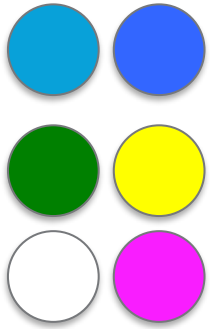
St. Paul's School (Dorking)

WORKSHOP 1

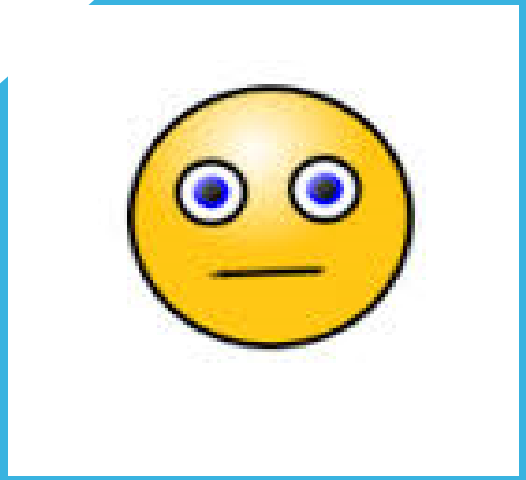
Introduction and Addition / Subtraction

18th January 2024



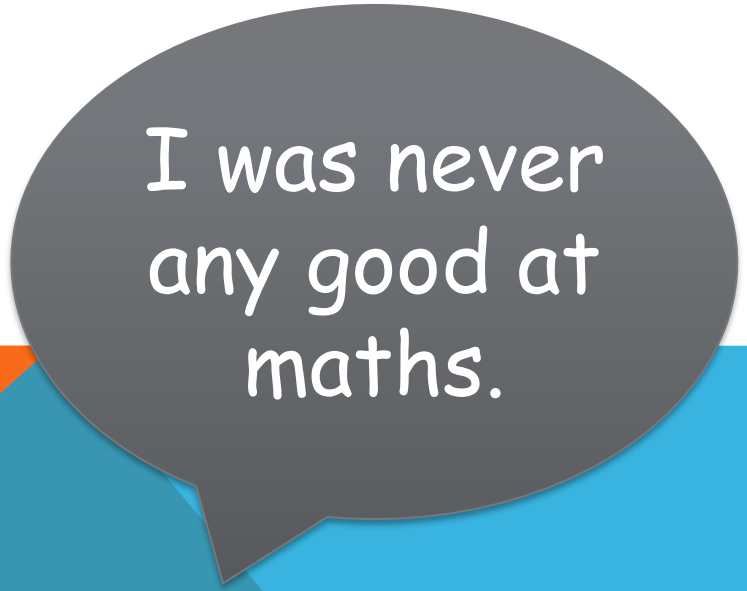
hundreds	tens	ones		tenths	hundredths
			.		
			.		
			.		

On a scale of one to ten, how much do you enjoy mathematics?



Research suggests that as many as 60% of adults would rather clean the toilet than work out a maths problem.

An even larger percentage say:



OWN EXPERIENCE

How we view maths will depend on our own experience at school.

Did you enjoy maths at school?

Did you find it difficult?

Were you encouraged and helped?

MATHS IS IMPORTANT

- It may come as a surprise that almost half of the working-age population (17 million) of England have numeracy skills equivalent to those expected for an 11 year-old child.
- Those adults with at least basic numeracy skills can expect to earn a quarter more than those who lack the necessary skills to solve basic mathematical problems.

NATIONAL CURRICULUM AIMS FOR CHILDREN

To 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

To reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

Can solve problems by *applying* their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

At St. Paul's we aim for our children:

- to be an active participant in their own learning.
- To be confident and numerate.
- to be *fluent* in their mathematics at the appropriate level.
- to be able to *reason* about their learning using the correct mathematical vocabulary.
- to be able to *apply* their skills and knowledge as they progress, through *sustainable* learning.
- *to develop an appreciation that mathematics is a key skill that equips them for life.*
- To *enjoy* mathematics

AIMS FOR THE WORKSHOP TODAY

To understand how maths is taught in EYFS. (Early Years / Reception)

To understand how maths is taught in KS1 and KS2.

To look at some of the strategies used in school for addition and subtraction.

To ask questions.

MATHS AT ST. PAUL'S

- Taught regularly each week.
- Follow White Rose maths scheme.
- Small steps in learning

- Follow the approach:

Concrete – use of equipment
Pictorial – drawing pictures and diagrams to support
Abstract – calculations. (formal addition / subtraction)

I DO WE DO YOU DO

TYPICAL MATHS LESSON

Children explained the small step of learning

Review of previous learning – STARTER

Whole class work on new small step – this includes teacher instruction, whiteboard work

Independent task – children practise the skill covered in whole class input. Teacher / LSA works with group.

Review – this will include review of work.

TYPICAL MATHS LESSON

Our aim is to provide a solid understanding of a concept by:

Fluency – practising the basic skill.

Reasoning – explaining why a calculation is correct / incorrect.

Problem Solving – deeper understanding through word problems and stories.

It is crucial that children can explain their thinking using the appropriate vocabulary. This not only embeds their own learning but supports the learning of others through hearing quality explanation.

HOW DO WE HELP CHILDREN WHO FIND MATHS CHALLENGING?

Pre-teaching

Equipment in lesson

Use of an adult to support

Our aim is always to ensure all children access the same small step with scaffolding if required.

FOCUS FOR THIS YEAR

To ensure children enjoy maths learning.

To develop further the use of equipment.

The use of visual images and practical resources is also crucial to the conceptual understanding of mathematics and supports children's talk.

CHILDREN NEED TO LEARN MATHEMATICS IN A SENSORY WAY.

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

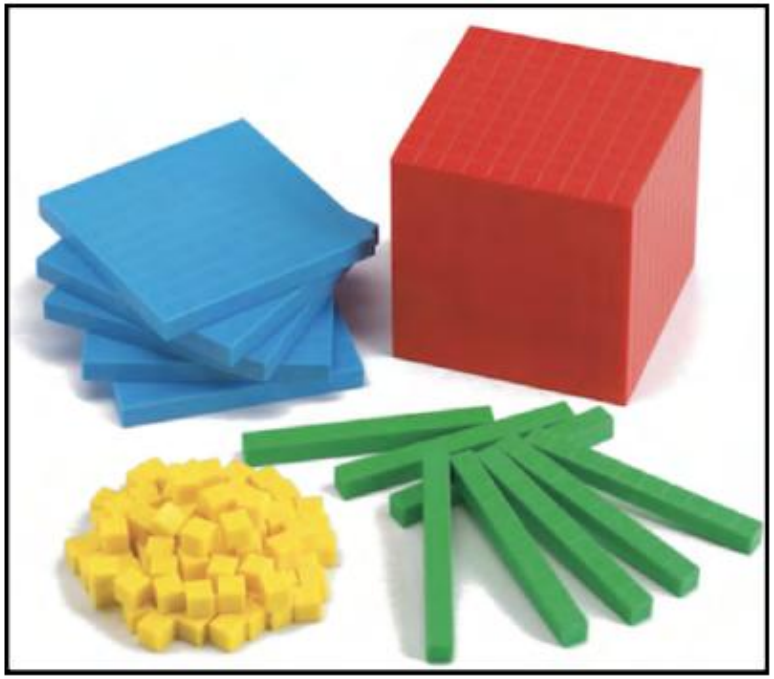
– Old Chinese proverb, sometimes attributed to Confucius

