# Mossford Green's
# Maths Calculation Booklet

Years 3-6

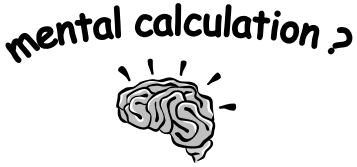
## This is the way we do it!

# “They didn’t do it like that in my day!”

Do your children ask for help with their maths homework and start talking in a foreign language, using words like ‘partitioning’, ‘chunking’, ‘grid multiplication’…..?

If so, you may feel the need for some translation.  This booklet is designed to explain some of the methods used to teach calculation in schools.

**Which is more important:**




?


This will depend on the numbers involved and the individual child.

When faced with a calculation, no matter how large or difficult the numbers may appear to be, all children should ask themselves:

Can I do this in my head?

If I can’t do it wholly in my head, what do I need to write down in order to help me calculate the answer?

Do I know the approximate size of the answer?

Will the written method I know be helpful?

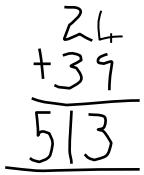
## When do children need to start recording?

The following table shows how some sort of recording is relevant throughout the primary years with mental strategies playing an important role throughout.

| Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year6 |
|---|---|---|---|---|---|---|
| ← Making a record of a calculation → | | | | | | |
| | | ← Jotting to support a mental strategy → | | | | |
| | | | ← Explaining a mental strategy → | | | |
| | | | | ← Developing written methods → | | |

It is important to encourage children to look first at the problem and then get them to decide which is the best method to choose – pictures, mental calculation with or without jottings, structured recording or calculator.

Children attempting to use formal written methods without a secure understanding will try to remember rules, which may result in unnecessary and mistaken applications of a standard method.




Some of the methods explained in this booklet involve 'partitioning' and a set of place value cards are attached which can be pasted onto card and cut out (your child will show you how to use them).

# ADDITION

## Prerequisite skills

Counting numbers to 20

Place numbers to 20 in order

Bonds up to 10 and to make 10

1 more than a number


Addition as combining groups


Doubling numbers within 20

**Relate number bonds to 10 to add multiples of 10 up to a total of 100 e.g. if**

3 + 4 is 7 then 30 + 40 is 70

Use familiar objects to recognise the place value of 2 digit numbers.


Recognise and explain 24 is ‘2 tens and 4 ones’


Addition as counting on

**Progressing to:** PARTITIONING AND RECOMBINING
Partition into tens and ones and recombine Pre J10 **(before jumping in 10s**

12 + 23 = 10 + 2 + 20 + 3
= 30 + 5
= 35

**As part of the early calculations policy, there are 3 ways for children to add numbers on a number line.**

**Jumping 10 – jumping in 10s and 1s**
**Targeting 10 – targeting a multiple of 10**
**O 10 – over jumping and adjusting**

# Jumping 10 – jumping in 10s and 1s

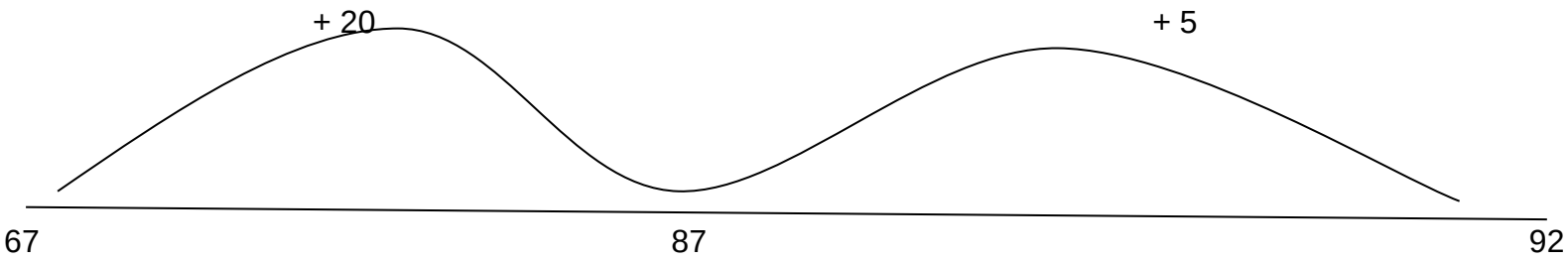
**J10 – Jumping in 10s and 1s**

This method involves starting with the largest number on the left of the number line. The small number is then partitioned and children jump, first adding the tens and then the units.

Children should write above the jump how much they are adding (e.g. +10, +1).

Once confident, children can progress to adding all the tens followed by all the units in one jump

**67 + 25**



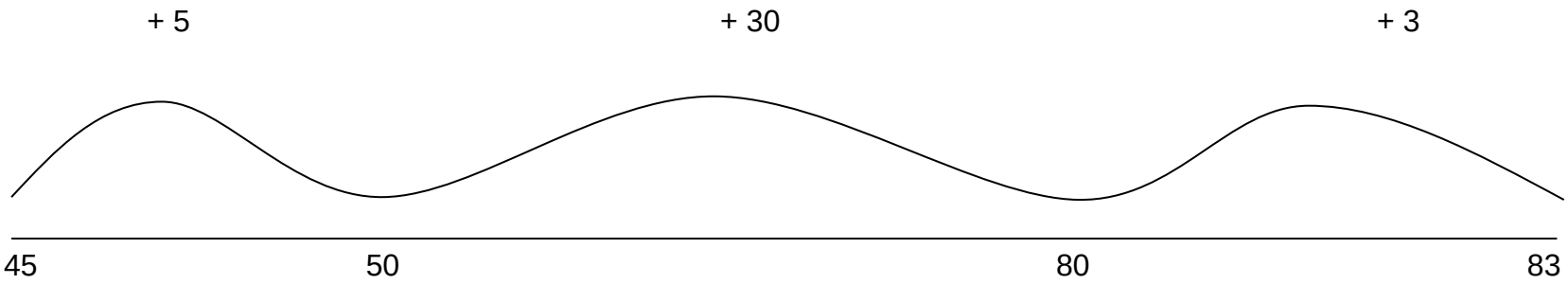

Once confident, children can progress to adding all the tens followed by all the units in one jump (eg + 50 + 2)

# Target 10 – targeting a multiple of 10

**T10 – Targeting a multiple of 10**

Children use their knowledge of known facts to target the tens, starting with the largest number. They add whatever number is needed to reach the next multiple of ten and then add on whatever is remaining.

