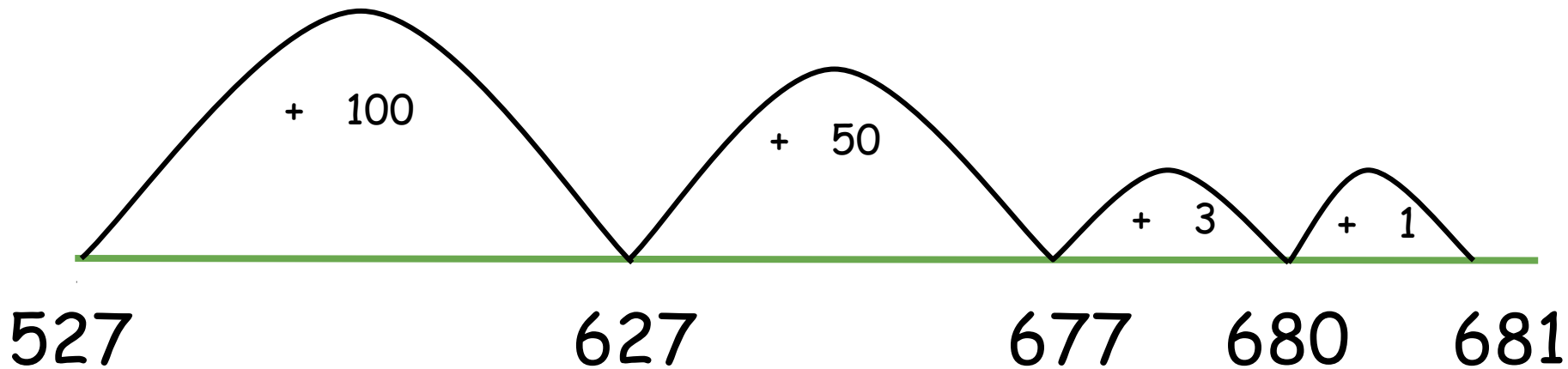




Step 1: Number line
Method

$$527 + 154 = \underline{\hspace{2cm}}$$

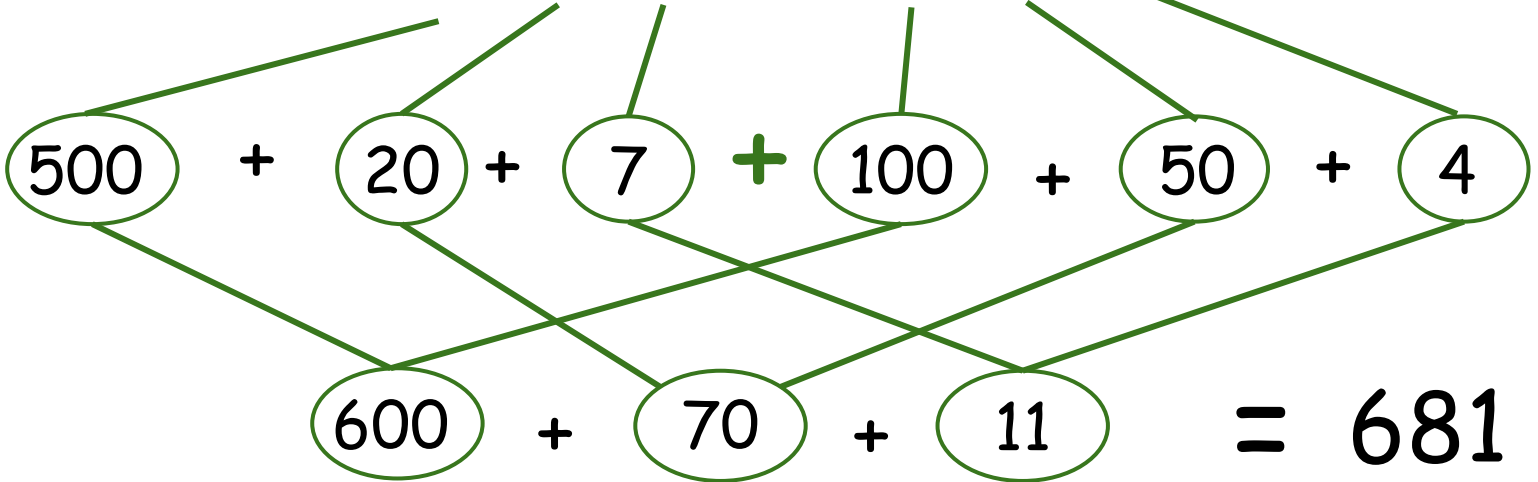




Step 2: Partitioning

$527 + 154 = \underline{\hspace{2cm}}$

$527 + 154 =$

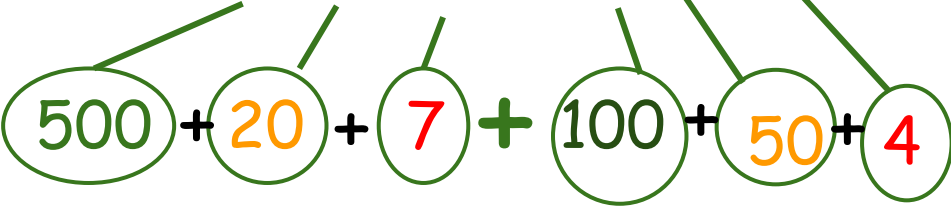




Step 2: Partitioning

$$527 + 154 = \underline{\hspace{2cm}}$$

$$527 + 154 =$$



$$500 + 100 = 600$$

$$20 + 50 = 70$$

$$7 + 4 = 11$$

$$600 + 70 + 11 = 681$$



Step 3: Column
Partitioning

$527 + 154 = \underline{\hspace{2cm}}$

$500 + 20 + 7$

$+ 100 + 50 + 4$

 $600 + 70 + 11 = 681$



Step 4: Expanded
Column Partitioning

$527 + 154 = \underline{\hspace{2cm}}$

527

+

154

 $7 + 4 = 11$

