
# CALCULATION POLICY

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# Contents

# Singapore Mathematics: Mastery

In line with the New Curriculum (2014) and Ofsted framework, we aim to develop children's mastery within Mathematics and have looked at how this will relate to the way in which we teach calculations across the school.

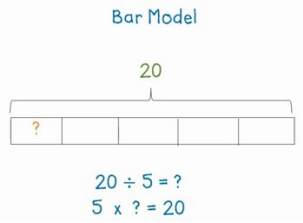
## The CPA Approach

One of the key learning principles behind the Singapore mathematics is the concrete pictorial abstract approach, often referred to as the CPA approach.
The concrete-pictorial-abstract approach, based on research by psychologist Jerome Bruner, suggests that there are three representations necessary for pupils to develop understanding of a concept. Reinforcement is achieved by going back and forth between these representations.

### Concrete representation


The enactive approach - a student is first introduced to an idea or a skill by acting it out with real objects. In division, for example, this might be done by separating apples into groups of red ones and green ones or by sharing 12 biscuits amongst 6 children. This progresses to representing the real object with a concrete substitute such as cubes or dienes or Cuisenaire rods. The enactive approach is a 'hands on' component using real objects and it is the foundation for conceptual understanding.

### Pictorial representation




The iconic approach - a student has sufficiently understood the hands-on experiences performed and can now relate them to representations, such as a diagram or picture of the problem. In the case of a division exercise this could be the action of drawing and circling objects or creating a bar model.

### Abstract representation


The symbolic approach - if a student has had lots of experience using the Concrete and Pictorial approaches, they will be able to work confidently in the abstract as they will have secure images in their heads of what they are working on. If they cannot visualise it, then they do not truly understand what they are doing, they are just following a set of rules without true understanding. Instead they should practise the type of calculation using real-life, concrete examples and visual representations of it to ensure true understanding is achieved.

# Addition Methods in Mathematics

# Addition: Stage A

## Combining sets, using number lines and counting on

**U + U, T U + U**

### Combining sets:

If you have 7 cubes and I have 4 cubes, how many cubes do we have altogether?

To answer this, the children need to physically join the 7 cubes and the 4 cubes together and then count how many altogether.

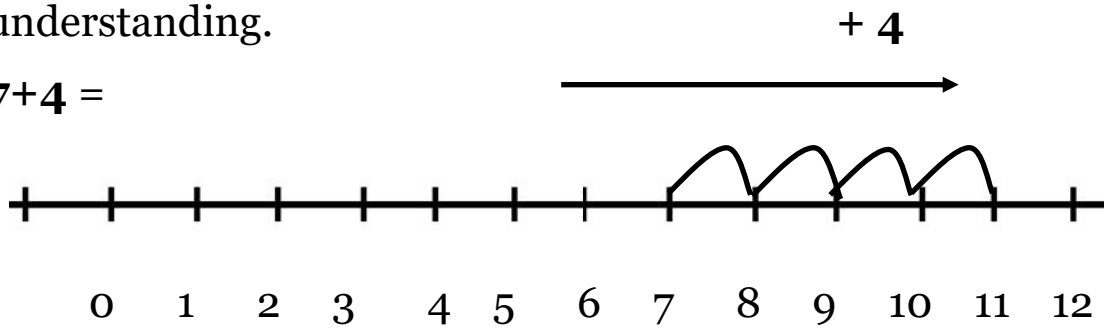
Children should have access to a wide range of counting equipment, everyday objects, as well as hoops and sorting trays.

### Counting on:

Put the number **7** in your head then count on **4**. The answer is where you land.

Using a number line Draw jumps on number line to support understanding.

**7+4 =**




Start on number 7, jump four spaces to the right. The answer is the number you land on.

## Pre-requisite skills

Number recognition

Numbers in order

One more and one less

How to count on accurately

Knowing the total is the number where you land

Total number of objects in a group

Understand that adding makes the number bigger

## Learning Commentary

**7 + 4 on a number line**

Start at 7, count on in ones (4)

What to say: "Start at 7, jump 1, 2, 3, 4 and the answer is where you land."

