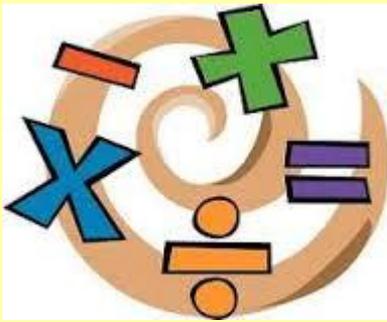


Real Life Maths

<https://www.youtube.com/watch?v=PXwStduNw14&feature=youtu.be>



Thinking is at the heart of Mathematics and therefore should be at the heart of mathematical teaching and learning.



Aims of this session;

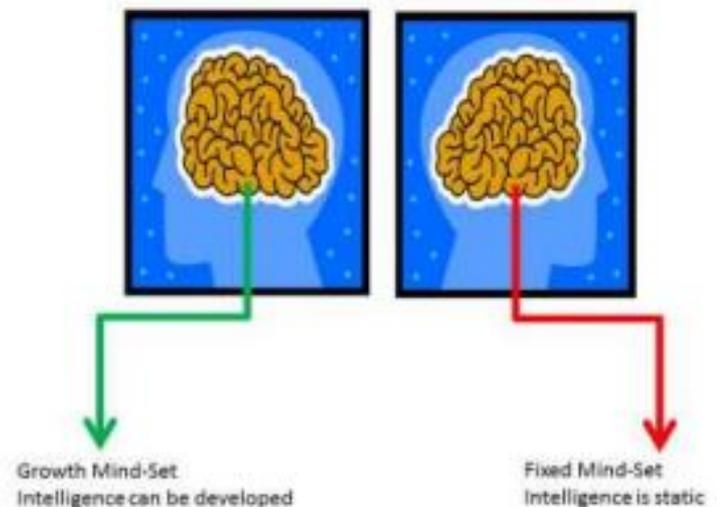
- To get an insight into how Maths is taught at Nanstallon.
- To take away some ideas to support your children at home with addition and subtraction.
- To work with some of our teachers and take part in a variety of maths activities.



Discuss 3 positive and negative experiences of Maths you had when you were a child.

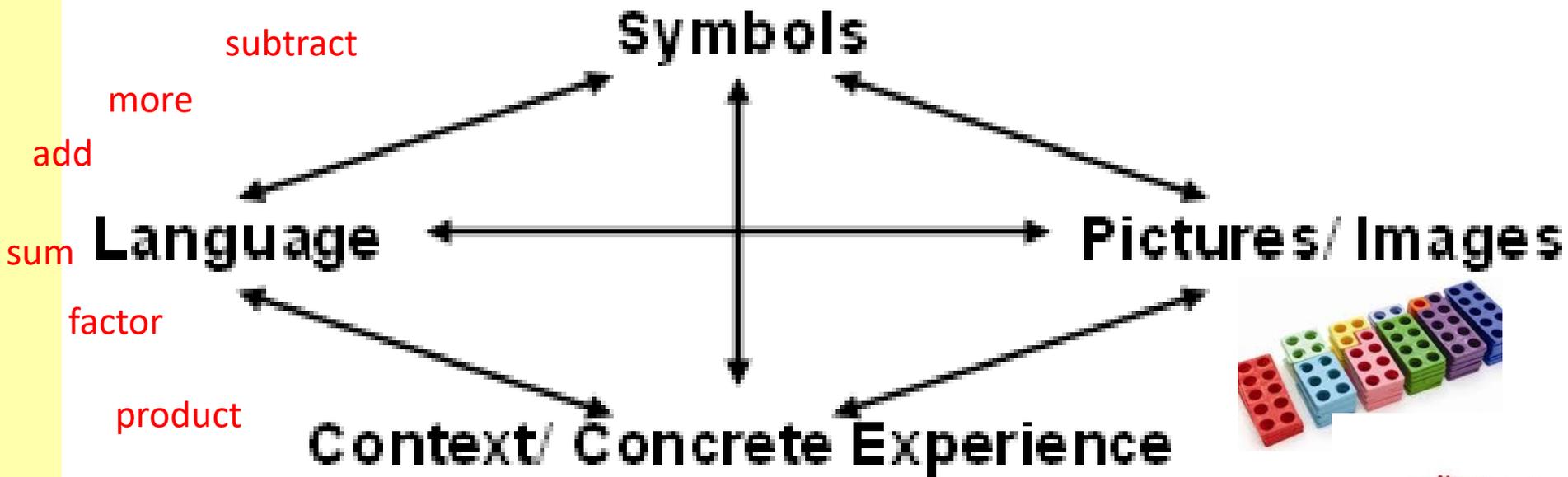
If children hear 'I can't do maths' from parents, teachers, friends they begin to believe it isn't important