$20 + 50 = 70$

$500 + 100 = 600$

681

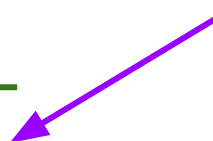


Step 5: Expanded
Column Addition

$527 + 154 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 527 \\ + 154 \\ \hline 11 \\ 70 \\ + 600 \\ \hline 681 \end{array}$$

Watch out!
You **exchanged**
10 ones for **1**
ten!





Step 6: Compact Column
Addition

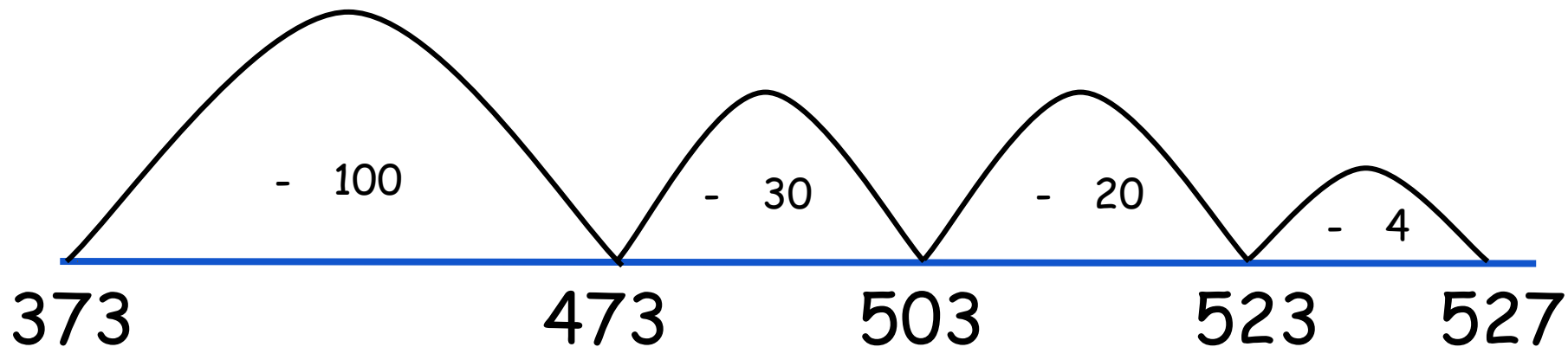
$527 + 154 = \underline{\hspace{2cm}}$

$$\begin{array}{r} + 527 \\ 154 \\ \hline 681 \\ \hline 1 \end{array}$$

Watch out! You
exchanged 10
ones for 1 ten!

Step 1: Number line
Method

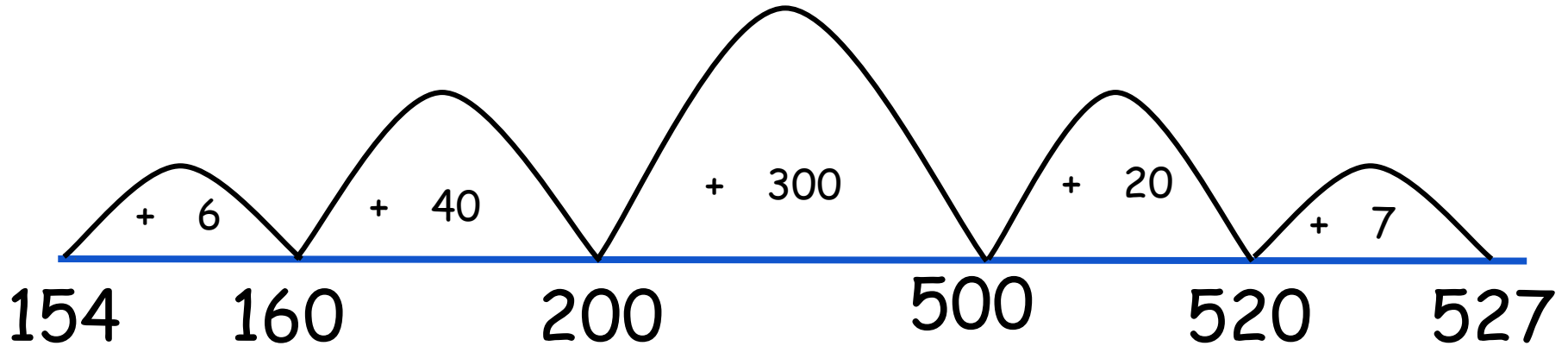
$$527 - 154 = \underline{\hspace{2cm}}$$



*Jumping down on a number line.

