition Jot 2

43 + 24 = 67



60 + 7

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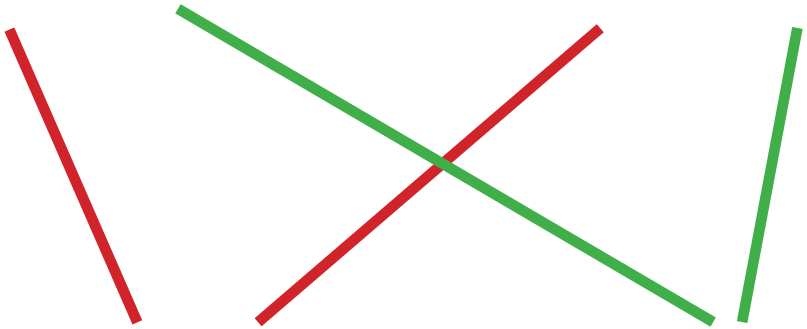
A7: Partition Jot 3

47 + 26 = 73



60 + 13

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A6: Expanded Column Addition

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

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A7: Column Addition 1

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

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A7: Column Addition 2

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

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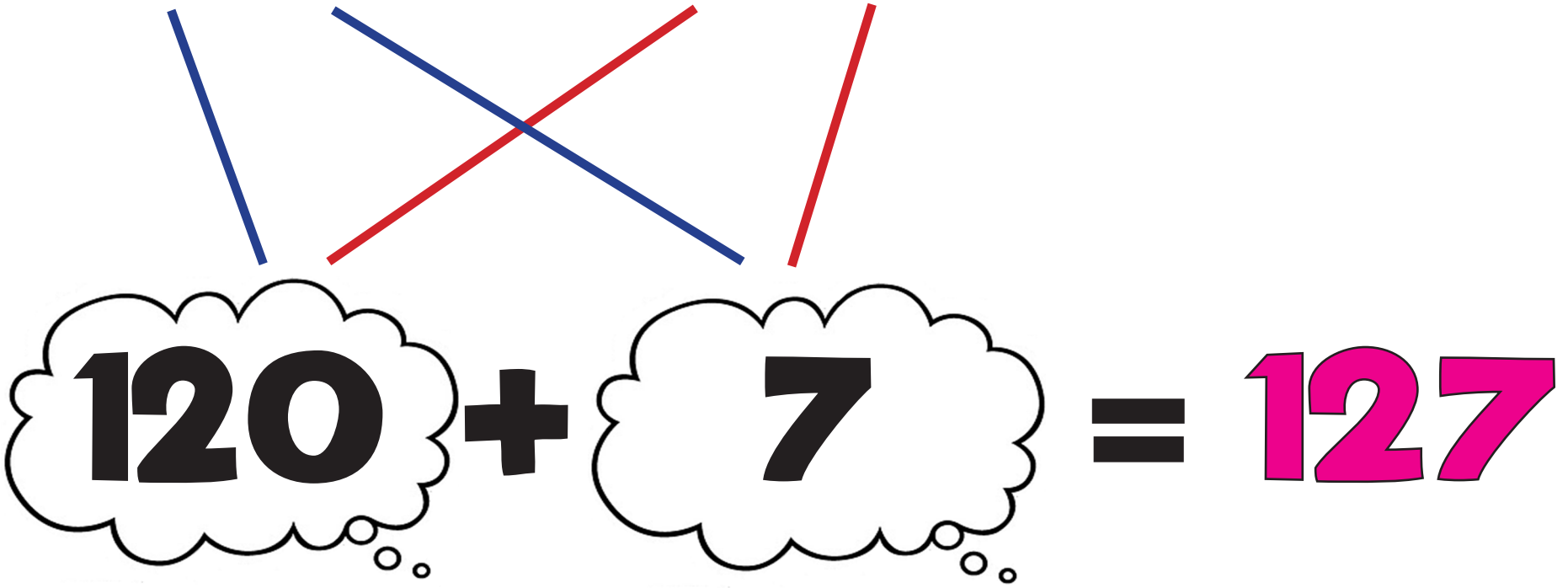
MA1: Partitioning

45 + 82 = 127



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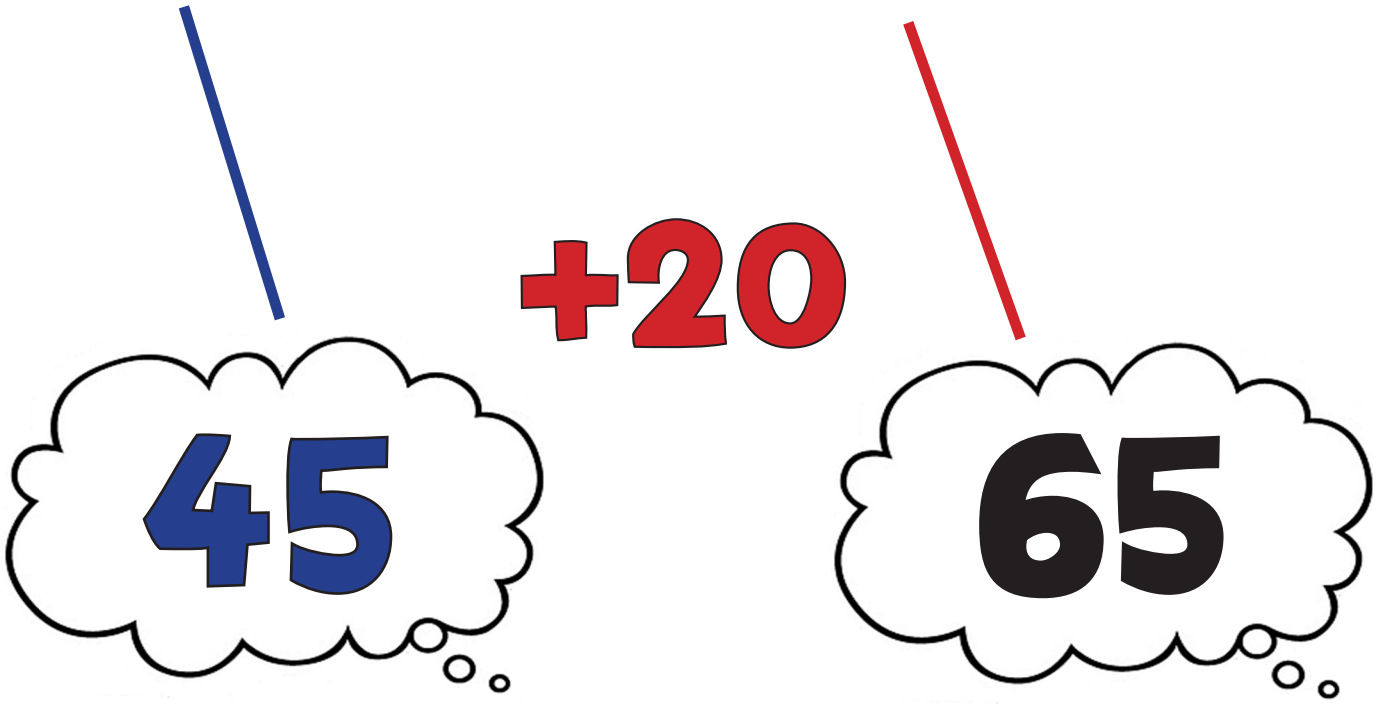
MA2: Counting On

