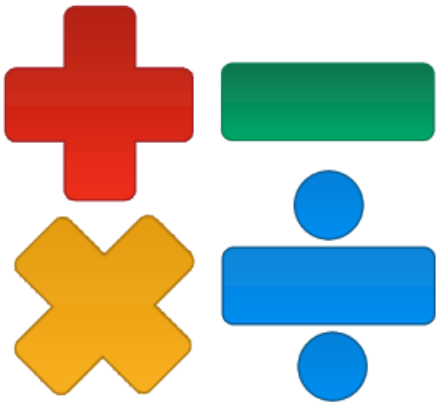
# St Luke's CE Primary School's Maths Calculation Policy



***We are a Christian school that serves a diverse community and works in partnership with parents to develop the whole child.***

# Content Page

# Vocabulary

- **Number sentence**

Examples

3 + 8 = ☐ ☐ + 9 = 15 16 - ? = 10

276 x 2 = 0.45 x 100 = 632 ÷ 12 = 2a = 3 + 5

- **Operations**

Addition +

Subtraction -
Multiplication x
Division ÷

❖ Vocabularies used to describe these operations

| + | - | × | ÷ |
|---|---|---|---|
| **addition** | **subtraction** | **multiplication** | **division** |
| sum | minus | times | divide |
| add | subtract | multiply | share between |
| more than | less than | product | split |
| altogether | decrease by | lots of | in equal groups |
| increase by | takeaway | groups of | |
| total | find the difference | | |

**Note:** real life words such as dropped, broken, sold, ripped, poured etc. can also be used to describe operations.

**Repeated addition** - used when multiplying multiples of the same number.
5 x 4 = 20
5 + 5 + 5 + 5 = 20

# Bar Modelling

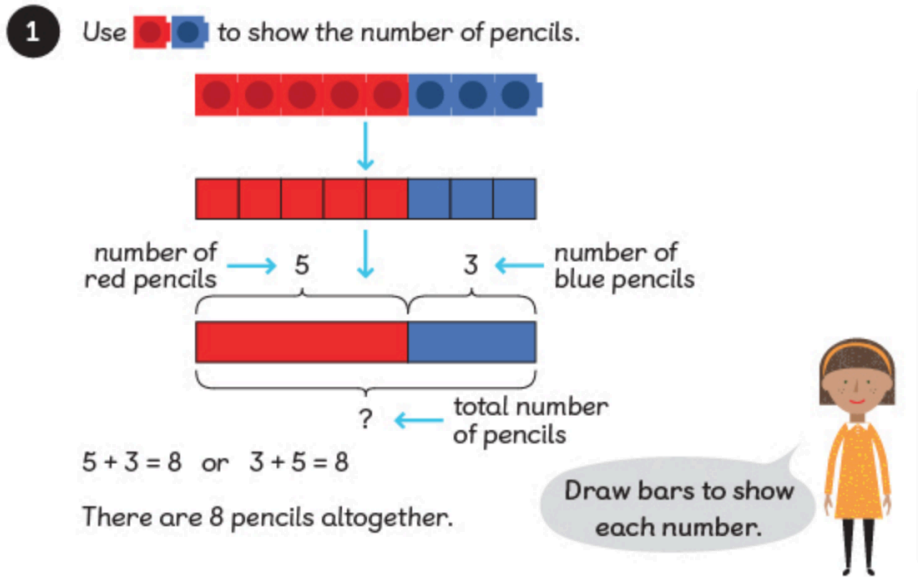
## What exactly is a bar model?

Essentially, the bar modelling technique is a form of visual algebra. It's a method for visualising a maths problem where bars or rectangles represent known numbers and unknown numbers. It acts as a bridge between the word problem and the abstract maths required to solve the problem.

When pupils are able  to visualise a word problem, they have a clearer understanding of what the question is about. They are also able to determine what operations are needed and can solve them in a more efficient manner. On the other hand, pupils will rely heavily on learning certain keywords in question and using them to determine operations needed which might not be the case. An example will be when most people see the word altogether, they automatically think of addition but it actually is referring to total amount.

Example 1
Part-part-whole model

The part-part-whole model can be used for questions involving all four operations, fractions, measure, algebra, time, ratio, proportion and much more.

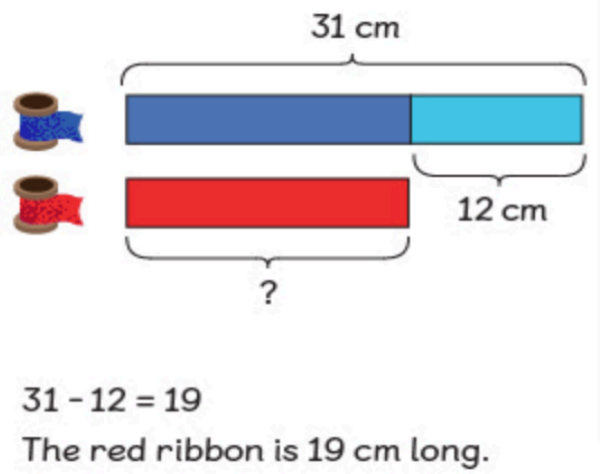



From the example above, we know two parts and need to find the whole. The unknown amount is always represented with a question mark and this tells us what calculation to do. For the part-part-whole model we know two pieces of information and have to find the other. So, we may know the whole and one part and have to find the other part.

## Example 2

Comparison model

The comparison model is a bit different. Here we're comparing two bars:




When working with the bar model, we can draw the bars on paper or represent them with cut-out strips of paper, Cuisenaire rods, interlocking cubes or even counters.

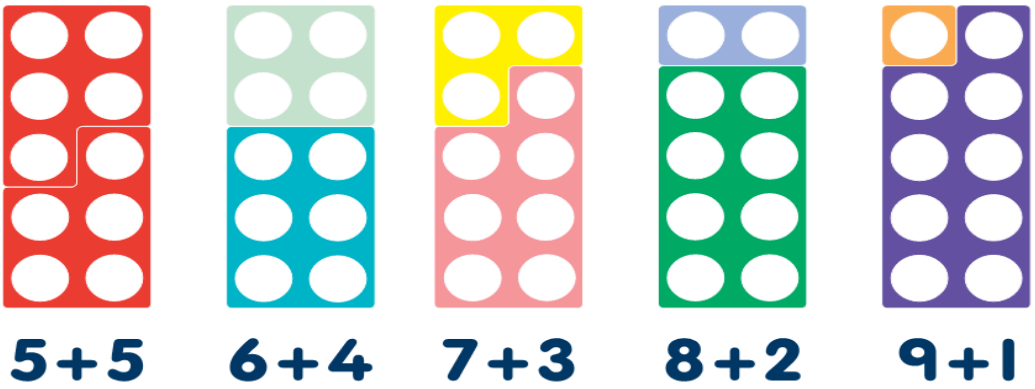
In this example we're looking at a before and after model. This means we need to represent the model at the start of the problem and at the end of the problem after there has been some sort of change.

**For more on Bar Modelling, see link below or contact Maths Lead.**

https://mathsnoproblem.com/blog/teaching-maths-mastery/making-the-most-of-bar-modelling/?utm_source=blog&utm_medium=blogintlink&utm_campaign=howtoteachcomparisonbarmodels

# Tens Frame

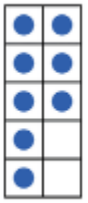
When playing and exploring pupils are provided with a range of equipments with which to explore making 6-9 as 'five and a bit'. For example, they could use a Numicon 'five' piece and join it with other pieces to make 6-9, or find 'five and a bit' pieces on dominoes.




During active Learning, tens frames are used as a label for areas in the setting that are restricted to certain numbers of pupils. Accompany the labels with the numerals.

When creating and thinking critically, pupils are encouraged to practise representing numbers 1-10 on fingers that have been shown on tens frames. Turn over a tens-frame card and show how many with fingers - start with 'grow it' so children can count out fingers if they need, then 'show it', putting up fingers without counting, then 'throw it', putting out their fingers without looking at them first.

8



There are 8 scissors in the image above so if i want to make 10, how many more will i need? Looking at the ten frame, pupils are able to determine that they need 2 more. Helping them understand number bonds of 10 whilst also finding another way of making 10.

An equation(number sentence) can also be ritten using the tens frame model above. **8 + 2 = 10** **or** **10 - 8 = 2**

Count out some objects out and agree the quantity. Pupils amy be asked, to place a certain amount of blocks or objects on the ten frame. From this, they are able to work out how many more is needed to make 10 or 20 depending on the number bonds that is being taught.

https://www.ncetm.org.uk/media/lmhgcfky/series_03_episode_13_numberblocks-support-materials_five_and_friends_april_2021.pptx
Link to NCETM's slides on Tens Frame.

# Addition

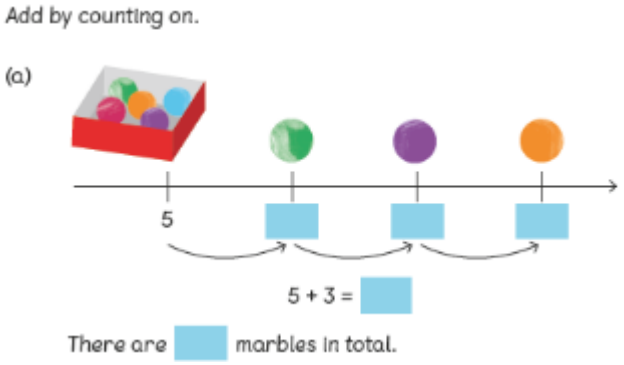
## Year 1

**Adding within 10**

Adding by counting on using number lines

- Draw a number line
- Start with your biggest number
- Use jumping to count on(forwards) to add on a specific amount

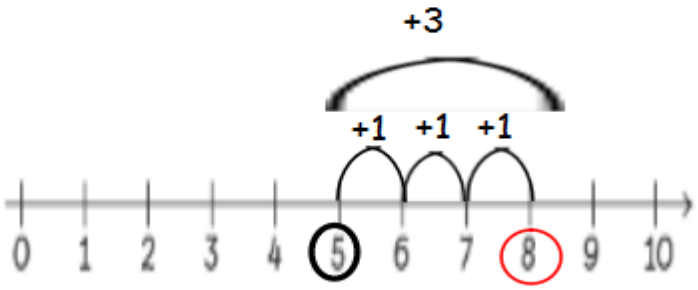
Example 1




So, I need to add 5 and 3.

5 + 3 =

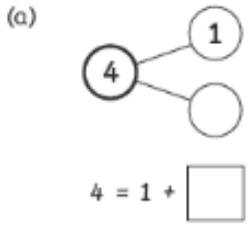
1. Draw my number line
2. Circle my biggest number
3. Jump three times to the right(adding on)
4. Circle the number you land on as your answer.
5. So 5 + 3 = 8



Example 2

**This question is worded differently but is still an addition question which allows children the chance to think.**

Adding by completing number bonds- missing numbers

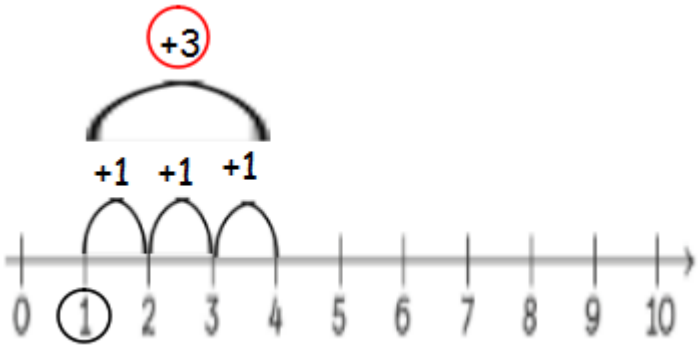



**Understanding the question:**

- Your answer is 4(total)
- How do I get to 4 from 1?
- What number do I add to 1 to get to 4?

