

Year 3: Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)

Year 4: Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens ones)

## Recognising the place value of digits (3 or 4 digit number - Years 3 and 4)

Eg. What is the value of 5 in 7592?

- ① Children are to write the number out, under labelled place value column titles:

1000s	100s	10s	0s
Thous.	Hundr.	Tens	Units
7	<u>5</u>	9	2

- ② Identify which column the digit falls under.  
Here, the 5 is in the hundreds column, therefore, we know that we have five hundreds.

- ③ Convert 'five hundreds' into digital form:  
Keep the 5 in the hundreds column and replace digits in any column to the right with 0's. Ignore any digits to the left.

100s	10s	0s
Hundr.	Tens	Units
<u>5</u>		

Place the 5 in a blank grid under the correct column.

100s	10s	0s
Hundr.	Tens	Units
5	0	0

Add 0's in any empty column to the right.



## Writing large numbers in numeric form

E.g. Write nine million one hundred and twenty thousand four hundred and three in numeric form.

- ① Write out the number in words and underline the words million and thousand where they occur:

Nine million one hundred and twenty thousand four hundred and three.

- ② Attach the words before 'million' with million. and attach the words before 'thousand' to thousand (stop when you hit million!)

Nine million one hundred and twenty thousand four hundred and three.

- ③ Remember, place value operates in groups of three. Create a place value grid in blocks of three:

Millions			Thousands			Units		
Hund.	Ten	u	Hund.	Ten	u	Hund.	Ten.	u.
100	10	0	100	10	0	100	10	0
Mill.	Mill.	Mill.	Thous.	Thous.	Thous.	Hund.	Ten	Unit

- ④ Place your millions block in words (nine million) into its place value block:

Millions			Thousands			Units		
H	T		H	T		H	T	U
Mill.	Mill.	Mill.	Thou	Thou	Thou	H	T	U
0	0	9						

⑤ Place your thousands block in words (one hundred and twenty thousand) into its place value block:

Millions			Thousands			Units		
H	T		H	T		H	T	U
Mill.	Mill.	Mill.	Thou.	Thou.	Thou.	H	T	U
0	0	9	1	2	0			

⑥ Place your remaining block - your units block - in words (four hundred and three) into its place value block.

Millions			Thousands			Units		
H	T		H	T		H	T	U
Mill.	Mill.	Mill.	Thou.	Thou.	Thou.	H	T	U
0	0	9	1	2	0	4	0	3

Remember, blocks should always contain three. Therefore, if you are putting a one or two digit number in, you must put 0 in front of it to create a block of three.

Eg. twenty-nine thousand:

Thousands		
H	T	
Thou.	Thou.	Thou.
0	2	9

Year 3: Compare and order numbers up to 1000

Year 4: Order and compare numbers beyond 1000/ Compare numbers with the same number of decimal places up to two decimal places

## Ordering and comparing whole numbers.

Eg Write these numbers in ascending order (least to greatest):

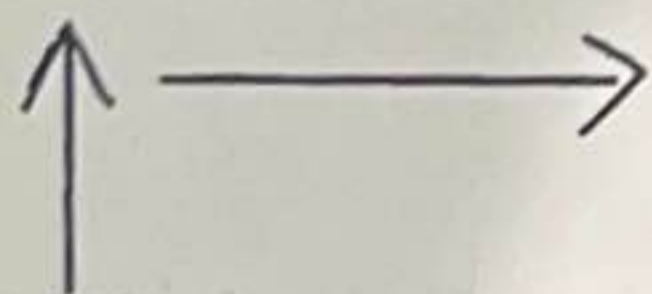
15,428      15,842      15,284  
51,782      105,827

① Firstly, you need to write out a blank place value grid:

100,000's Hundr. Thous.	10,000's Ten Thous.	1,000's Thous.	100's Hundreds	10's Tens	0's Units
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② Then, place all of the numbers into the place value grid:

100,000's Hundr. Thous.	10,000's Ten Thous.	1,000's Thous.	100's Hundreds	10's Tens	0's Units
0	1	5	4	2	8
0	1	5	8	4	2
0	1	5	2	8	4
0	5	1	7	8	2
1	0	5	8	2	7



③ Now we can compare the numbers. It is easiest to list the biggest first and work down to the smallest (may need to reverse the order for the answer).

Start in the column furthest to the left. (hundred thousands)

The biggest digit in the leftmost column gives us the biggest number.

④ Only one number has a digit in our left most column (hundred thousands) therefore, this is our greatest number.

Greatest: ① 105,827.

②

③

④

Least: ⑤

write it down on your ranking list.

⑥ Go back to your place value grid:

	HTh	TTh	Th	H	T	U
	0	1	5	4	2	8
	0	1	5	8	4	2
	0	1	5	2	8	4
②	0	5	1	7	8	2
①	1	0	5	8	2	7

↑

Starting in the next left most column, find the greatest digit. This is your next greatest number.

Record in your ranking list and cross out.

Greatest: ① 1 0 5, 8 2 7

② 5 1, 7 8 2

③

④

Least: ⑤

⑦ Go back to your place value grid:

	HTh	TTh	Th	H	T	U
	0	1	5	4	2	8
③	0	1	5	8	4	2
	0	1	5	2	8	4
②	0	5	1	7	8	2
①	1	0	5	8	2	7

↑ same    ↑ same    ↑

Repeat - go to the left most column containing digits. Find the greatest digit. If they are the same, move to the column to the right.

Continue this until you have found the next greatest number. Record it, cross it out and repeat.

The same process is followed for ordering decimals

E.g. round 256,813 to the nearest thousand.  
 round 531,846 to the nearest hundred thousand

Step 1

Write out number  
 (with place value columns  
 if necessary)

<sup>100</sup> Th	<sup>10</sup> Th	Th	H	T	U
2	5	6,8	1	3	

5	3	1,8	4	6
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Step 2

Underline the column  
 you are rounding to (eg.  
 nearest 10, underline tens  
 column).

<sup>100</sup> Th	<sup>10</sup> Th	Th	H	T	U
2	<u>5</u>	6,8	1	3	(nearest thousand)

<u>5</u>	3	1,8	4	6	(nearest hundred thousand)
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Step 3

Indicate column to  
 the right (highlight,  
 draw arrow, circle etc)

2	5	<u>6</u>	8	1	3
			↑		

<u>5</u>	3	1,8	4	6
↑				

Step 4

If 4 or lower, we stay  
 the same.

If 5 or more, we go up

2	5	<u>6</u>	8	1	3	Eight takes us up
			↑			

<u>5</u>	3	1,8	4	6	Three stays the same
↑					

If going up:

If staying the same:

⑤ Keep the underlined number  
 the same

5	3	1,8	4	6
↓	↓	↓	↓	↓
5	0	0,0	0	0

⑥ Turn remaining digits after to  
 zeros

500,000

⑦ Write out digits before if there  
 are any.