$$45 + 20 = 65$$



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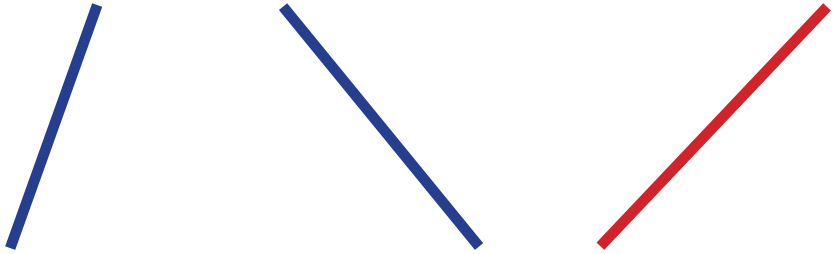
MA3: Number Bonds

45 + 95 = 140



40 + 100 = 140

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MA4: Double & Adjust

45 + 46 = 91

45 + 45 + 1

90 + 1 = 91

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MA5: Round & Adjust

45 + 39 = 84

45 + 40 - 1

85 - 1 = 84

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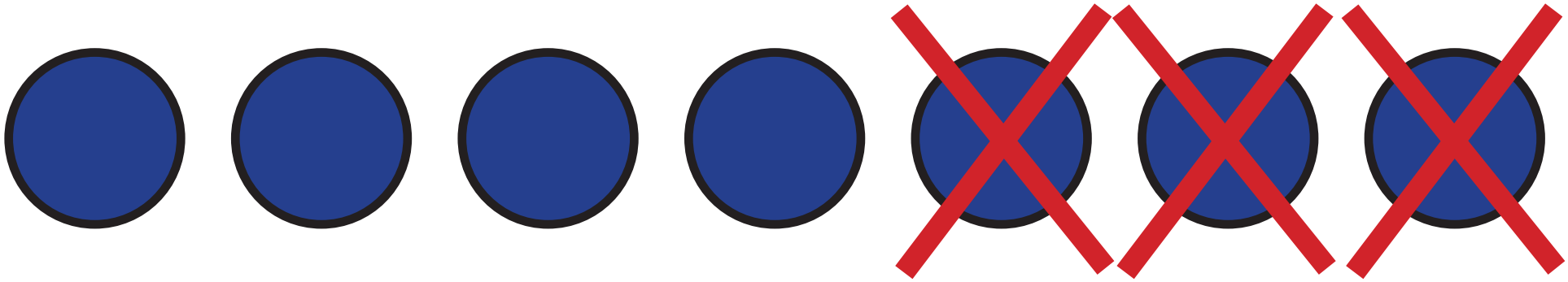
S1: Objects



7 - 3 = 4

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

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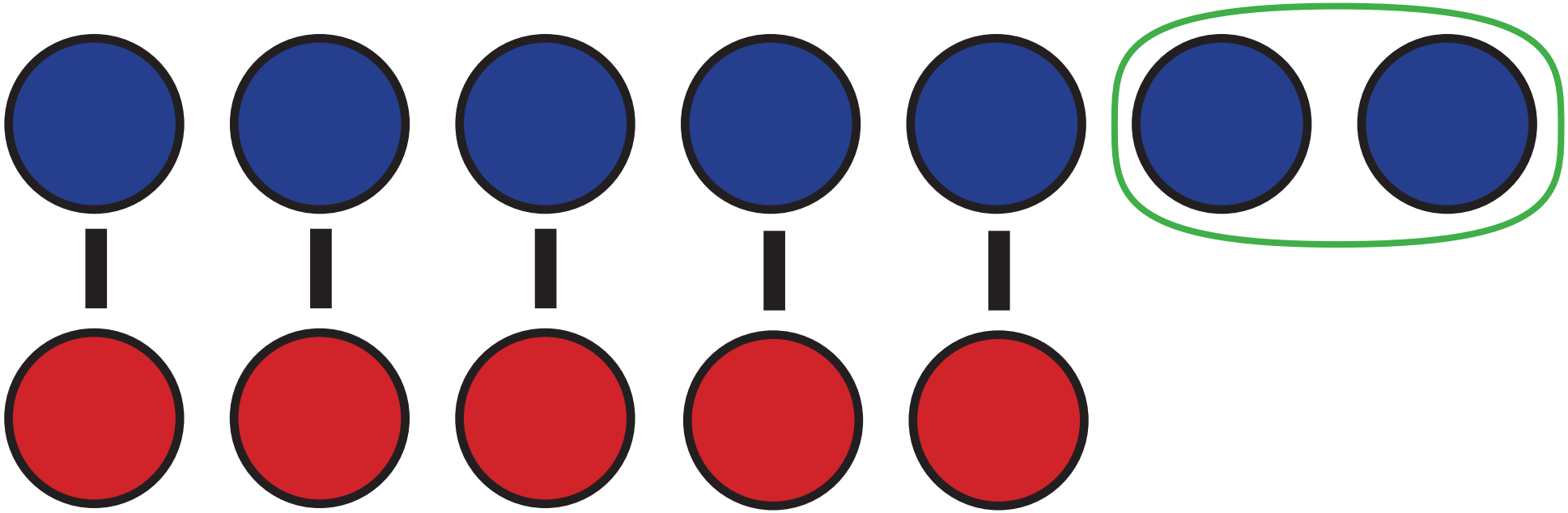
S2: What's the Difference?