Answering Question:

1. Child can rewrite question as 1 + ☐ = 4
2. Can they use their number lines now?
3. Draw a number line
4. Circle my 1
5. Jump till I get to 4
6. How many jumps did I complete?
7. Therefore, 1 + 3 jumps will take me to 4
8. So my missing number is 3



# Year 2

Example 1

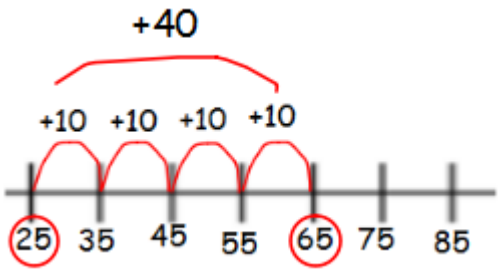
***Simple addition*** - ***Counting on to add***

25 + 40 =

- **Count on**
  - Count on from 25 in 10s
  - Count on 4 times in 10s(can use fingers as a measure - 25 in my head)
  - Start the count on fingers from the next number not your starting number

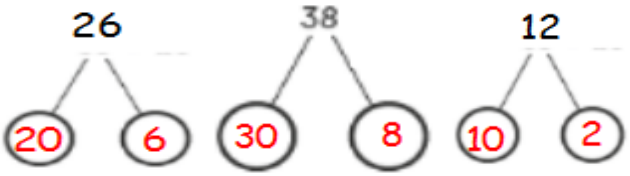
25, 35 ,45 ,55 ,65

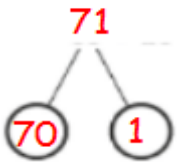
- **Using a Number Line**
  - Draw a number line
  - Start with your smallest number(circle starting number)
  - Count on in tens or ones depending on the question(10s for this question)
  - Start your jumps with +10 at a time.
  - It takes you to 35, next jump of +10 to 45, then +10 to 55 and the last +10 to 65.
  - Check how many you have jumped(+40 - 4 jumps of 10)
  - The answer is 65



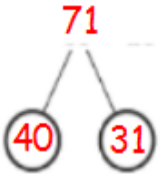

- **Using Partitioning**

  **What is partitioning?**
  - **Partition means splitting a number.**
  - **26 can be split into 20 and 6.**
  - **The 2 numbers should add up to give the original number.**



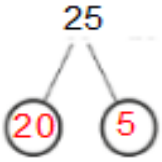

the numbers can be partitioned differently as well.




Now that we know how to partition, we can try partitioning to add.

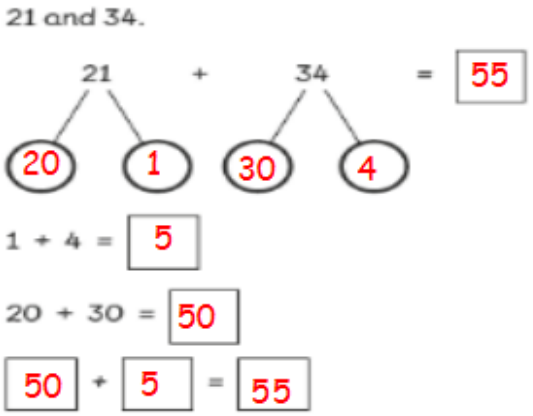
- **Using Partitioning to add**
  **Which number needs to be partitioned?**
  **The 25 will partition to 20 and 5**
  **Add the multiples of 10 (20 + 40)**
  **Then count on the single digit (5)**

Example 1 25 + 40 =

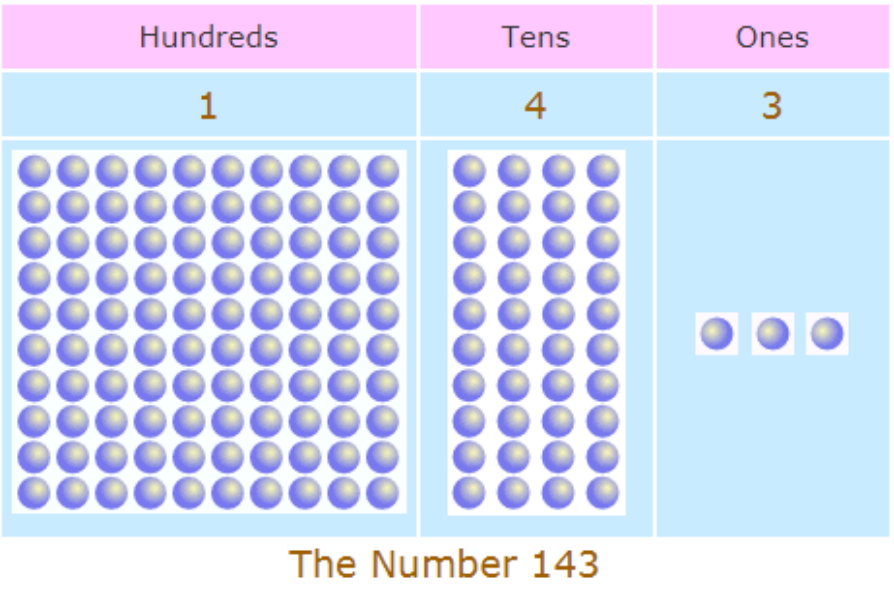



20 + 40 = 60
60 + 5 = 65 count on 5 from 60

Example 2



## Understanding Place Value



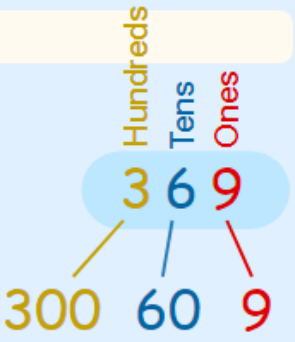

The Number 143

That shows we have 1 Hundred, 4 Tens and 3 Ones:

This can also be written as $1 \times 100 + 4 \times 10 + 3 \times 1$.

Example: "369" means 3 Hundreds, 6 Tens and 9 Ones

Which is also $3 \times 100 + 6 \times 10 + 9 \times 1$




- **Using Column Method to add**

This method is written in columns using place value.

- ❖ Label place value
- ❖ Align the numbers
- ❖ Start adding from the ones column
- ❖ Count on to add in their columns

26 + 10 =

| | tens | ones | |
|---|---|---|---|
| | 2 | 6 | |
| + | 1 | 0 | |
| | 3 | 6 | |

Place value (PV)

6 ones + 0ones is 6ones. Write underneath the ones column.
2tens + 1tens is 3tens. Write underneath the tens column.
Your answer is 36.

- **Adding with renaming/regrouping using column method**

Sometimes referred to as carrying over.
This follows adding using the column method but one or more of the columns might go over 10 when added.

- ❖ Label place value
- ❖ Align the numbers
- ❖ Start adding from the ones column
- ❖ Count on to add in their columns

Example 1
26 +4 =

| | | 1 | |
|---|---|---|---|
| | tens | ones | |
| | 2 | 6 | |
| + | | 4 | |
| | 3 | 0 | |

6ones + 4ones is 10 ones.
Every column can only hold 1 digit. Therefore the 1 in 10 (1 tens or 10ones) need to be placed in the tens column whilst the 0ones goes in the ones column. Move onto the tens column. There are 2 tens and 1 tens(10 ones that have been renamed to 1 tens). Add your 2 tens to 1 tens to give you 3 tens.

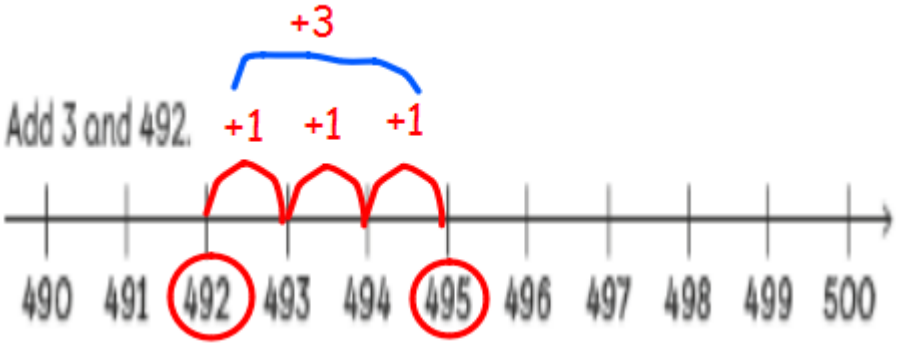
Example 2
57 + 23 =

| | | 1 |
|---|---|---|
| | tens | ones |
| | 5 | 7 |
| + | 2 | 3 |
| | 8 | 0 |

7 ones + 3 ones = 10 ones. Place 0 ones in ones' column. Rename the 10 ones to 1 tens into the tens column(by writing 1 on top of the tens column).
5 tens + 2 tens = 7 tens. Then add your renamed 1 tens 7 tens + 1 tens= 8 tens.
57 + 23 = 80

# Year 3, 4, 5 and 6

- **Adding using a number line.** Refer to Years 1 and 2 for explanation on adding using the number line**(not necessarily for Years 4, 5 and 6)**.




- **Adding using column method(without renaming)**

  259 + 310 =

| | h | t | o |
|---|---|---|---|
| | 2 | 5 | 9 |
| + | 3 | 1 | 0 |
| | 5 | 6 | 9 |

  Since there is nothing to rename, the place values are added and placed in their respective columns.
  It is very important that we are aligning correctly.

- **Adding using column method with Renaming/regrouping**

Also sometimes referred to as carrying over.

Example 1

| | | h | t | o |
|---|---|---|---|---|
| | | 7 | 5 | 6 |
| + | | | | 7 |
| | | 7 | 6 | 3 |

Example 2

| | | h | t | o |
|---|---|---|---|---|
| | | 6 | 6 | 8 |
| + | | 2 | 2 | 4 |
| | | 8 | 9 | 2 |

Example 3

| | | | | |
|---|---|---|---|---|
| | 13 | 17 | 14 | 5 |
| + | 1 | 4 | 6 | 7 |
| | 5 | 2 | 1 | 2 |

Refer to Year 2 adding with renaming for explanation.

# Subtraction

## Year 1

- **Subtracting by crossing out**

Example 1

7 - 2 = ☐

7 – 2 = 5

5 ladybirds are left.

Example 2

I have 8 bananas. I peel 5 of them. How many bananas are not peeled?

8 – 5 = ☐

- ❖ Children can draw their 8 bananas.

- Cross out the 5 that has been peeled.
- How many are left over?
- Count what is left
- That is your answer

8 - 5 = 3

Example 3

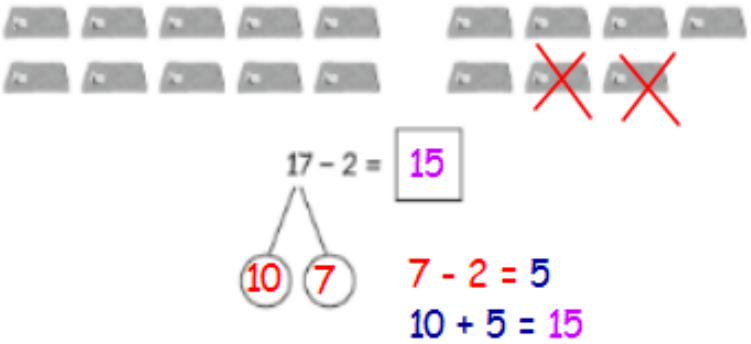
3 chicks have eaten. How many chicks are still eating?

10 - 3 = 7

7 chicks are still eating.

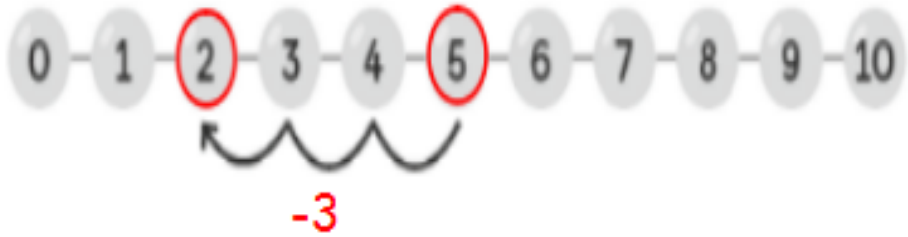
- **Crossing out to subtract within 20**

Subtract 2 from 17 or 17 - 2 =




- **Subtracting on a numberline by counting back**

5 - 3 =




5 – 3 = 2

- Just like adding using a numberline, draw the number line.