Extend to: Start at 7, then count on 4

What to say: "8, 9, 10 as child counts and 11 the answer is where you land."

## Vocabulary

| | | |
|---|---|---|
| plus | and | add |
| more than | altogether | count on |
| equals | total | digit |
| number | bigger | makes |
| is the same as | start | |

# Addition: Stage B

## Partitioning ('splitting numbers')

### T U + T U

| B1 | B2 |
|---|---|
| **40 + 36 =** | **47 + 38 =** |
| 40 + 30 = 70 | 40 + 30 = 70 |
| 0 + 6 = 6 | 7 + 8 = 15 |
| 70 + 6 = 76 | 70 + 15 = 85 |

*It may support understanding to work with B1 and B2 alongside each other*

Extend to hundreds

**134 + 146**

100 + 100 = 200

30 + 40 = 70

4 + 6 = 10

200 + 70 + 10 = 280

Include decimals in the context of money

**£1.20 + £2.50**

£1 + £2 = £3

20p + 50p = 70p

£3 + 70p = £3.70

## Pre-requisite skills

Place value to H T U

Count in 10's

Add multiples of 10: this could be from counting in 10's

Partition two digit numbers

Understand that adding makes the number bigger

Use known addition facts

## Learning Commentary

**47 + 38**

Partition the numbers into tens and units

Add the tens 40 + 30 = 70

Add the units 7 + 8 = 15

Add the tens and units 70 + 15 = 85

The answer is the total.

## Vocabulary

| | | |
|---|---|---|
| partitioning | adding | column |
| total | Tens | Units |

# Addition: Stage C

## Partitioning and starting column method

### Column method up to T U + T U

### Written method

**C1 Partitioning 83 + 42**

**8 3 + 4 2**

| T | | U | | |
|---|---|---|---|---|
| 80 | + | 3 | | |
| 40 | + | 2 | | |
| 120 | + | 5 | = | 125 |

**C2 Column Method Stage 1**

| | H | T | U |
|---|---|---|---|
| | | 8 | 3 |
| + | | 4 | 2 |
| | | | 5 |
| + | 1 | 2 | 0 |
| | 1 | 2 | 5 |

*It may support understanding to work with C1 and C2 alongside each other.*

## Pre-requisite skills

Place value to HTU

Partitioning to HTU

Counting on in multiples of 10

Number bonds

Bridging 10's boundary

Bridging 100's boundary

Use known addition facts

## Learning Commentary

*See Stage B for Partitioning approach*

### Column Method

Write each digit under the appropriate column **(HTU)**

Add the digits in the Units column. Place the answer under the Answer line ensuring the digit is in the Units column.

Add the digits in the Tens column. Place the answer under the Answer line ensuring the digit is in the Tens column.

Add the digits in the Hundreds column. Place the answer under the Answer line ensuring the digit is in the Hundreds column. The answer is now under the Answer line.

## Vocabulary

| | | |
|---|---|---|
| partitioning | adding | column |
| total | Tens | Units |
| hundreds | digit | answer line |
| answer | | |

# Addition: Stage D

## Column method

### Up to H T U + H T U
### (expanded and compact)

**D1 Method (expanded)**

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

**D2 Carrying (compact)**

| | H | T | U |
|---|---|---|---|
| | 3 | 6 | 7 |
| + | 1 | 8 | 5 |
| | 5 | 5 | 2 |

Extend to decimals in the context of money

| | T | U | . | t | h |
|---|---|---|---|---|---|
| | 6 | 7 | . | 2 | 5 |
| + | 1 | 5 | . | 1 | 5 |
| | 8 | 2 | . | 6 | 0 |
| | 1 | | | 1 | |

**£82.60**

## Pre-requisite skills

Adding Units, Tens and Hundreds

Place value: HTU

Use known addition facts

## Learning Commentary

Example: 367+185

Write the digits under the correct heading **(HTU)**

Start with the Units column.

Add the Units together (7 + 5 =12), put the 2 units below the answer line in the units column and carry the ten Units into the Tens column, as one Ten.