7 - 5 = 2

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

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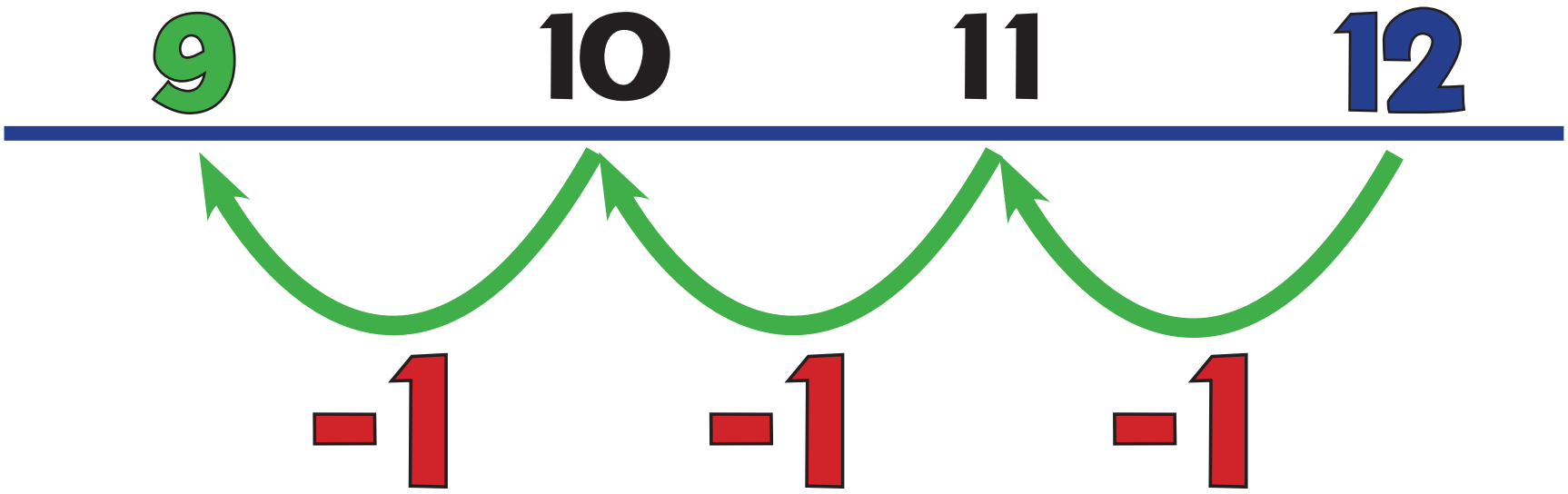
S3: Counting Back



12 - 3 = 9

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

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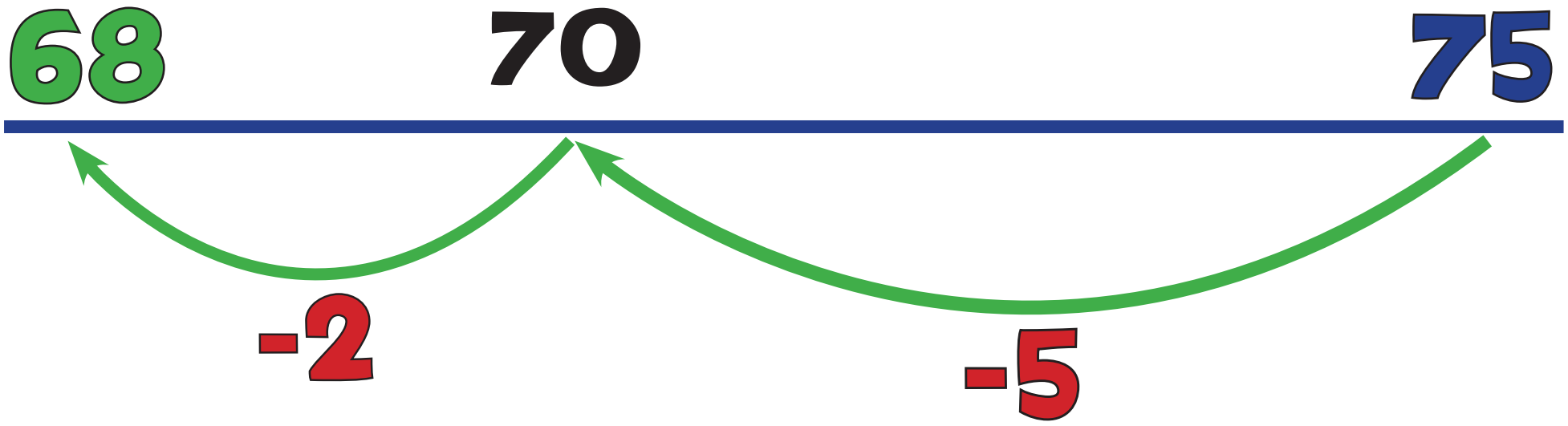
S4: Backwards Jump



75 - 7 = 68

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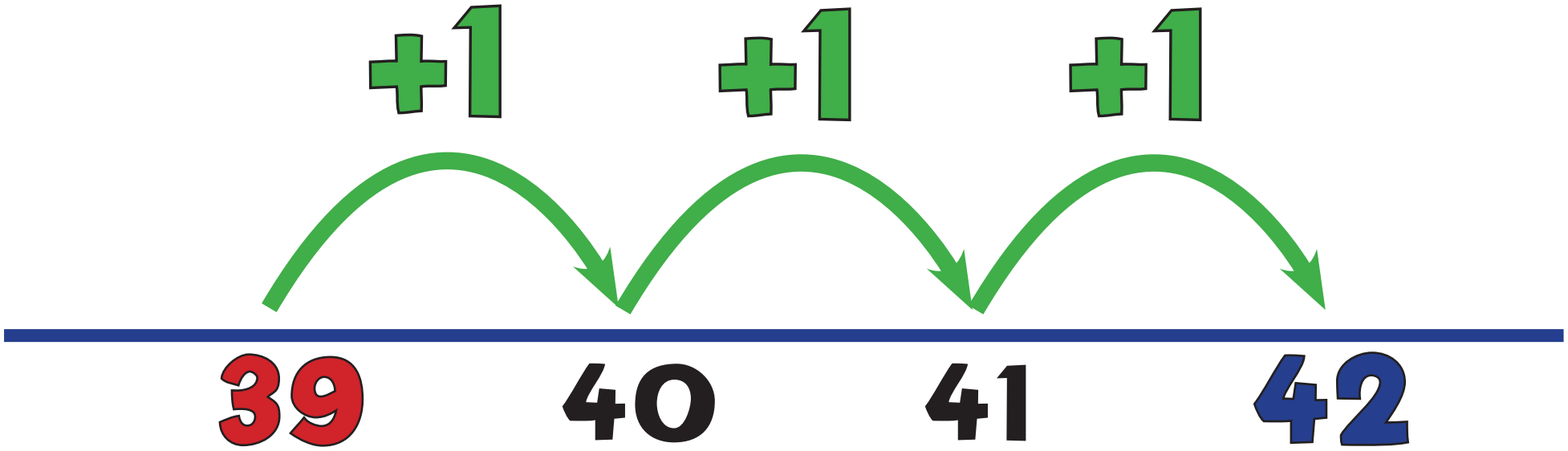
S5: Counting On



42 - 39 = 3

"How many more is 42 than 39? What is the difference?"