People become less embarrassed about maths skills as it is acceptable to be 'rubbish at maths'



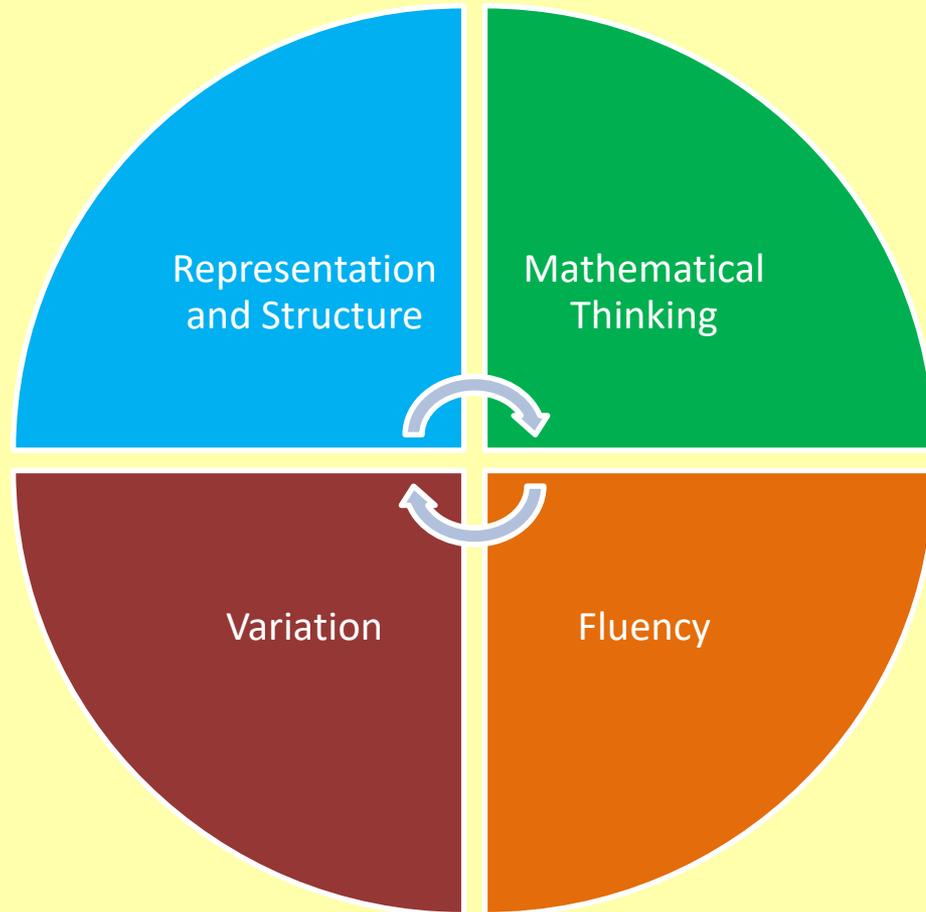
Maths at Nanstallon

= + x %



Here is a receipt for some shopping. How much did I spend? How much change did I get from £20?

Our Teaching and learning is supported by...



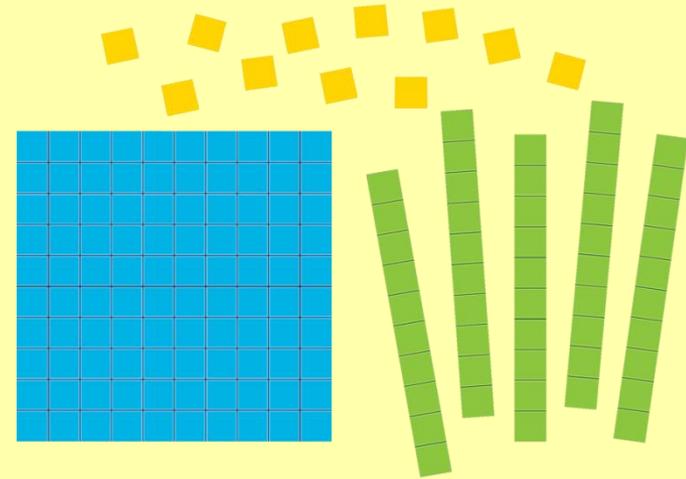
The Maths Curriculum

Children should:

- Become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language.
- **Solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

We use a variety of practical resources in both KS1 and KS2

- The use of visual images and practical resources is crucial to the *conceptual understanding* of mathematics and supports children's talk.
- Conceptual understanding means that children are confident with the mathematics involved and don't just follow a process.



Children need to learn mathematics in a sensory way.