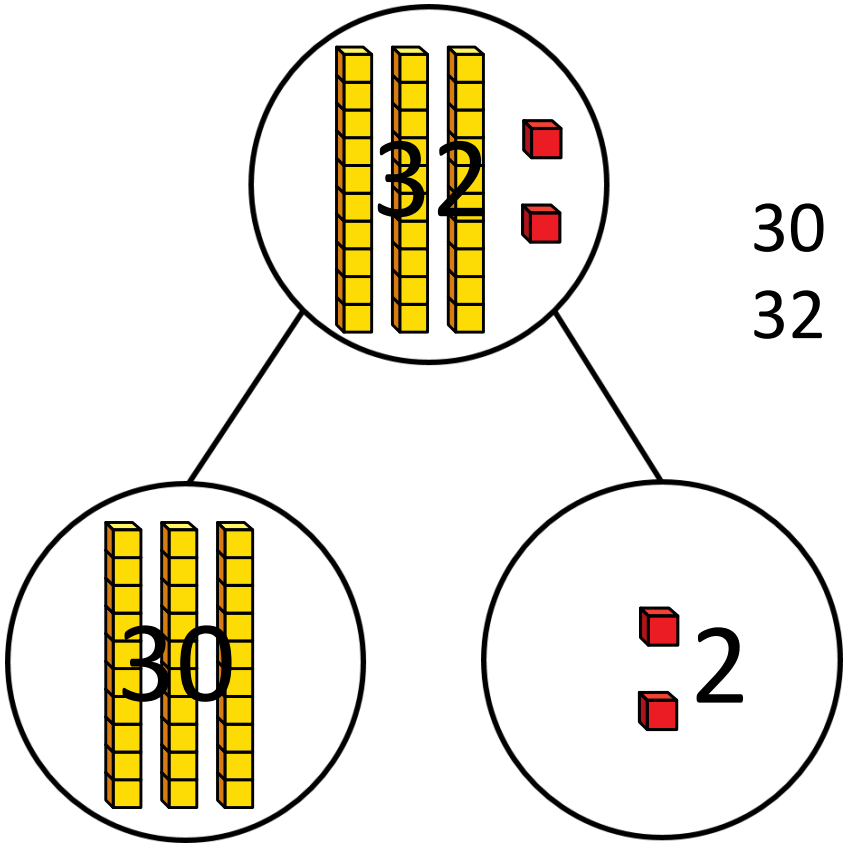
Each year before the teaching of addition and subtraction, teachers will spend time exploring place value.

Place value means understanding number.

Partitioning.

BASE 10 / DIENES





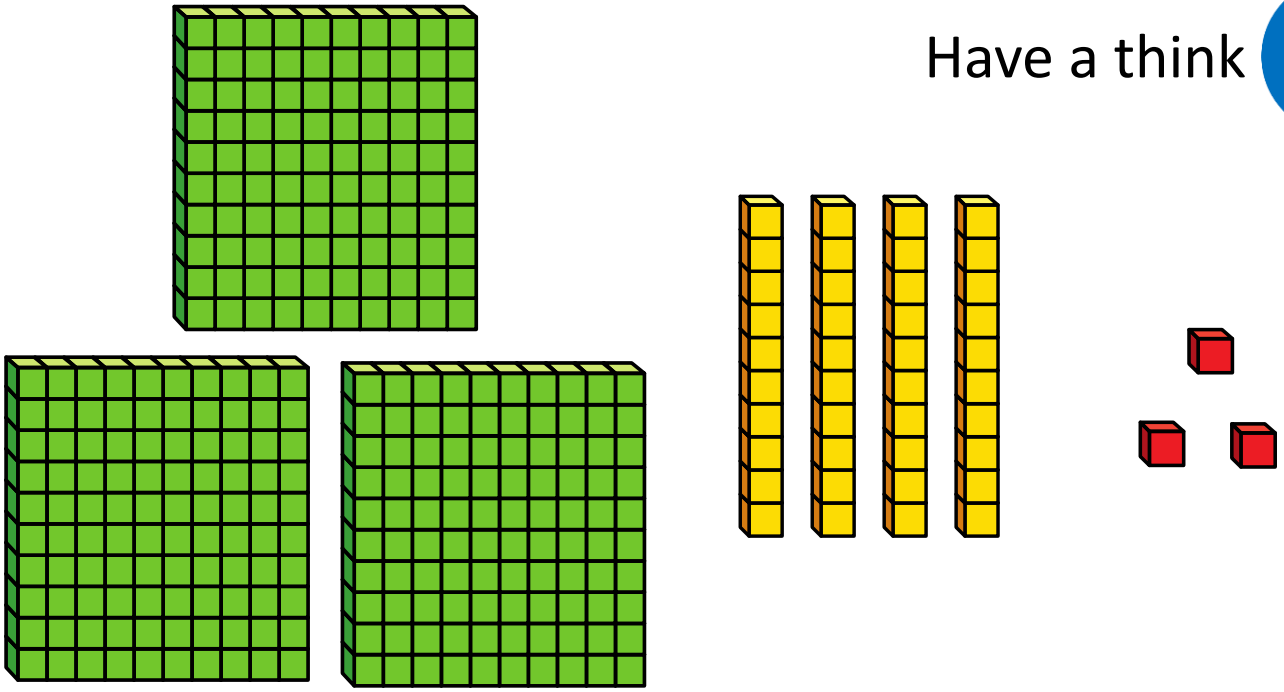
$30 + 2 = 32$

$32 = 30 + 2$

There are _3_ tens and _2_ ones.

The whole is _32_ One part is _30_ The other part is _2_

Have a think



There are 3 hundreds, 4 tens and 3 ones. The number is 343

343 = 300 + 40 + 3

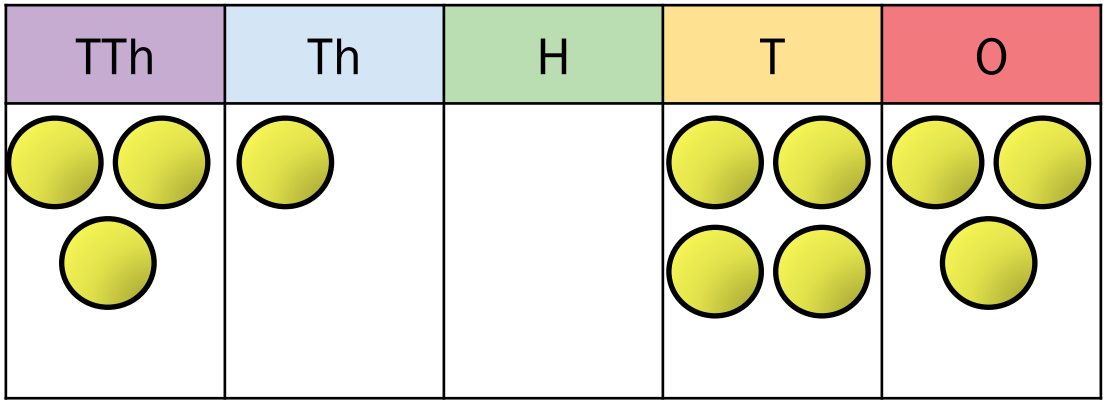
Can you make me the number 26 using the dienes?

Can you make the number 32 using the dienes?

How many tens in 26? Show me.