Step 2: Number line
Method

$$527 - 154 = \underline{\hspace{2cm}}$$



*Using the inverse and jumping up!



Step 2: Partitioning

$$47 - 24 = \underline{\hspace{2cm}}$$

$$40 - 20 = 20$$

$$7 - 4 = 3$$

$$20 + 3 = 23$$

Step 3: Column
Partitioning

$$527 - 154 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 400 \\ \cancel{500} + 20 + 7 \end{array}$$

$$\begin{array}{r} - 100 + 50 + 4 \end{array}$$

$$300 + 70 + 3 = 373$$

Step 4: Expanded
Column Partitioning

$527 - 154 = \underline{\hspace{2cm}}$

527

- 154

$7 - 4 = 3$

$120 - 50 = 70$

400

 $\cancel{500} - 100 = 300$

373

Step 5: Expanded
Column Addition

$527 - 154 = \underline{\hspace{2cm}}$

Watch out!
You **exchanged**
1 hundred for
10 tens!

$$\begin{array}{r} \overset{1}{\cancel{5}} \cancel{2} 7 \\ - 154 \\ \hline 3 \\ 70 \\ + 300 \\ \hline 373 \end{array}$$

Step 6: Compact Column
Subtraction

$527 - 154 = \underline{\hspace{2cm}}$

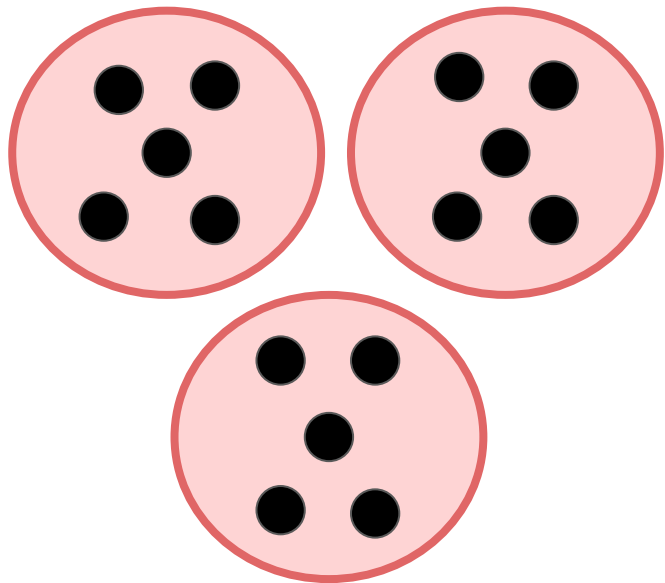
$$\begin{array}{r} 4 \quad 1 \\ - \quad 527 \\ \hline 154 \\ \hline 373 \end{array}$$

Watch out! You
exchanged 1
hundred for 10
tens!!



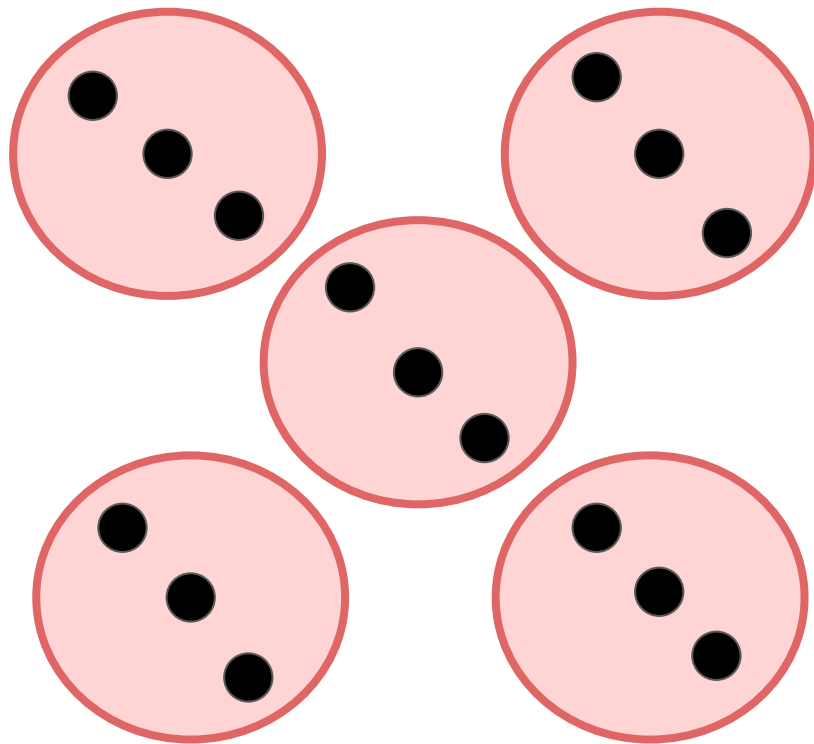
Step 1: Groups of...