- *What I hear, I forget; What I see, I remember; What I do, I understand.*"

What does your child use at home to help them?



Addition: Reception

Early learning goals:

- ✓ Count reliably with numbers from 1 to 20, place them in order.
- ✓ Say which number is one more than a given number.
- ✓ Using quantities and objects, they add two single-digit numbers and count on to find the answer.

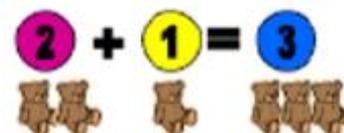
Recognise numbers up to 20 and understand the meaning of each number by recognising and knowing their clusters

1 one 	2 two 	3 three 
4 four 	5 five 	6 six 
7 seven 	8 eight 	9 nine 

Count on in ones and say which number is one more than a given number using a number line or number track to 20.



Begin to relate addition to combining two groups of objects using practical resources, role play, stories and songs.



Know that counting on is a strategy for addition. Use numbered number lines to 20.



Year 1

addition and subtraction

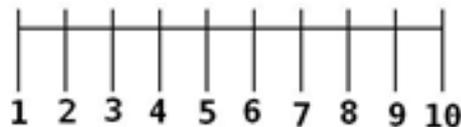
The curriculum states that by the end of year 1 children should be able to;

- Read/write/interpret statements involving addition (+), subtraction (-) and the equals (=) signs.
- Add and subtract one-digit and two-digit numbers to 20 including zero
- Represent and use number bonds within 20
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? + 2$.

Year 1 addition and subtraction

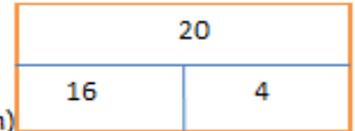


Concrete

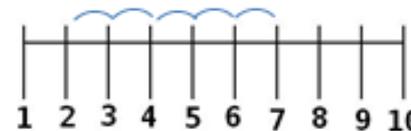


$$7 - 5 = 2$$

Note counting below the line for subtraction.



(Note counting on above the line for addition)



$$2 + 5 = 7$$

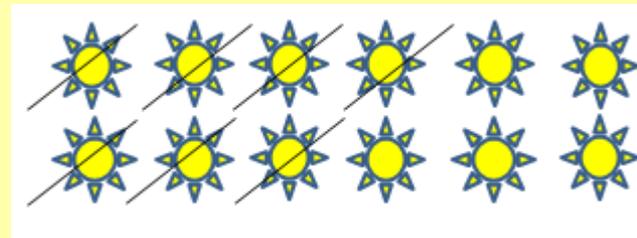
Use numbered number lines to add, encourage children to start with the largest number and count on.

Abstract

$$10 - 2 = 8$$

$$6 - 1 = 5$$

How many more/find the difference between 3 and 5



Recalling facts

- It is important that children recognise number bonds, different pairs of numbers with the same total.

10

$7 + 3$



6

$3 + 3$

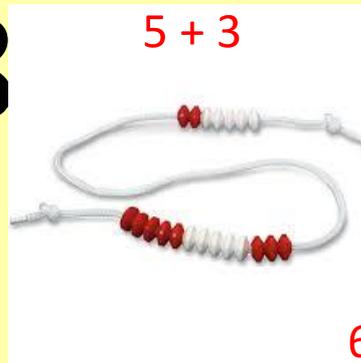
$5 + 4$

9



8

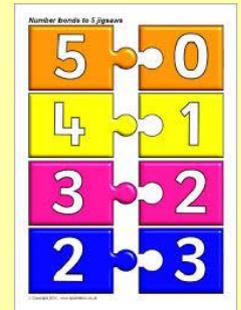
$6 + 2$



$3 + 2$

5

$1 + 4$



$6 + 1$

7

$3 + 4$

Year 2

addition and subtraction

The curriculum states that by the end of year 1 children should be able to;

- solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- Apply their increasing knowledge of mental and written methods
- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
 - *a two-digit number and ones*
 - *a two-digit number and tens*
 - *two two-digit numbers*
 - *adding three one-digit numbers*
- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

Children in year 2 build upon
Their learning from year 1 in a systematic way.

For example

Deriving number bonds to 10
to help with bonds to 20 and 100

$$1 + 9 = 10$$

$$11 + 9 = 20$$

$$10 + 90 = 100$$

$$5 + 2 = 7$$

$$15 + 2 = 17$$

$$35 + 22 = 57$$

I know ... So....