Write the one Ten under the bottom line in the Tens column. This digit should be written smaller.

Add the digits in the Tens column, remembering to include any carried digit. 6 Tens + 8 Tens + 1 Ten = 15 Tens

Write the 5 Tens below the answer line in the Tens column and carry the ten Tens into the Hundreds column, as one Hundred.

Write the one Hundred under the bottom line in the Hundreds column. This digit should be written smaller.

Add the digits in the Hundreds column, remembering to include any carried digit. 3 Hundreds + 1 Hundred + 1 Hundred = 5 Hundreds.

The answer is now under the Answer line. carry Tens Units Hundreds below the bottom line

## Vocabulary

carry Tens Units

below the bottom line

# Subtraction Methods in Mathematics

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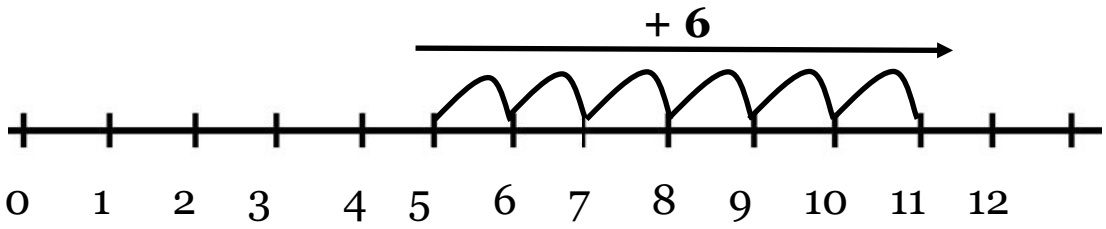
# Subtraction: Stage A

## Find the difference / Counting on:

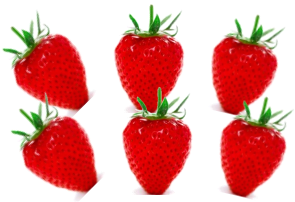
Find a 'difference' by counting up;

I have collected 5 cards. For a set of cards I need 11 in total. How many more cards do I need to collect?




Start on the smaller number 5 and count on in ones until you reach the larger number. How many jumps are there?

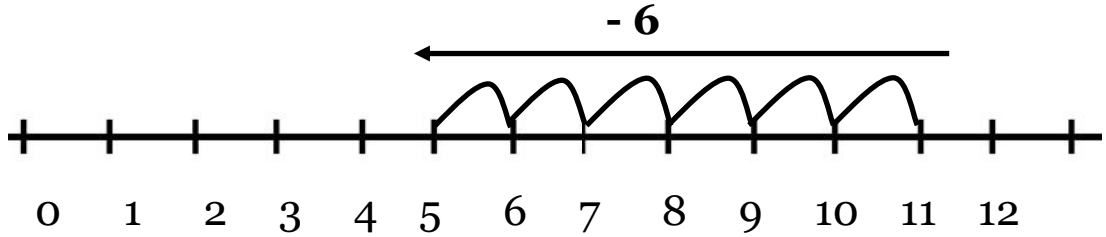
## Take away



Understand subtraction as 'take away'.
e.g. I have 6 strawberries, I give 1 away, how many do I have left?

Jumping back method:

I have 11 sweets. I give my friend 6 of them. How many sweets do I have left?




Start at 11 on the number line.

Jump back 6 digits, where did you land?

The answer is where you land.

## Pre-requisite skills

Knowledge of ordinal numbers

Can recite numbers forwards and backwards

Counting forwards and backwards on a numbered number line

Recognise numbers

Understand subtraction as take away and find the difference

## Learning Commentary

Finding the difference:

Start with the smaller number.

Count up in ones to the larger number.

How many jumps did you do?

How many steps did you take?

Taking away: the 'jumping back' method

Start with the bigger number

Jump back in ones

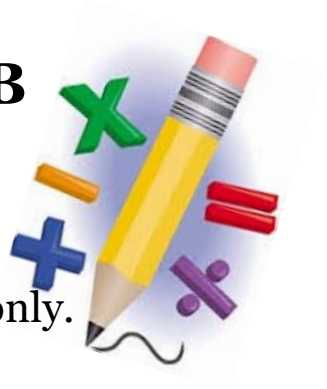
Where did you land?