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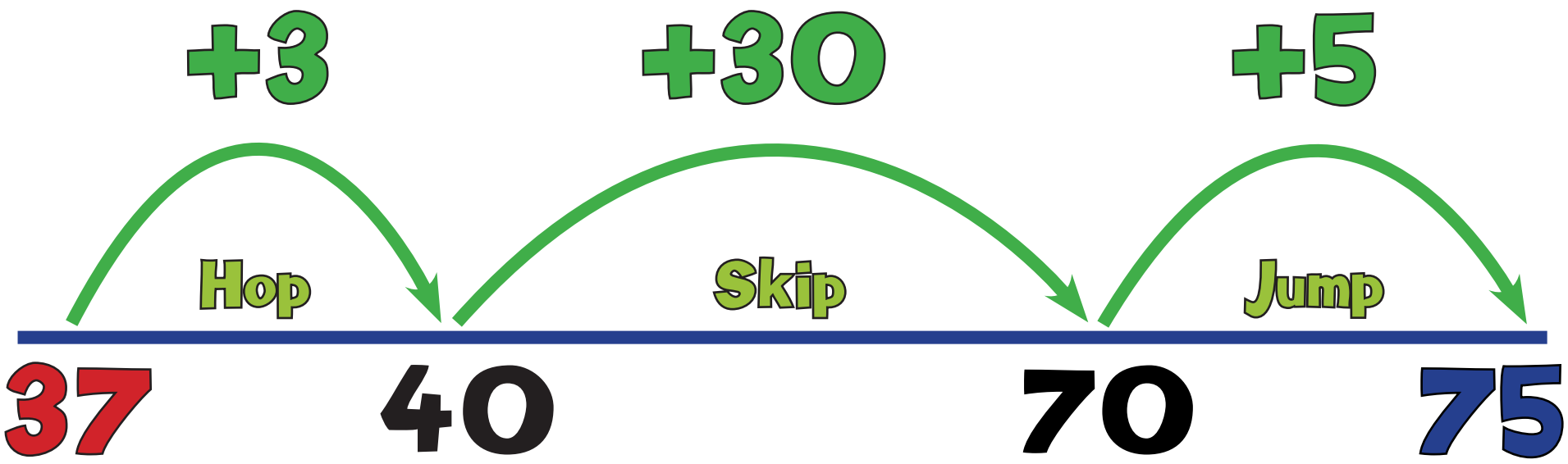
S6: Triple Jump!



75 - 37 = 38

"By counting on from 37 to 75 (3 + 30 + 5), I know the difference between 75 and 37 is 38."

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S7: Column Subtraction 1

H	T	U
6	9	3
- 2	7	1
4	2	2

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S8: Expanded Column

Subtraction (100, 10, 1s)

723 - 356 = 367

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

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S9: Column Subtraction

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

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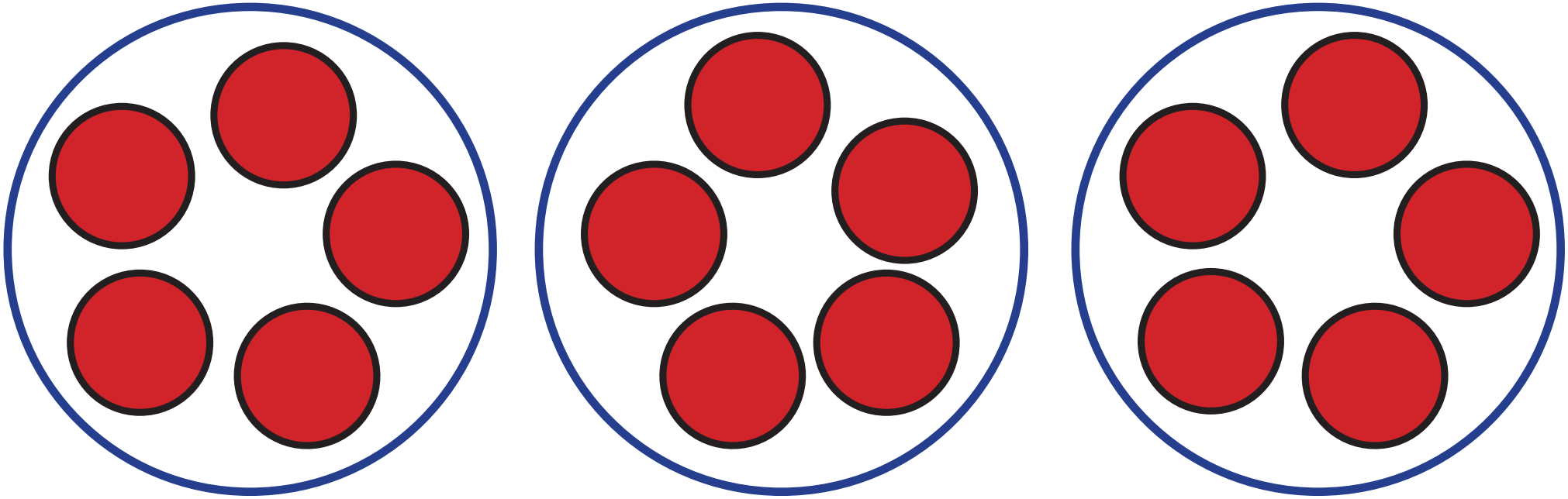
M1: Repeated Addition

(Groups)