Progression in small steps

$$33 + 5 = \quad 33 + 8 =$$

$$33 + 15 = \quad 33 + 18 =$$

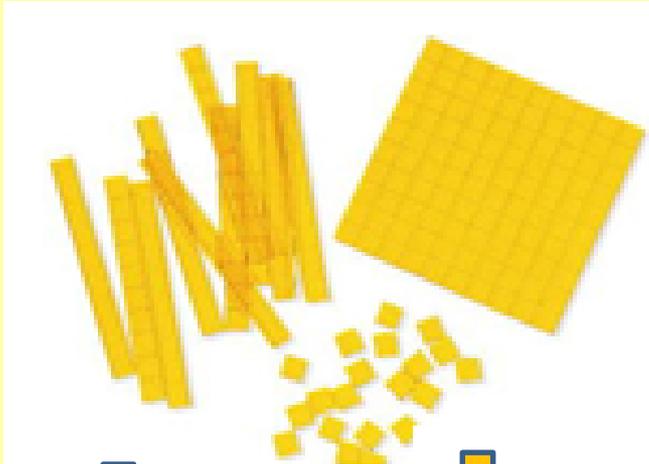
$$3 + 6 + 7 =$$

$$38 - 7 = \quad 38 - 9 =$$

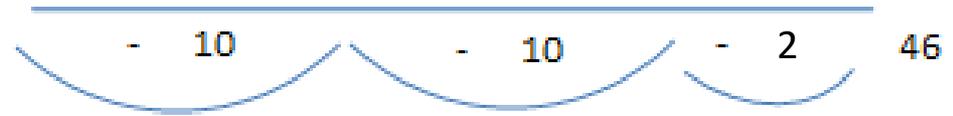
$$38 - 12 = \quad 38 - 19 =$$

Year 2 addition and subtraction

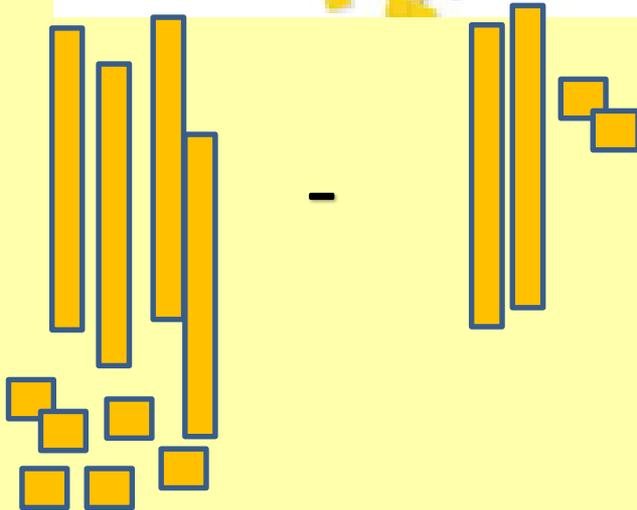
$$46 - 22$$



$$46 - 22 =$$



46	
24	22



Now it's your turn...

There is no single way to learn...

There is no single, exclusively correct learning style in mathematics. We learn things in a variety of ways.

How would you do this calculation using the methods taught?

25



35p

Amy buys **one** pear for 35p.

She pays with a 50p coin.



How much change does Amy get?

p

Children need to know that numbers can be partitioned in different ways to aid calculation.

$$\begin{array}{r} 4 \quad 1 \\ \cancel{50} \\ \underline{35} \\ \underline{15} \end{array}$$

$$\begin{array}{ccccccc} \leftarrow & \leftarrow & \leftarrow & \leftarrow & & & \\ -10 & -10 & -10 & -5 & & & 50 \\ \hline 15 & 25 & 35 & 45 & & & \end{array}$$

Counting back strategy

Number bonds

Subtracting a single-digit number from a tens number

Subtracting a multiple of ten from any number

Partitioning numbers efficiently

Combining numbers to calculate a total

Counting up strategy

- Number bonds to ten
- Adding a multiple of ten to any number
- Combining numbers to find a total
- Understanding the finding the difference model.