⑤ Add 1 to the  
 underlined digit (if already 9, you  
 will need to exchange into next  
 column)

2	5	<u>6</u>	8	1	3
		↓ +1			
		7			

⑥ Zero all the digits after

7000

⑦ Copy any digits before.

257000

Eg. Round 2.7 to the nearest whole number.

- ① Write out your number

2.7

- ② Underline column rounding to (whole = units)

2.7

- ③ Indicate column to the right (tenths)

2.7  
↗

- ④ If 0, 1, 2, 3 or 4 in the tenths (column to the right), keep units the same and cross out the tenths

Eg. 1.3 (4 or below in tenths)

1.~~3~~ = 1

- ⑤ If 5, 6, 7, 8 or 9 in the tenths (column to the right), add one to the units and cross out the tenths

Eg. 2.7 (5 or above in tenths)

+ 1 X

3.~~7~~ = 3

Answers must be given without a decimal point or numbers after the decimal point

Eg. 3 ✓ BUT 3.0 X



## Negative Numbers

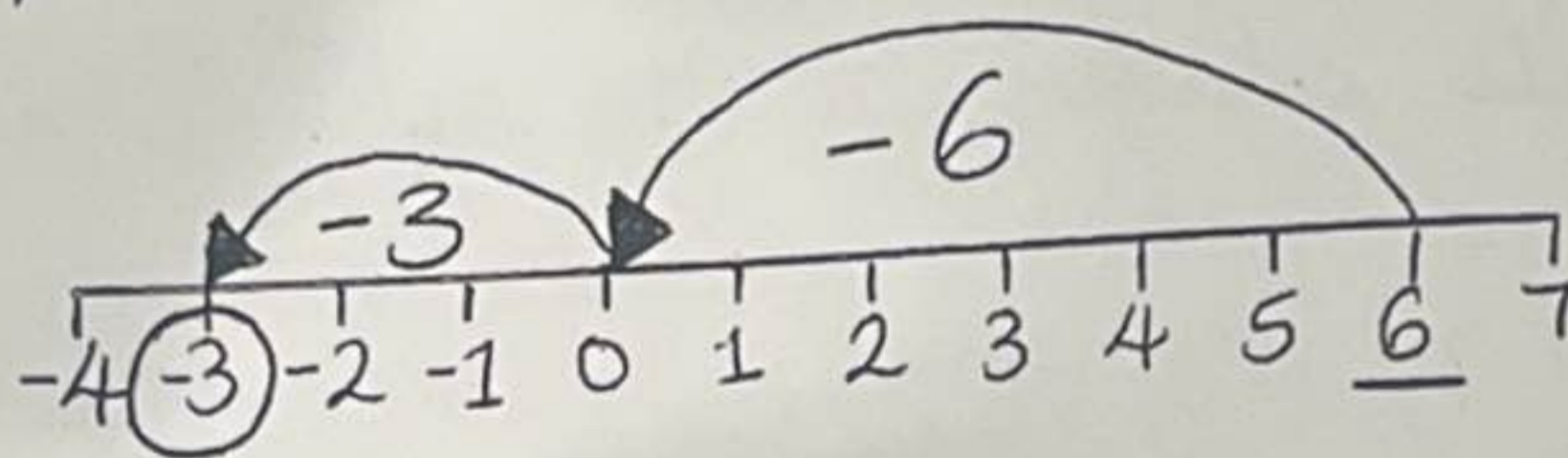
\* Starting with a number line and moving beyond in years 5 and 6.

If adding, count right on your number line.

If subtracting, count left on your number line.

If counting through zero, count to zero and then count on.

Eg.  $6 - 9 =$



→ Positive number - bigger positive number = find difference and make it negative.  
 $6 - 9 =$  Difference is 3  
 Answer is -3

→ Negative number + bigger number = find difference and keep it positive.  
 $-4 + 7 =$  Difference is 3  
 Answer is +3

→ Negative number + smaller number = find difference and make it negative.  
 $-11 + 3 =$  Difference is 8.  
 Answer is -8

→ Negative number - any number = find the total of the two numbers and make it negative.  
 $-2 - 4 =$  Total is 6  
 Answer is -6

## Negative numbers 2.

\* Finding the difference between numbers where one or more is negative.

### When one number is negative

Ignore the positive/negative symbols and add the two numbers together  $\rightarrow$  answer is your difference.

Eg. Find the difference between:  
- 3 and 4.

- \* Add 3 and 4 together = 7
- \* 7 is the difference.

### When both numbers are negative.

Find the difference between the two numbers.

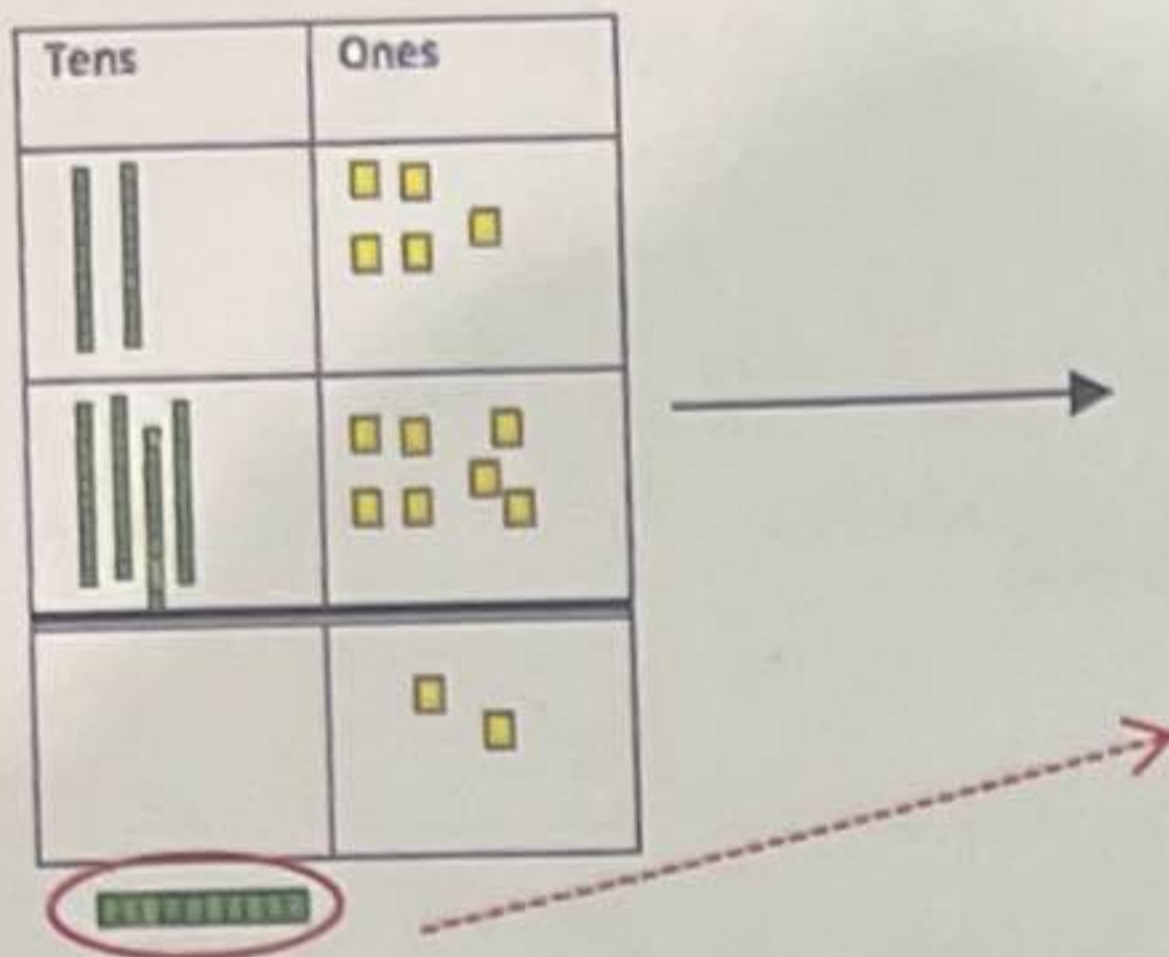
Eg. Find the difference between:  
- 3 and - 9