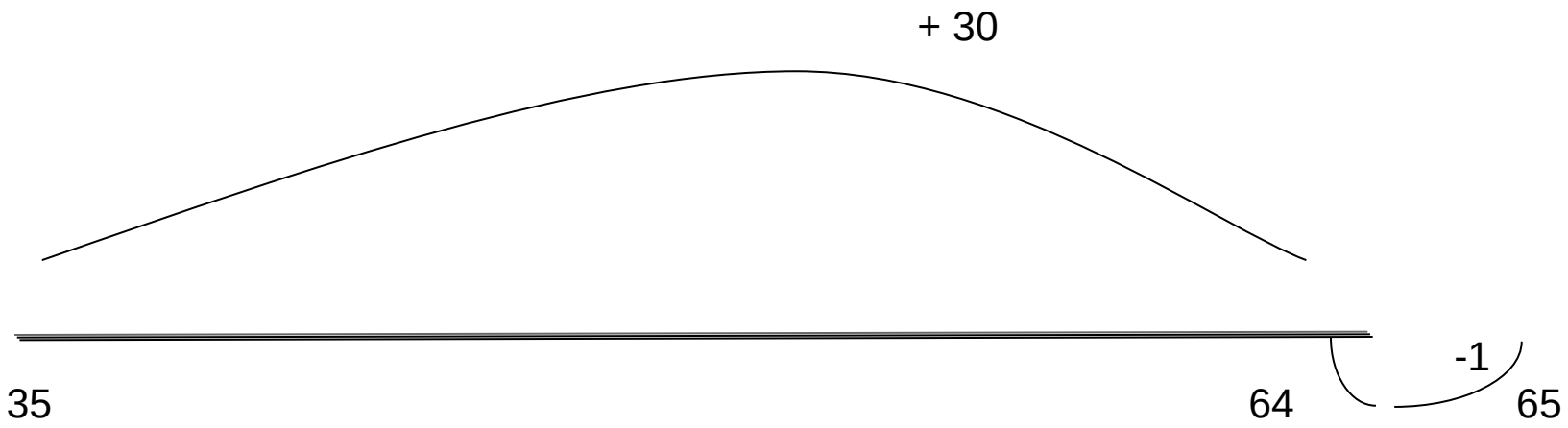
45 + 38



# O10 – Over jumping and adjusting

This method would only really be used if one of the numbers ends in a 9 or a 1 (possibly a 8 or a 2). The round the number being added to the nearest multiple of ten and then jump by this amount along the number line. Adjustments would then be made by adding or subtracting (whichever is appropriate).

35 + 29



# Using an informal method by counting on in multiples of 10 with a number line

Why use a number line?

It helps me to show on paper what is going on in my head

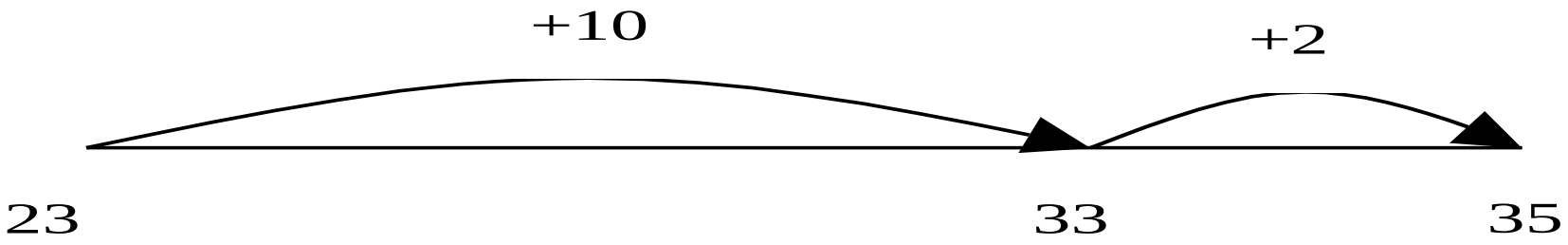
## Jumping 10 – example

**TU + TU**

**23 + 12**

**10** **2**

Start at 23 (the larger number) on the number line. *Partition* the smaller number 12 into tens and units and count on the multiples of 10 in jumps of tens and then the units. The number reached at the end of the number line is the answer.



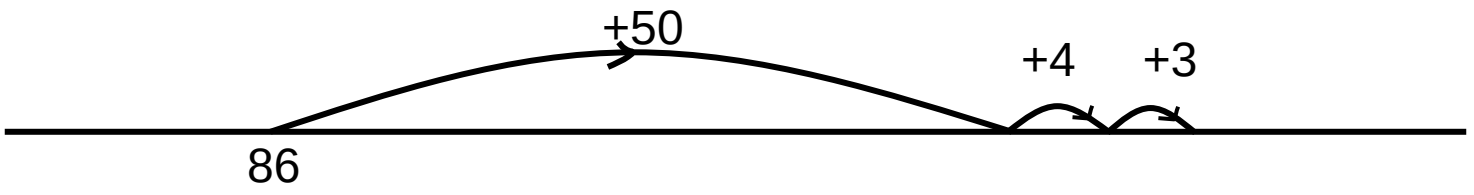
## Jumping 10 – example

Once a child has become confident, they will be able to make larger jumps in one go.

**TU + TU**

**86 + 57**

Start at 86 (the larger number) on the number line. *Partition* the smaller number 57 into tens and units and count on the multiples of 10 first and then the units.