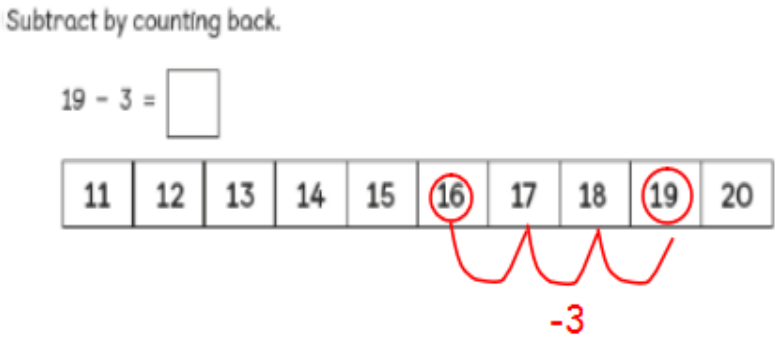
- Write numbers down
- Circle the bigger number
- Jump backwards 3 times(subtracting or taking away 3)
- Circle the number you land on(2)
- Answer is 2

- **Subtracting by counting backwards**

  5 - 3 =
  - Put your bigger number in your head
  - Count backwards from the next number(4)
  - Count back 3 times(use fingers to help you)
  - This method is not the most efficient but works for 1 and 2 digit numbers.

# Year 2

- **Subtracting using number lines to count backwards.**



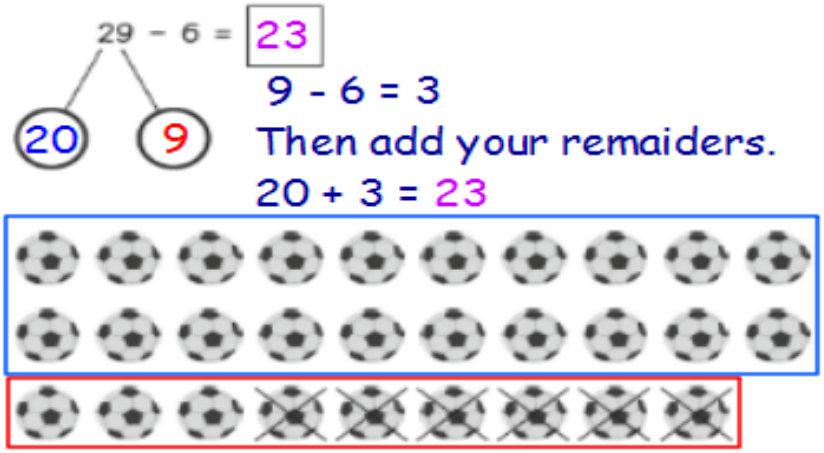

19 - 3 = 16

Refer to Year 1- subtracting using number lines for explanation.

- **Subtracting by partitioning and crossing out**

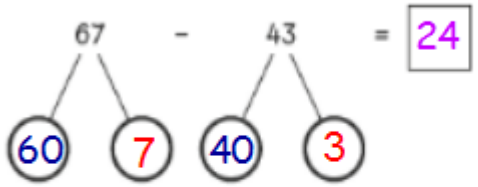
  Example 1

6 from 29.




Example 2

43 from 67.




60 - 40 = 20

7 - 3 = 4

Then add remainders 20 + 4 = 24

- **Subtracting using column method**

  Example 1

  47 - 4 =

| | tens | ones |
|---|---|---|
| | 4 | 7 |
| - | | 4 |
| | 4 | 3 |

  Rewrite question using the column method(include your Place Value)
  Align ones and tens correctly
  Bigger number goes on top
  7 ones - 4 ones = 3 ones , the 3 ones goes under the ones column
  4 tens - nothing(0) = 4 ones , the 4 tens goes under the ones column

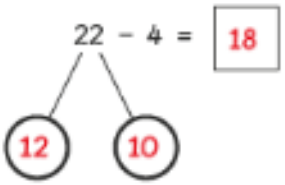
  Example 2

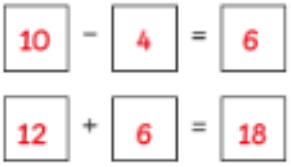
| | tens | ones |
|---|---|---|
| | 7 | 5 |
| − | 4 | 5 |
| | 3 | 0 |

- **Subtracting with Renaming/Regrouping**

❖ **Using partitioning**

4 from 22.




Partition the bigger number to 10 and 12.
In this case, I cannot partition into 20 and 2.
As I cannot take 4 from 2.

- **Using Column Method**

Example 1
24 - 7 = 17

| | tens | ones |
|---|---|---|
| | 2 | 4 |
| − | | 7 |
| | | |

| | tens | ones |
|---|---|---|
| | ~~2~~ 1 | 14 |
| − | | 7 |
| | 1 | 7 |

❖ 4 ones take away 7 ones is not possible(as we are not working in negatives)
❖ So rename(collect) 1 tens from the 2 tens(which is renamed as 10 ones)
❖ Do not forget to cross out the 2 tens and change it to 1 tens.

- The 10 ones are added to the 4 ones to become 14 ones.
- 14 ones takeaway 7 ones gives 7 ones.
- Write the answer under one's column.
- Since we took one tens away from the 2 tens, there is only 1 tens left.
- 1 tens take away nothing(0) is 1 tens.
- Place the 1 tens(answer) under the tens column.

Example 2

53 - 27 = 16

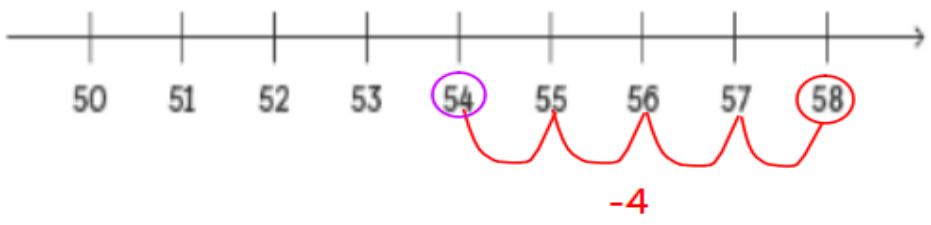

63 - 35 = 28


# Year 3, 4, 5 and 6

- **Subtracting using number line**(Years 4, 5, and 6 may not necessarily need number lines to subtract)

Example 1

58 - 4 = 54 or subtract 4 from 58



Refer to Year 2 for explanation on subtracting using number lines.

- **Subtracting using Column Method- Without Renaming or Regrouping?**

Example 1

253 – 22 = ☐


Example 2

795 - 264 =

Subtract 264 from 795 =


Subtracting these equations are straightforward and do not require any regrouping or renaming as they are being subtracted within ten.

Refer to Year 2 for further explanation on simple subtraction using column method and place value.

- **Subtracting using Column Method- Without Renaming or Regrouping?**

Example 1

475 - 429 = 46


- ❖ Rewrite equation using a column method(include your place value)
- ❖ Ensure you have aligned correctly
- ❖ Start from the ones column(always)
- ❖ 5 ones take away 9 ones is impossible(as we are not working with negatives)

- Move to the tens column and rename(borrow) 1 tens to 10 ones into the ones column
- This gives you 15 ones in the ones column now
- Do not forget to cross out the tens as it has reduced in amount(6 ones).
- 15 ones takeaway 9 ones will result in 6 ones. Place under one's column.
- Now onto the tens. 6 tens take away 2 tens will give 4 tens.
- Subtract 4 hundreds from 4 hundreds will give 0 hundreds.
- Answer is 46

Example 2

500 - 48 = 452


- Rewrite equation using a column method(include your place value)
- Ensure you have aligned correctly
- Start from the ones column(always)
- 0 ones take away 8 ones is impossible(as we are not working with negatives)
- Move to the tens column and rename(borrow) 1 tens (not possible as there is on 0 tens)
- So you will need to move to the hundreds column to rename from.
- 1 hundreds will be renamed to 10 tens. Then, rename 1 tens to 10 ones.
- Do not forget to cross out the hundreds and tens as they have both reduced in amount(4 hundreds and 9 tens).
- 10 ones take away 8 ones will result in 2 ones. Place under one's column.
- Now onto the tens. 9 tens take away 4 tens will give 5 tens.
- Subtract nothing(0 hundreds) from 4 hundreds will give 4 hundreds.
- Answer is 452

Example 3


Example 4

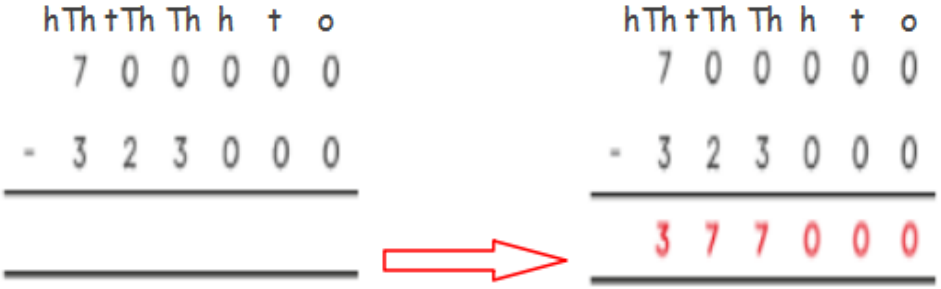
Find the difference:

65 724 – 45 678 = ☐


Example 5

248 135 – 88 473 = ☐


Examples 6




Note:In upper year groups(Key Stage 2), the method remains the same with bigger numbers into the tens of millions. So the place values increase and that will mean sometimes there are more columns to rename or regroup.

# Multiplication

## Year 1

- **Counting in/making groups of...**

Example 1

5 groups of 2

2 + 2 + 2 +2 +2 = 10

Example 2

5 groups of 3

3 + 3 +3 +3 +3 = 15

# Year 2

- **Year 2 focuses on x 2, 5 and 10**
- **Grouping to multiply and divide**

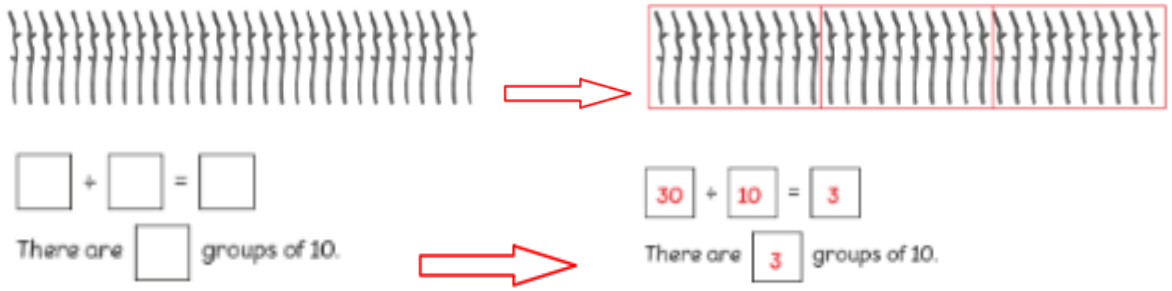
Multiplication and division are inverse of each other therefore work hand in hand.

Example 1

Circle in groups of 10

30 ÷ 3 = 10

3 groups of 10 = 30



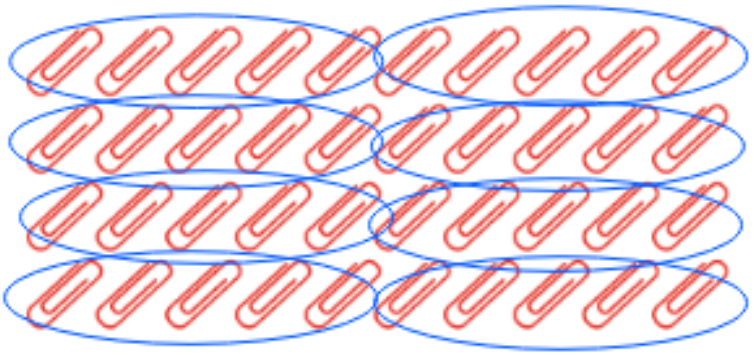

- Read question
- Find out what groups of items there is to be made
- Circle the objects to find how many groups there are.

Example 2

Put into 5 equal groups.

There are ☐ in each group.