- \* Difference between 3 and 9 = 6
- \* 6 is the difference.

Remember - The difference is always written as a positive number.

Year 3: Add numbers with up to three digits, using formal written methods of columnar addition

Year 4: Add numbers with up to 4 digits using the formal written methods of columnar addition



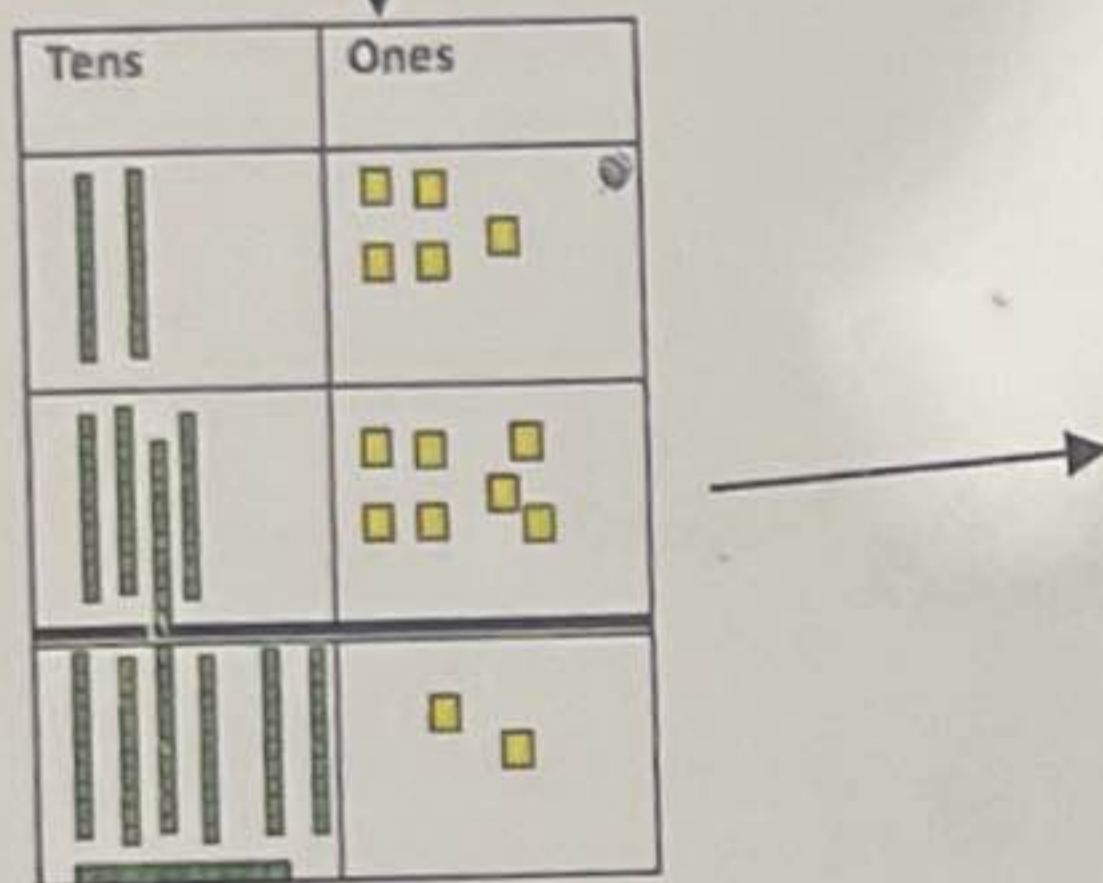
Compact method

$$\begin{array}{r}
 \text{T U} \\
 + 47 \\
 \underline{25} \\
 2 \\
 \hline
 1
 \end{array}$$

Add the units together, exchanging 10 units for a tens rod if necessary.