What is the value of the 2 tens? 10 / 20

1) Draw counters to represent 31,043

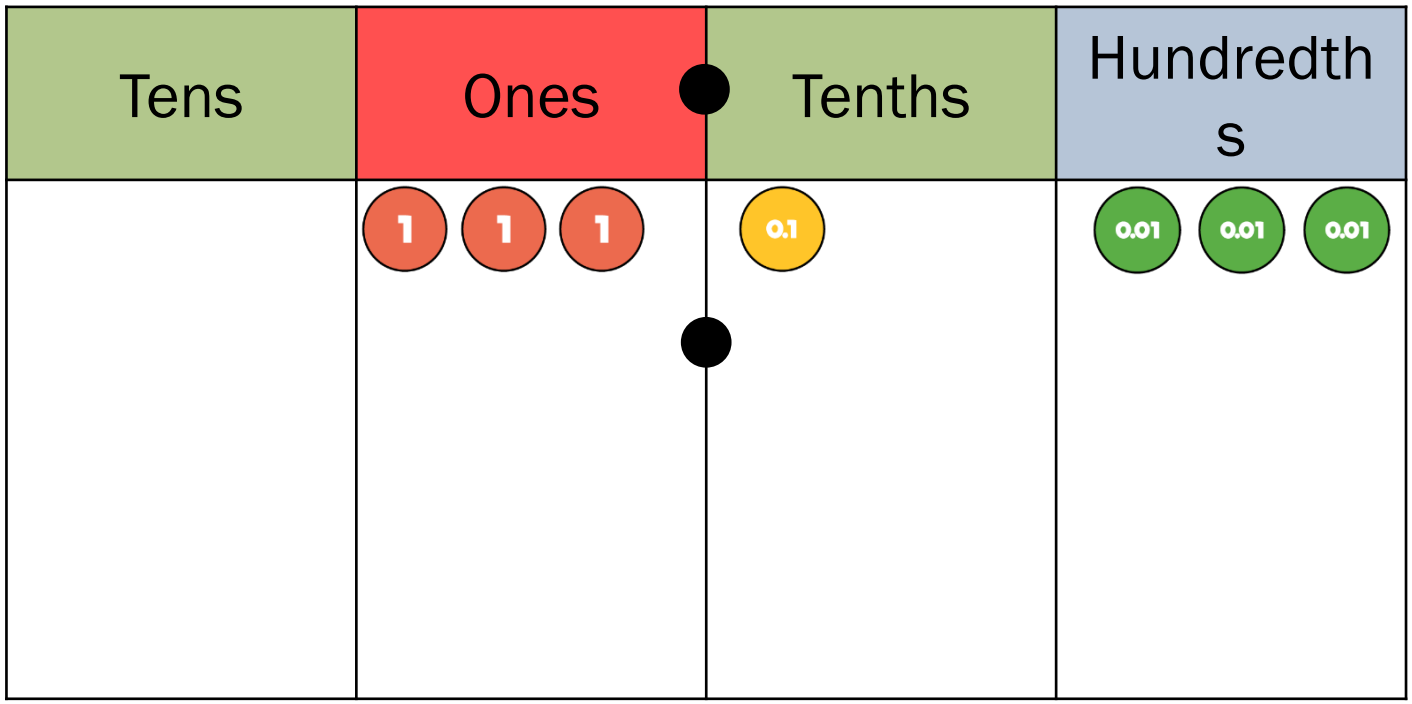


2) Complete the number sentence.

42,305 = 40,000 + 300 + 2,000 + 5

3) What is the value of the digit 2 in 52,301?

Two thousand / 2,000



There are ☐ ones, ☐ tenth and ☐ hundredths.

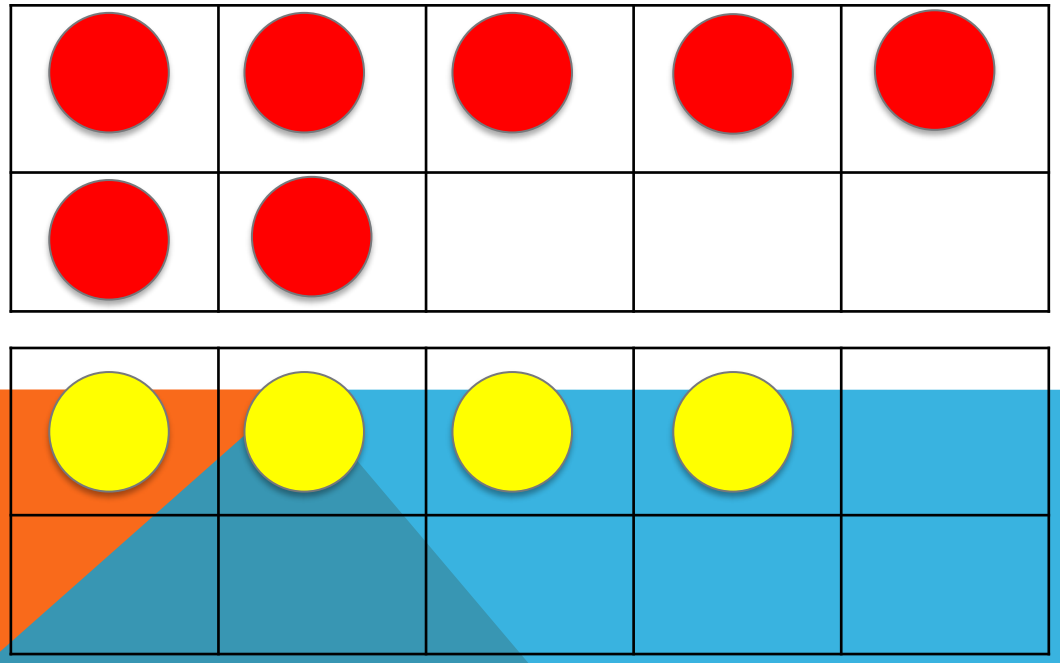
The number is ☐

Addition through the years

ADDITION: REGROUPING TO MAKE 10

Solve... 7 + 4

Model



Calculations

7 + 4 = 11

You try:

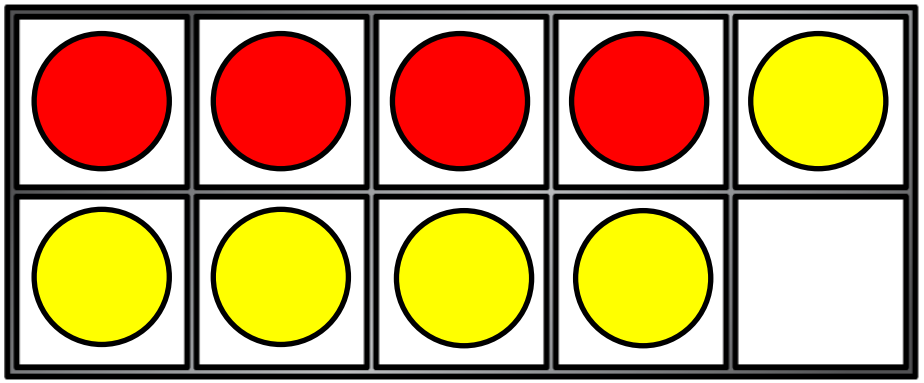
5 + 8 =

6 + 5 =

There are four red cars and five yellow cars in a car park.

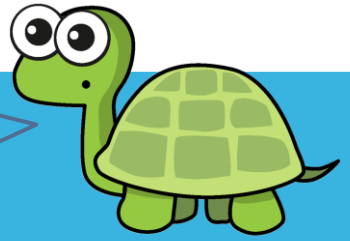
How many cars are there altogether?

9 cars

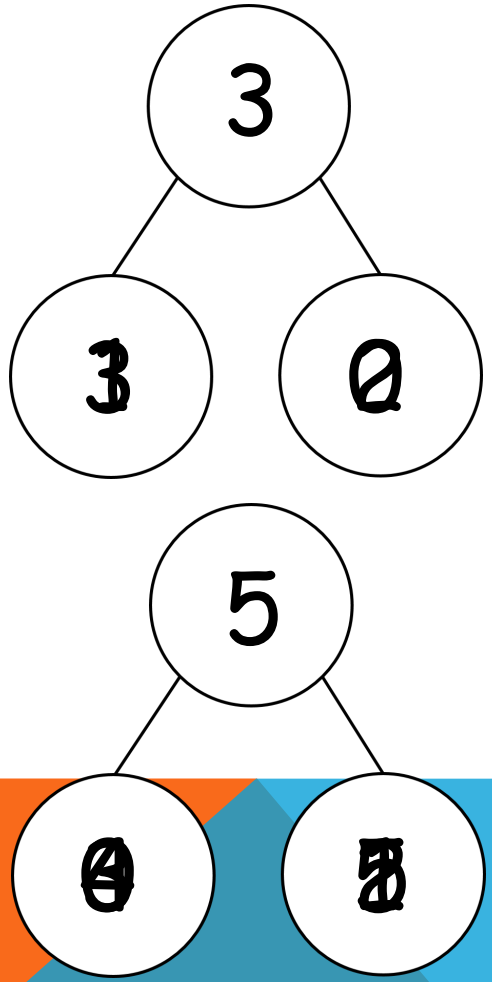


$4 + 5 = 9$

There is one space so there must be 9 cars in total.