(Make sure that the child does not count the starting point as a jump)

## Vocabulary

| | | |
|---|---|---|
| take away | how many more? | count on |
| jump back | numbers | forwards |
| backwards | land | jumps |
| find the difference | starting point | start at 10, jump back 5 |
| start at 3, count on to | 10 | |

# Subtraction: Stage B

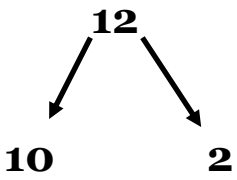


## Partitioning

In subtraction, we partition the smaller number only.

*Example 1*

**37 – 12 =**




**37 – 10 = 27**

Take the Tens (from the smaller number) away from the bigger number.

The answer to this calculation is then used as the start of the next calculation.

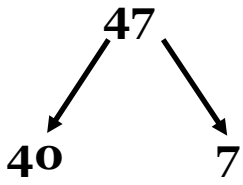
Take away the Units, using the jumping back method.

So it is 37-10 = 27

27 - 2 = 25

*Example 2*

**83 – 47 =**




**83 – 40 = 43**

Take the Tens (from the smaller number) away from the bigger number.

The answer to this calculation is then used as the start of the next calculation.

Take away the Units, using the jumping back method.

So it is 83 - 40 = 43

43 - 7 = 36

## Pre-requisite skills

Partitioning two digit numbers Subtract multiples of 10 Subtract single digits

Subtract single digits crossing the Tens boundary

Place value

Concept of subtraction Counting on

Jumping back  Use known subtraction facts

## Learning Commentary

e.g. 32 – 17

Start with the larger number and take away the Tens (32 – 10 = 22)

Now take away the Units (22 – 7 = 15)

What is the answer?

## Vocabulary

| | | |
|---|---|---|
| partition | subtract | take away |
| number sentence | counting on | jumping back |
| Tens | Units | digit |

# Subtraction: Stage C

## Partitioning and start decomposition

### Column Method Stage

| | T | U |
|---|---|---|
| | 3 | 7 |
| - | 1 | 2 |
| | 2 | 5 |

Write T U.

Set out the digits in the correct columns.

Show calculation sign.

Start with the Units, 7 Units take away 2 Units is 5 Units.

Place the answer under the answer line ensuring the digit is in the Units column.

Then subtract the Tens, 3 Tens take away 1 Ten is 2 Tens.

Place the answer under the Answer line ensuring the digit is in the Tens column.

The answer is 25.

Moving to:

### Column Method Stage 2

| | T | U |
|---|---|---|
| | 5 | 1 |
| | ~~6~~ | 2 |
| - | 4 | 5 |
| | 1 | 2 |

Write T U.

Set out the digits in the correct columns.

Show calculation sign.

Start with the Units, 2 Units take away 5 Units.

It is not possible to take 5 Units away from 2 Units, so you need to borrow a Ten.

Put a line through the 6 Tens and replace with a 5.

Move the Ten into the Units column and now we have 12 Units.

We can now answer 12 Units - 5 Units = 7 Units.

Place the answer under the answer line ensuring the digit is in the Units column.

Now subtract the Tens, 5 Tens - 4 Tens = 1 Ten.

Place the answer under the answer line ensuring the digit is in the Tens column.

The answer is 17.

## Pre-requisite skills

Partition numbers

Use known subtraction facts

## Learning Commentary

When using column method make sure of the following:

Write T U at the top of the columns.

The digits must be set out in the correct columns.

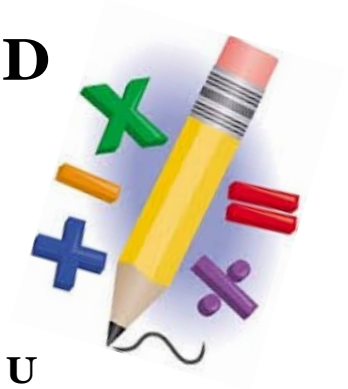
Children must write calculation symbol to the left of the column. Follow method as explained.