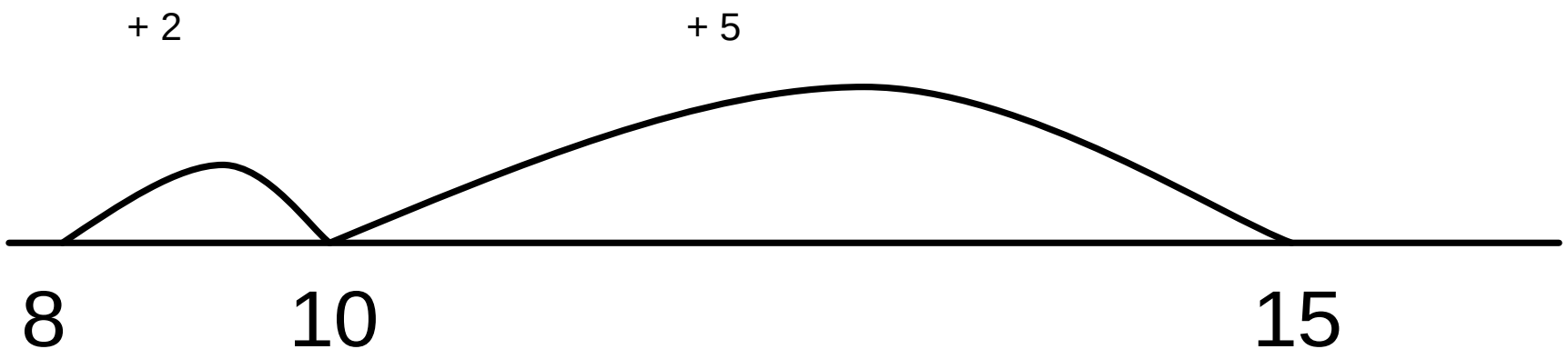

136 140 143

**86 + 57 = 143**

**Targeting 10**

**(**Targeting the 10, partitioning and bridging through 10)

8 + 7 =




**Children should be able to partition the 7 to relate adding the 2 first to target the 10 and then the 5.**

# ADDITION

**Using a number**

**Number line to add too much and then subtract (Over 10)**

HTU + TU

**754 + 96**

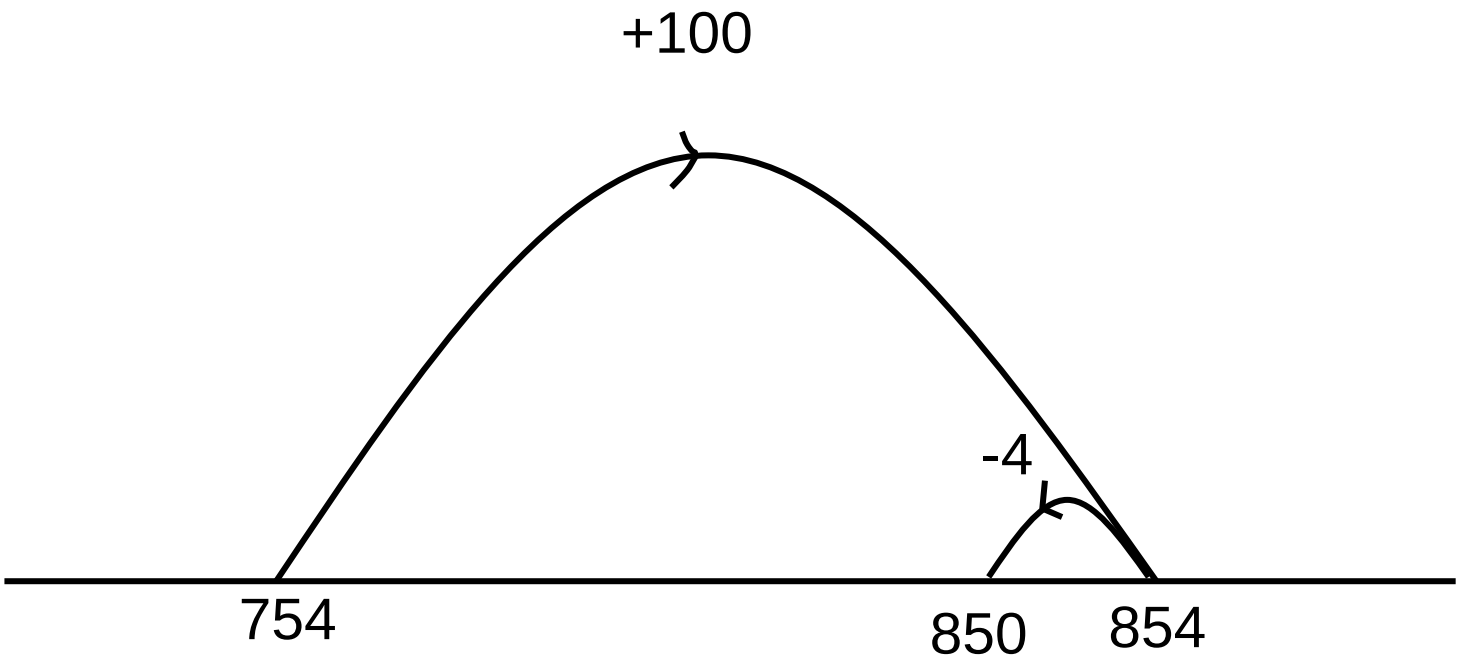
Why are you subtracting when you should be adding?

I noticed that 96 is close to 100. 100 is easier to add than 96 but that means I've added 4 too many. I need to subtract 4 from the number I reach.

## 010 – Example

**HTU +**
**TU**

Start with the larger number 754. Add on 100 and then subtract 4.




**754 + 96 =**

## Progression from Mental Maths

- Mental method, using partitioning

**Partition into hundreds, tens and ones and recombine**

Either partition both numbers and recombine or partition the second number only e.g.

358 + 73 = 358 + 70 + 3
= 428 + 3
= 431

Mental methods involve partitioning the numbers, then adding the tens and the units separately.

**HTU + TU**

358 + 73 = 358 + 70 + 3
= 428 + 3
= 431

# ADDITION

**Expanded method: moving on from adding the *most significant digits* first to adding *least significant digits* first**

HTU +
TU

**Why switch to adding the units *(least significant digits)* first?**

**I know that I can add numbers in any order and the total will be the same. My teacher has told me that I need to practise adding the units first. The next method I will learn works this way. I must remember to line the numbers up in the correct columns.**

**HTU +**
**HTU**

Add *most significant digits* first:
(in this example, **hundreds**)

Add *least significant*
(in this example,

| HTU | |
|---|---|
| 625 | |
| + 148 | |
| 700 | 600 + |
| 60 | 100 |
| 13 | |
| 773 | |

Leading to

| HTU | |
|---|---|
| 625 | |
| + 148 | |
| 13 | 5 + 8 |
| 60 | 20 + 40 |
| 700 | 600 + 100 |
| 773 | |

**Mentally add**
**700 + 60 + 13 = 773**

**625 + 148 =**

# ADDITION

## Using the compact method

HTU + HTU

**587 + 475**

**Why do you say 80 + 70 instead of 8 + 7?**

**I need to remember the value of each digit, so I know the size of the numbers I am adding and whether my answer makes sense.**

HTU + HTU

587 + 475

HTU

587

+

7 + 5 = 12
Place the 2 in the units column and repartition the 10 to the tens column.