☐ ÷ 5 = ☐



Put into 5 equal groups.

There are 8 in each group.

40 ÷ 5 = 8

## Using times tables to divide

In year 2, pupils also start to use their times tables to help them divide. The rule is if you know your x2 then you can apply them .

We can make a family of multiplication and division facts.

5 × 2 = 10 ——— 10 ÷ 2 = 5

2 × 5 = 10 ——— 10 ÷ 5 = 2

The multiplication and division equations are related.

# Year 3

- Year 3 mainly focuses on x3, 4 and 8
- Using repeated addition to multiply
  Here, children add on the same amount to make as many groups as needed to make the x tables they require.
  Examples

2 rows of 3
2 × 3 = 6

If we know 2 × 3 = 6, how can we tell what 3 × 3 is?

2 rows of 3
2 × 3 = 6

If we know 2 × 3 = 6, how can we tell what 3 × 3 is?

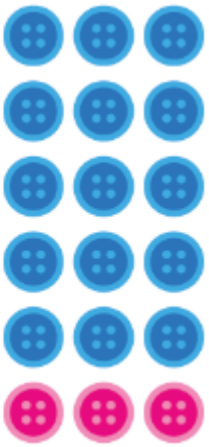
**Tips**

- X4 and x 8 have a link so it's easier to learn together as 4 is half of 8 and 8 is double 4 therefore, you can double your x4s if you know them to give you your x8s.
- This can also be described as counting up in 3s, or whichever times tables are being used.
- If I know 5 x 3 = 15 , then + 3 will give me 5 x 6 = 18
  Example

Write the missing numbers.

1 $5 \times 3 = 15$

$6 \times 3 = 15 + \square = \square$



- Groups of a number can be used to multiply as well. In this case, you can make the same group a number of times to multiply.

$3 \times 8 = 24$

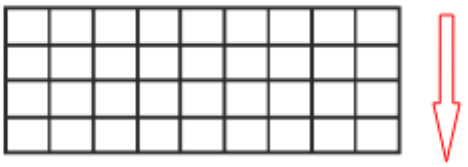
If I know that 3 x 4 = 12, then six groups of 4 should give me 3 x 8 which is 24 because 8 is double 4.

- Questions can be worded differently.

**Example**

Colour the squares to find the product of

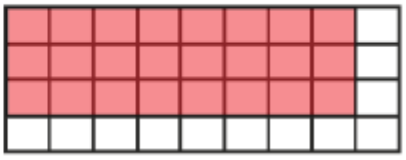
(a) 3 and 8



Colour the squares to find the product of

(a) 3 and 8

24



**In this case, children are still applying groups off. Shade 3 groups of 8 .**

**Word Problem**

(b) Amira puts 8 roses in a vase.
How many roses are there altogether if there are 9 vases?

[ ] × [ ] = [ ]

There are [ ] roses altogether in 9 vases.

(b) Amira puts 8 roses in a vase.
How many roses are there altogether if there are 9 vases?

[ 8 ] × [ 9 ] = [ 72 ]

There are [ 72 ] roses altogether in 9 vases.

**Counting up in a particular x table**

Complete the number patterns.

(a) 8, 16, 24, [ ], [ ], 48

(b) 40, 48, [ ], [ ], 72

Complete the number patterns.

(a) 8, 16, 24, 32, 40, 48

(b) 40, 48, 56, 64, 72

# Year 4, 5 and 6

## Year 4

**When starting to multiply in Year 4, the Year 3 methods are used. These are also used for when pupils are struggling until they become confident and can move onto using other topics that will be discussed below.**

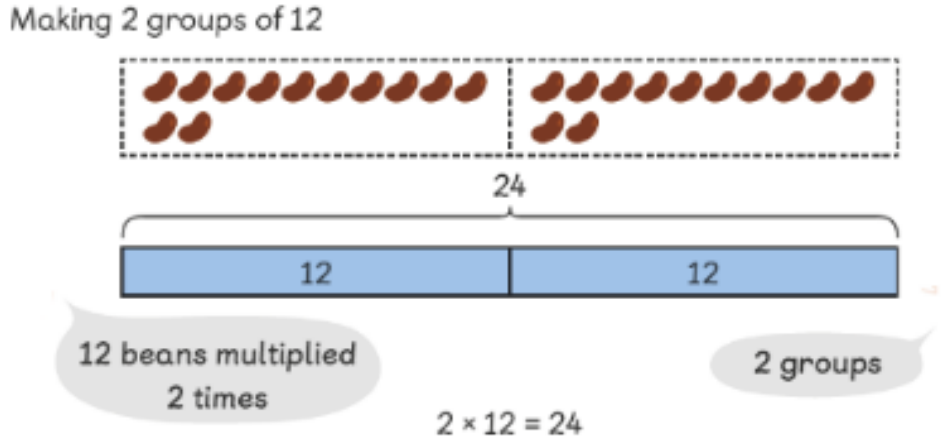
**The Year 4 multiplication(or x tables) include, x 6,7 9, 11 and 12.**

**The assumption is that by the end of Year 4, all pupils know their x tables from 1 to 12. So from here on, the aim is to apply x tables not learning them.**

## Years 5 and 6

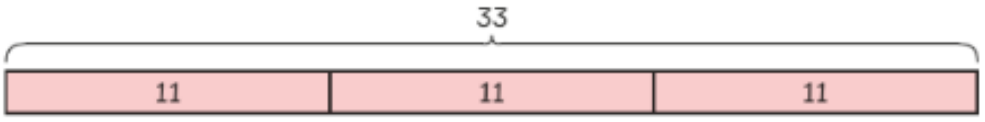
**As stated above, the assumption is that all children coming into year 5 should know their x tables but it is not always the case due to a variety of reasons. The above methods can be used to help children who struggle with x tables or multiply in general but the numbers start to get bigger so you can't be sat down adding on so many 8 to find 8 x 315.**

**<u>Using the bar method</u>**




**The top bar is always the total amount or number.**

Use 33 beans to make 3 groups.




3 groups

$3 \times 11 = 33$

11 multiplied 3 times

$11 \times 3 = 33$

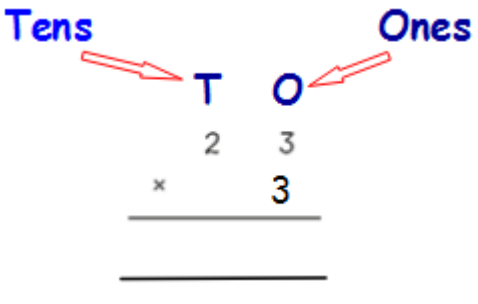
**The number of bars will increase as the number of multiplication increases hence, this again, might not be the most suitable method to use with larger numbers.**

**Column Multiplication**

**Tips**

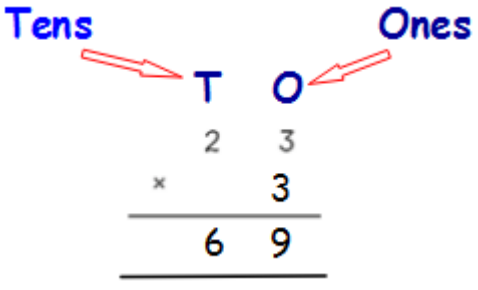
- **Always start from the ones column or the right handside and work your way to the left columns.**
- **Knowledge of place value is essential. You should start thinking of these numbers as the value they are in their columns. Thus the 3 is 3 ones and the 2 is 2 tens which is the same as 20. This is important because it affects the calculations and the alignment of the calculation.**

**Single Multiplications (Expanded) or Multiplying without Renaming**

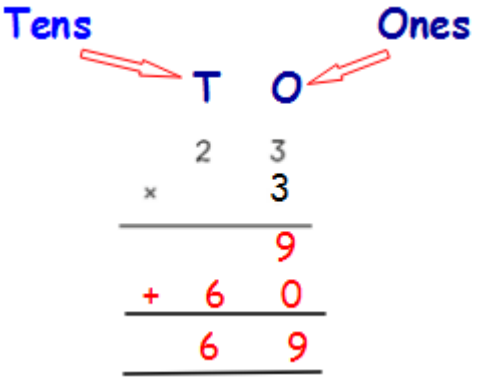


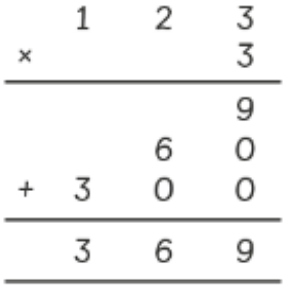

This is straightforward as you can just multiply your digits and align them under the correct columns.

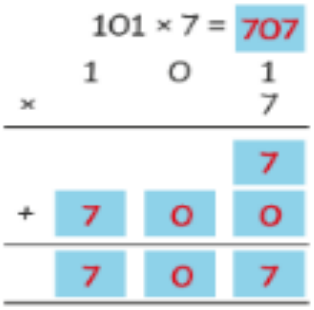
This can also be expanded to accommodate for the 2 tens x 3 which will be 60 .



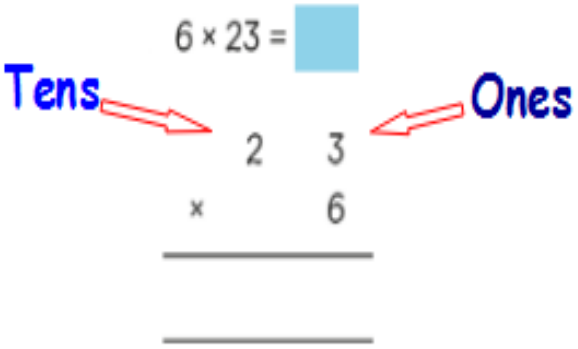

OR






**Compact method**




6 x 3 ones is 18. Since the 18 crosses into the tens column, the 8 is place under the ones column and the the 1 under the tens column. The next calculation will then be 6 x 20 not 6 x 2. This is because the 2 is in the tens column. 6 x 20 is the same as 6 x 2 = 12 make that 10 x bigger to get your 120 which goes into the hundreds column. Add the 2 calculations.

**Multiplication with Renaming**

**Step 1**

Multiply the ones.


**Step 2**

Don't forget to add the 1 ten.

Multiply the tens.

Don't forget to add the 2 hundreds.

Multiply the hundreds.

**Step 3**

| | | | |
|---|---|---|---|
| | 2 4 | 1 7 | 3 |
| × | | | 4 |
| | 1 | 8 | 9 2 |

**Examples**

| | H | T | O |
|---|---|---|---|
| | 1 4 | 7 | 3 |
| × | | | 2 |
| | 9 | 4 | 6 |

Multiply the ones.

Multiply the tens.

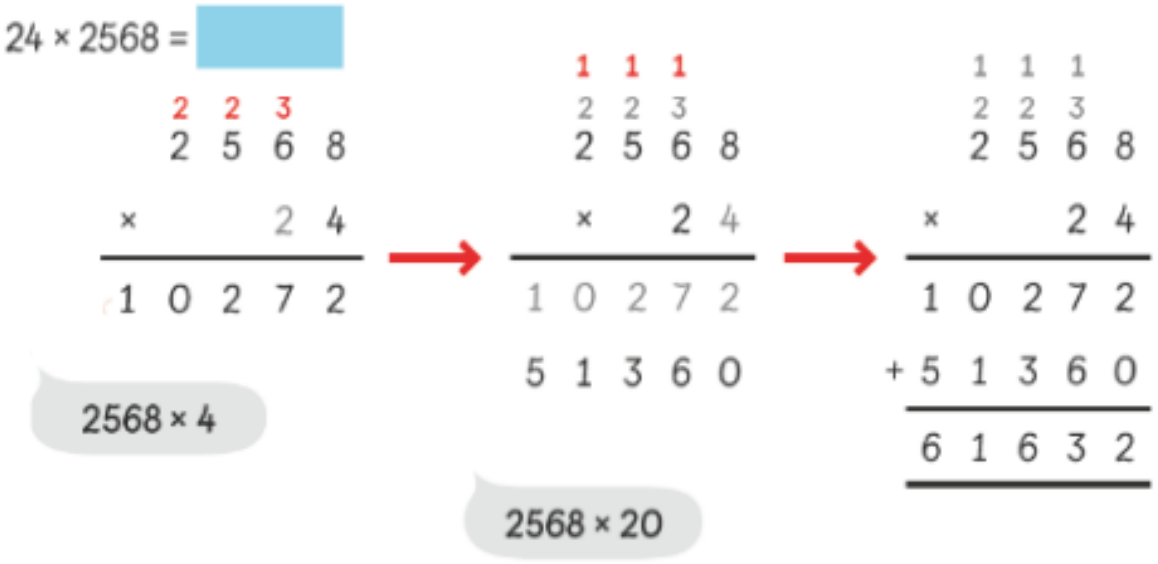
Multiply the hundreds.