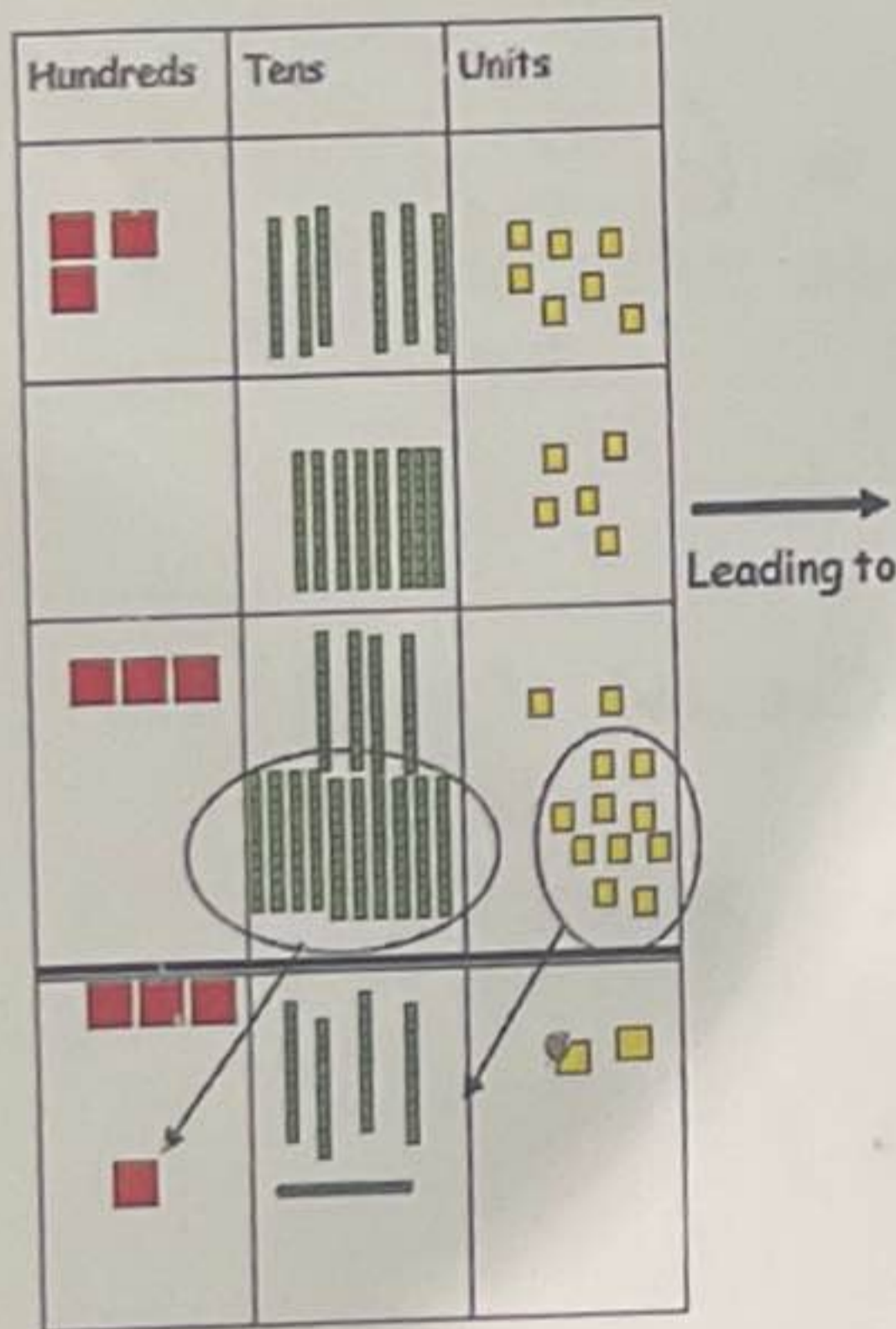
(A ten exchanged under)

Leading to



$$\begin{array}{r}
 \text{T U} \\
 + 47 \\
 \underline{25} \\
 72 \\
 \hline
 \cancel{x}
 \end{array}$$

Add the tens together, including the exchanged one. Remember to cross out the exchanged numbers once used.

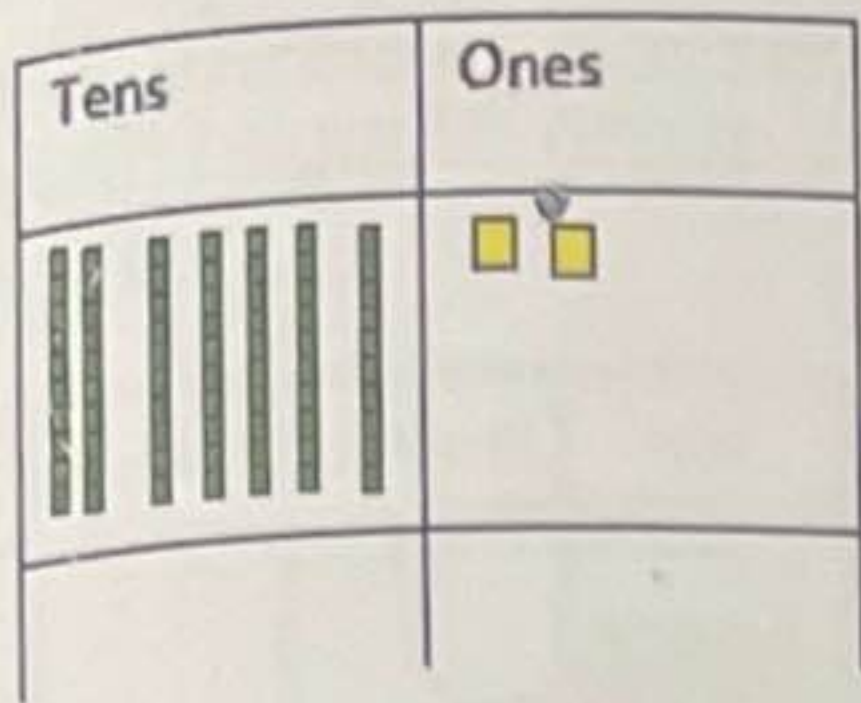


Leading to

$$\begin{array}{r}
 \text{H T U} \\
 + 367 \\
 \underline{85} \\
 452 \\
 \hline
 \cancel{x} \cancel{x}
 \end{array}$$

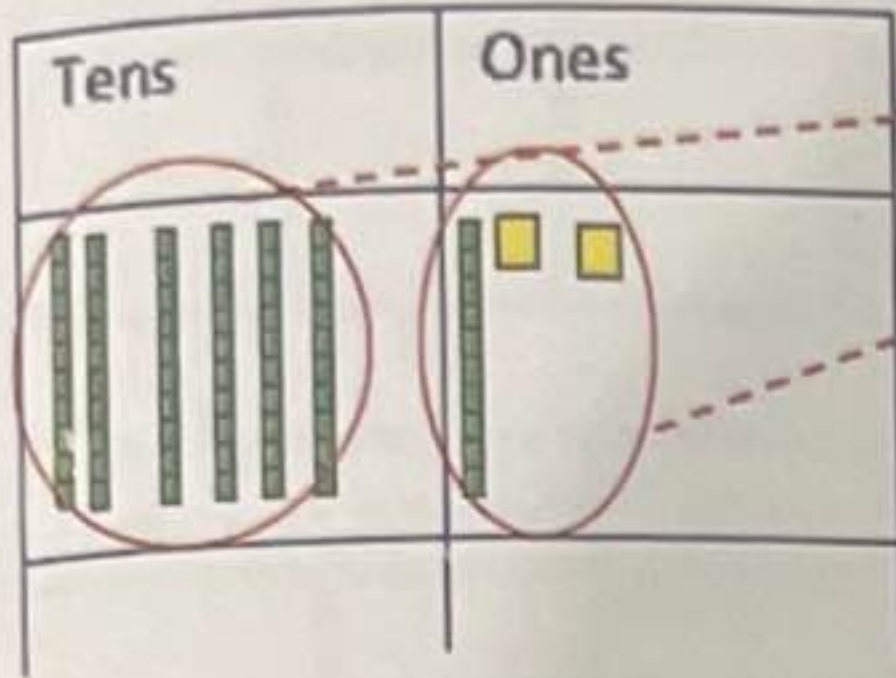
Extend on two previous steps by exchanging ten x 10 rods for a one hundred flat block.