35 +5 +10 50

40 50

Counting back

Number bonds

Number line

Written method

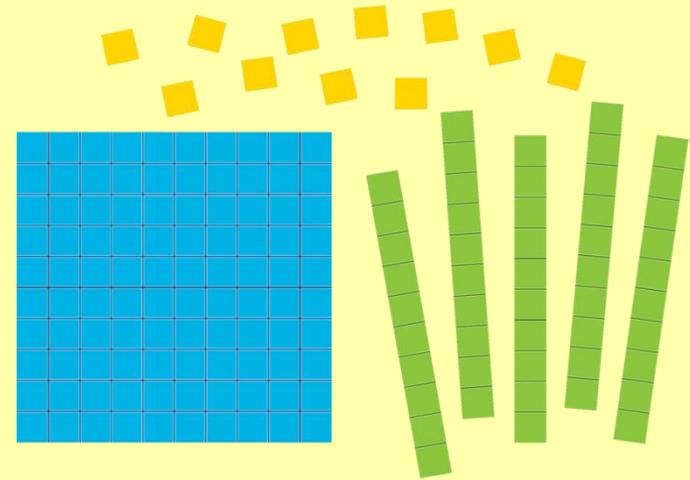
Place value counters

Counting forwards

Refreshments



In KS2 we encourage children to learn formal methods alongside using apparatus



Year 3

- As outlined in the National Curriculum pupils should be taught to:
- Add and subtract numbers mentally, including:
 - *a three-digit number and ones*
 - *a three-digit number and tens*
 - *a three-digit number and hundreds*
 - *a three-digit number and thousands*
- Add and subtract numbers with up to three digits, using formal written methods of columnar addition
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Progression in small steps

$$352 + 237 =$$

$$248 + 37 =$$

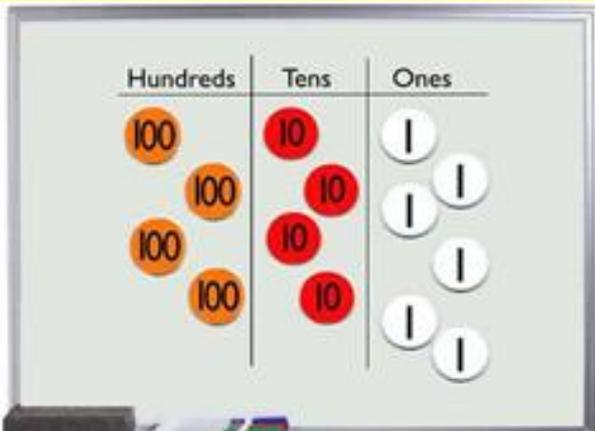
$$352 - 231 =$$

$$286 + 356 =$$

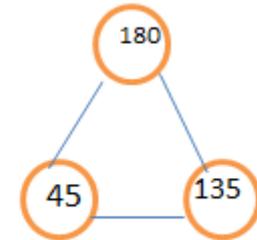
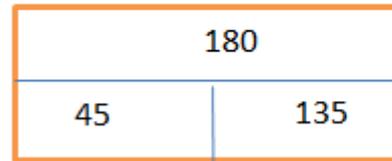
$$248 - 39 =$$

$$256 - 148 =$$

Year 3



Pictorial



H T O

2 7 8

+ 8 2

3 6 0

1 1

Formal written method

H T O labelled in columns.

One digit per square

Calculate from the ones column

Carry the tens

Year 4

As outlined in the National Curriculum pupils should be taught to: Add with up to 4 digits using the formal written methods of columnar addition where appropriate

- Estimate and use inverse operations to check answers to a calculation
- Solve addition two-step problems in contexts, deciding which operations and methods to use and why.

Year 4

TH	H	T	O
1	2	7	8
+		1	8
<hr/>			
1	4	6	0
<hr/>			
	1	1	

Abstract

Formal written method

TH H T O labelled in columns.

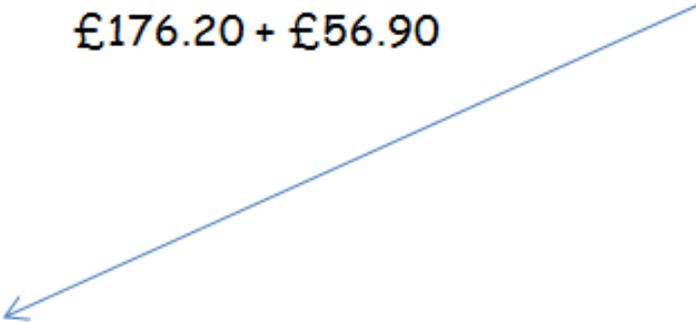
One digit per square

Calculate from the ones column

Carry the tens

£176.20 + £56.90

7	6	.	2
+	5	6	.
<hr/>			
1	3	3	.
<hr/>			
1	1	1	



Now it's your turn...

Have a go...

1

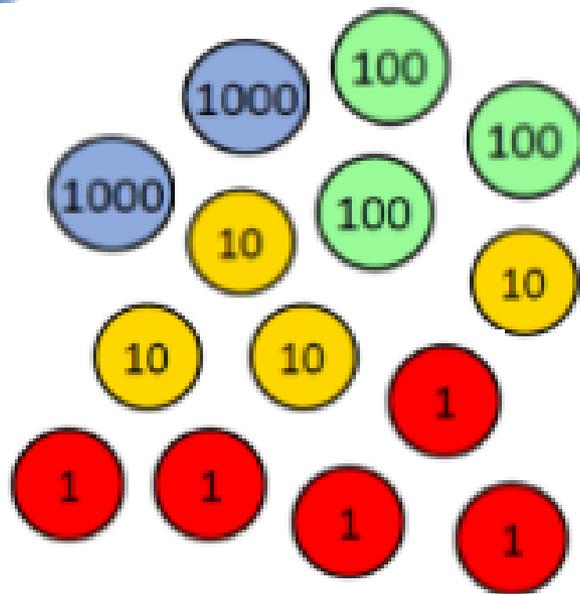
Here is a number. Add 3 thousands to the number.