What bonds can you find?



$1 + 2$ $2 + 1$

$3 + 0$ $0 + 3$

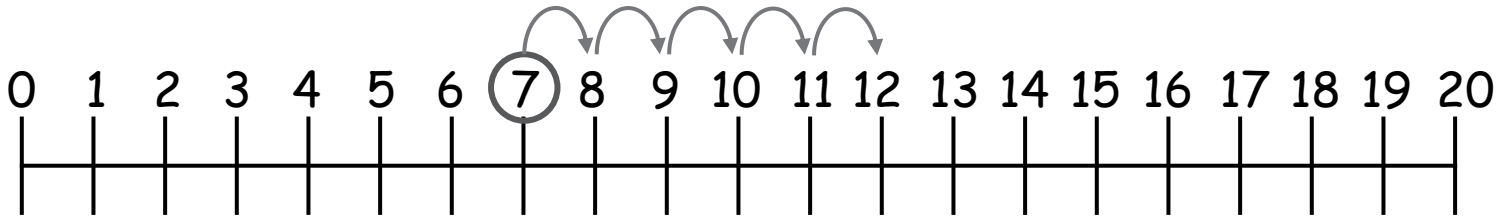
$4 + 1$ $1 + 4$

$3 + 2$ $2 + 3$

$0 + 5$ $5 + 0$

Have a think

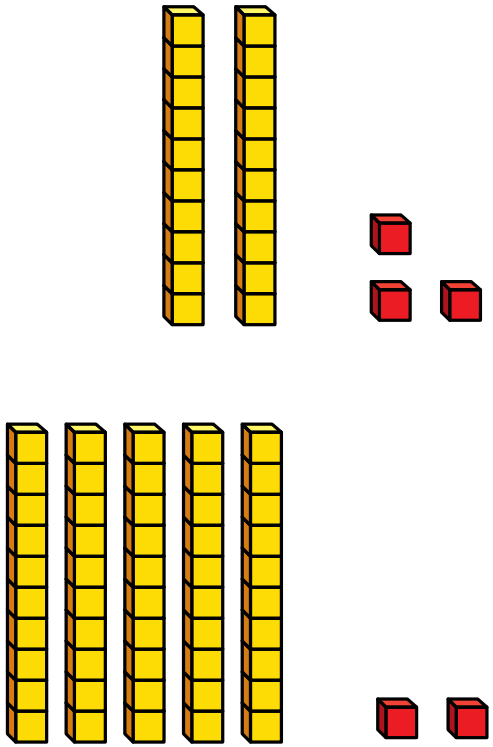
Mo starts counting at 7
and counts on 5



To work out 7 + 5, I will count on
from 7

7 + 5 = 12

Use base 10 to calculate 23 + 52

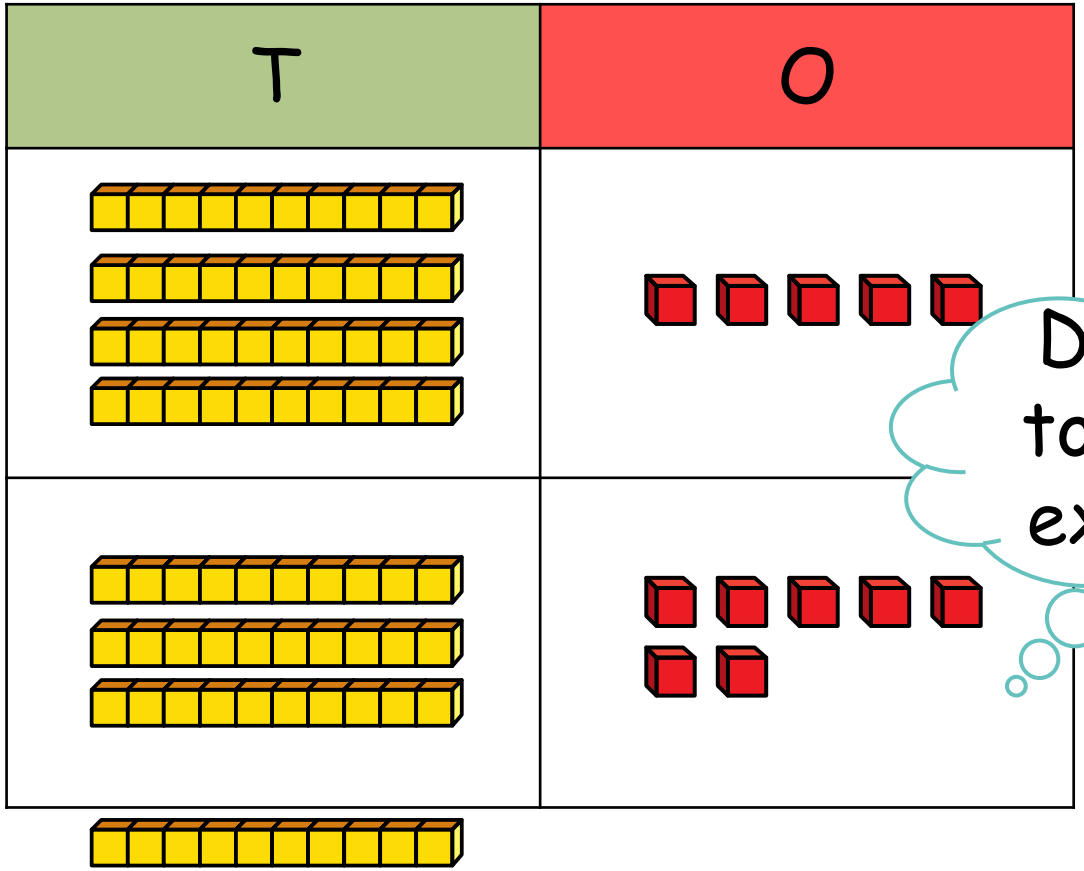


Tens	Ones
7	5

23 + 52 = 75

Have a think

Use base 10 to calculate 45 + 37

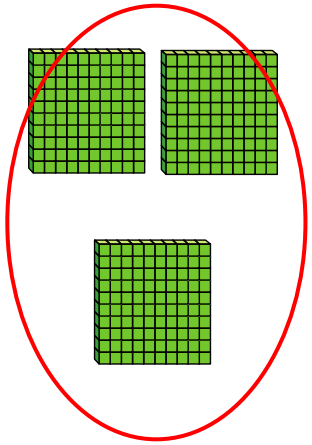
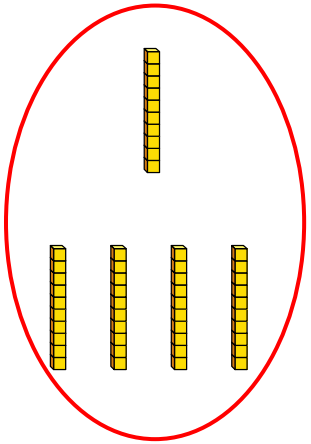
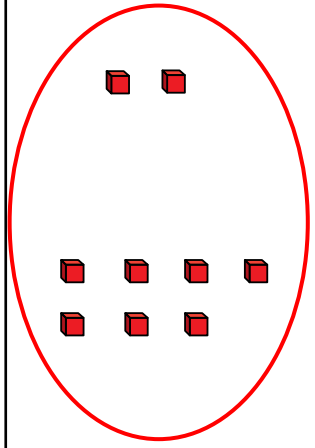


There are 8 tens and 2 ones.