## Vocabulary

borrow from column decomposition

symbol

# Subtraction: Stage D



## Decomposition

## Column Method Stage 3

**753 – 286 = 467**

| | H | T | U |
|---|---|---|---|
| | 6 | 4 | 1 |
| | ~~7~~ | ~~5~~ | 3 |
| - | 2 | 8 | 6 |
| | 4 | 8 | 7 |

Write H T U .

Set out the digits in the correct columns.

Start with the Units, 3 Units - 6 Units.

It is not possible to take 6 Units away from 3 Units, so you need to borrow a Ten. Put a line through the 5 Tens and replace with a 4 (write it smaller).

Move the one Ten into the Units column and now we have 13 Units.

We can now answer 13 Units take away 6 Units (13 Units – 6 Units = 7 Units).

Place the answer under the answer line ensuring the digit is in the Units column.

Now subtract the Tens, 4 Tens take away 8 Tens.

It is not possible to take 8 Tens away from 4 Tens, so you need to borrow a Hundred.

Put a line through the 7 Hundreds and replace with a 6 (write it smaller).

Move the one Hundred into the Tens column and now we have 14 Tens.

We can now answer 14 Tens take away 8 Tens (14 Tens – 8 Tens = 6 Tens)

Place the answer under the answer line ensuring the digit is in the Tens column.

Now subtract the Hundreds column. 6 Hundreds take away 2 Hundreds is 4 Hundreds (6 Hundreds – 2 Hundreds = 4 Hundreds) Place the answer under the answer line ensuring the digit is in the Hundreds column.

The answer is 467.

## Pre-requisite skills

Use known subtraction facts

## Learning Commentary

When using column method, make sure of the following:

Write H T U at the top of the columns.

The digits must be set out in the correct columns.

Children must write calculation symbol to the left of the column.

Follow method as explained.

## Vocabulary

borrow column decomposition

symbol

# Multiplication Methods in Mathematics

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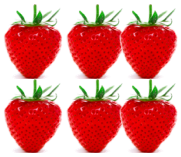
# Multiplication: Stage A

## Multiplication as repeated addition

### Using Pictures and Marks



• • •
• • •

Looking at columns

2 + 2 + 2

3 groups of 2

Looking at rows

3 + 3

2 groups of 3

Counting using a variety of practical resources.

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, beads and cubes.

## Applying to word problems

There are 2 sweets in one bag.

How many sweets are there in 5 bags?

## Pre-requisite skills

Counting in 2s, 5s and 10s

Repeated addition

Understand the concept of groups of equal size

## Learning Commentary

5 groups of 2

How big does each group have to be? 2

or

How many are in each group? 2

How many groups do we need / are there? 5

How many objects are there altogether? 10

## Vocabulary

| | | |
|---|---|---|
| add | lots of | groups of |
| same | repeated addition | |

# Multiplication: Stage B

## Linking multiplication and repeated addition

### Arrays support understanding of the concept of repeated addition

An array is a systematic arrangement of objects, often in rows and columns.

● ● ● ●
● ● ● ●

**4 x 2**

**4 + 4**

● ●
● ●
● ●
● ●

**2 x 4**

**2 + 2 + 2 + 2**

8 is the total number of objects.

## Pre-requisite skills

Understand multiplication as repeated addition

Understand that 4 x 2 is the same as
2 x 4, 3 x 6 = 6 x 3 and so on.
(Commutative law)

## Learning Commentary

Which groups can you see in the array?