Add the 1 hundred.

**OR**

| | | | |
|---|---|---|---|
| | 4 | 7 | 3 |
| × | | | 2 |
| | | | 6 |
| | 1 | 4 | 0 |
| + | 8 | 0 | 0 |
| | 9 | 4 | 6 |

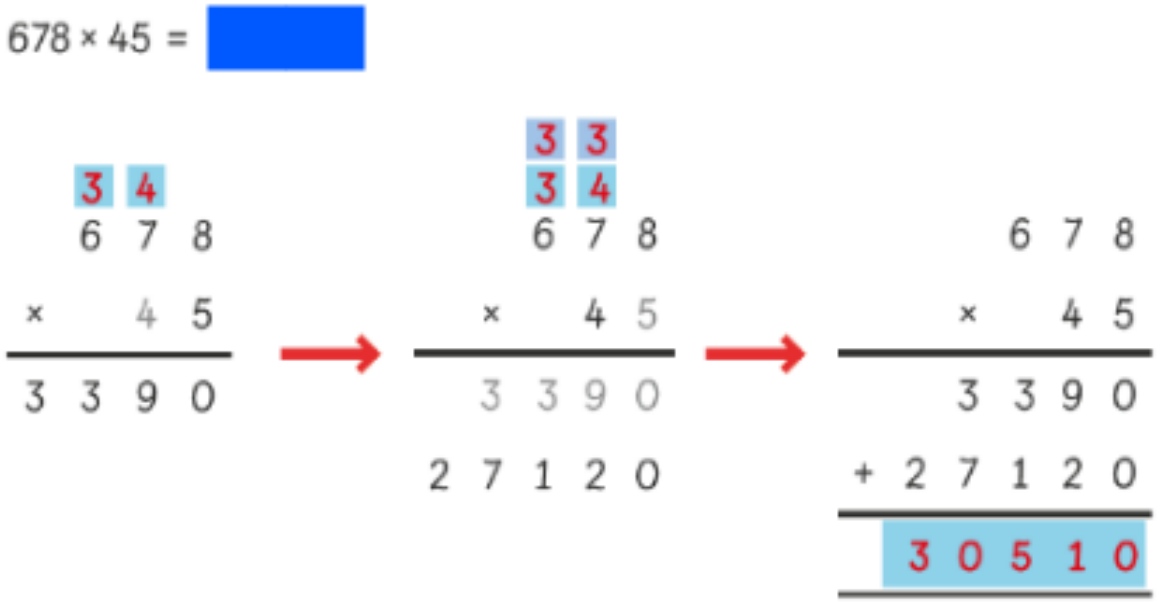
**Multiplying 2 digits by larger numbers**




**Tips**

- Always start from the ones column and work your way to the thousands.
- Place your reminders on the immediate top of your column so you don't get confused.
- Do not forget to add your renamed digits at the top.

**Example 2**



# Division

## Year 1

**For Year 1, multiplication links right into division so the idea of grouping or sharing to divide is used instead of having other methods. See multiplication/grouping from Years 1 and 2.**

## Year 2

**<u>Grouping to Divide</u>**

There are 20 chocolates.

20 ÷ 2 is equal to 10.

Put 2 chocolates in each bag.

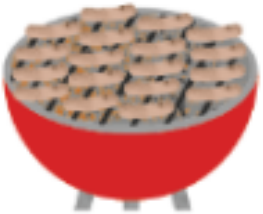
Emma gets 10 bags of chocolate.

20 ÷ 2 = 10 is a division equation.
20 ÷ 2 = 10 is read as twenty divided by two equals ten.

## Sharing

How can the sausages be put equally on 2 plates?
What is the number of sausages on each plate?

There are 18 sausages.



Put 18 sausages equally on 2 plates.

$2 \times 9 = 18$

There are 9 sausages on each plate.

$18 \div 2 = 9$

## Using x-tables to Divide

The idea of this is to use knowledge of x-tables to solve division. If you know that 2 x 7 = 14 , then 14 divided by 2 should give you 7 or 14 divided by 7 should give you 2.

Example 1

$16 \div 2 = 8$ — $8 \times 2 = 16$

$20 \div 2 = 10$ — $10 \times 2 = 20$

$15 \div 5 = 3$ — $3 \times 5 = 15$

$45 \div 5 = 9$ — $9 \times 5 = 45$

## Example 2

Hannah has 50 paper clips.
She gives some children 10 paper clips each.
How many children does Hannah give the paper clips to?

You can draw pictures to help you.

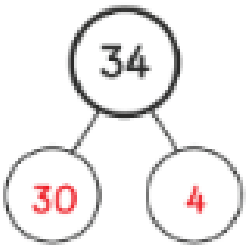
50 ÷ 10 = 5

Hannah gives the paper clips to 5 children

# Year 3

## Simple Dividing(partitioning)

(a) 34 ÷ 2 =




= 15 + 2

= 17

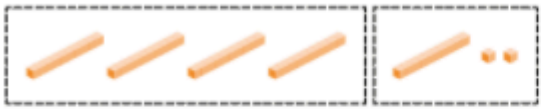
34 ia a tens number so its easier to divide when its regroupeed or partitioned(split). Always try and split it into 2 numbers that the factors(2) give can divide without any remainders. So 34 can be partitioned into 30 and 4. Both are divisible by 2

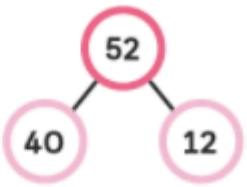
## Dividing with regrouping

Example 1

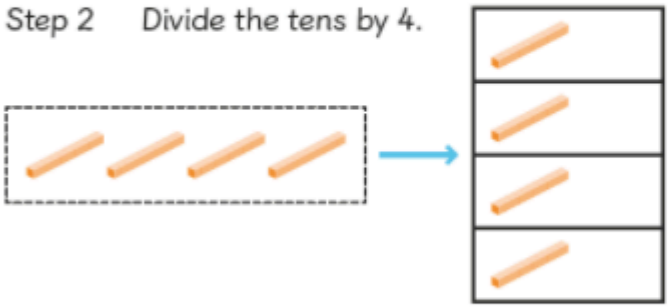
52 ÷ 4 = ☐

Step 1 Split 52 into 40 and 12.






Step 2 Divide the tens by 4.




Step 3 Regroup 1 ten into 10 ones.

Tone 4 tens is the same as 4 groups of 10 which is 40
So the place value of the 4 in 40 can be referred to as 4 tens.

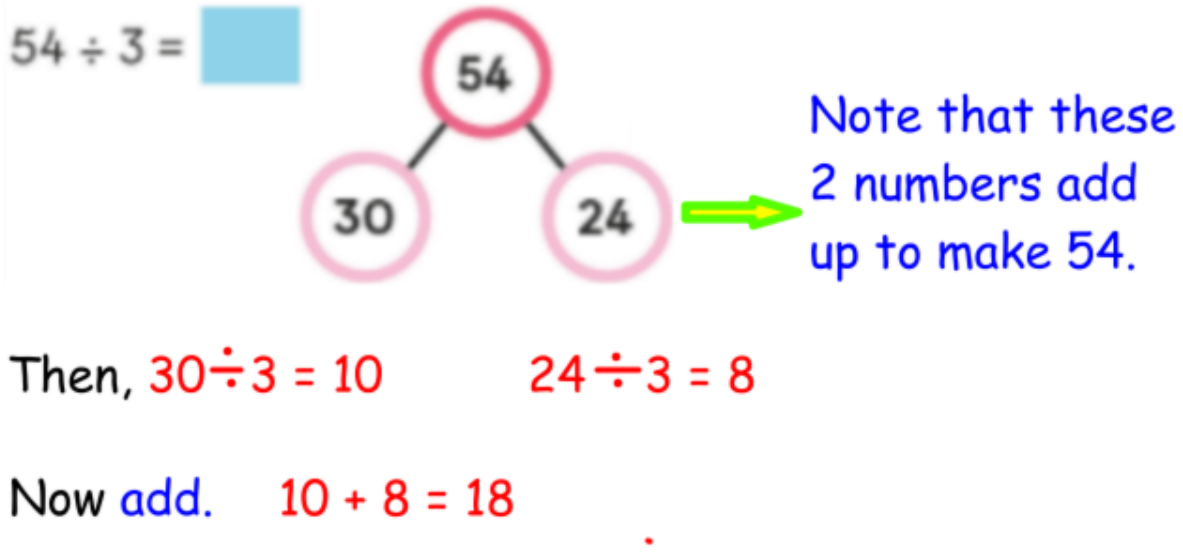
Explanation : On here a part-whole model has been used where the number 52 has been partitioned into 40 and 12. This is because both numbers can be easily divided by the divisor 4 equally.

## Example 2

Divide.

(a) 54 ÷ 3 = ☐


Explanation:
The part-whole method is being used here again. They have partitioned or regrouped the number 54 into numbers that can easily be divisible by the divisor(3).




## Years 4, 5 and 6

Year 4 also uses the dividing with regrouping or the partitioning method. Check above under the Year 3 Division section for this method.
Year 4 also introduces remainders and the Long Division Method. This is very efficient when working with numbers that do not divide equally and are not exactly on the timestables that children have been learning in school, so bigger numbers.

**Dividing with regrouping - remainders**

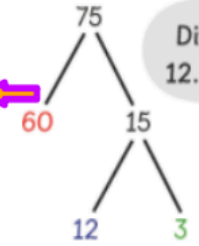
Example

75 ÷ 6 = ☐

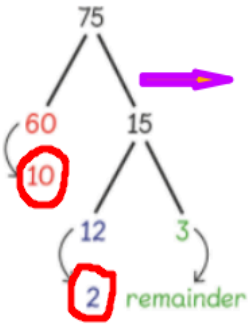

75 has been split into tens and ones. 7 tens and 5 ones.

Method 1

Note; It is important that these 2 numbers add up to 75 as youre dividing 75.




Divide 60. Divide 12. What about 3?

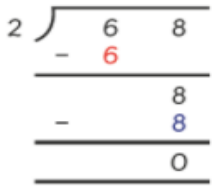


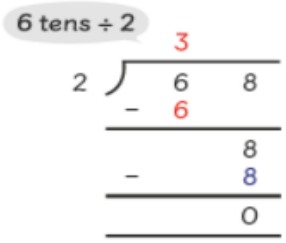

When dividing using this method, 75 is partitioned into 60 and 15. This is so pupils can divide by 6.
60 can be divided by 6 an 15 is divisible by 6 with a remainder of 1.