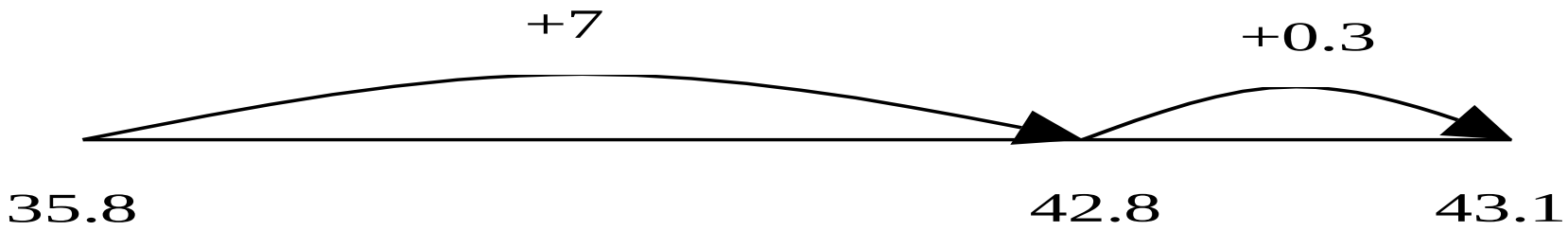
80 + 70 = 150 then + 10 (carried forward) which totals 160.
Place 60 in the tens column and repartition the 100 forward to the hundreds column.

500 + 400 = 900 then + 100 which totals 1000. Place this in the thousands column.

587 + 475 =

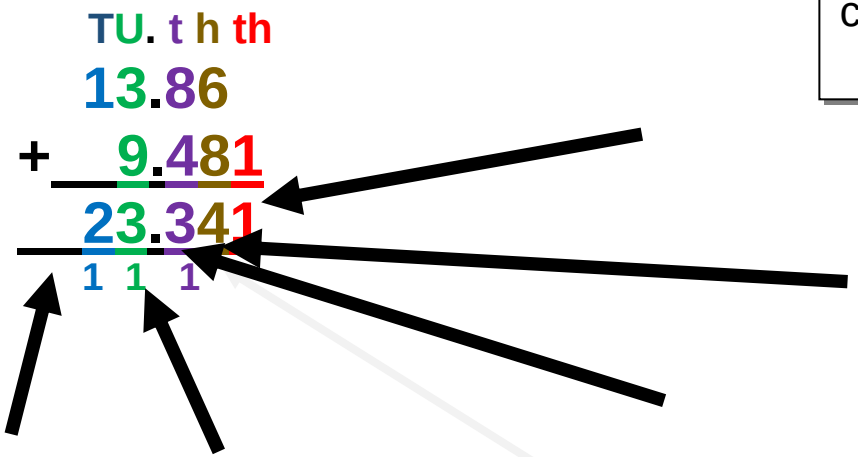
# Using a number line to add decimals

Either partition both numbers and recombine or partition the second number only e.g.
35.8 + 7.3 = 35.8 + 7 + 0.3
= 42.8 + 0.3
= 43.1



# Using the compact method to add decimals

13.86 + 9.481 = 23.341




0 + 0.1 = 0.1
Place the 1 in the thousandths column.

0.06 + 0.08 = 0.14
Place the 4 in the hundredths column and repartition the 1 to the tenths column

10 + 0 = 10
then add 10
Place in the tens column

3 + 9 = 12 then add 1
Place the 3 in the column method and repartition the 1 to the tens column

0.8 + 0.4 = 1.2 then add 0.1
Place the 1 in the tenths column and repartition the 1 into the units column

# End of Year Objectives for Addition

**Yr1 – recall and jottings for U+U, T+U, T+T, TU+U (within 20 including 0)**
**Yr2 – TU+U, T+TU, TU+TU, U+U+U**
**Yr3 – mental methods for HTU + U, HTU+T, HTU+H; written methods for HTU+TU, HTU+HTU**
**Yr4 – written methods as above and ThHTU+ThHTU, U.t+U.t, £U.th+£U.th**
**Yr5 – written method for addition of numbers with more than four digits; 2 or more integers, decimals with 2dp e.g. 29.78 + 54.34**
**Yr6 – As above**

Differentiation Steps for each Stage:

- Not crossing tens
- Crossing Tens
- Crossing Hundreds Only
- Crossing Tens and Hundreds

In addition:

- The number line must be modeled as an image to support calculation from Reception to Year 6
- Jottings must be modelled as a clear image/strategy for mental calculation
- If the calculation can be carried out mentally then do not give it to practice vertical calculation e.g. TU + TU should not be calculated vertically

**Always present calculations horizontally in order to consider mental calculations first.**

# SUBTRACTION

## PREREQUISITE SKILLS:

**Prerequisite skills** (based on the practical)
Number bonds to 10

Counting back from 20

Find one less than a given number

Subtract using quantities and objects 2 single digit numbers

Count back to subtract single digit numbers


Understand subtraction as 'take away'

*There are two concepts linked to subtraction:*

*Subtract - where it is natural to count back to 'take away'*
*Find the difference – where the understanding of the vocabulary leads to using addition to count on*