Compact decomposition



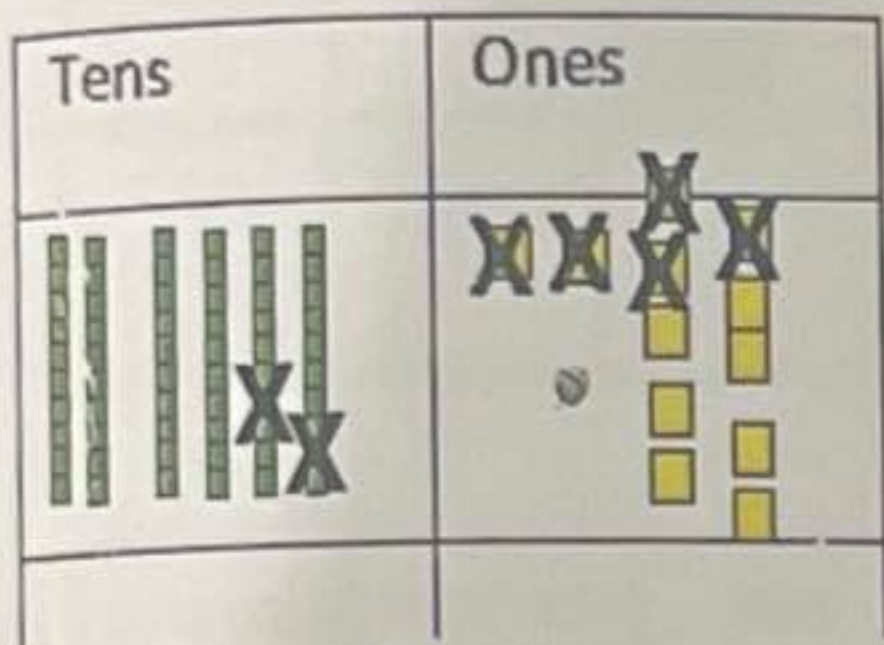
$$\begin{array}{r} 72 \\ -25 \\ \hline 47 \end{array}$$

Count out 72 Base 10 blocks into the place value grid



$$\begin{array}{r} \overset{6}{\cancel{7}}\overset{1}{\cancel{2}} \\ -25 \\ \hline \end{array}$$

Subtract your units first, exchanging from tens if necessary



$$\begin{array}{r} \overset{6}{\cancel{7}}\overset{1}{\cancel{2}} \\ -25 \\ \hline 47 \end{array}$$

Subtract 5 units and 2 tens, recording how many units and tens remain vertically

Year 3: Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers time one-digit numbers, using mental and progressing to formal written methods

Year 4: Multiply two-digit and three-digit numbers by a one-digit number using formal written layout

x	hundreds	tens	ones
6		●●●●	●●●●●●●●
=			

$$\begin{array}{r} 24 \\ \times 6 \\ \hline \end{array}$$

x	hundreds	tens	ones
6		●●●●	●●●●●●●●
=		●●	●●●●

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 4 \\ \hline 2 \end{array}$$

x	hundreds	tens	ones
6		●●●●	●●●●
=	●	●●	●●●●

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 44 \\ \hline 12 \end{array}$$

x	hundreds	tens	ones
6		●●	●●●●
=	●	●●	●●●●

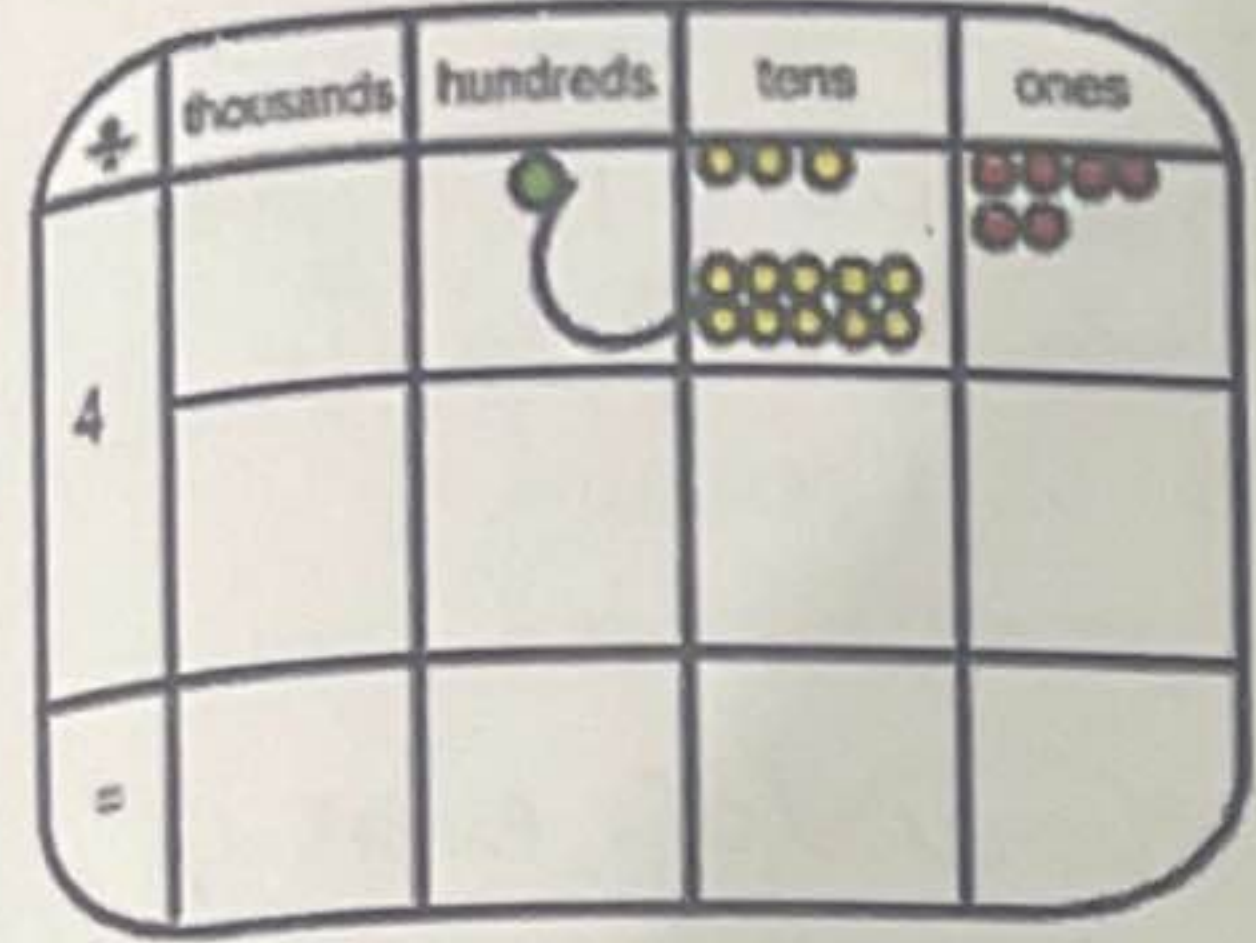
$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 12 \end{array}$$