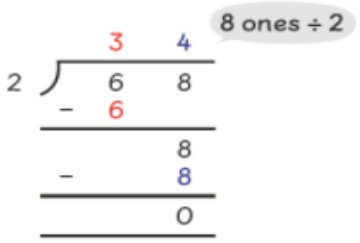
Add the 10 and the 2 = 12 R1

## Long Division

Example 1



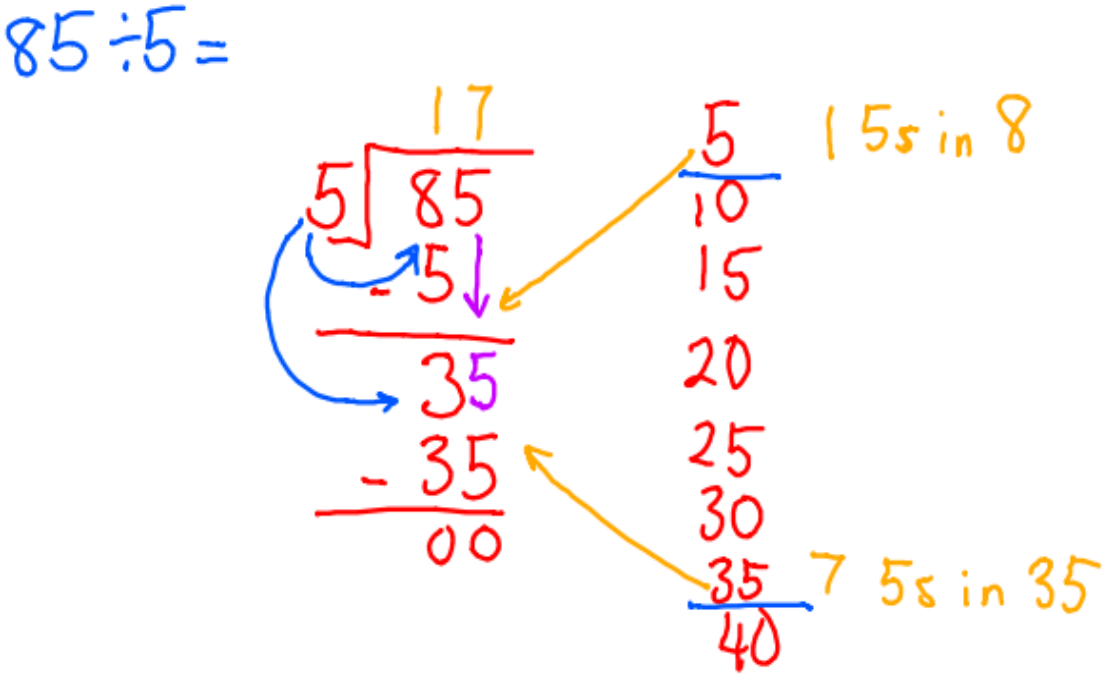




Each should take 34 postcards.

68 ÷ 2 = 34

This is how long division is shown in MNP books.

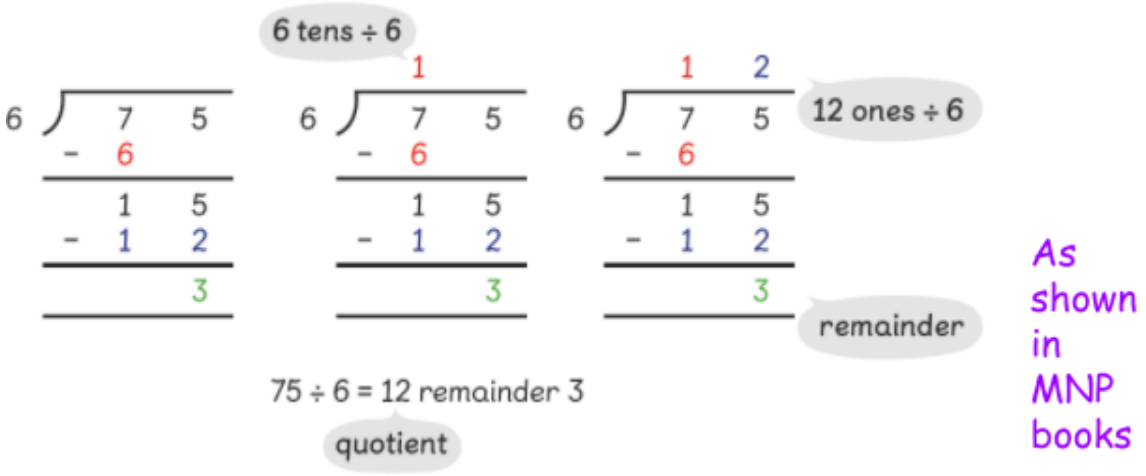
*Use the explanation to explain or to give pupils strategies to help them learn the step.




Explanation

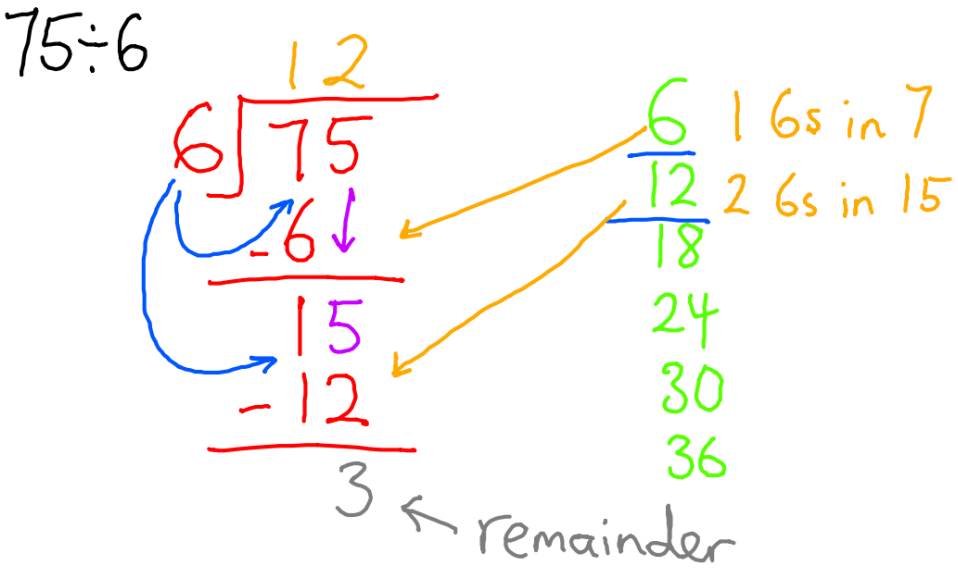
1) Rewrite question in long division format. Note that the 5(divisor) is always on the outside.
2) Write down the xtables for the divisor(5). This will be used for division facts.
3) How many 5s are there in 8?
4) There are 1 fives in 8.
5) Underline the 5 where you stopped as 10 is more than 8.
6) Place the 1 on top of the 8.
7) Bring the 5 down.
8) Subtract from the 8.(Note: Make sure you are placing the 5 under the 8(tens column) and not the 5(ones column).
9) You are done with the 8(tens column) now so move onto the 5(ones column). Drop the 5 next to the 3 that is left over(remainder).
10) Now you have 35.
11) How many 5s are there in 35? Check your xtables.
12) There are seven 5s in 35.
13) Place the 7 on top of the 5(one column)
14) Subtract. If you get a zero, then there are no remainders.

## Long Division with remainders




As shown in MNP books

Same questioned explained below




Explanation

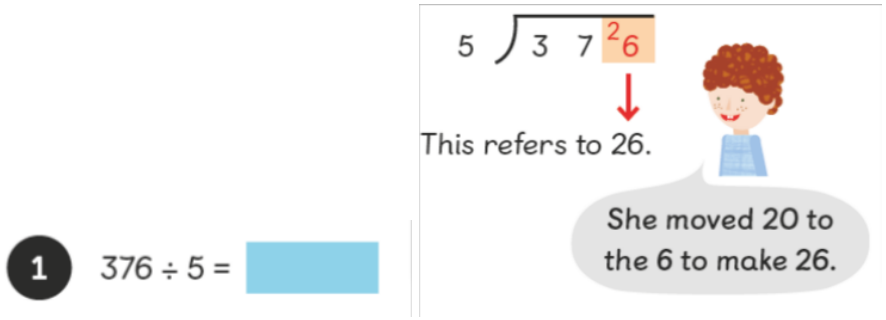
1. Rewrite question in long division format. Note that the 6(divisor) is always on the outside.
2. Write down the xtables for the divisor(6). This will be used for division facts.
3. How many 6s are there in 75?
4. There are 1 sixes in 7.
5. Underline the 6 where you stopped as 12 is more than 7.
6. Place the 1 on top of the 7.

7. Bring the 6 down.
8. Subtract from the 7.(Note: Make sure you are placing the 6 under the 7(tens column) and not the 5(ones column).
9. You are done with the 7(tens column) now so move onto the 5(ones column). Drop the 5 next to the 1 that is left over(remainder).
10. Now you have 15.
11. How many 6s are there in 15? Check your xtables.
12. There are seven 2s in 15.
13. Place the 2 on top of the 5(one column)
14. Subtract. The 3 is the remainder.

This same method can be used for dividing by 3 or 4 digit numbers.

**Short Division**

The short division is introduced in Year 5 and carried through to Year 6. It is a compressed version of the Long Division.




Explanation
How many 5s are there in 37? - always start with the first two digits if possible.
Using our times tables, we know that 7 x 5 is 35 so there are 7 5s in 37.
Place the 7 on top of the 37.
Since 5 x 7 is 35 and not 17, there is a remainder if 2 in the tens column.
The 2 tens - remainder- is then renamed into the ones column to give us 26 ones.
How many 5s are there in 26?
Using our times tables, we know that 5 x 5 is 26. So there are 5 5s in 26 with a remainder of 1.

Place the 5 next to the 7 on top of the 37 with a remainder (R) of 1.

# Journalling

At St Lukes, we have been using journaling as a tool that allows us to assess understanding after a concept has been taught. But it's far more than a simple reflection at the end of a lesson.

The use of maths journals in our classrooms depends on the needs of our learners. The aim is to be able to use them daily during lessons, ask learners to write entries at the end of the lesson, or use them for particular lessons.

To help make these journals more effective we are aiming to:

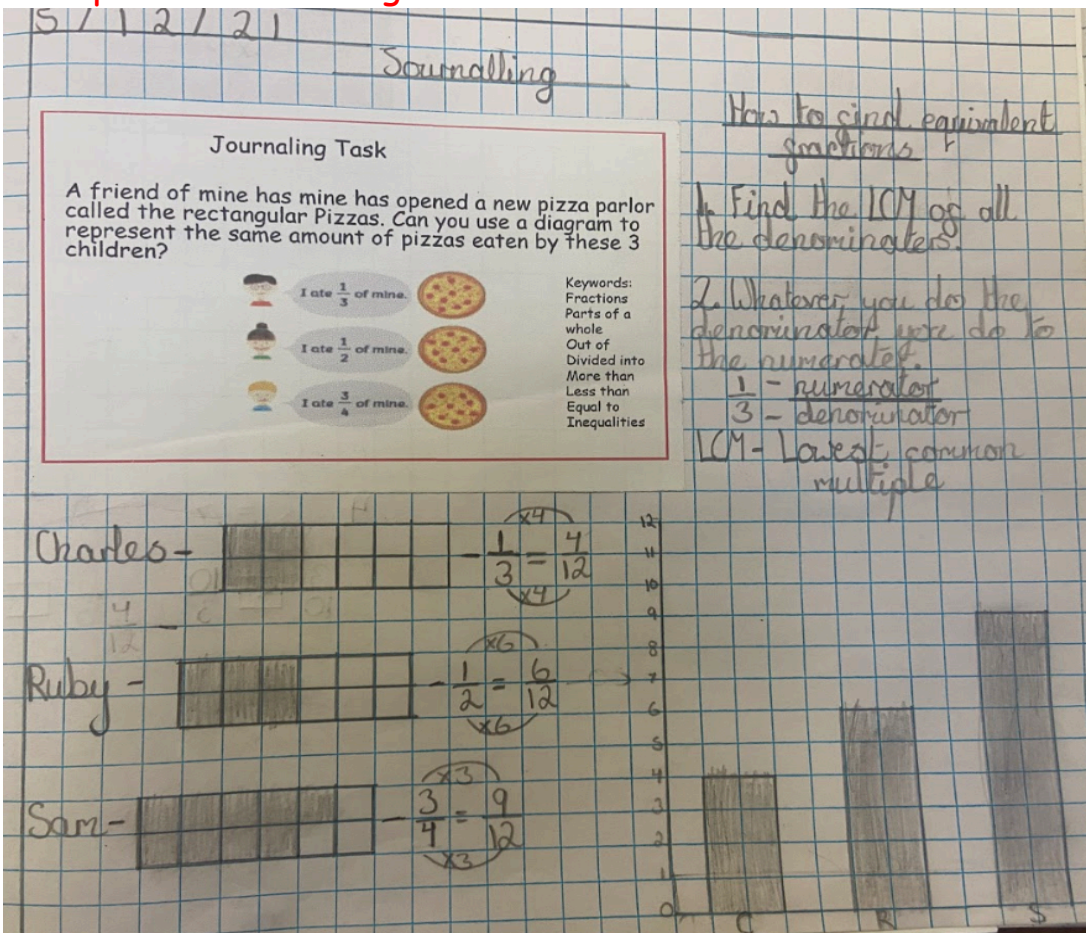
- Plan them into our lesson
- Leave adequate time to journal
- Regularly use the different types of journaling tasks
- Check them around once a week
- There is no need for formal marking
- We keep in mind that, they should not be perfect
- We are not aiming to find the 'right' answer

During these journaling sessions, pupils are encouraged to record their responses in different ways. They can use pictures, diagrams, and writing. Expressing themselves like this develops their mathematical language and helps them verbalise their thinking. They can start to make deep connections between areas of learning through this. The most important and beneficial part to this is the fact that all pupils can work and learn at their own pace and at the same level without the requirement to produce a standardised answer.