# SUBTRACTION

**Use a number line to count on from the smallest number to the largest number**

TU - TU

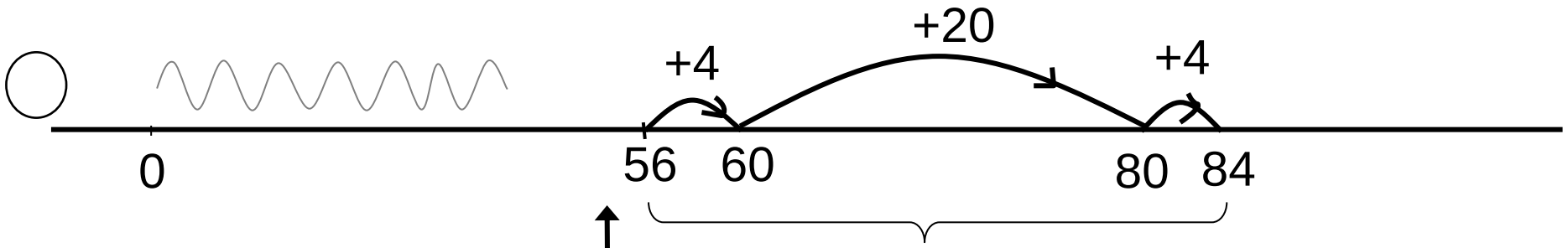
**84 - 56**

**Why do you count on for a subtraction question?**

**Counting on a number line is easier than taking away, especially if the numbers are close together like 203 – 198.**

**TU - TU**

**84 - 56**



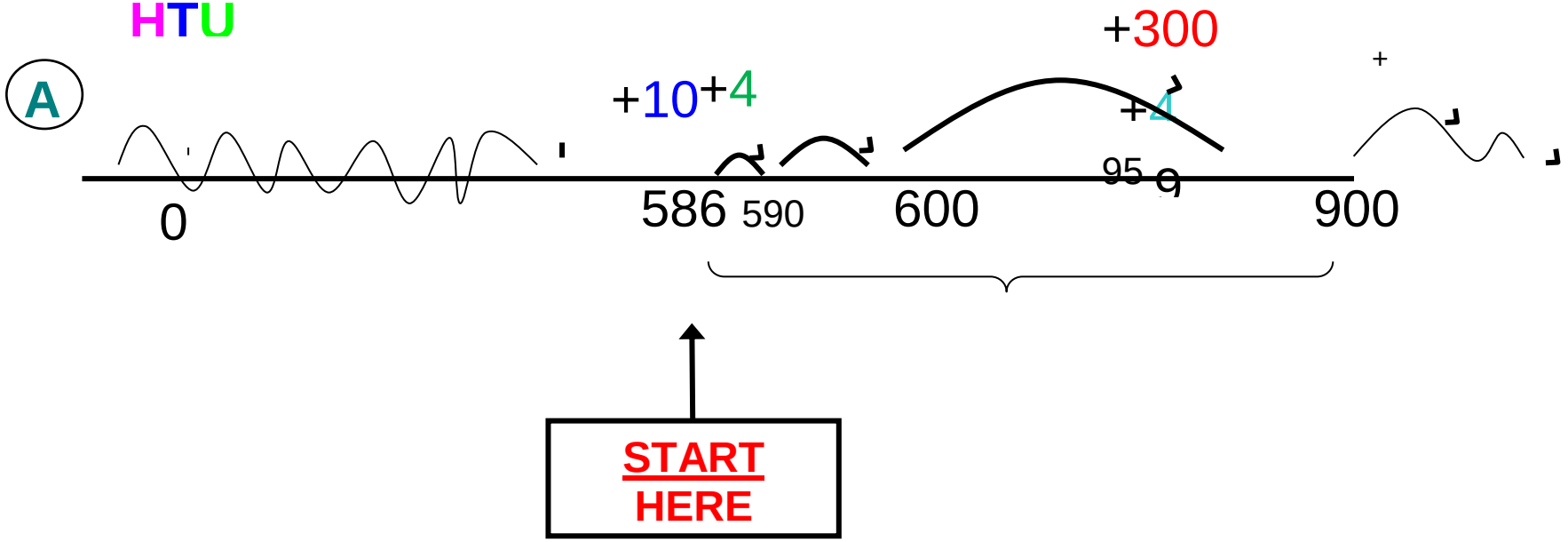

Start by ‘taking away’ (crossing out) the 56.

**START HERE**

Find the *difference* between the two numbers. Count on from 56 to 84.
20 + 4 + 4 = 28

**84 – 56 = 28**

**HTU - HTU**




**START HERE**

'Take away' the 586

Find the *difference* between the two numbers.
Count on from 586 to 954.
300 + 50 + 10 + 4 + 4 = 368

# SUBTRACTION

**Working towards a standard method**

HTU - TU

**154 - 37**

**The whole number is 154. It is possible to subtract 7 but for this method I need to do one subtraction in each column. So I exchange one ten from the tens column for ten ones in the units column.**

**Why do you need to rearrange the numbers 50 + 4 and rewrite them as 40 + 14?**

**HTU -**
**TU**

Both these numbers are partitioned into their HTU parts, so we can do 3 easier calculations.

54 is the same value as

40 10 4.

Now 7 can be subtracted from 14.

Subtract the units, tens, then hundreds.

100 +50 +4
\- 30 +7

40 10
100 + 50 + 4
\- 30 + 7

100 + 40 +14
\- 30 +7

100 + 10 + 7 =

100 – 0 =

40 – 30

14 – 7

Here the answers from each calculation are added to give the answer.

**154 - 37 =**

# SUBTRACTION

**Standard method**

HTU - HTU

**754 - 286**

**Why didn't you use the standard method straight away?**

**Because all the stages I have learnt before have really helped me understand exactly what I'm doing.**

**HTU -**
**HTU**

54 is the same value as 40 10 4.
Now 6 can be subtracted from 14.

740 is the same value as 600 + 100 + 40 .
Now 80 can be subtracted from 140.

Or, more efficiently the *standard method*.

40 1
**700 + ~~50~~ + 4**
**- 200 + 80 + 6**

60 1
**~~700~~ + 40 + 14**
**- 200 + 80 + 6**

**600 + 140 +**
**- 200 + 80 +**
**400 + 60 + 8**

1 4 1
**~~75~~**
**4**

**754 – 286 =**
**468**

# End of Year Objectives for Subtraction

**Year 1 – mentally subtract U-U, TU-U, TU- TU (up to 20 e.g. 15 – 12)**
**Year 2 - mentally TU-U, TU-multiple of 10, mentally with informal jottings TU-TU**
**Year 3 – subtract mentally, HTU – U, HTU – T, HTU – H, TU-U, TU-TU. Formal written methods for TU-TU, HTU-TU, HTU-HTU**
**Year 4 – as above and efficient written methods for ThHTU-ThHTU, ThHTU-HTU, U.t – U.t, £U.th-£U.th**
**Year 5 – Efficient written methods for subtraction of 2 integers with more than 4 digits e.g. 45230 - 12432 and decimals with up to 2dp e.g. 54.34-29.78**
**Year 6 – as above**

Please note:
There are two concepts linked to subtraction:
Subtract - where it is natural to count back to 'take away'
Find the difference – where the understanding of the vocabulary leads to using addition to count on [complementary addition].

- Children should not move on to a written method if they are not completely confident with using a number line.
- Children will need to have had experience of different types of jumping on a number line e.g. T10 (target the ten), J10 (jump in 10s) and know how to partition numbers in different ways.
- These methods can also be easily applied, at different levels, to finding differences in values of money, measures and time**.**

**Always present calculations horizontally in order to consider mental calculations first.**

# MULTIPLICATION

**Prerequisite skills**

Multiplication is related to known facts including doubling and counting groups of the same size.

3 + 3

E.g. use of dominoes and dice.