3 groups of 5



$$3 \times 5 = \underline{\hspace{2cm}}$$

5 groups of 3





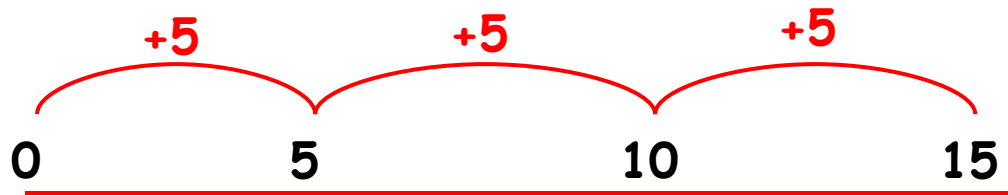
Step 2: Repeated Addition and Arrays

$$3 \times 5 = \underline{\hspace{2cm}}$$

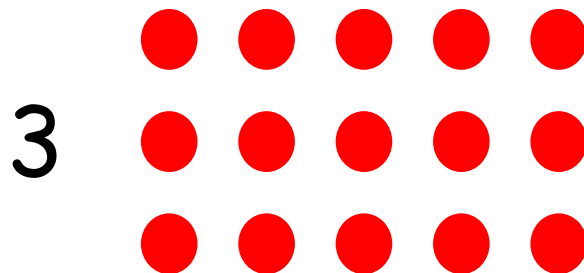
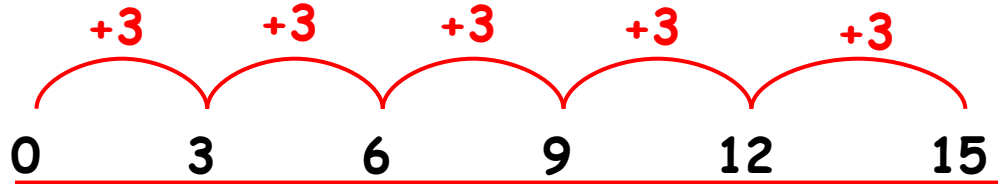
Repeated Addition

Array

$$5 + 5 + 5 = 15$$



$$3 + 3 + 3 + 3 + 3 = 15$$

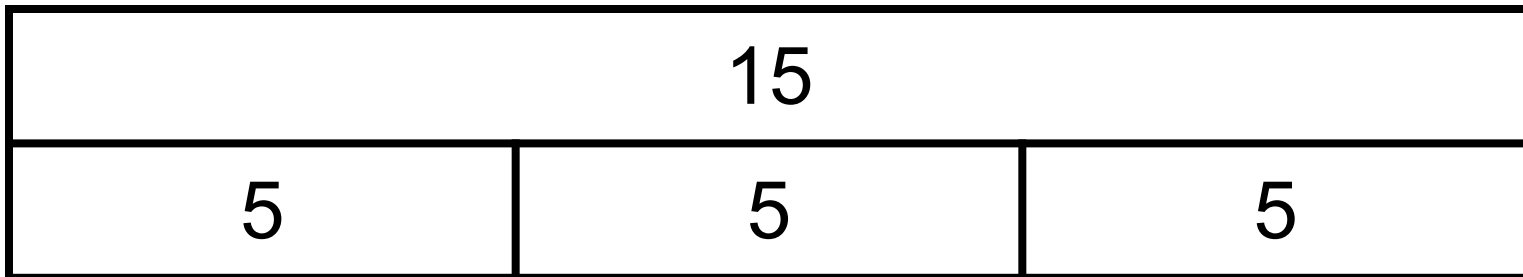


5



Step 4: Bar Model to check
my answer by division.

$$5 \times 3 = 15$$



$$15 \div 3 = 5$$



Step 3: Grid Method

$$25 \times 3 = \underline{\hspace{2cm}}$$

$$125 \times 3 = \underline{\hspace{2cm}}$$

$$25 \times 3 = \underline{\hspace{1cm}}$$

$$125 \times 3 = \underline{\hspace{1cm}}$$

X	20	5
3	$20 \times 3 = 60$	$5 \times 3 = 15$

$$60 + 15 = 75$$

X	100	20	5
3	$100 \times 3 = 300$	$20 \times 3 = 60$	$5 \times 3 = 15$

$$300 + 60 + 15 = 375$$



Step 4: Partitioning
Column Multiplication

$25 \times 3 = \underline{\hspace{2cm}}$

25

X

3

$5 \times 3 =$

15

$20 \times 3 =$

60

75

20

X

3

60

5

X

3

15

+

60

15

75



Step 5: Partitioning
Column Multiplication

$$125 \times 3 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 125 \\ \times 3 \\ \hline \end{array}$$

$$5 \times 3 = 15$$

$$20 \times 3 = 60$$

$$\begin{array}{r} 100 \times 3 = 300 \\ \hline \end{array}$$

$$375$$

$$\begin{array}{r} 100 \\ \times 3 \\ \hline \end{array}$$

$$300$$

$$\begin{array}{r} 20 \\ \times 3 \\ \hline \end{array}$$

$$60$$

$$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$$

$$15$$

$$300 + 60 + 15 = 375$$



Step 6: Compact
Multiplication

$125 \times 3 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 125 \\ \times \quad 3 \\ \hline 375 \\ \hline 1 \end{array}$$



Step 7: Long Multiplication

$$124 \times 33 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 124 \\ \times 33 \\ \hline \end{array}$$

$$\begin{array}{r} 372 \\ 3720 \\ \hline \end{array}$$

$$4092$$

Exchange ten ones for one ten.