2 groups of 4 (across)

4 and 4

4 + 4 = 8

4 groups of 2 (down)

2 and 2 and 2 and 2

2 + 2 + 2 + 2 = 8

## Vocabulary

| | | |
|---|---|---|
| across | down | total |
| array | repeated addition | |

# Multiplication: Stage C

## Partition,

### Begin grid method up to T U x U

Start to partition (split Tens and Units numbers e.g. 12) into their Tens and Units e.g. 12 = 10 + 2, 24 = 20 + 4)

12 x 4 =

10 x 4 = 40

2 x 4 = 8

40 + 8 = 48

Partitioning: Start of grid method

32 x 3 = 96

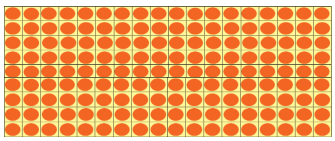
| | T | U |
|---|---|---|
| X | 30 | 2 |
| 3 | 90 | 6 |

| | T | U |
|---|---|---|
| | 9 | 0 |
| + | | 6 |
| | 9 | 6 |

# Pre-requisite skills

Understand multiplication as repeated addition.

Use arrays to support understanding of partitioning.



**18 x 9**

Doubling multiples of 10 up to 30

Partition 2 digit numbers

Multiples of 10 up to 100

Addition (T U + T U)

Multiplications facts (appropriate tables)

Understand that multiplying by 10 involves digits shifting to the left on a number grid.

# Learning Commentary

**32 x 3**

How can we partition 32? (30 and 2)

Put the numbers into a grid.

Now work out 3 x 30 (90).

Then work out 3 x 2 (6).

Add up those answers using T U columns.

The total is the answer.

| | T | U |
|---|---|---|
| X | 30 | 2 |
| 3 | 90 | 6 |

| | T | U |
|---|---|---|
| | 9 | 0 |
| + | | 6 |
| | 9 | 6 |

# Vocabulary

| | | | |
|---|---|---|---|
| Tens | multiplication | multiples of 10 and 100 | total |
| Units | multiply | how many altogether | partitioning |
| x 10 | represents | repeated addition | x 100 rows |
| Rows / | columns | arrays | |

# Multiplication: Stage D

## Grid method for questions up to T U x U

Use the grid method of multiplication (as below)

**23 x 7**

Grid method:

Estimate: 20 x 10 = 200

| | T | U |
|---|---|---|
| X | 20 | 3 |
| 7 | 140 | 21 |

| | H | T | U |
|---|---|---|---|
| | 1 | 4 | 0 |
| + | | 2 | 1 |
| | 1 | 6 | 1 |

# Pre-requisite skills

Column addition to H T U

Can multiply by multiples of 10

Know appropriate times tables

Partition 2 digit numbers

# Learning Commentary

23 x 7

We estimate by rounding the numbers to the nearest 10 and multiply them (20 x 10 = 200).

How can we partition 23? (20 and 3).

Put the numbers into a grid.

| | T | U |
|---|---|---|
| X | 20 | 3 |
| 7 | 140 | 21 |

| | H | T | U |
|---|---|---|---|
| | 1 | 4 | 0 |
| + | | 2 | 1 |
| | 1 | 6 | 1 |

Now work out 7 x 20 (140).

Then work out 7 x 3 (21).

Add up those answers using H T U (writing the larger number first).

The total is the answer.

# Vocabulary

| | | | |
|---|---|---|---|
| Tens | multiplication | multiples of 10 and 100 | total |
| Units | multiply | how many altogether | partitioning |
| x 10 | represents | repeated addition | x 100 rows |
| rows / | columns | arrays | estimate |

# Multiplication: Stage E

## Grid method for questions up to T U x TU

Grid method:

Use the grid method of multiplication (as below)

**72 x 38**

Grid method:

Estimate: 70 x 40 = 2800

| | T | U |
|---|---|---|
| X | 70 | 2 |
| 30 | 2100 | 60 |
| 8 | 560 | 16 |

| | Th | H | T | U |
|---|---|---|---|---|
| | 2 | 1 | 0 | 0 |
| + | | 5 | 6 | 0 |
| | | | 6 | 0 |
| | | | 1 | 6 |
| | 2 | 7 | 3 | 6 |

## Pre-requisite skills

Column addition to Th H T U

Can multiply multiples of 10 by multiples of 10

Know appropriate times tables

Partition 2 digit numbers

## Learning Commentary

72 x 38

How can we partition 72? (70 and 2)

How can we partition 38? (30 and 8)

Put the numbers into a grid

| | T | U |
|---|---|---|
| x | 70 | 2 |
| 30 | 2100 | 60 |
| 8 | 560 | 16 |

Now work out 30 x 70 (2100)

Then work out 30 x 2 (60)

Now work out 8 x 70 (560)

Then work out 8 x 2 (16)

Add up the answers using Th H T U (writing in the numbers from largest first to smallest last).