5 x 3 = 5 + 5 + 5 = 15

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

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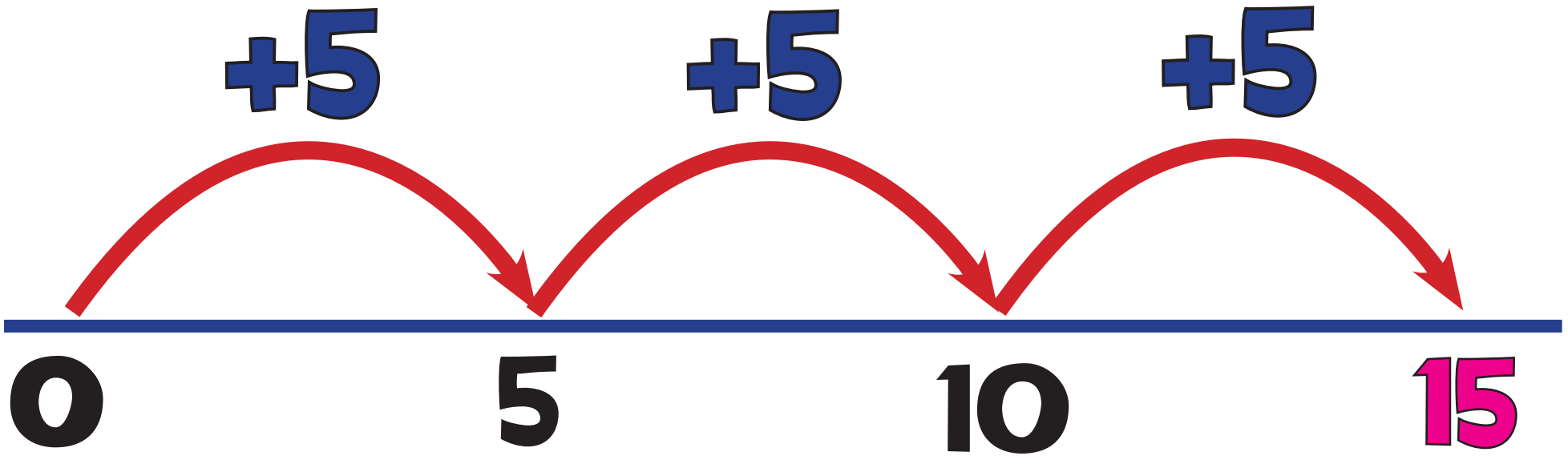
M2: Repeated Addition

(Number Line)



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

"5 multiplied by 3" means "5, 3 times!"

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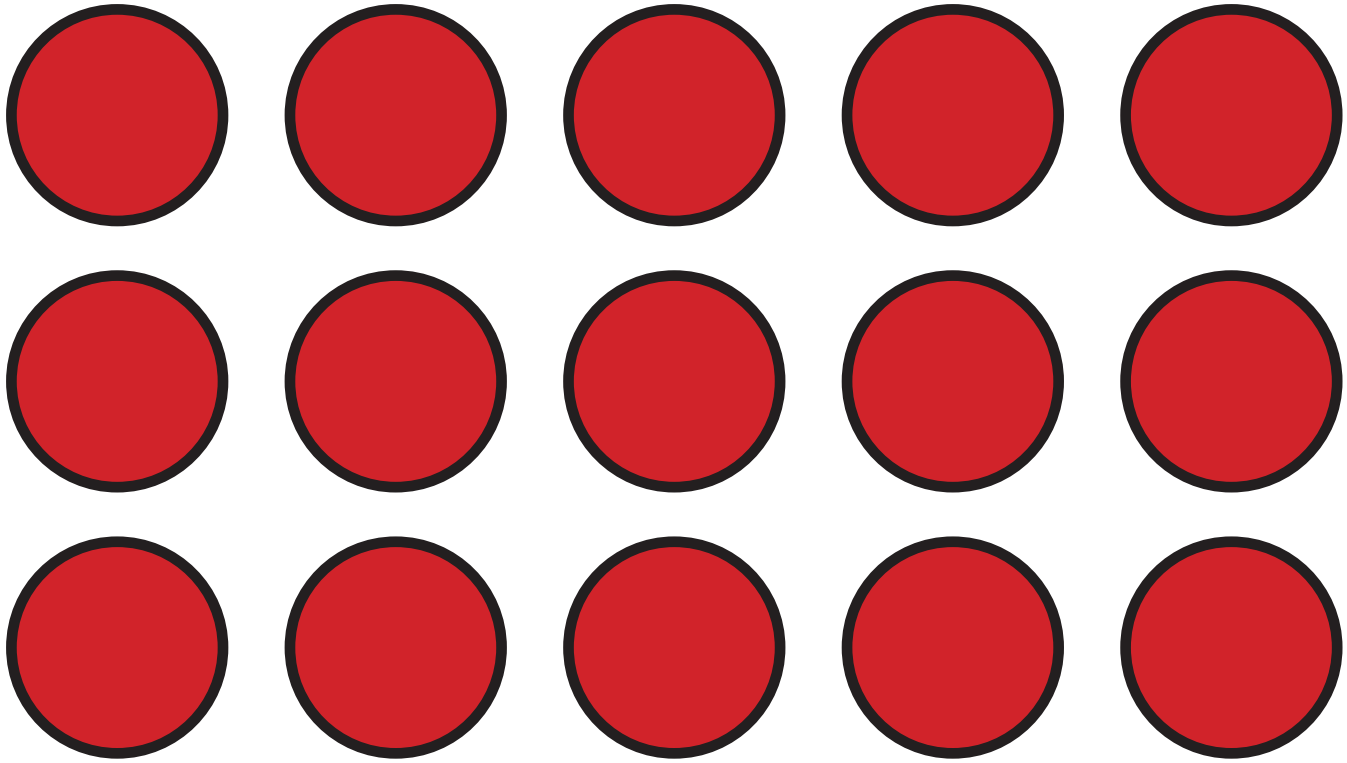
M3: Arrays