45 + 37 = 82

Have a think

$212 + 147 = 359$

	Hundreds	Tens	Ones
+			
	3	5	9

	H	T	O	
	2	1	2	
+	1	4	7	
	3	5	9	

Have a think

$$351 + 213 = 564$$

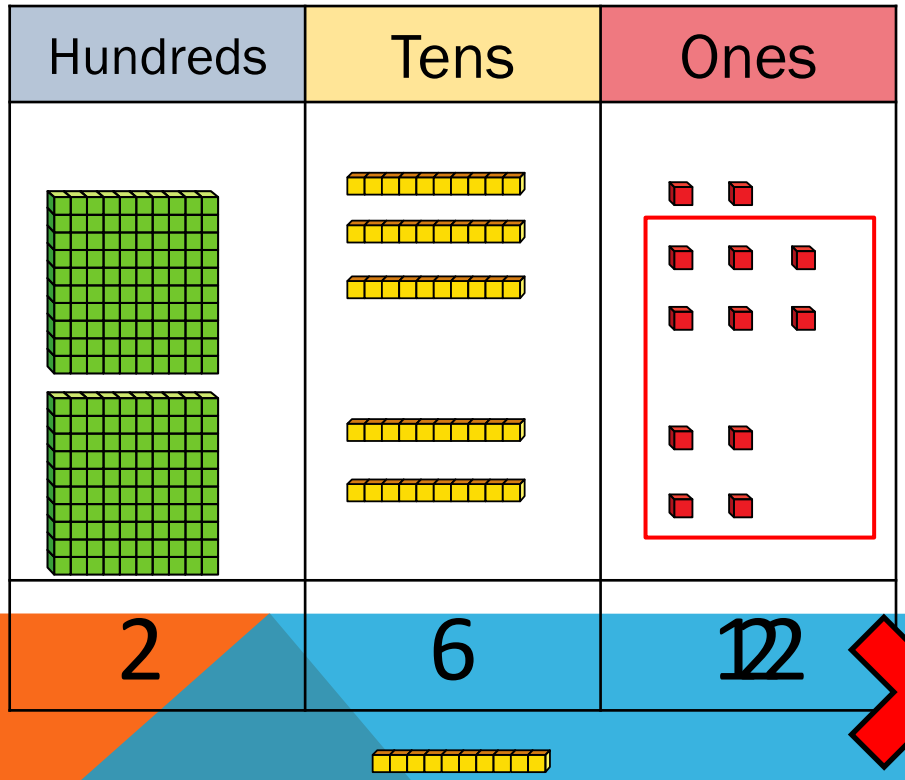
	Hundreds	Tens	Ones
	100 100 100	10 10 10	1
+	100 100	10 10	
		10	1 1 1
	5	6	4

	H	T	O
	3	5	1
+	2	1	3
	5	6	4

Mr Rose earns £138 on Monday.

He earns £124 on Tuesday.

How much does he earn in total? £262

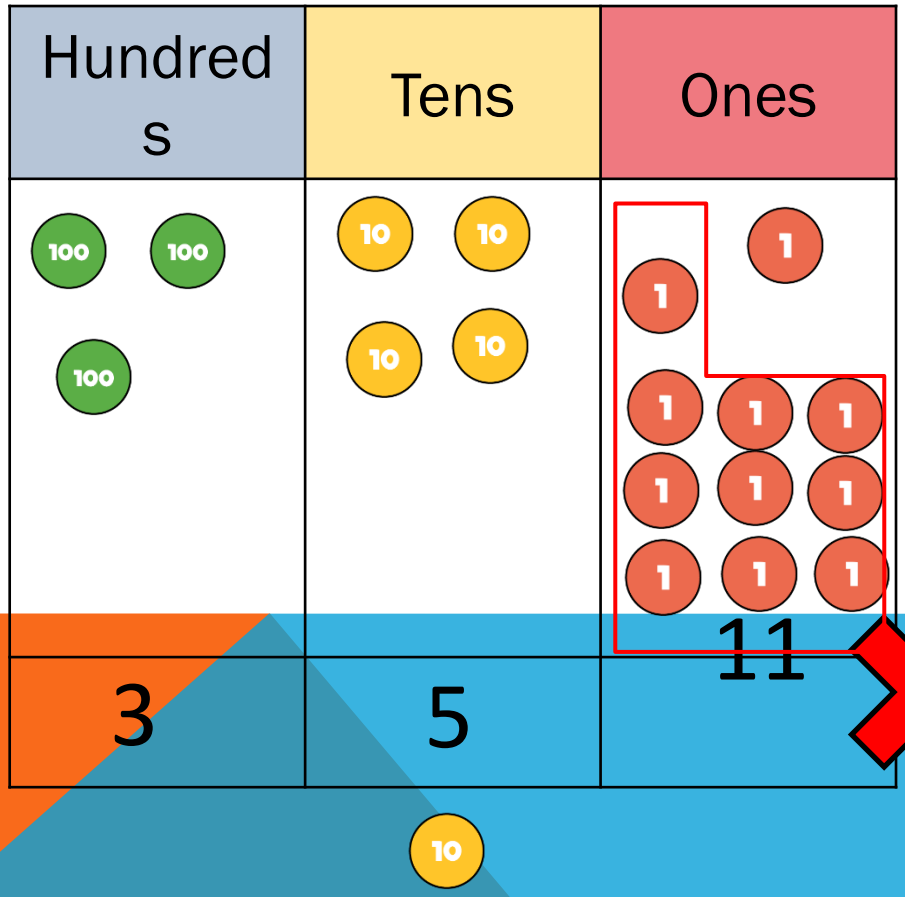


	H	T	O	
	1	3	8	
+	1	2	4	
	2	6	2	
		1		

Mo scores 243 points in a game.

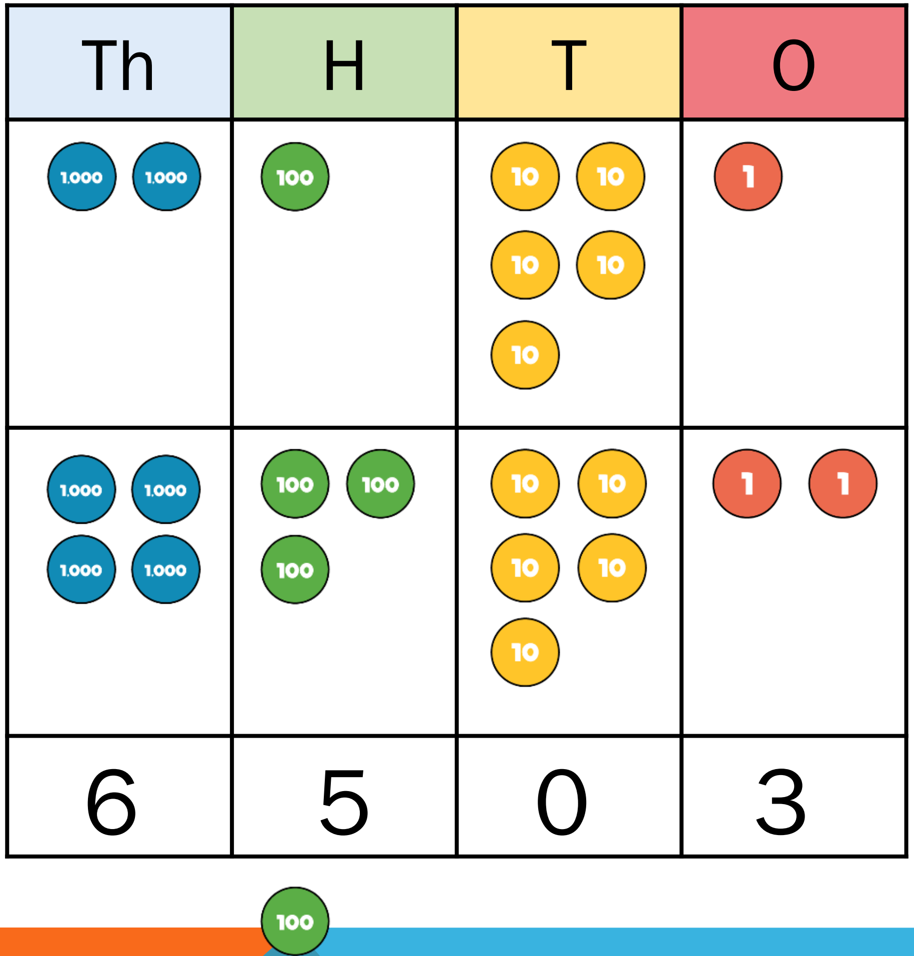
Eva scores 108 points in a game.