**Counting using a variety of practical resources**

Numicon and bead strings

Counting in 2s e.g. counting socks, shoes, animal's legs…

Counting in 5s e.g. counting fingers, fingers in gloves, toes…

Counting in 10s e.g. fingers, toes…

# MULTIPLICATION

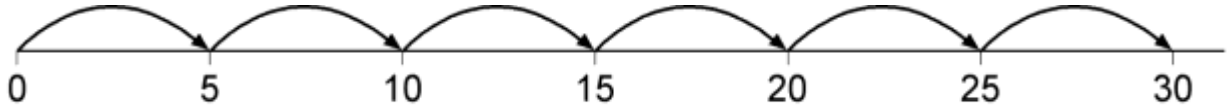
## Introduction to Multiplication

Multiplication is repeated addition

For example:

$5 \times 6 = 30$ → Which is the same as → $5 + 5 + 5 + 5 + 5 + 5 = 30$

*We can use a number line to show the repeated addition and work out the answer.*

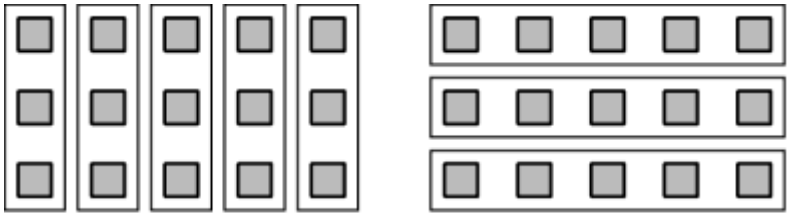


# MULTPICATION

Using arrays to support multiplication

An array is objects or shapes that are arranged in a rectangle. Arrays are very important in helping children understand how multiplication works.

They learn that in the array the answer is always the same (eg 3 × 5 is the same as 5 × 3), even when you rotate.



# MULTIPLICATION

**Introducing multiplication on a number line**

TU X U

**14 x 5**

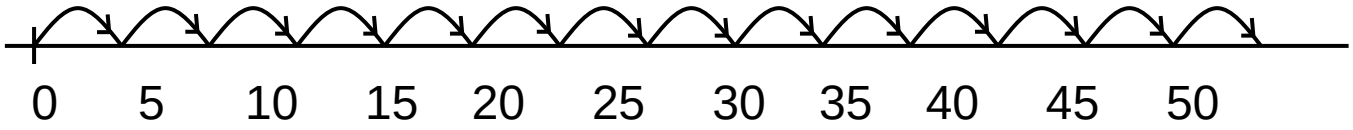
**How is multiplication the same as repeated addition?**

**The number line helps me see each group of 5 clearly.
If I add 5 fourteen times, that is the same as 5 multiplied by 14 (5 x 14). I can make 14 individual jumps of 5 along the number line, or 1 jump of 5 x 10 and 1 jump of 5 x 4. Table facts will help me do this more quickly.**

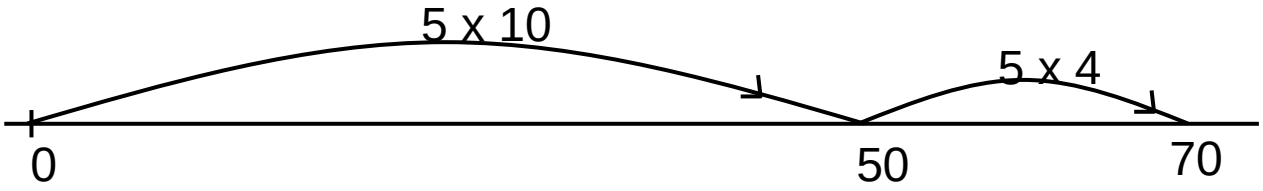
**TU x U**

# 14 x 5

The number line shows 5 multiplied by 14. This is equal to 14 multiplied by 5 (14 jumps of 5 on the number line).




Multiplication is *repeated addition.*




Using table facts to make bigger jumps is more efficient.

**14 x 5 = 70**

# GRID

TU X U

**14 x 5**

**Why do you *partition* the numbers into tens and units?**

**It doesn't take long!**
**I can see what I have to multiply very easily.**

**TU x U**

**14 x 5**

*Partition* TU number into tens and units parts.

14 becomes 10 and 4

**14 x 5**

| X | 10 | 4 | |
|---|---|---|---|
| 5 | 50 | 20 | **70** |

50 + 20 = 70

50 comes from multiplying 10 by 5.

20 comes from multiplying 4 by 5.

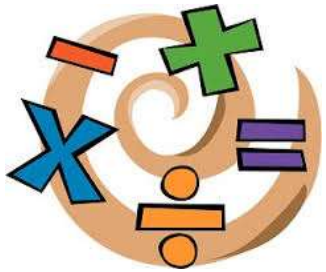
**14 x 5 = 70**

# GRID

TU X TU

**46 x 32**

**Isn't it difficult to multiply 40 by 30?**



**I know that 30 is 3 x 10 and multiplying by 10 is easy so I do 40 x 3 x 10 = 120 x 10 = 1200.**

**You've got to do a lot of calculations – don't you get confused?**

**The layout of the grid helps me organise what I have to do. I like this method.**

**TU x**
**TU**

Both numbers are *partitioned* into their tens and units parts, 46 becomes 40 and 6 and 32 becomes 30 and 2.

**46 x 32**

| X | 40 | 6 | |
|---|---|---|---|
| 30 | 1200 | 180 | 1380 |
| 2 | 80 | 12 | + 92 |
| | | | **1472** |

The *part products* are added in stages to give the final *product* or answer of 1472.

**46 x 32 = 1472**

# MULTIPLICATION

**Grid method, Expanded method and Compact method**

TU X U

**23 x 8**

**What are the brackets for in the expanded method?**

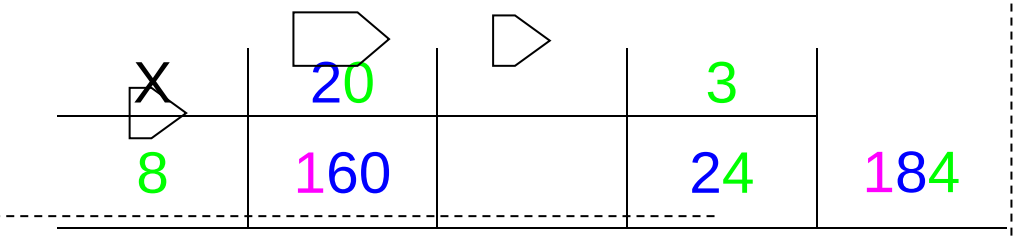
**Why do you multiply 3 by 8 first in the compact method? In all the other methods I've noticed that you've multiplied the tens number first!**

**They remind me which numbers I am multiplying. I also have to remember to line the numbers up as hundreds, tens and units.**

**I multiply the units first so I can carry forward any tens I need to! This method is very quick but I have to remember to add on any numbers I carry forward.**

# TU X U
# 23 x 8

## GRID




## EXPANDED METHOD

HTU
23
x 8
160
+ 24
184

(20 x 8)
(3 x 8)

20 multiplied by 8 equals 160.