Exchange ten tens for one hundred.

Multiply by the ones

$$3 \times 4 = 12$$

$$3 \times 20 = 60$$

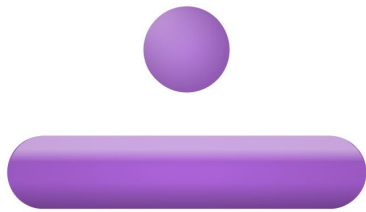
$$3 \times 100 = 300$$

Multiply by the tens

$$30 \times 4 = 120$$

$$30 \times 20 = 600$$

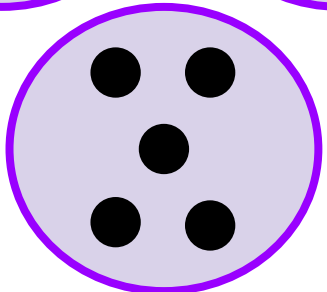
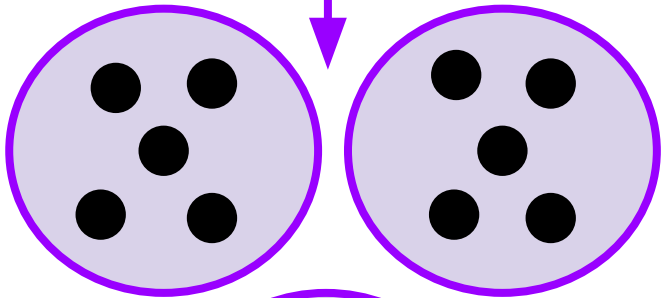
$$30 \times 100 = 3000$$



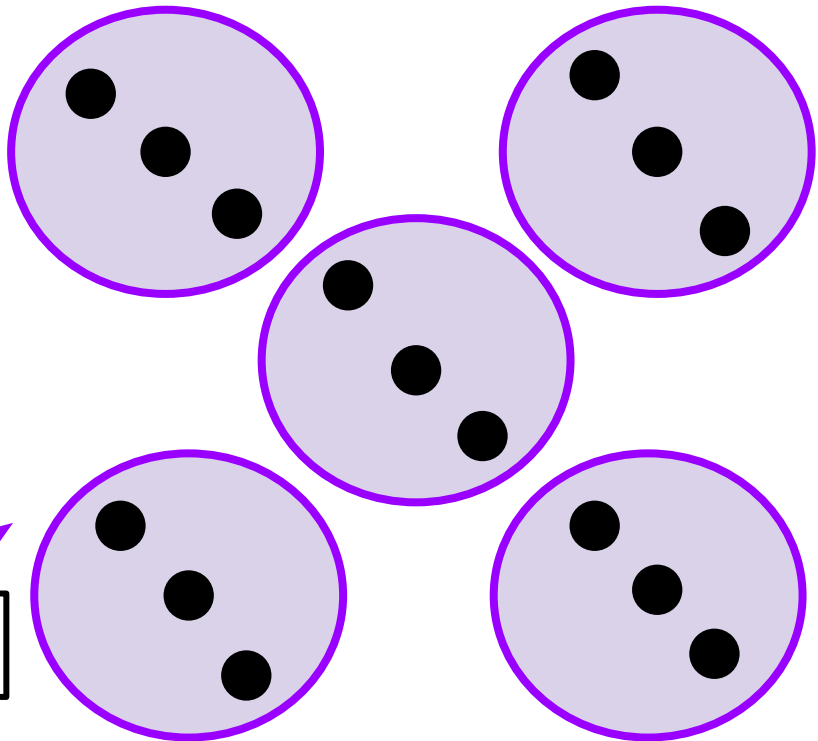
Step 1: Equal Sharing
into groups

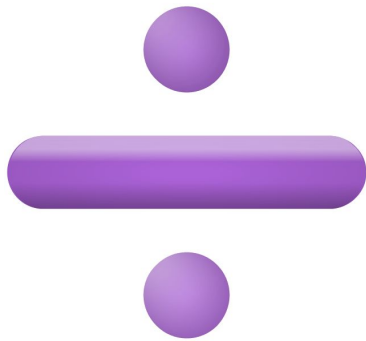
$$15 \div 3 = \underline{\hspace{2cm}}$$
$$15 \div 5 = \underline{\hspace{2cm}}$$