For more information on journaling, see link below or speak to the maths lead.

https://mathsnoproblem.com/blog/teaching-maths-mastery/5-types-of-maths-journals/

# Examples of Journaling at St Lukes



## Maths Journal

Look at the subtraction equation.

$$136 - 75 = 61$$

**Self Check**

I know how to...

- ☐ add numbers without renaming.
- ☐ add numbers with renaming.
- ☐ subtract numbers without renaming.
- ☐ subtract numbers with renaming.
- ☐ solve word problems involving addition and subtraction.

*Write a word problem using the equation.*

*Show how you solve your word problem using a model.*

In class E there was 136 apples the teacher took 75 so she gave the 61 to the rest of the class so the teacher threw up.

136

75 | 61

29/11/21

Scaffolding

LO: Can I divide decimals up to thousands?

List of instructions for dividing 1, 2 or 3 digit numbers by 10, 100, 1000

1. First, you draw a place value chart.
2. ~~Next~~ Next, you position the numbers in the right column → 106: H T O t | 1 0 6
3. Then if you are dividing by 100 you must put 0.0__ depending on how many zeros there are.

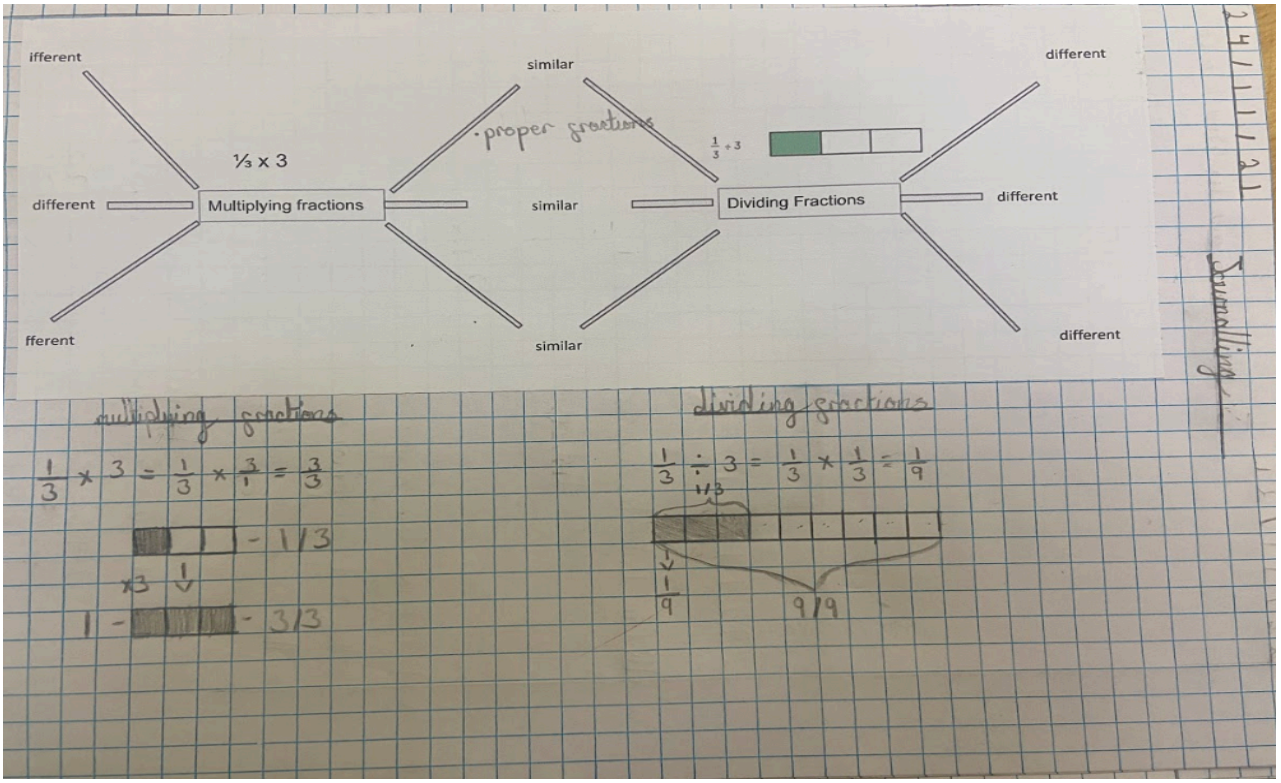
Examples

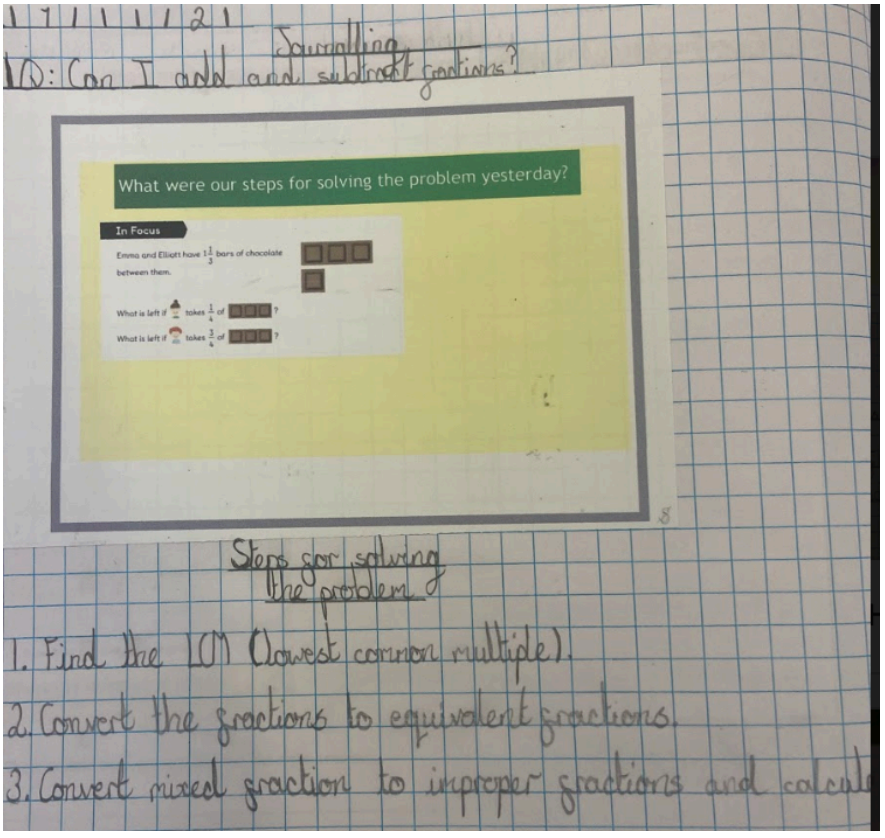
| H | T | O | t | h | th |
|---|---|---|---|---|---|
| 2 | 4 | 6 | | | |
| | 2 | 4 | 6 | | |

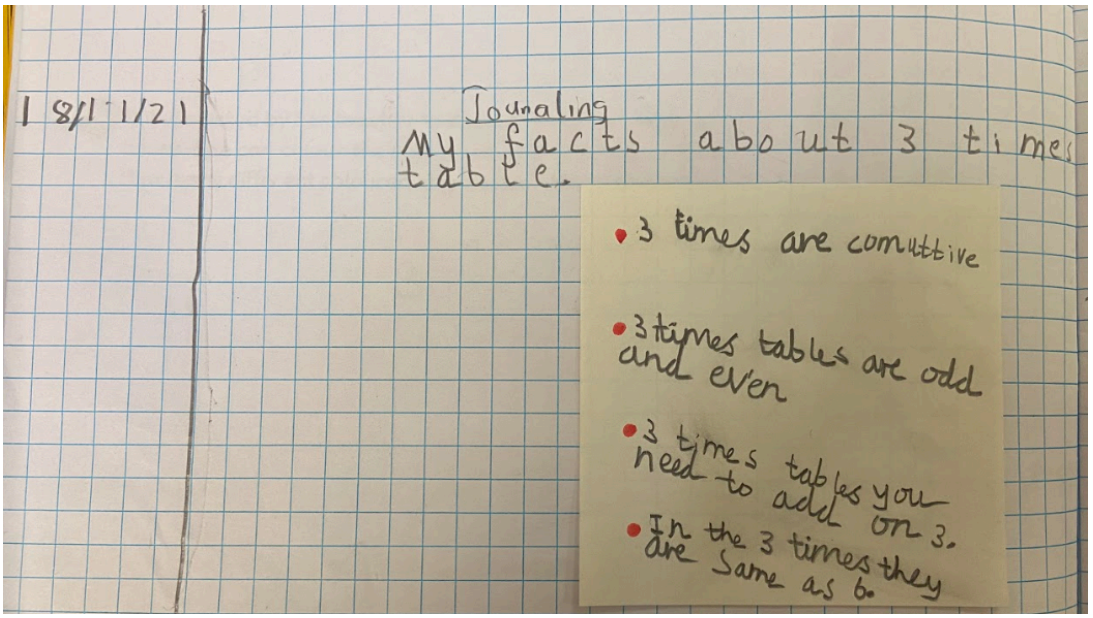
246 ÷ 100 = 2.46

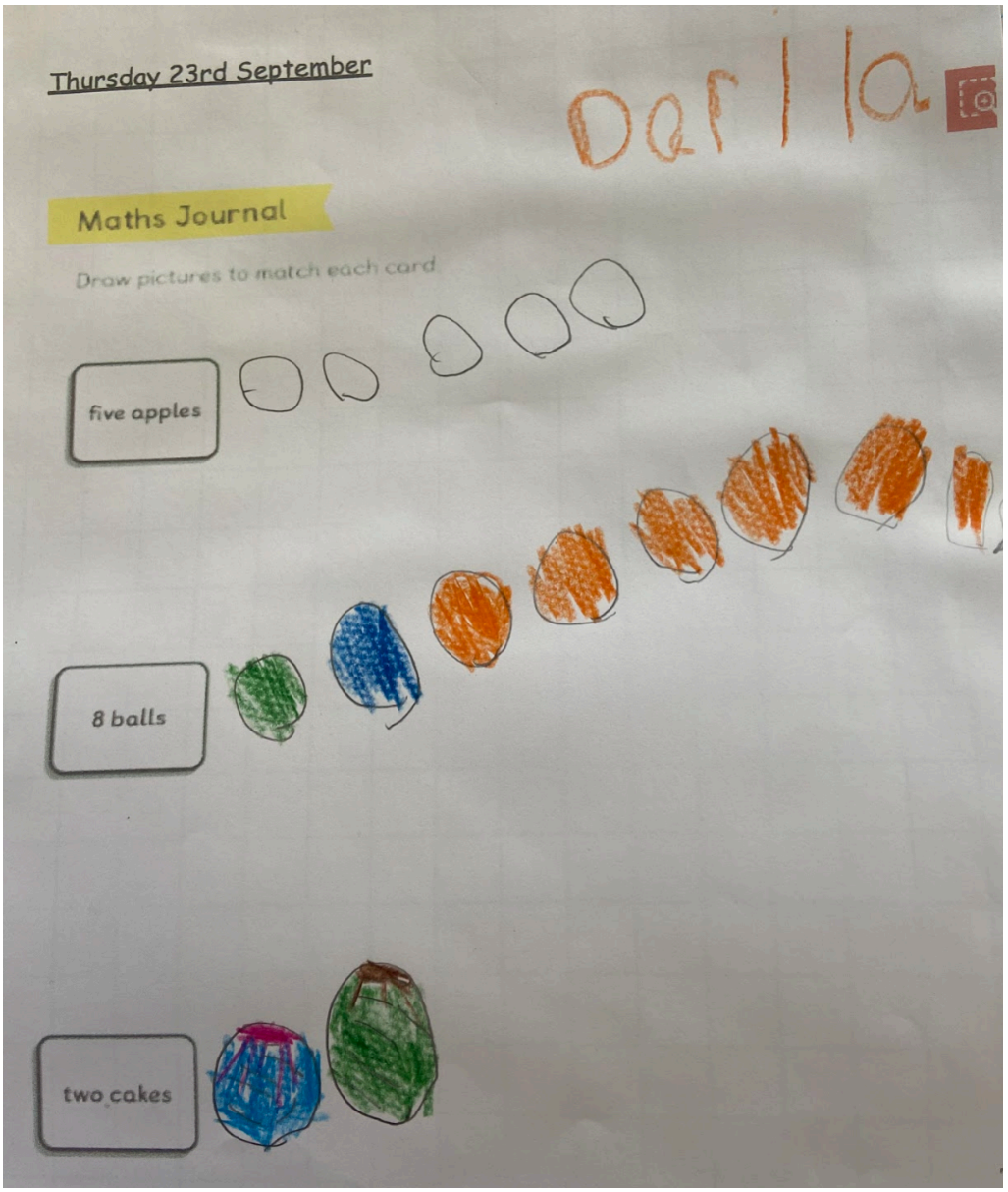
| H | T | O | t | h | th |
|---|---|---|---|---|---|
| | 8 | 9 | | | |
| | | 0 | 8 | 9 | |