Year 3: Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers time one-digit numbers, using mental and progressing to formal written methods

Year 5: Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

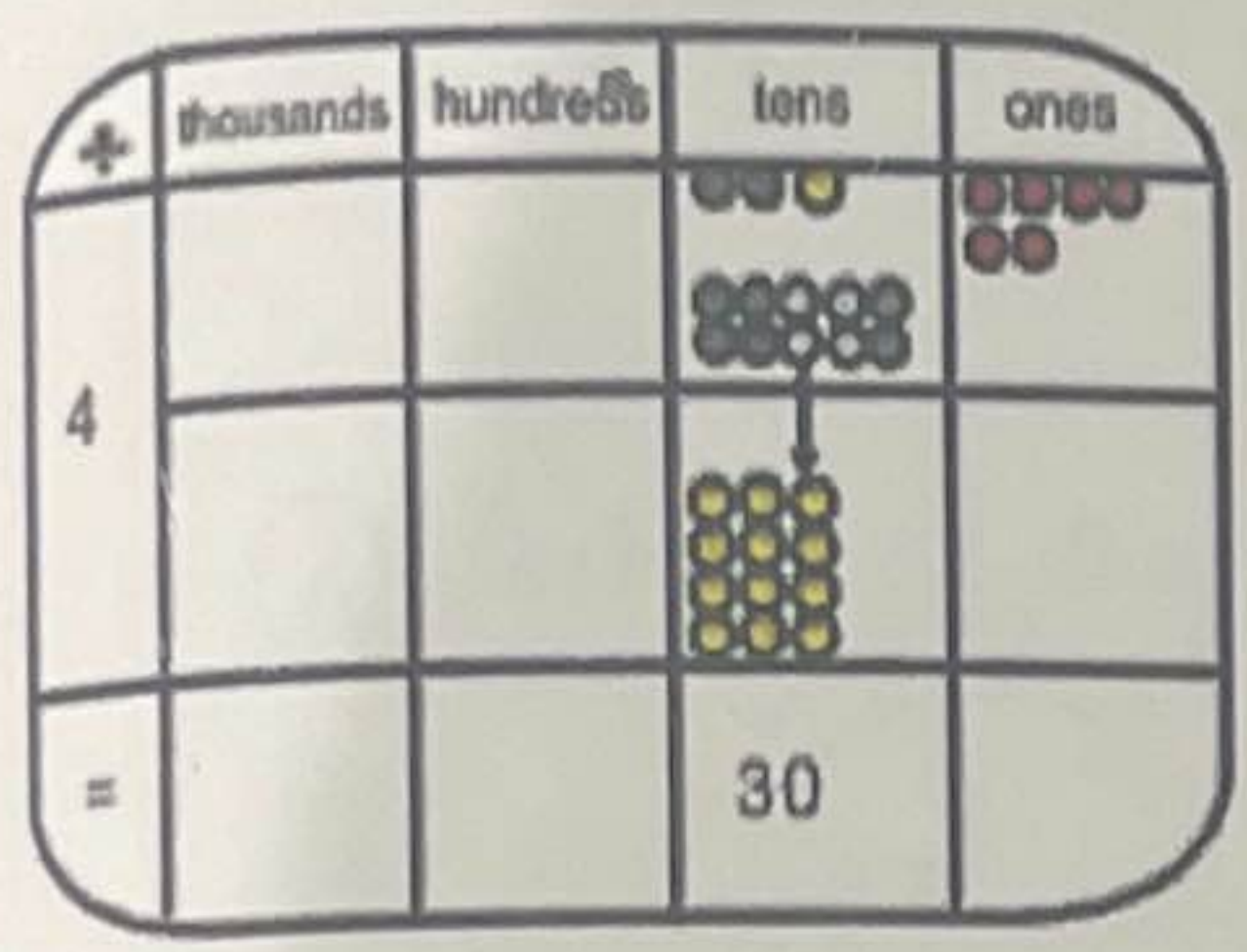
**Short division — dividing by a single digit**

We can begin to group counters into an array to show short division working  
 $136 \div 4$