How many do they score in total? 351



	H	T	O	
	2	4	3	
+	1	0	8	
	3	5	1	
		1		

Have a think



	2	1	5	1	
+	4	3	5	2	
	6	5	0	3	
		1			

I have 5 hundreds, so I do not need to make an exchange.

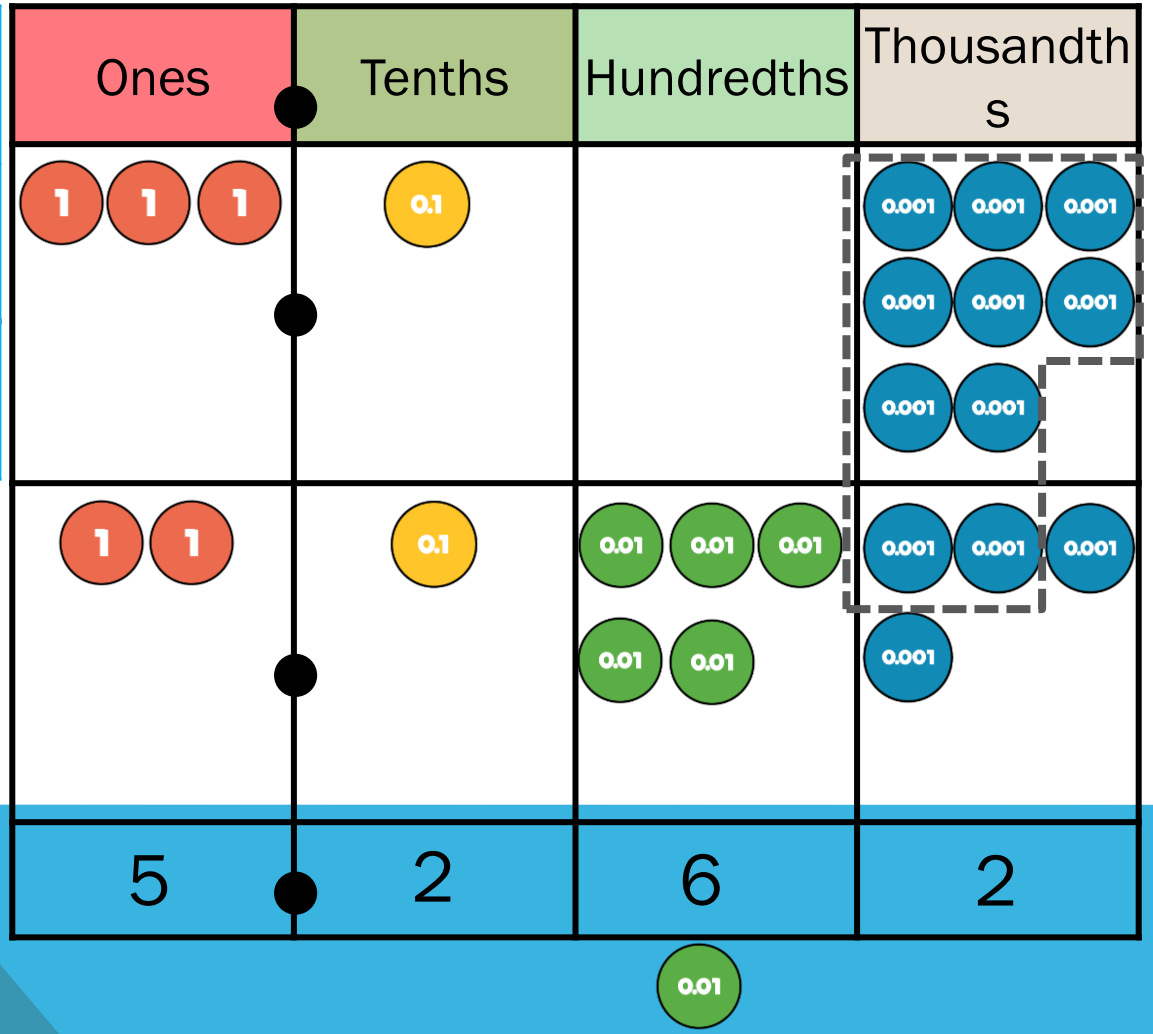
$3.108 + 2.154 = 5.262$

Have a think

Which columns will involve an exchange?