15 shared between 3



15 shared between 5



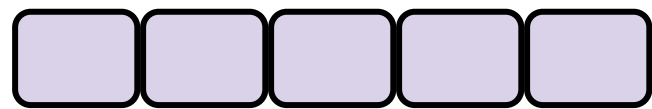
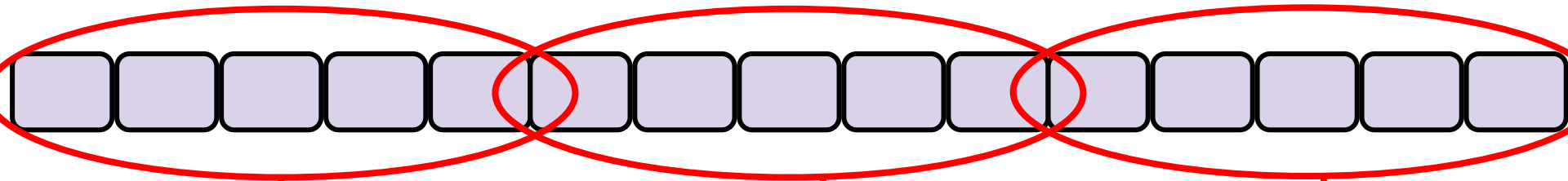


Step 2: Taking away
"sets of"

$$15 \div 5 = \underline{\quad}$$

How many sets of 5 in 15?