The total is the answer.

## Vocabulary

| | | | |
|---|---|---|---|
| Tens | multiplication | multiples of 10 and 100 | total |
| Units | multiply | how many altogether | partitioning |
| x 10 | represents | repeated addition | x 100 rows |
| rows / | columns | arrays | estimate |

# Division Methods in Mathematics

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# Division: Stage A

## Sharing and grouping (up to 20 objects)

Practical experiences that lead to the understanding of division as having equal groups

## Sharing

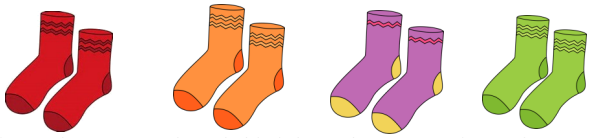
Begin to understand division as having groups of equal size

Sharing – 6 sweets are shared between 2 people. How many do they have each?

## Grouping

Sorting objects into groups of 2 / 3 / 4

You have eight socks. How many pairs of socks are there?



There are 10 books. Each child is given 2 books. How many children are there?
Jo has 12 Lego wheels. How many cars can she make?

## Difference between sharing and grouping

Sharing:

Number of groups is known and you are finding out the **size** of the groups.

Grouping:

Size of groups is known and you are finding out **the number of** groups.

## Pre-requisite skills

Counting skills

Counting objects in order

Understanding numerical value

## Learning Commentary

Sharing – 6 sweets are shared between John and Lucy. How many do they have each?

John and Lucy:

One for John, one for Lucy, one for John, one for Lucy, one for John, one for Lucy.

How many sweets does each person have?

John has 3 sweets and Lucy has 3 sweets.

Grouping – I have 6 socks. How many pairs of socks are there? How many 2's are in 6?

One group / pair of 2, another group / pair of 2, another group / pair of 2.

I have 3 groups / pairs.

## Vocabulary

| | | |
|---|---|---|
| groups of | share | one each |
| equally | two each etc | same (beginning '=') |
| equals | number sentence | take away |
| add | pair | |

# Division: Stage B

## Grouping including number lines

## T ÷ U

### Grouping

6 ÷ 2 can be modelled as:

There are 6 strawberries.

How many people can have 2 each?

How many 2's go into 6?

6 ÷ 2 can be modelled as:

How many 2's are in 6? (practical: circling dots/pictures)

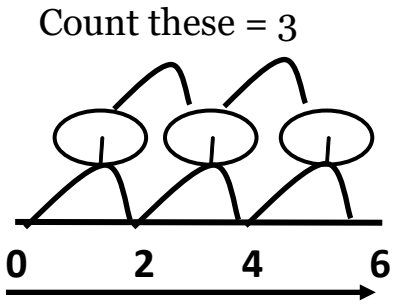
### Key understanding:

How many of (one number) goes into another?

6 ÷ 2 on a number line.

How many 2's go into 6?

Answer: 3 lots of 2




Also use number lines to jump in 2's, 5's, 10's.

### Next steps

Find one half – split total into 2 groups.

Find one quarter – split total into 4 groups.

## Pre-requisite skills

Place value

Grouping objects into groups of equal size

Sharing objects into equal groups

Two more/less (linking with the number line)

Understanding of equal groups

Some use of the number line for counting in e.g. 2's

Knowledge of the inverse (e.g. 6 ÷ 2 = 3 so 3 x 2 = 6)

## Learning Commentary

How many .... are in ....?

How many of (one number) go into another?

## Vocabulary

| | | |
|---|---|---|
| more | less | equal |
| 6 ÷ 2= | groups | more |
| less | equal | lots of |
| How many... | How many....go in to. | ....? |

# Division: Stage C

## Grouping including remainders.

### C1 Understand division: No remainders

15 ÷ 3 can be modelled as:

How many 3's go in to 15?