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

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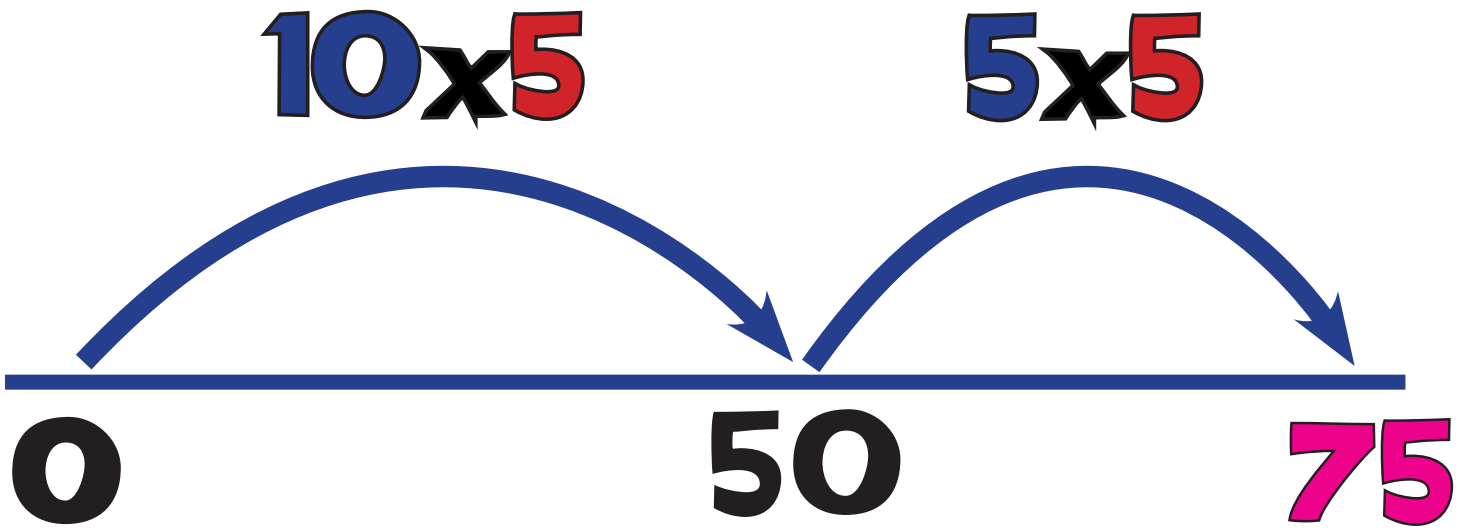
M4: Partitioning!



10 x 5 = 50

5 x 5 = 25

75

15 x 5 = 75

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M5: Grid Method 1

Short Multiplication

15 x 5 = 75

x	10	5
5	50	25

50 + 25 = 75

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M6: Grid Method 2

Short Multiplication

147 x 4 = 588

x	100	40	7
4	400	160	28

400
160
+ 28
588

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M7: Expanded Column

147		
x 4		
28	(4 x 7)	
160	(4 x 40)	
400	(4 x 100)	
588		

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M8: Column Multiplication

$$\begin{array}{r} 147 \\ \times \quad 4 \\ \hline 588 \\ \hline 1\ 2 \end{array}$$

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M9: Grid Method

Long Multiplication

x	40	3
60	2400	180
5	200	15

2400
200
180
+ 15
2795

43 x 65 = 2795

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M10: Long Multiplication

Column

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

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MM1: Jump!

x1000

x100

x10

Th	H	T	U	.	$\frac{1}{10}$	$\frac{1}{100}$
3	4	0	0			
	3	4	0			
		3	4			
			3	.	4	

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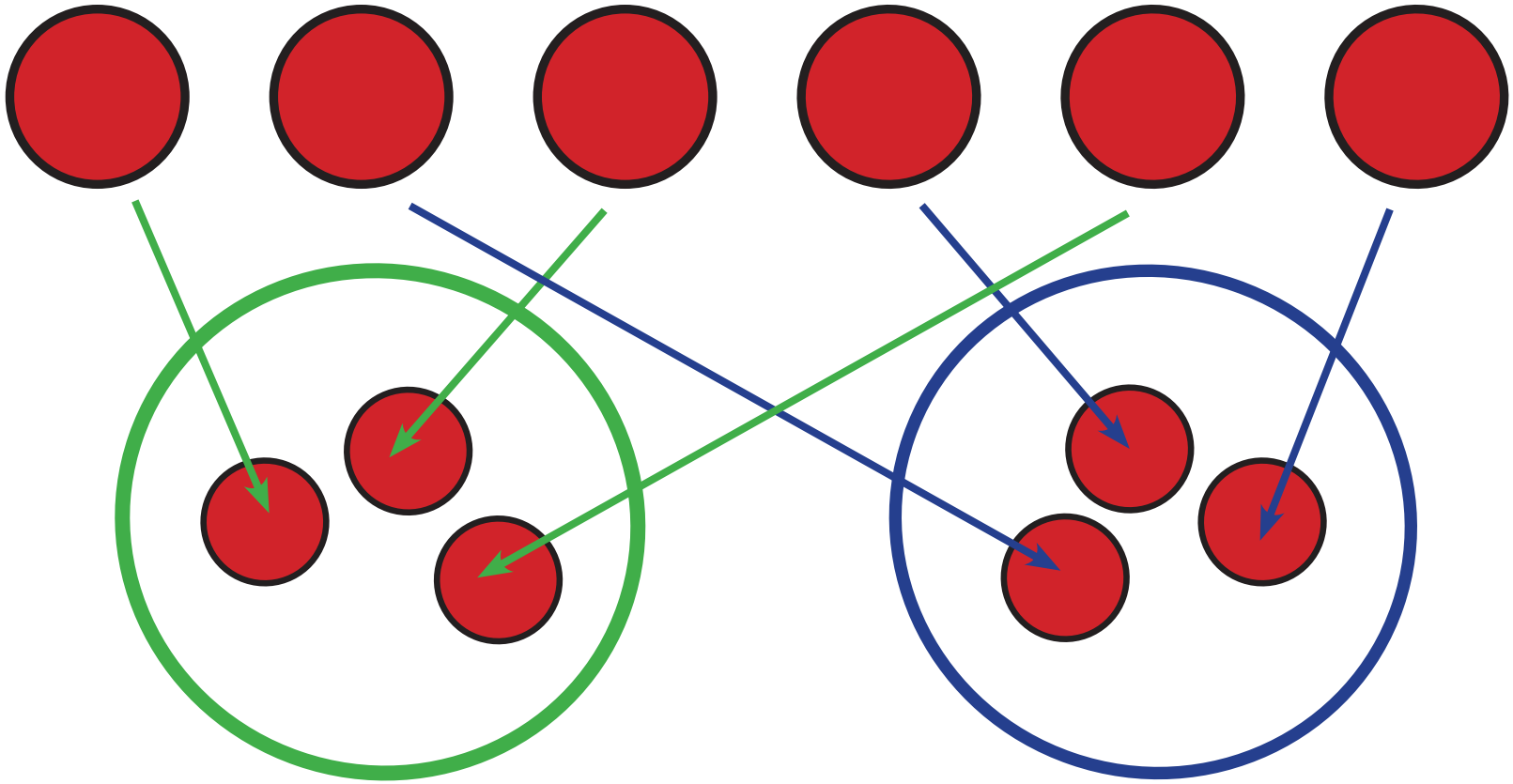
D1: Sharing