89 ÷ 10 = 0.89


ifferent
similar
different
⅓ x 3
proper fractions
different
Multiplying fractions
similar
Dividing Fractions
different
fferent
similar
different
Spelling
multiplying fractions
1/3 x 3 = 1/3 x 3/1 = 3/3
1/3
x3
3/3
dividing fractions
1/3 ÷ 3 = 1/3 x 1/3 = 1/9
1/3
1/9
9/9


Spelling
LO: Can I add and subtract fractions?
What were our steps for solving the problem yesterday?
In Focus
Steps for solving the problem
1. Find the LCM (Lowest common multiple).
2. Convert the fractions to equivalent fractions.
3. Convert mixed fraction to improper fractions and calcul


18/1/21
Jounaling
My facts about 3 times table.
3 times are comuttive
3 times tables are odd and even
3 times tables you need to add on 3.
In the 3 times they are same as 6.


Thursday 23rd September
Darla
Maths Journal
Draw pictures to match each card
five apples
8 balls
two cakes

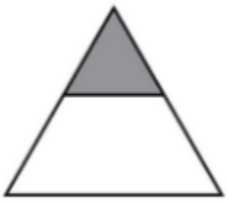
# Fractions

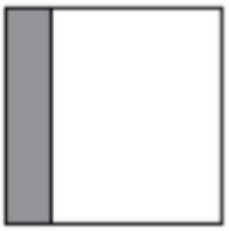
## Year 1

**Making Halves**

When making halves pupils must understand that :

- making halves is the same as putting a whole into 2 equal parts.
- Or putting a whole into 2 equal halves.
- That 2 halves makes a whole or 1 whole.
- It can also be sharing into 2 equal groups.

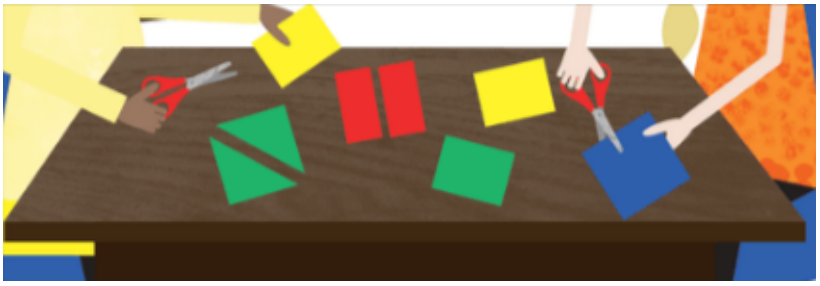




*Although these 2 shapes have been put in2 parts, they are not in 2 EQUAL parts so they are not halves.

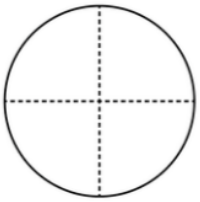
- Halves mighty not look the same as shown below.
- The language one out of 2 can be used.

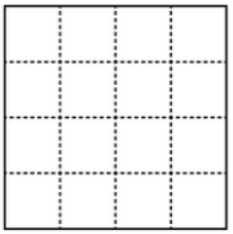
* Pupils might only be required to shade halves and not to work out a half of a number. They are only required to have an understanding of what a half is.



Example 1

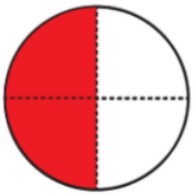
Shade to show half of each shape.

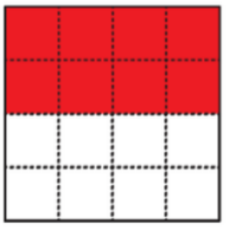
(a) 

(b) 

When halving, each person should get equal amount so will mean

having to shade one for one person, let's say Mia and leave one unshaded for another(Lesley). So for the circle, you will wnd up with 2 shaded parts for Mia and 2 unshaded parts for Lesley. Emphasise that these should be equal amounts.

(a) 

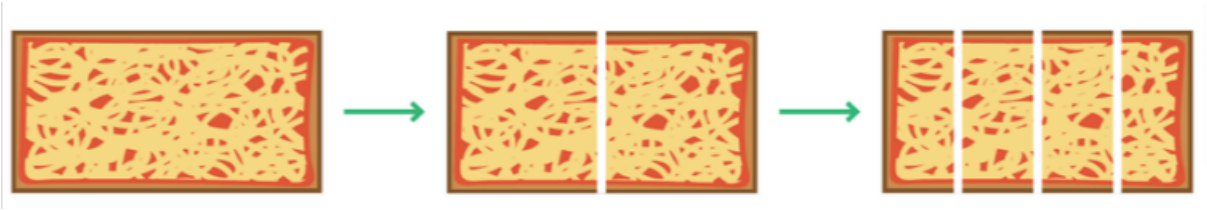
(b) 

Mia's shaded in red and
Lesley's unshaded in white.

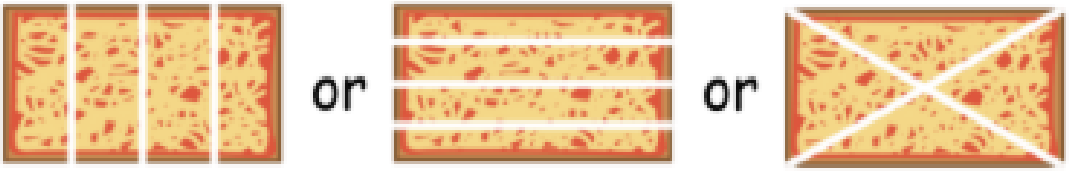
**Making Quarters**

Folowing on from making halves pupils should have a solid foundation that making fractions requires them to have equal parts so making quarters will also mean making 4 equal parts. This can be introduced as making a half of a half.

A great example of this will be to take a square paper (1 whole). Emphasise on the fact that you are starting with 1 whole (1). Fold paper into 2 halves and fold again into 2 halves. Pupils can undo the folds to reveal 2 equal halves or 4 quarters. Those 2 comparisons can be made as they are the same fraction (equivalent fractions).



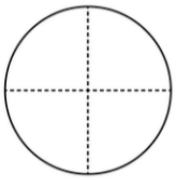
A rectangular paper can be used to show this and a squared paper can be folded diagonally to show that quarters can be made in so many different ways as shown below.




The sentence one out of four should be introduced at this point.
I have four pieces, if i were to shade one, I will have shaded 1 out of the four pieces making $\frac{1}{4}$.

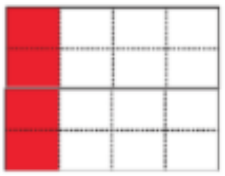
Example 2

Shade to show a quarter of each shape.

(a) 

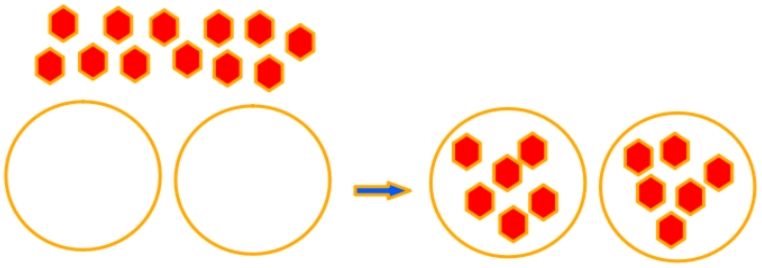
(b) 

To complete a shade a quarter question, it is important for your pupils to bw able to identify the four pieces needed and shade 1 out of those identified 4 pieces.
So for question (b), said pupil should be able to identify the first row (or column) as having 4 pieces hence 1 out of the 4 pieces can be shaded and move onto the next row(column) until all the rows or columns are completed. They would have shaded 4 out of 16 pieces which is the same as a quarter of this square.

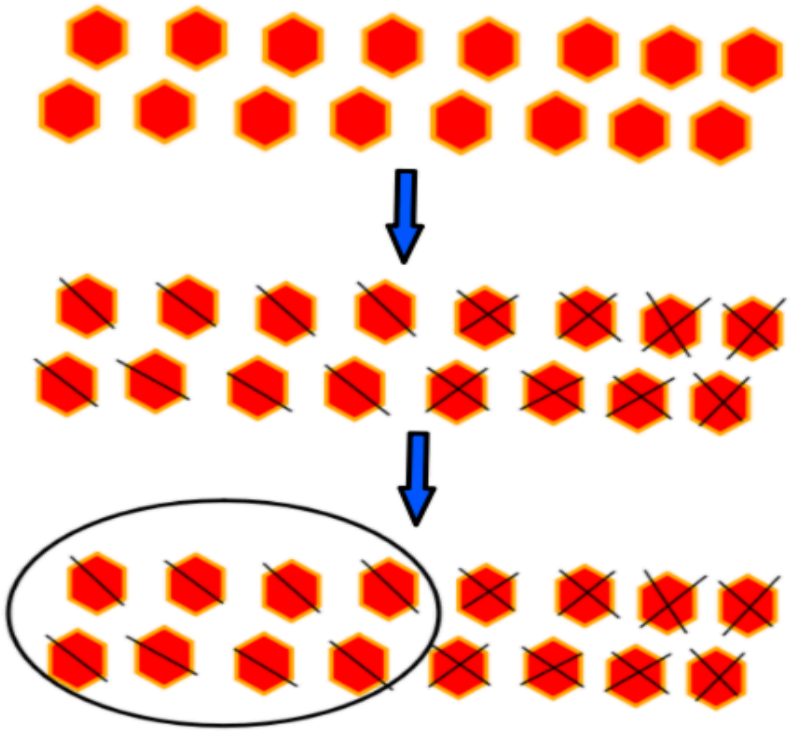


Pupils should also start to draw their own rectangles and put them in equal part to find halves and subsequently quarter as 2 halves make 1 quarter.

**Sharing and Grouping( into halves and quarters)**
With sharing a nd grouping to halves and quarters, the idea of EQUAL amounts should still be empahsised.
These can be completed by physically moving around concrete resources into 2 groups by drawing 2 circles and sharing amongst the 2 circles.
Example 1



Example 2



When grouping these 16 objects into 2 halves, pupils can cross out on one side and a double cross on another side.
Pupil should continue crossing out until there are no more objects left uncrossed.
Those with one group will form 1 half and the rests forms the second half.

Example 3

A tick and a cross can also be a good way of grouping. Always remember to tick one at a time from both ends.

Year 2