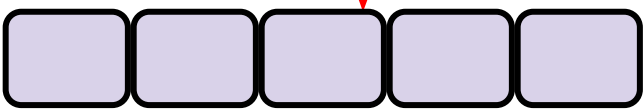
Take away sets of 5



3 sets of 5



2 sets of 5



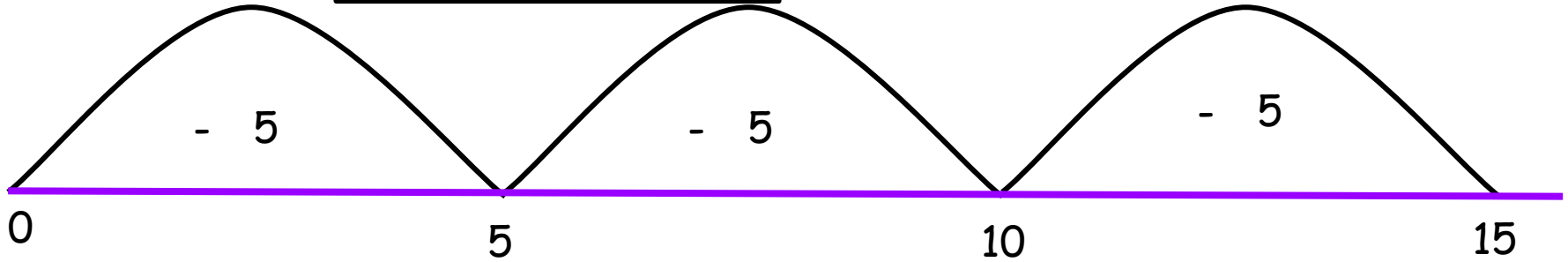
1 set of 5

Step 3: Repeated Subtraction on a numberline

$$15 \div 5 = \underline{\quad}$$
$$15 \div 3 = \underline{\quad}$$

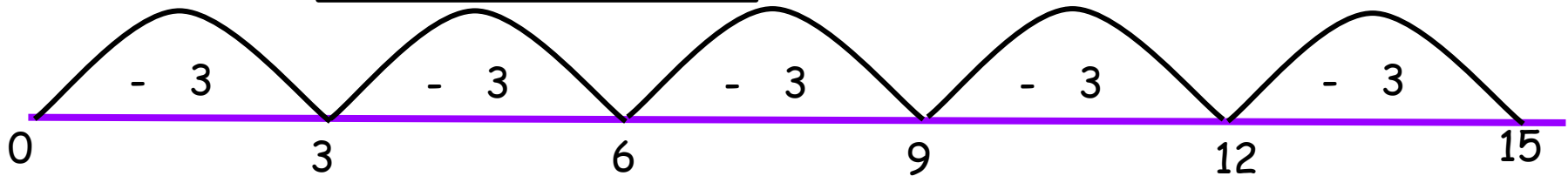
3 jumps of 5

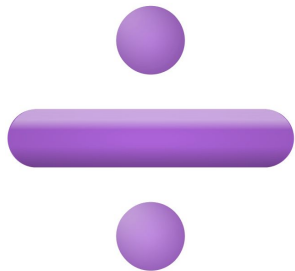
Take away sets of 5



5 jumps of 3

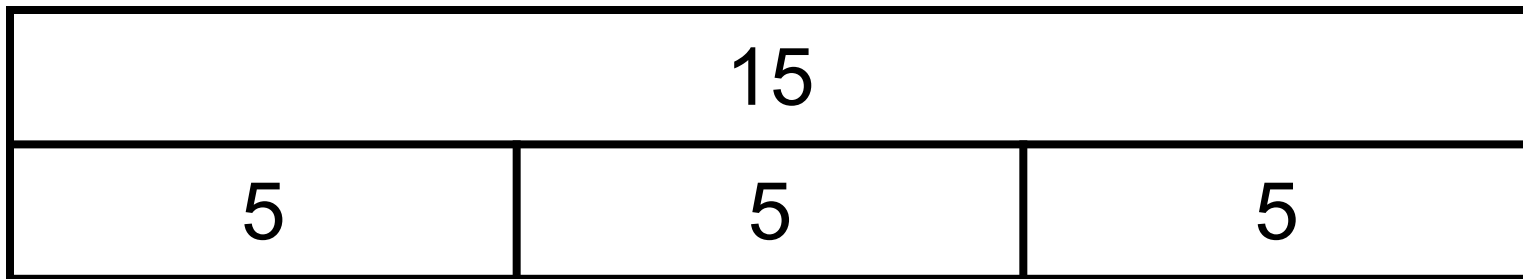
Take away sets of 3





Step 4: Bar Model to check
my answer by division.

$$15 \div 3 = 5$$

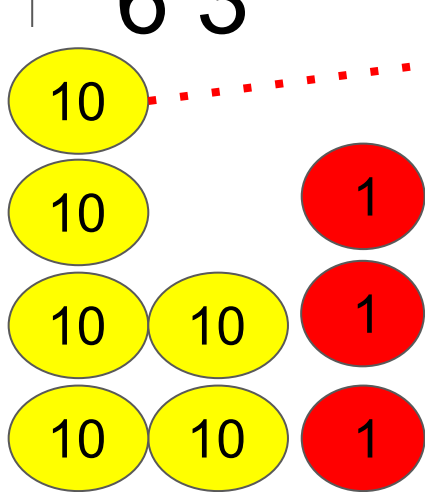
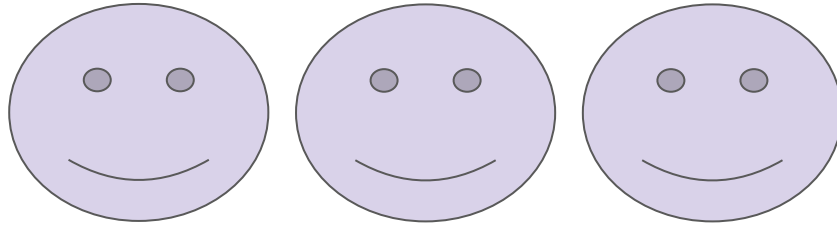


$$5 \times 3 = 15$$

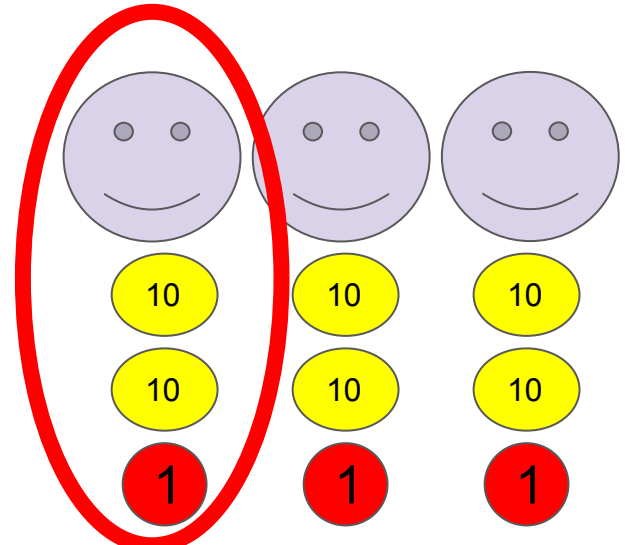
Step 3: The Sharing Method

$$63 \div 3 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 21 \\ 3 \overline{) 63} \\ \underline{6} \\ 0 \end{array}$$



Share into equal groups!