Final product from totalling

## COMPACT

HT
U
23
x
8

3 multiplied by 8 equals 24 (the first *part product*).

2 is the 2 tens that need to be carried forward and added to the next *part product*.

20 multiplied by 8 equals 160 (2nd *part product*), **plus** the 2 tens equals 180.

The digits are put in the correct columns, to give the answer 184.

**23 x 8 = 184**

# MULTIPLICA

**Grid method, Expanded method and Compact method**

TU X TU

**46 x 32**

**I recognise the long multiplication method. How do you multiply 46 by 30?**

**Well, I know that 46 x 30 is the same as 46 x 3 x 10. I know my answer will end in zero when I multiply this whole number by 10. So, I put the zero in first. Then I multiply 46 x 3 using the short multiplication method.**

## TU X TU

## GRID METHOD

| X | 40 | 6 | |
|---|---|---|---|
| 30 | 1200 | 180 | 1380 |
| 2 | 80 | 12 | + 92 |
| | | | 1472 |

## EXPANDED

The 4 *part products* are set out vertically underneath the calculation.

```
  46
x 32
 120   (40 x 30)
   0   (6 x 30)
 180   (40 x 2)
  80
```

*Part products* totalled to give final product.

## COMPACT METHOD

```
 ¹46
 X 1
 32
 92
138
  0
```

2 x 6 = 12
2 x 40= 80 + 10
= 90

30 x 6 = 180

30 x 40 = 120 + 10 = 130

**46 x 32 = 1472**

# End of Year Objectives for Multiplication

**Year 1–practical problems that combine groups of 2, 5 or 10**
**Year 2 -represent multiplication as repeated + and arrays. Practical and informal written methods and vocabulary used to support multiplication alongside known facts and mental strategies. Understand and use '3 for free' for x and □of the 2, 3,4,5,6, 8 and 10 times-tables.**
**Year 3 –Describe the effect of Ux10, TUx10, Ux100, TU x 100. Practical and informal written methods for TU x U.**
**Year 4 –Derive and recall x and ÷ facts up to 12 x 12 and '3 for free' facts. Multiply numbers to 1000 by 10 and 100. Formal written layout and explain TU/HTU x U.**
**Year 5 –mentally multiply TU x U. Multiply whole numbers and decimals by 10, 100 and 1000. Formal written methods to multiply ThHTU x U, ThHTU x TU, U.t x U**
**Year 6 –mentally calculate TU x U, U.t X U. Formal written methods to multiply up to 4 digit by 2 digit and one digit with up to 2 decimal places.**

**<u>As with addition and subtraction, before progressing through the stages of calculation:</u>**

**Learning**

- It is crucial to know or be able to derive key number facts:

⇨ Understand and use doubling and halving
⇨ ×/÷ 10 (as moving a place to the left/right NOT "add a zero" etc.!!)

- Place value and partitioning MUST be clearly understood and explained using the appropriate mathematical vocabulary.

**Teaching**

- The number line and the use of arrays must be modelled as images to support calculation from Reception to Year 6.
- Jottings must be modelled as a clear image/strategy for mental calculation.
- If the calculation should be possible mentally then do not give it to practise vertical calculation, e.g. 23 x 15 should not be calculated vertically. Consider use of numbers carefully.

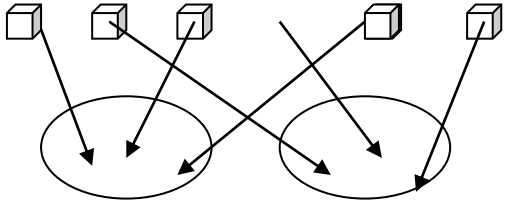
**Always present calculations horizontally in order to consider mental calculations first**

# DIVISION

## Sharing objects equally

**<u>SHARING</u> equally** *occurs when a quantity is shared out equally into a given number of portions, and we can work out how many are in each portion.*

E.g. 6 ÷ 2 (share 6 sweets between 2 children)



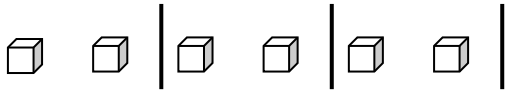
Sharing can be carried out using practical apparatus, such as cubes.

**If children <u>only</u> understand the sharing model of subtraction they will need very good knowledge of tables in order to carry out division**

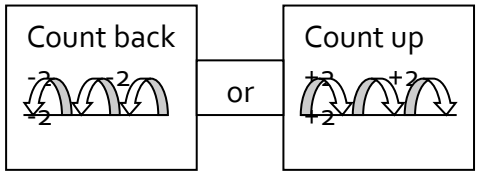
**<u>GROUPING</u> (or repeated subtraction)** *occurs when we are asked to find how many groups of a given size are equivalent to the original quantity. For example how many groups of 2 marbles are in a set of 6 marbles, the calculation*

6 ÷ 2 (how many 2s in 6?)

**Vocabulary → divided into groups of**



Shown/calculated on a number line:




- ***KS1 tends to focus on "sharing" because this is a word and a concept that children understand and also it is the picture suggested by halving.***

# DIVISION

## Introducing division on a number line

TU ÷ U

**29 ÷ 3**

**Why are you adding on one line and subtracting on the other? And what has subtraction got to do with division?**

**I need to see how many groups of 3 there are in 29, so I either add on or take away groups of 3 until I can't add or take any more. Using the subtraction method will help me later on.**

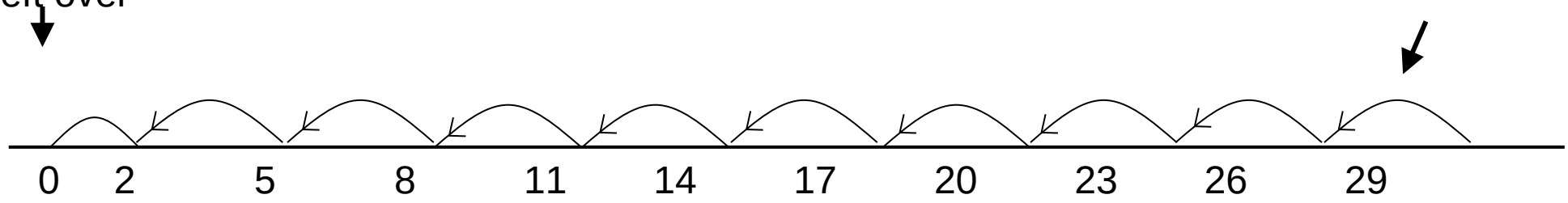
**TU ÷**
**I I**

Counting back in groups of 3 on a number line.