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

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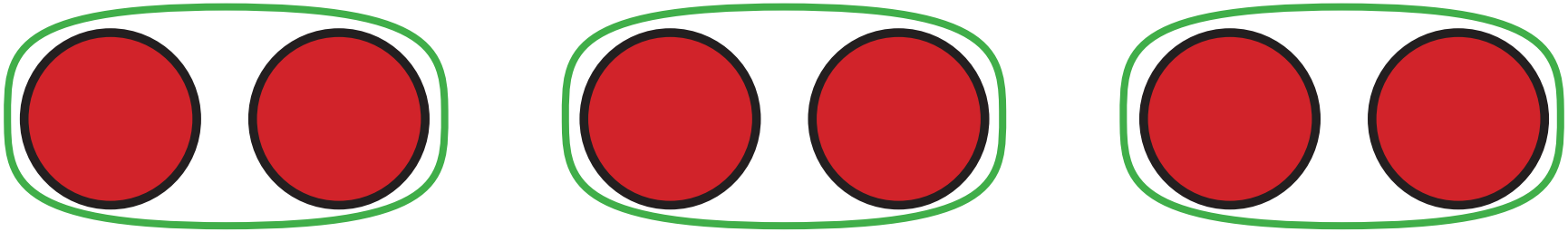
D2: Grouping (Concept)



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

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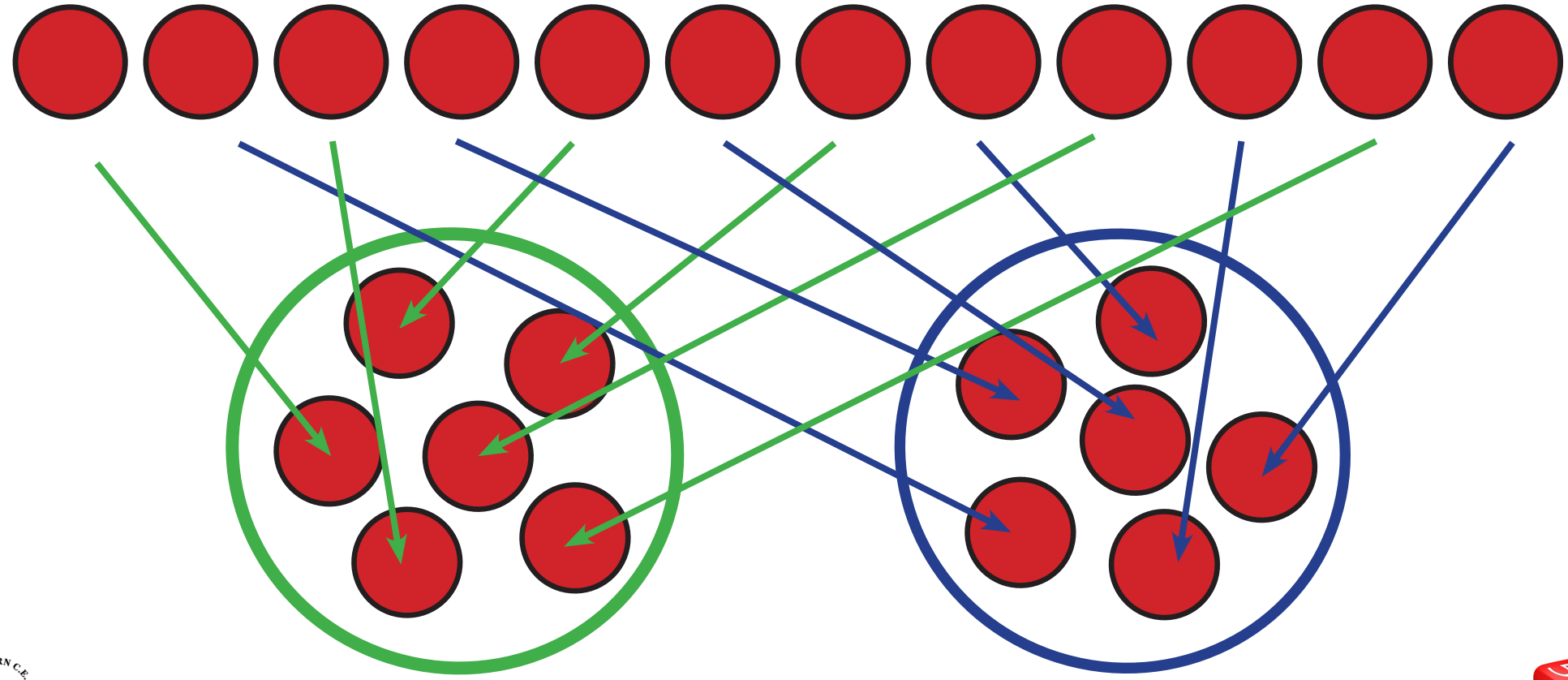
D2: Division as Sharing

12 ÷ 2 = 6

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



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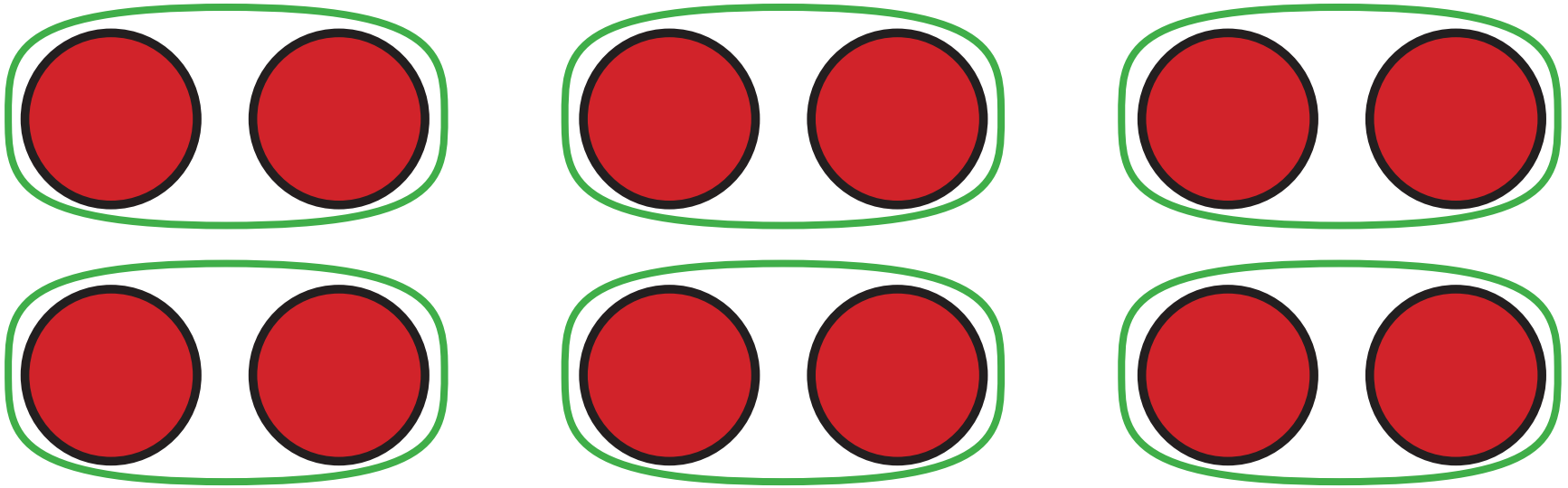
D4: Division as Grouping