Which counter did you use?

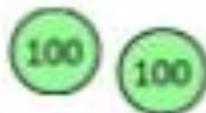
Add 3 hundreds to the number. What number do you have now?

Subtract 3 tens from the number. Which counters do you need to take away?

Add five ones to the number. How many ones do we have? Can we exchange our ones for a ten?



Subtract 2,332 from the number below.



Which questions are easy?
Which questions are hard?

$$8,7273 + 4 =$$

$$8,273 + 4 \text{ tens} =$$

$$8,273 - 500 =$$

$$8,273 - 5 \text{ thousands} =$$

Why are some easier than others?

$$\begin{array}{r} 4 \square 6 \square \\ + 2 5 \square 1 \\ \hline \square 7 8 9 \end{array}$$

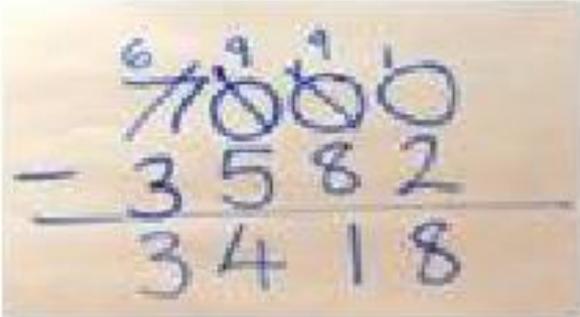
I know...

So...

Sam, Lucas and Jemima are solving the calculation $7000 - 3582$

Here are their methods.

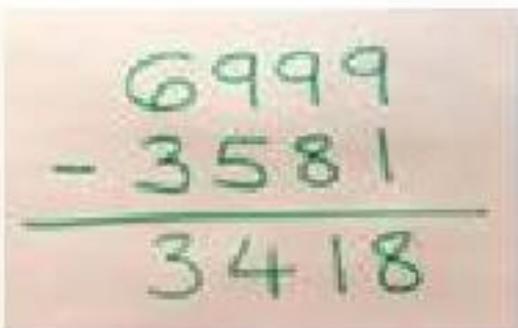
Sam



Sam's method shows the subtraction $7000 - 3582$ using a standard column method. The number 7000 is written with a 6 above the 7 and 9s above the zeros. The number 3582 is written below it. A horizontal line is drawn under 3582. The result 3418 is written below the line. The 7000 is crossed out with a large 'X'.

$$\begin{array}{r} \overset{6}{\cancel{7}}\overset{9}{\cancel{0}}\overset{9}{\cancel{0}}\overset{0}{\cancel{0}} \\ - 3582 \\ \hline 3418 \end{array}$$

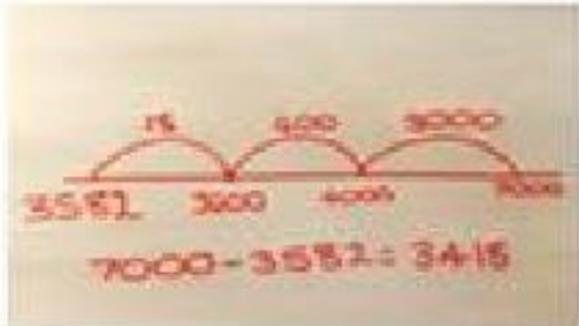
Lucas



Lucas's method shows the subtraction $7000 - 3582$ using a compensation method. The number 6999 is written in green above the number 3581, also in green. A horizontal line is drawn under 3581. The result 3418 is written below the line.

$$\begin{array}{r} 6999 \\ - 3581 \\ \hline 3418 \end{array}$$

Jemima



Year 5

- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition)
- Add and subtract numbers mentally with increasingly large numbers
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Year 5

Building on Y4 strategies of adding up to 4 digits using column addition, move to adding up to numbers within 1 million.