	3.	1	0	8
+	2.	1	5	4
	5.	2	6	2

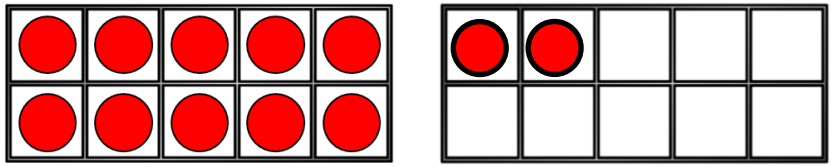
1



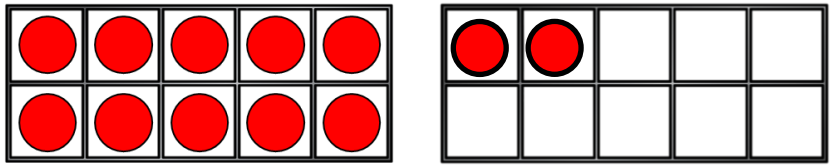
Subtraction through the years

1) 12 – 2 = ____

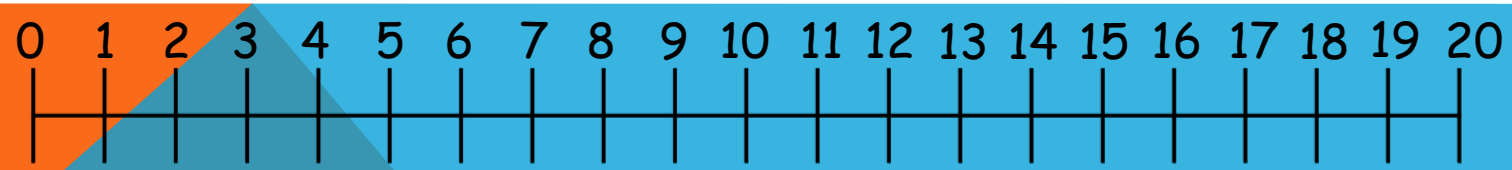
2) 12 – 7 = ____



3) 12 – 4 = ____

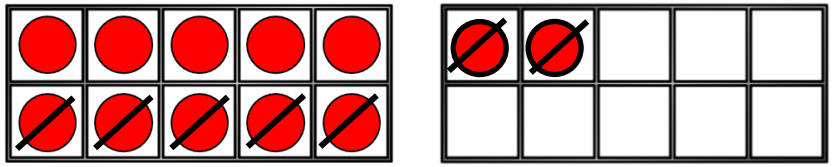


4) Use the number line to work out 13 – 6

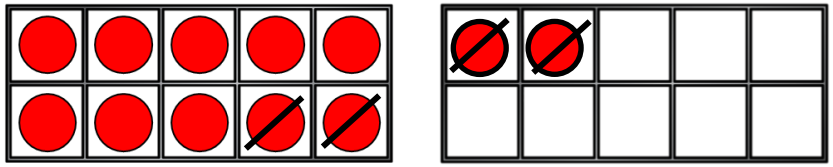


1) $12 - 2 = \underline{10}$

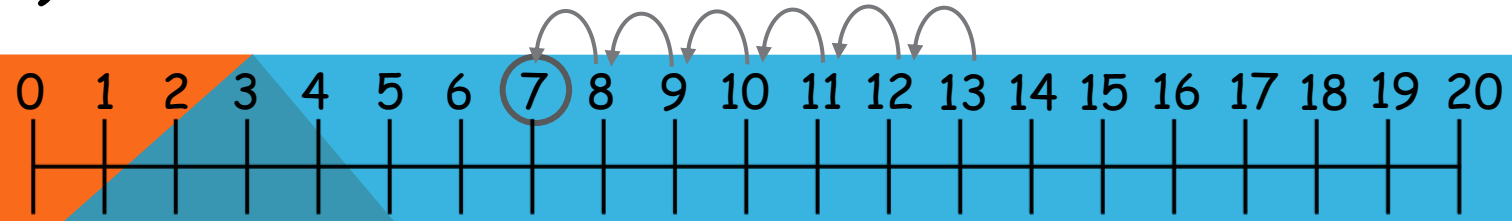
2) $12 - 7 = \underline{5}$

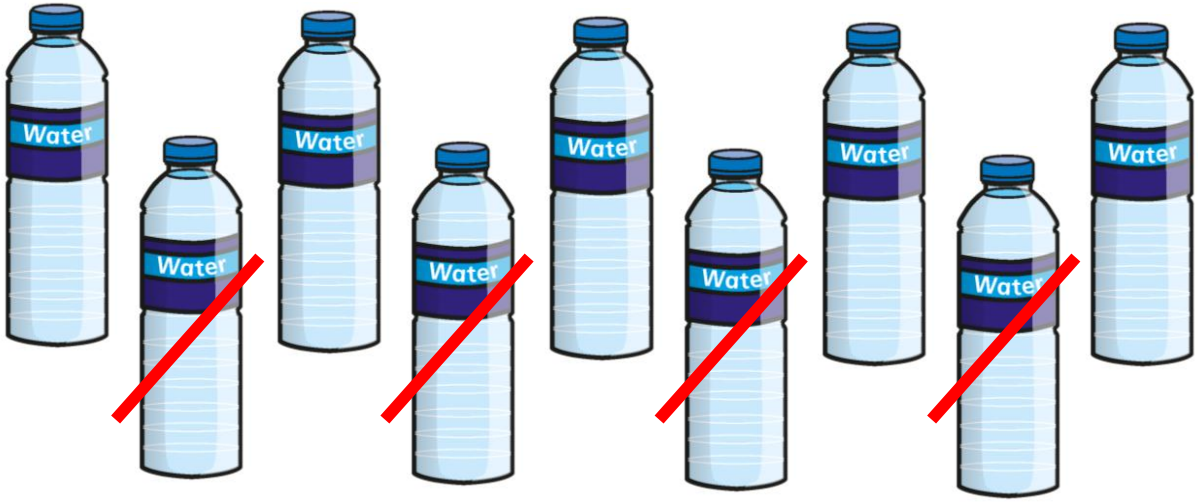


3) $12 - 4 = \underline{8}$



4) Use the number line to work out $13 - 6$





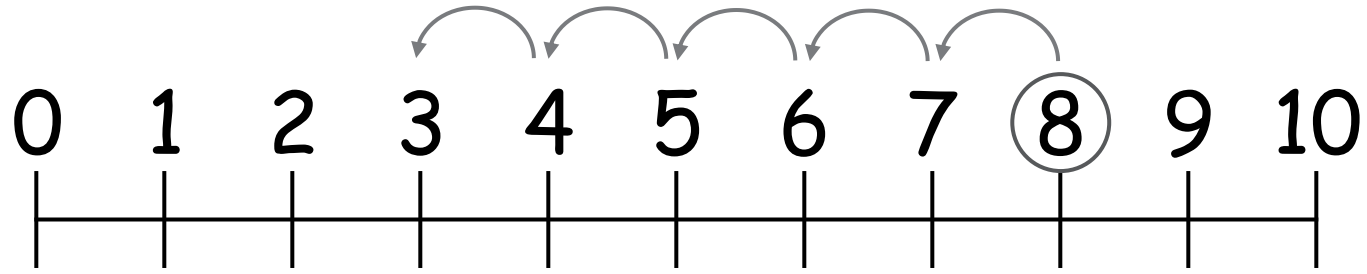
First there were 9 bottles of water.

Then 4 bottles were drunk.

Now there are 5 bottles of water.

Have a think

$$8 - 5 = 3$$



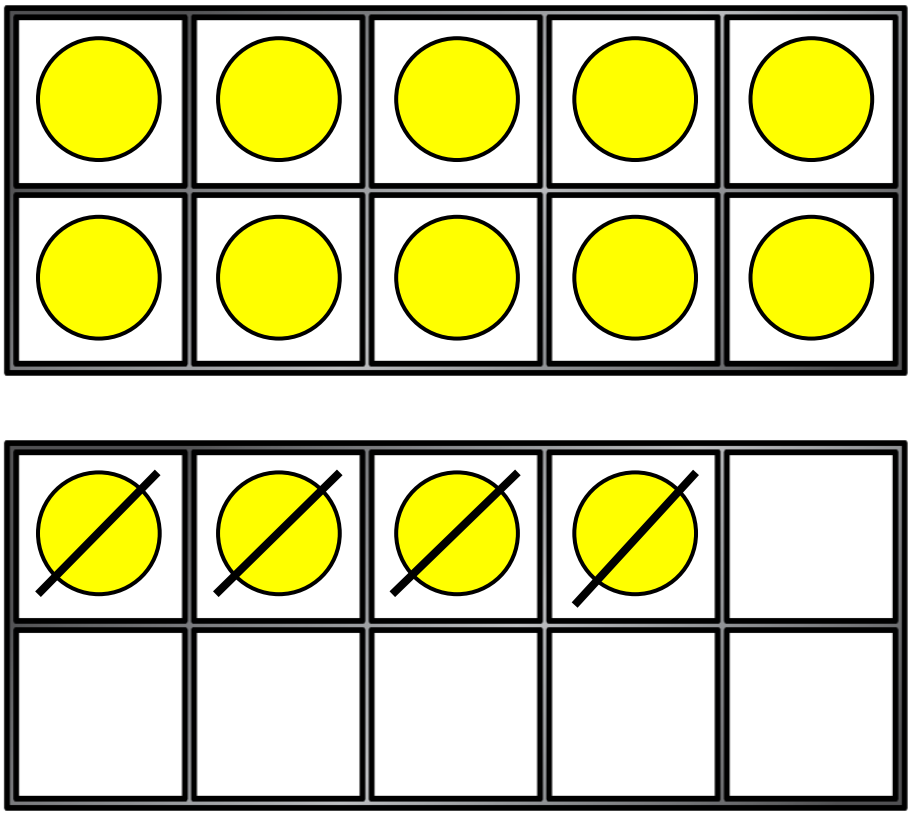
I need to start from 8

I need to make 5 jumps backwards.