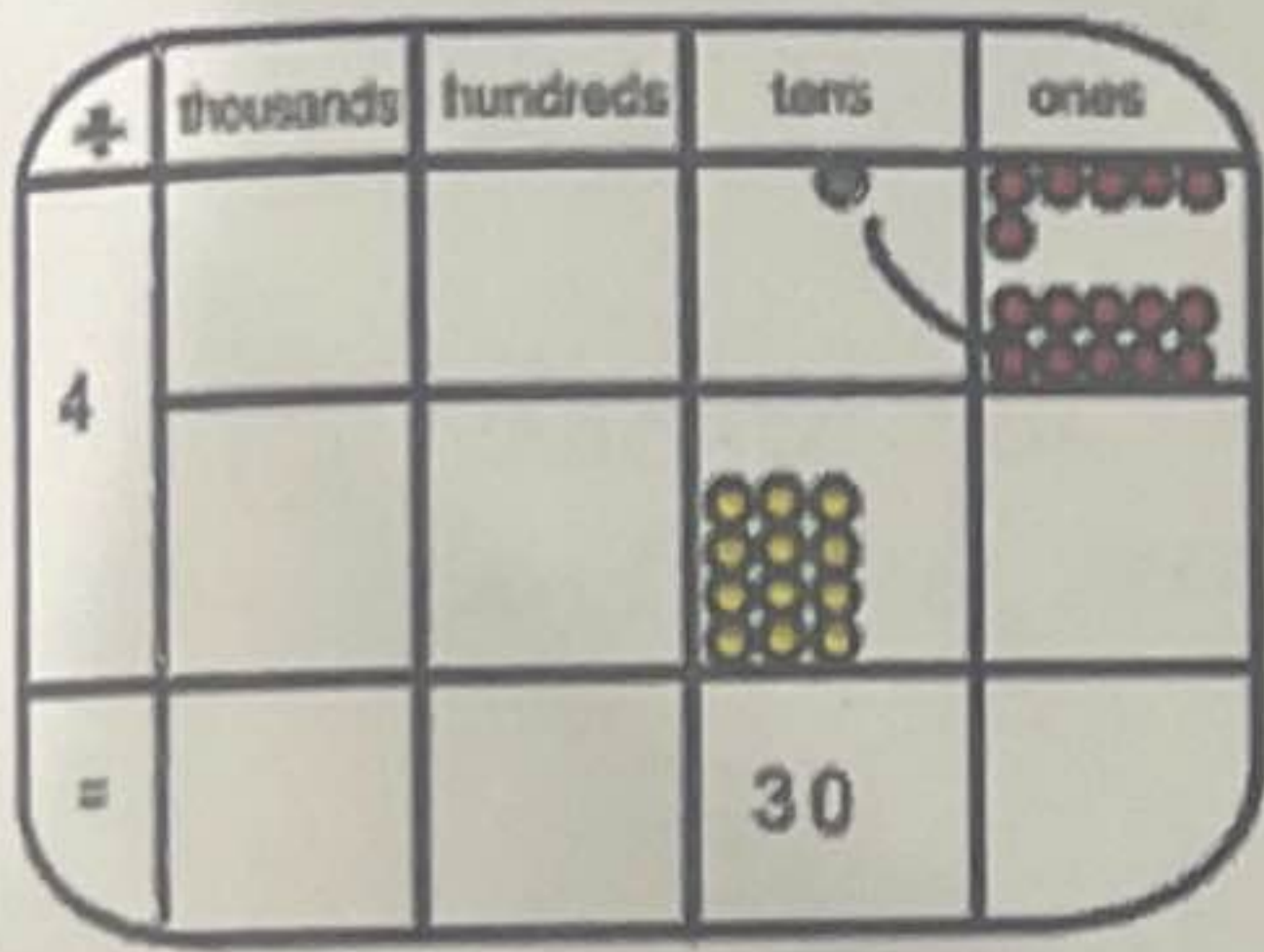
$$\begin{array}{r} 0 \\ 4 \overline{) 136} \end{array}$$

Starting from left:  
 1 in hundreds column cannot be shared equally into four groups so exchange it for ten 10's counters.  
 Record a 0 in the hundreds column.



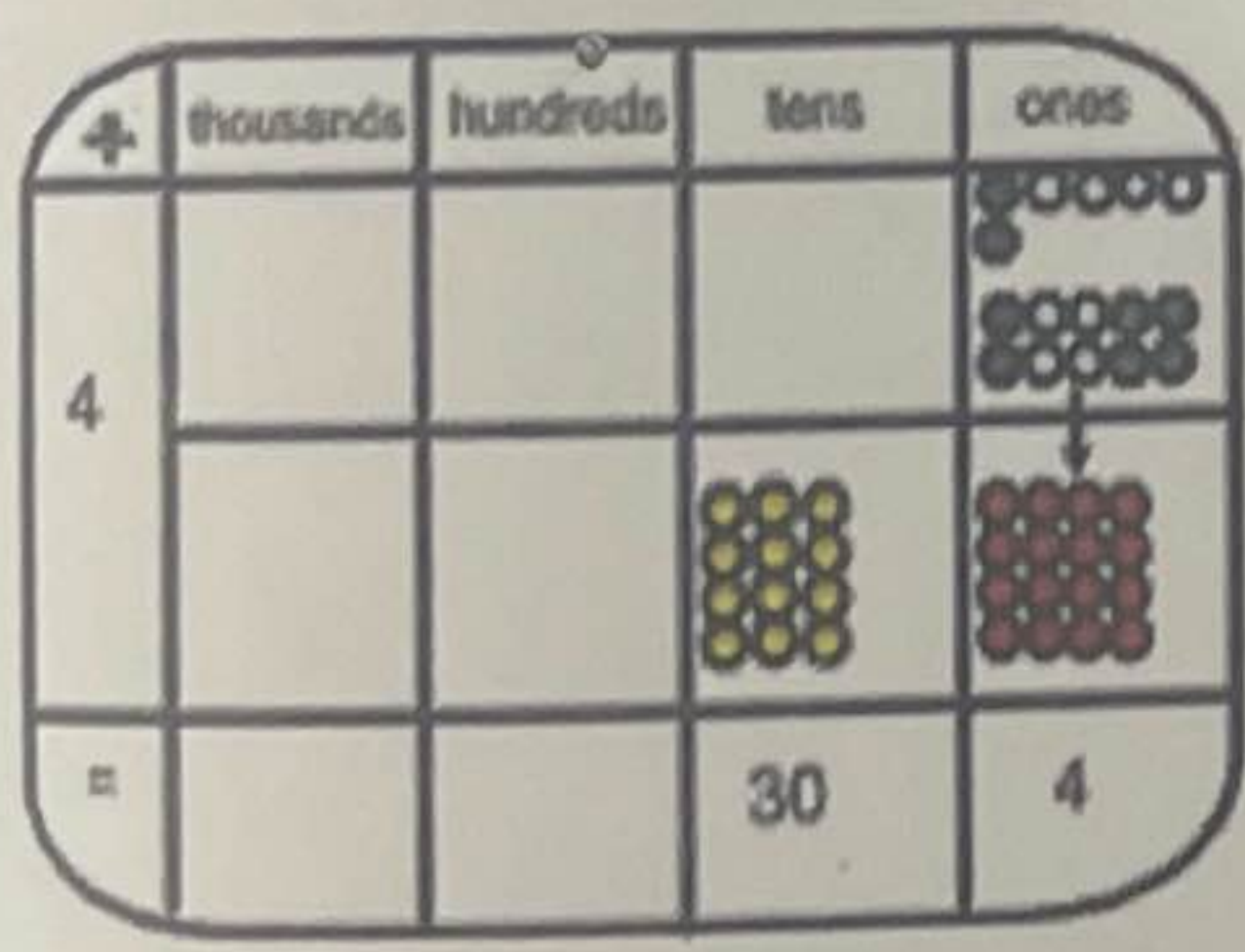
$$\begin{array}{r} 03 \\ 4 \overline{) 136} \end{array}$$

Organise tens counters into four equal groups/rows.  
 There are 3 in each row- record this in the tens column above the bus stop.