9 groups of 3 on a number line.

**START HERE**

2 left over




There are 9 groups of 3 in 29, with 2 left over.

**29 ÷ 3 = 9r2**

# DIVISION

## Chunking on a number line

TU ÷ U

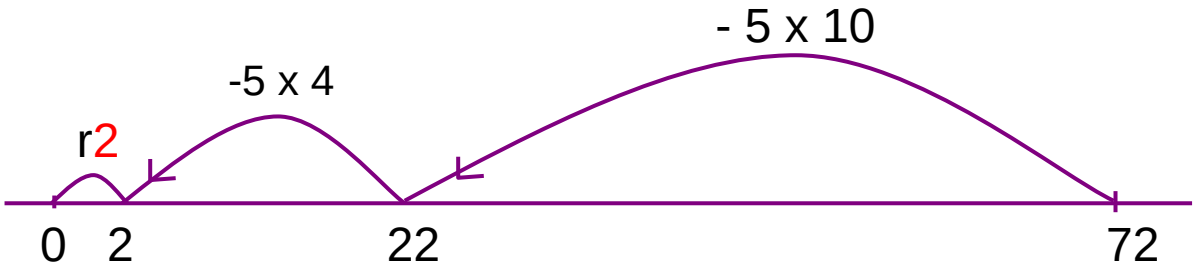
**72 ÷ 5**

**I've never heard of chunking before! How does this help with division?**

**If I can, I try to take out 10 groups of the number I'm dividing by. This is a big chunk and makes the calculation easier. But I can take out chunks that are any number of groups.**

# TU ÷ U

## 72 ÷ 5




Subtract 4 groups of 5 (20) from 22 to land on 2.

Subtract 10 groups of 5 (50) from 72 to land on 22.

**START HERE**

14 groups of 5 subtracted altogether.

2 left!
This is the *remainder*.

**72 ÷ 5 =**

# DIVISION BY

HTU ÷ U

**256 ÷ 7**

**How do you decide what size chunk to subtract?**

**I look for chunks of 10 first. If I take bigger chunks it makes the calculation quicker and easier. Method C is shorter and more efficient than B .**

How many groups of 7 in 256?

## HTU ÷ U

## 256 ÷ 7

256
-70 (7 x 10 )
186
-70 (7 x 10 )
116
-70 (7 x 10 )
46
-42 (7 x 6 )
4

Subtract chunks of 70 (7 x 10).

How many groups of 7 in 46?

Total the numbers of groups of 7.

10 + 10 + 10 + 6 = 36

Leading to

256
-210 (7 x 30)
46
-42
4 (7 x 6)

Subtract one large chunk of 210 (7 x 30).

36 groups of 7 have been subtracted and there is 4 left over.

**256 ÷ 7 = 36r4**

# SHORT DIVISION

**HT U ÷ U**

**4 3 2 ÷ 2**

$$2\overline{)\,4\;3^{1}2}\;\;2\;1\;6$$

In order that this method is taught to its best efficiency we first discuss the place value of each digit but then take each digit as a stand alone unit value e.g. 4 rather than 400. It is imperative that children have a secure understanding of place value before progressing to this method as throughout the modelling they may need to explain the true place value of each digit rather than its unit value e.g. 30 rather than 3.

# End of Year Objectives for Division

**Year 1 –practical problems that share into equal groups of 2, 5 or 10.**
**Year 2 –derive and recall division facts for 2, 5 or 10, represent division as repeated subtraction (grouping) and sharing. Practical and informal written methods and vocabulary used to support division, including remainders. To know that division is not commutative.**
**Year 3 –Practical and informal written methods for TU□U. Understand and use '3 for free' for x and □of the 2, 3, 4, 5, 6, 8 and 10 times-tables. Round remainders up or down, depending on the context.**
**Year 4 –Derive and recall x facts up to 12x12 and apply '3 for free' facts. Divide numbers to 1000 by 10 and 100. Develop and use formal written layouts to record.**
**Year 5 –Divide whole numbers and decimals by 10, 100 and 1000. Divide numbers up to 4 digits by a one digit number using the formal written methods for division and interpret remainders appropriately for the context.**
**Year 6 –Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division interpreting remainders as fractions, decimals, etc. Divide numbers up to 4 digits by a two digit number using the formal written methods for division and interpret remainders appropriately for the context.**

**<u>As with multiplication, before progressing through the stages of calculation:</u>**

**Learning**
- It is crucial to know or be able to derive key number facts:
⇨ Understand and use doubling and halving
⇨ ×/÷ 10 (as moving a place to the left/right NOT "add a zero" etc.!!)
- Place value and partitioning MUST be clearly understood and explained using the appropriate mathematical vocabulary.

**Teaching**
- The number line and the use of arrays must be modelled as images to support calculation from Reception to Year 6.
- Jottings must be modelled as a clear image/strategy for mental calculation.
- If the calculation should be possible mentally then do not give it to practise vertical calculation, e.g. 24 ÷ 3 should not be calculated using short division. Consider use of numbers carefully.

# CALCULATIONS IN

All the methods in this booklet support children in using their mental and written skills to solve calculations. Children need to be encouraged to use the method that they understand and can use confidently.

It is important that children are able to choose the most appropriate method for the calculation. For example:

**4003 – 3998** These numbers are very close together and so counting up on a number line (actual or imagined) would be the most efficient method.

**200 ÷ 4** Dividing by 4 is the same as halving and halving again. As it is easy to halve 200 and easy to halve 100, this would be the most efficient method.

Using and applying appropriate skills is very important, when calculations are needed to solve a problem.

**4 C.DS at £2.99 – how much altogether?**
£2.99 is almost £3.00 and so round up, multiply, then adjust:
4 x £3.00 = £12.00
£12.00 – 4p = £11.96