Written methods

$$\begin{array}{r} \text{TTH TH H T O} \\ 3 \ 1 \ 2 \ 7 \ 8 \\ + \ 1 \ 2 \ 1 \ 8 \ 2 \\ \hline 4 \ 3 \ 4 \ 6 \ 0 \end{array}$$

1 1

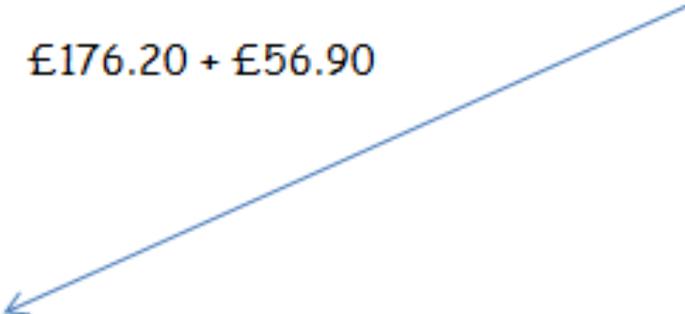
$$\begin{array}{r} 1 \ 7 \ 6 \ . \ 2 \\ + \ 5 \ 6 \ . \ 9 \\ \hline 2 \ 3 \ 3 \ . \ 1 \\ 1 \ 1 \ 1 \end{array}$$

Formal written method

TH TH H T O labelled in columns.

One digit per square

Calculate from the ones column

$$£176.20 + £56.90$$


Year 6

- Solve addition multi-step problems in contexts, deciding which operations and methods to use and why

Year 6

Building on Y5 strategies of adding numbers within 1 million move to adding within 10 million.

$$\begin{array}{r} 522486 \\ 232173 \\ + 21561 \\ \hline 776220 \\ 121 \end{array}$$

Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.

Calculating decimals to three decimal places

$$\begin{array}{r} 0.432 \\ 1.215 \\ + 0.136 \\ \hline 1.783 \\ \hline \times \end{array}$$

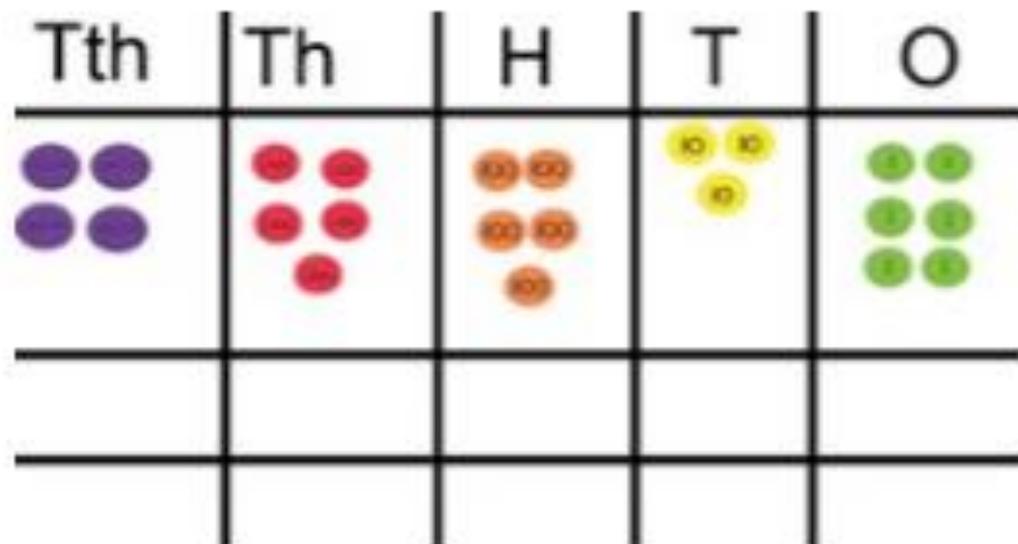
Now it's your turn...

Solve:

4,434

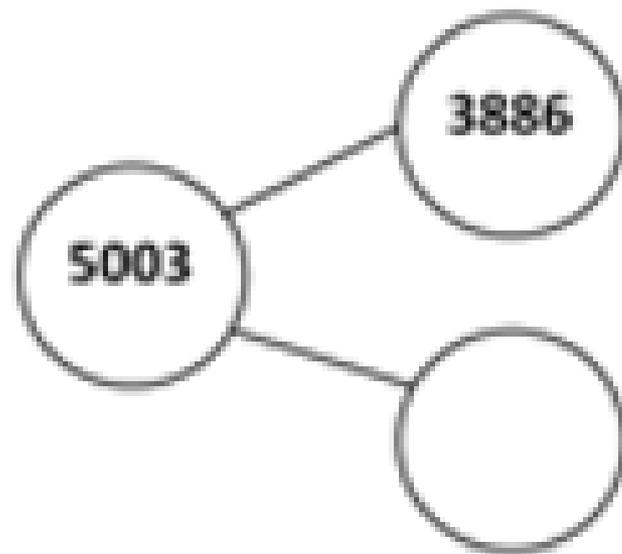
+3,325

$$45,536 - 8,426$$



Find the missing numbers.
What methods did you use?