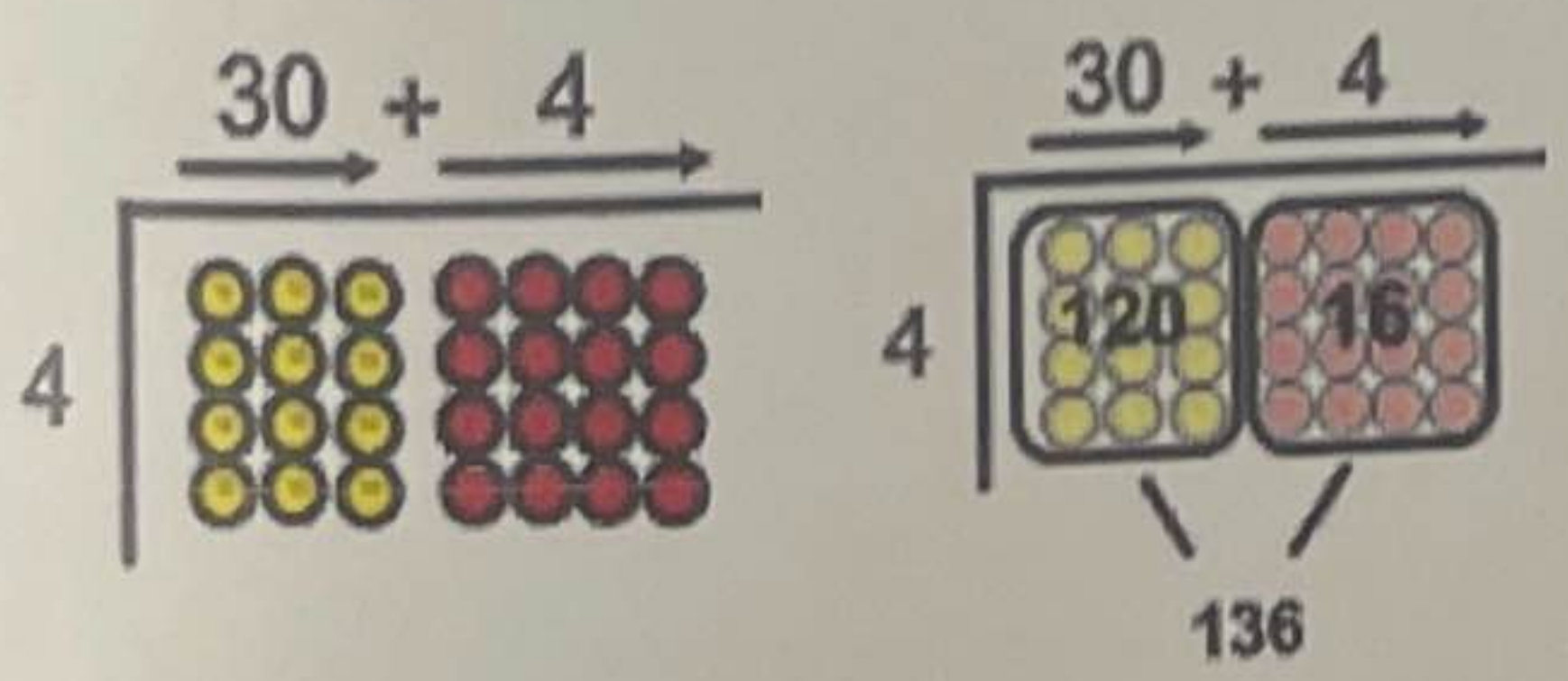
$$\begin{array}{r} 03 \\ 4 \overline{) 136} \end{array}$$

There is one tens counter left which cannot be shared in the tens column- exchange it for ten units.



$$\begin{array}{r} 034 \\ 4 \overline{) 136} \end{array}$$

Share units counters into 4 equal groups/rows.  
 There are 4 in each group- record this on top of the bus stop in the units column.



## Fractions

Finding a fraction of an amount.  
Eg.  $\frac{3}{4}$  of 24.

① Divide total quantity by your denominator (This gives you one part)  
 $24 \div 4 = 6$

② Multiply answer (one part) by the numerator, even if the numerator is 1.

$$6 \times 3 = 18$$

③ Add unit of measure if necessary.

$$\text{So } \frac{3}{4} \text{ of } 24 = 18$$

## Finding Equivalent fractions

Eg  $\frac{1}{8} = \frac{2}{\boxed{?}}$  OR  $\frac{2}{\boxed{?}} = \frac{4}{10}$

- ① Write out your numbers, drawing arrows from the known fraction, to the fraction I do not fully know  
(denominator  $\rightarrow$  denominator and numerator  $\rightarrow$  numerator)

$\frac{1}{8} = \frac{2}{\boxed{?}}$  OR  $\frac{2}{\boxed{?}} = \frac{4}{10}$

- ② Looking at the two values we know, find the scale factor.

$\frac{1}{8} = \frac{2}{\boxed{?}}$  OR  $\frac{2}{\boxed{?}} = \frac{4}{10}$

- ③ Whatever you have done to the top, you do to the bottom and vice versa.

$\frac{1}{8} = \frac{2}{16}$  OR  $\frac{2}{5} = \frac{4}{10}$



Year 3: Add and subtract fractions with the same denominator within one whole

Year 4: Add and subtract fractions with the same denominator

Adding or subtracting fractions with the same denominator.

Eg  $\frac{2}{4} + \frac{1}{4}$

① The denominator always stays the same  $\frac{2}{4} + \frac{1}{4} = \frac{?}{4}$

② Add the numerators (2 + 1)

$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

Eg  $\frac{5}{6} - \frac{3}{6} = \frac{2}{6}$

## Ordering and comparing unit fractions.

Unit fractions are fractions with the numerator 1.

Eg.  $\frac{1}{2}$   $\frac{1}{3}$   $\frac{1}{4}$   $\frac{1}{5}$   $\frac{1}{6}$   $\frac{1}{7}$

Ordering unit fractions is simple!

The bigger the denominator, the smaller the fraction (because it has been divided into more parts).

So:

$$\frac{1}{7} < \frac{1}{4}$$

Least =  $\frac{1}{8}$   $\frac{1}{5}$   $\frac{1}{4}$   $\frac{1}{2}$  → Greatest =  
Biggest denominator      Smallest denominator

## Ordering and comparing fractions with the same denominator.

When the denominator is the same, the larger the numerator, the greater the fraction.

So:

$$\frac{4}{5} > \frac{2}{5}$$

Least =  $\frac{1}{8}$   $\frac{3}{8}$   $\frac{6}{8}$   $\frac{7}{8}$  → Greatest =  
Smallest numerator      Largest numerator