12 ÷ 2 = 6

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



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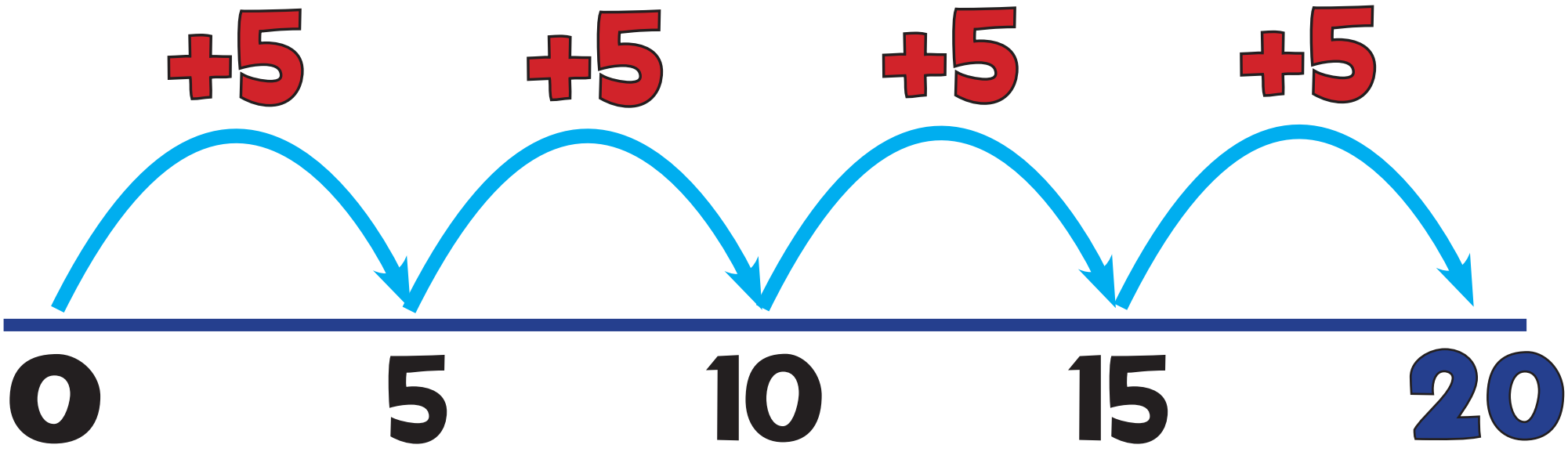
D5: Grouping on a Number Line



20 ÷ 5 = 4

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

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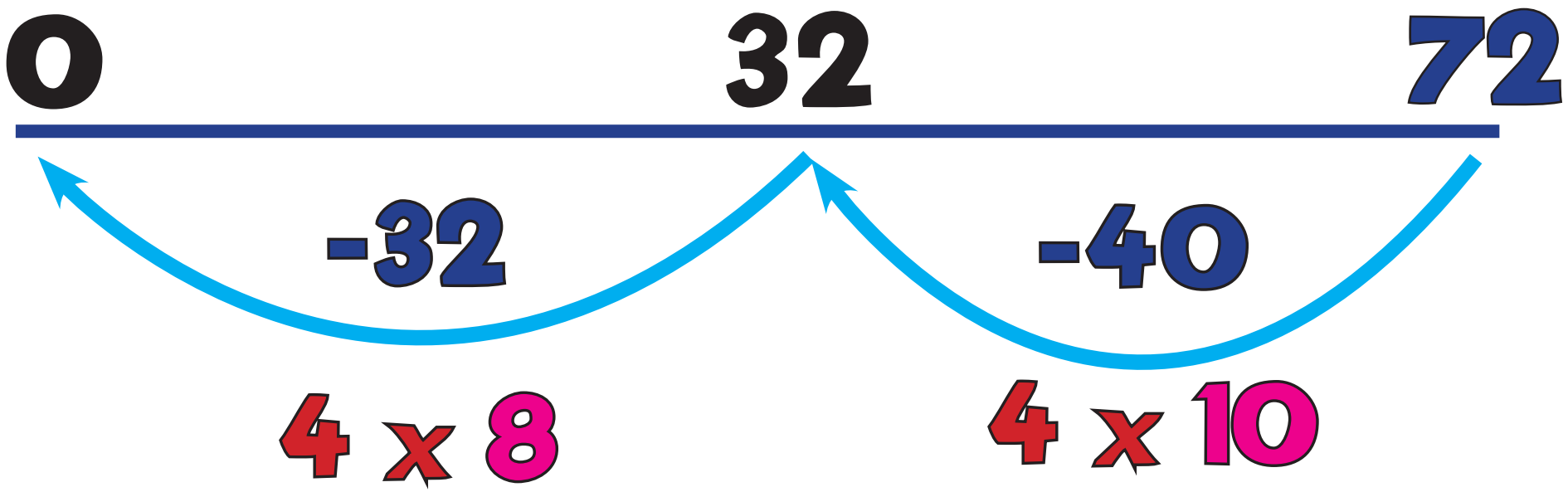
D6: Take a Chunk!



$$72 \div 4 = 18$$

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

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D7: Chunking

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

$136 \div 4 = 34$

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D8: Short Division

$$136 \div 4 = 34$$

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

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D9: Long Division

Compact Method

$$
\begin{array}{r}
37 \\
16\overline{)592} \\
-\ 480 \quad (16 \times 30) \\
\hline
112 \\
-\ 112 \quad (16 \times 7) \\
\hline
0
\end{array}
$$

$592 \div 16 = 37$

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D10: Long Division

Traditional Method

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

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

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MD1: Jump!

Th	H	T	U	.	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$	$\frac{1}{10000}$
			3	.	4			
			0	.	3	4		
			0	.	0	3	4	
			0	.	0	0	3	4

÷10

÷100

÷1000

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