(5 x 3 = 15 so 15 ÷ 3 = 5)

### C2 Understand division: Remainders

### Practical Method

How many 3's go into 13?

Take 13 sweets and make groups of 3 sweets until you cannot make any more groups of 3.

Can we make another group of 3 sweets? No. So there is one sweet left over.

Answer: Four 3's with 1 left over = 4 r 1

Modeling with sweets or other objects will help to illustrate that it is not possible to make another group of 3 which results in 1 'left over.'

### C3 Building on from Stage B : Number Line

13 ÷ 3 We use our knowledge of the 3 times tables to count in 3's Count in 3s


4 groups of 3 make 12 and there is 1 left over which is called a remainder.

13 ÷ 3 = 4 r1

## Pre-requisite skills

Pre-requisite skills

Link with times tables

Understand division as repeated subtraction

## Learning Commentary

How many …'s go into …?

Can we make another group of …?

How many are left over?

Is there a remainder?

## Vocabulary

| | | |
|---|---|---|
| left over | remainder | equal |
| group | lots of | division |
| How many….go in to. | ….? | How many left over? |
| Can we make another | group of…? | |

# Division: Stage D

## Chunking: Dividing 2 digit numbers by 1 digit number T U ÷ U

### Sharing and grouping

30 ÷ 6 can be modeled as how many 6's go into 30?

(Link with times tables – 5 x 6 = 30 so 30 ÷ 6 = 5)

### Sharing and grouping with remainders

(i) 21 ÷ 4 = 5 r1

Link with times tables: 5 x 4 = 20 so 20 ÷ 4 = 5 and as it is 21÷ 4 not 20 ÷ 4, you have 1 left over as a remainder.

(ii) Start of chunking 21 ÷ 4

| | T | U |
|---|---|---|
| | 2 | 1 |
| - | 2 | 0 |
| | | 1 |

(5) x 4

5 r 1

Answer: 5r1

Where the answer will be less than 10, method (i) is more efficient. Children will often estimate the answer using times table knowledge before they decide which method to use.

## Pre-requisite skills

Understand division as repeated subtraction

Subtracting single multiples

Understanding chunking as making equal groups

Knowledge of column subtraction

Simple addition

## Learning Commentary

How many 4's go into 21?

Take away 5 groups of 4 which is 20. Put a ring around the 5.

How much is left? 21 – 20 = 1

Can we take away any more groups of 4 without going below 0? No.

How many groups have we taken away altogether? 5

Are there any left over? 1- that is the remainder.

So the answer is 5r1.

Vocabulary take 1 group away how many are left? can we make another group of ...? how many groups of .... do we have altogether? are there any left over? remainder (as 'r') chunking divisor

## Vocabulary

| | |
|---|---|
| take away 1 group | How many are left? |
| chunking | divisor |
| Are there any left over? | remainder (as 'r') |
| Can we make another group of..... | do we have already? |

# Division: Stage E

## Chunking: Becoming more efficient

**T U ÷ U** (dividing 2 digit numbers by 1 digit number)

Continue with chunking and developing efficiency.

72 ÷ 6

| | T | U | |
|---|---|---|---|
| | 7 | 2 | |
| - | 6 | 0 | 10 x 6 |
| | 1 | 2 | |
| - | 1 | 2 | 2 x 6 |
| | | 0 | |

**12**

Answer: 12

## Pre-requisite skills

Knowing appropriate multiplication number facts
e.g. 10 x 5
Children need to recognise key multiples to use (e.g. 10 x ….)
Subtraction (column method)

## Learning Commentary

How many 6's go into 72?

Can we take away 10 x 6?

Yes, that leaves us with 12.

Can we take away any more groups of 6?

Yes, we can take away 2 x 6 from 12 which leaves us with 0 – so there is no remainder.

So we have 10 + 2 6s, which means the answer is 12.

12 6s go into 72.

## Vocabulary

| | |
|---|---|
| groups | chunk |
| times tables facts | Larger chunks |
| more efficient | remainder |
| divisior | I know…because… |