3465	
2980	



Complete the bar model.

27,492		
15,263	?	5,703

How can I help my child at home? Mathematics

- count anything and everything;
- skips, jumps, claps, pasta shapes, trees, red cars etc.
- count backwards from a number to zero
- count in 2s, 5s 10s 20s $\frac{1}{2}$ s etc. whilst walking to school climbing the stairs, playing on the swing or trampoline etc
- play games with dice:
- throw a dice and double the number
- add ten to the number
- throw two dice and add or subtract the numbers
- throw two dice and you can add the numbers together if they are both even or both odd
- play a game using one dice and double the number if odd and halve the number if even.

How can I help my child at home? - Mathematics

- Play games with dominoes:
- add the dots on each side of the domino
- find dominoes with the same number of dots on each side
e.g. double 4 is 8,
- find dominoes with an odd/even number of dots
- find as many dominoes as you can with the same number of dots, (6 and 1 has the same number of dots as 3 and 4) etc.
-
- Put marbles in two containers. Say how many marbles are in the boxes in total and the child works out the possibilities for each box i.e. 8 marbles altogether so could be $7 + 1$, $6 + 2$, $5 + 3$, $4 + 4$ etc.

How can I help my child at home? - Mathematics

- Get to know money;
- recognise coins,
- sort coins,
- find the coin with the highest/lowest value,
- add pairs of coins,
- create a home shop using toys or fruit etc.
- find different coins to give the same value e.g. how many ways can we pay for an item costing 10p? 5p and 5p or 2p + 2p + 2p + 2p + 2p etc.
- Involve children in shopping activities.

- Identify shapes in the environment while in the park or walking to school etc.
- finding the lightest, longest, widest, heaviest etc.

- **Most of all have fun with mathematics.**

Useful websites:

[Maths Frame](#)

My Maths

Hit the Button

Sumdog <https://www.sumdog.com/>

Ixl

For Year 6

[Corbett Maths](#)



Activity ideas



- Draw a line. Mark 0 and 10 (or any number range needed). Roll a dice. Decide where that number would go and write it in. Repeat. This could also be played with playing cards. You can also start at any number and include whatever your child needs, eg decimals or fractions.
- Inbetweenies

39 39.4 40

50

67

Start by asking for a 2 digit number. Place it at the start of the line. Now ask for a higher 2 digit number and place at the end of the line. Now keep asking for numbers in between until you start having to think about decimals and then the fun begins!

Activity ideas



Place Invaders!

You can use a calculator if you like.

Enter a 5 digit number into your calculator ensuring each digit is different. You may not use 0.

When a number is called out, look to see if this digit appears in your number. If it does, you can change that digit to 0 by subtracting the appropriate number using the calculator keys.

The first to reach exactly zero is the winner.

Nice or Nasty!



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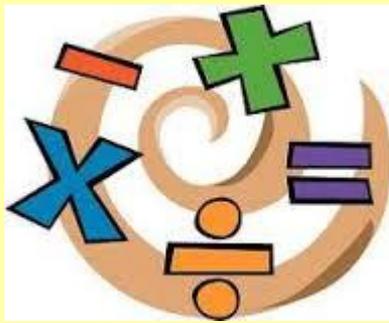
This game can be played in a number of ways, including with decimals. Either play it by seeing who can end up with the highest (or lowest) number. You need to decide beforehand. Using a 1-9 dice, take turns to roll it. Whatever number you land on needs to be placed on one of your squares. If you are making a 3 digit number, for example, and you are seeing who gets the highest number then you would be hoping to place any larger numbers in the hundreds column and smaller ones in the ones column, but you never know what you will roll! You can also play a version where you add numbers and decide on your target total at the start of the game.

Nice version!

Have a target total and the winner is whoever gets closest to that target without going bust.

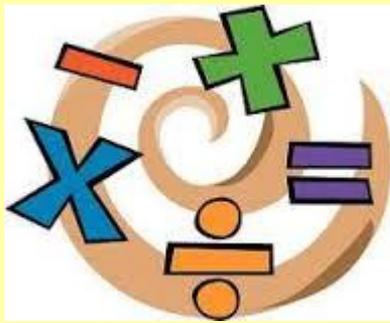
Nasty version!

You are allowed to place digits on your partner's board to make it trickier for them.



Thinking is at the heart of Mathematics and therefore should be at the heart of mathematical teaching and learning.





MATHS PLAYTIME

Q & A with some of the teachers