Step 4: The Grouping Method

$$98 \div 7 = \underline{\hspace{2cm}}$$

14
7 | 98

4 groups of 7 ones

1 group of 7 tens

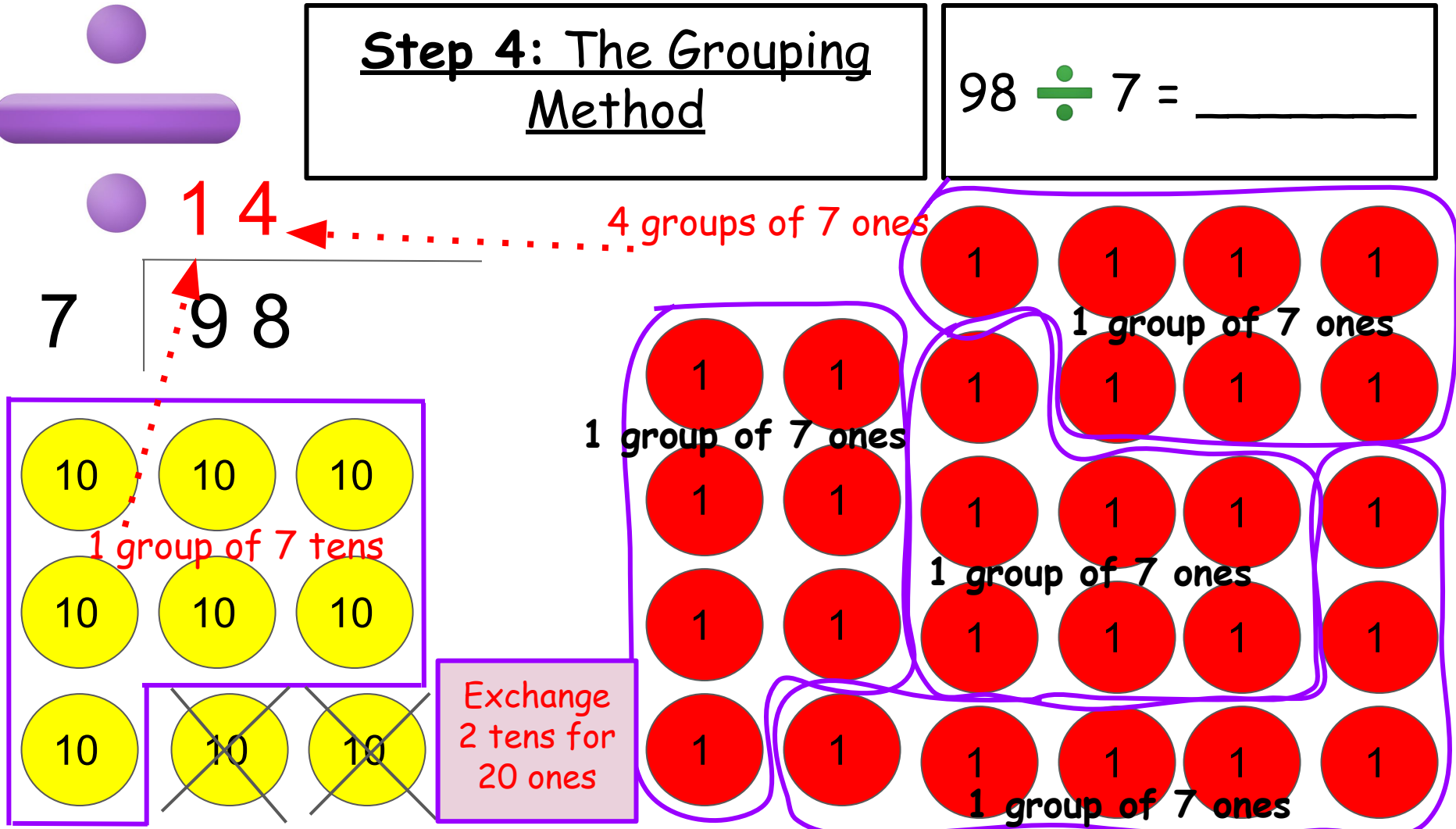
Exchange
2 tens for
20 ones

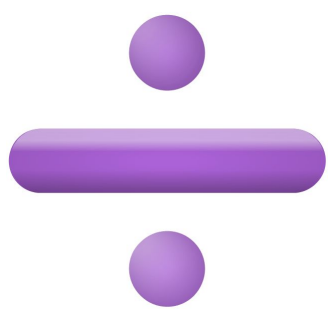
1 group of 7 ones

1 group of 7 ones

1 group of 7 ones

1 group of 7 ones





Step 4: Short Division - The Bus Stop Method

$$98 \div 7 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 1 \\ 7 \overline{) 98} \end{array}$$

You can make one group of 7 tens when you have 9 tens.

Two tens are exchanged for 20 ones.

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array}$$

Finally, you can make 4 groups of 7 with 28 ones!



Step 5: Short Division
with remainders

$$99 \div 7 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 1 \\ 7 \overline{) 99} \end{array}$$

You can make one group of 7 tens when you have 9 tens.

Two tens are exchanged for 20 ones.

$$\begin{array}{r} 14 \text{ r } 1 \\ 7 \overline{) 99} \end{array}$$

Finally, you can make 4 groups of 7 with 29 ones with remainder 1!

Step 6: Long Division -
Chunking

$$432 \div 15 = \underline{\hspace{2cm}}$$

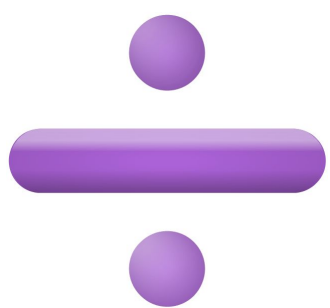
28 r 12

$$\begin{array}{r} 15 \overline{) 432} \\ - 300 \\ \hline 132 \\ - 120 \\ \hline 12 \end{array}$$

15 x 20

15 x 8

12



Step 7: Long Division -

$$432 \div 15 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{- 30} \\ 132 \\ \underline{- 120} \\ 12 \end{array}$$

A red dotted arrow points from the remainder 12 at the bottom to the 12 in the quotient 28 r 12 at the top.