I land on 3

Have a think

$14 - 4 = \square$

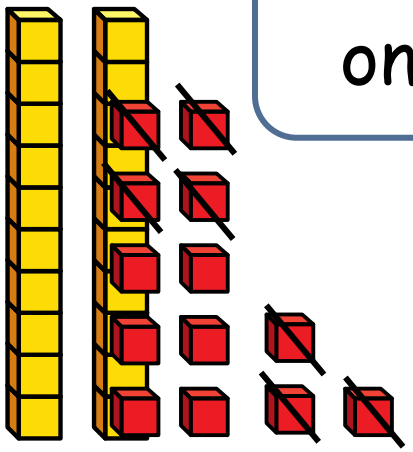


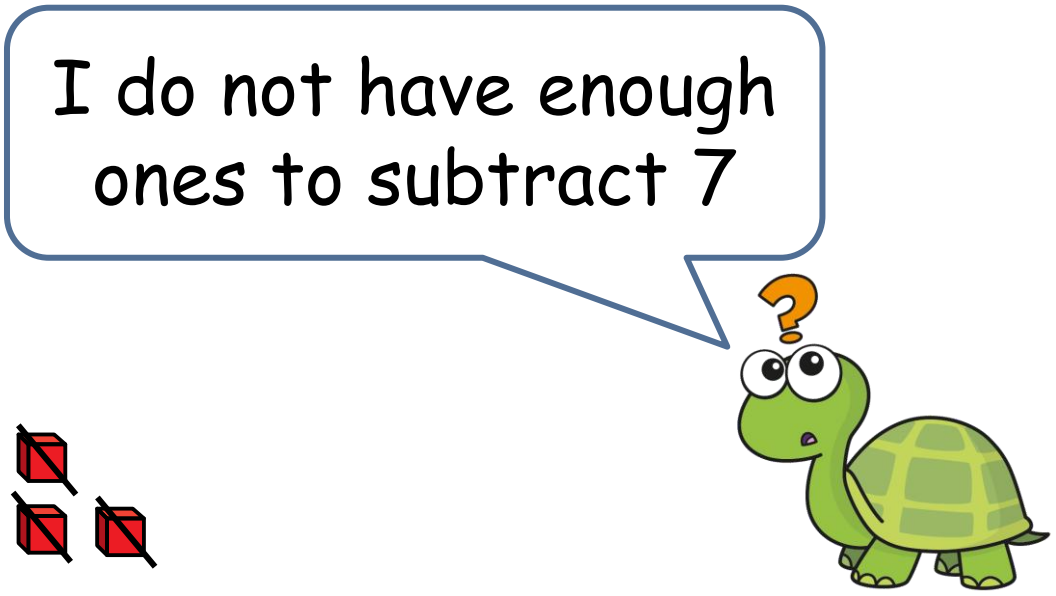
Have a think

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Tiny is calculating 23 – 7 using base 10

$$23 - 7 = 16$$

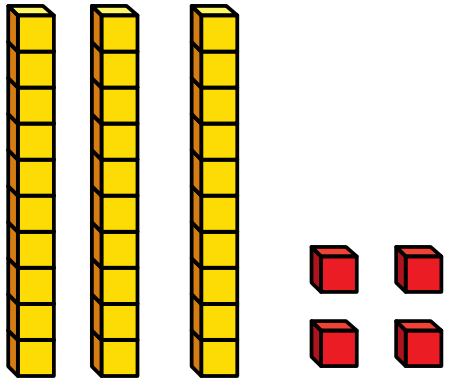




What could Tiny do?

Have a think

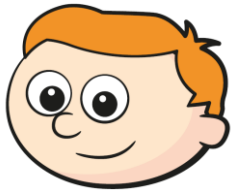
Ron uses base 10 to make this number.



What number has Ron made? 34

Ron wants to subtracts 5 ones.

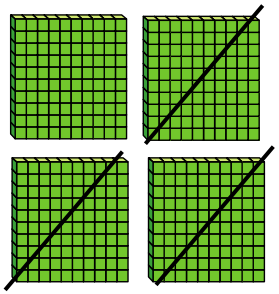
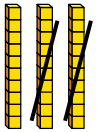
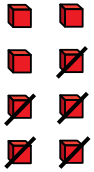
I cannot do this.
There are only 4 ones.



Ron

What should Ron do?

$$438 - 325 = 113$$

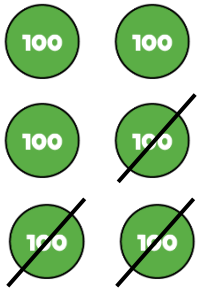
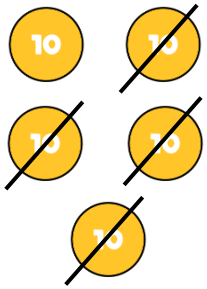
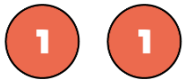
Hundreds	Tens	Ones
		
1	1	3

	H	T	O
	4	3	8
−	3	2	5
	1	1	3

Do we need to make an exchange?

Have a think

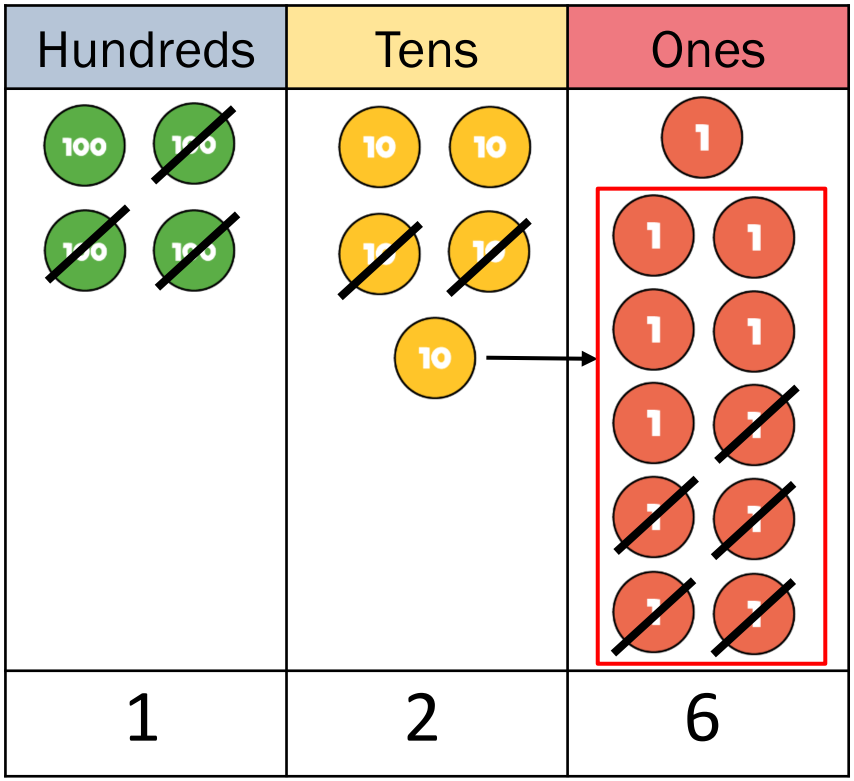
$$652 - 340 = 312$$

Hundreds	Tens	Ones
		
3	1	2

	H	T	O
	6	5	2
−	3	4	0
	3	1	2

Do we need to make an exchange?

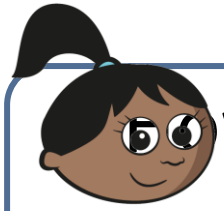
$451 - 325 = 126$



	H	T	O
	4	^{4}~~5~~	^{1}1
−	3	2	5
	1	2	6

I will exchange 1 ten for 10 ones.

Have a think



How do you know when an exchange is needed?

If you have enough ones, you do not need to make an exchange.

I will exchange 1 ten for 10 ones.

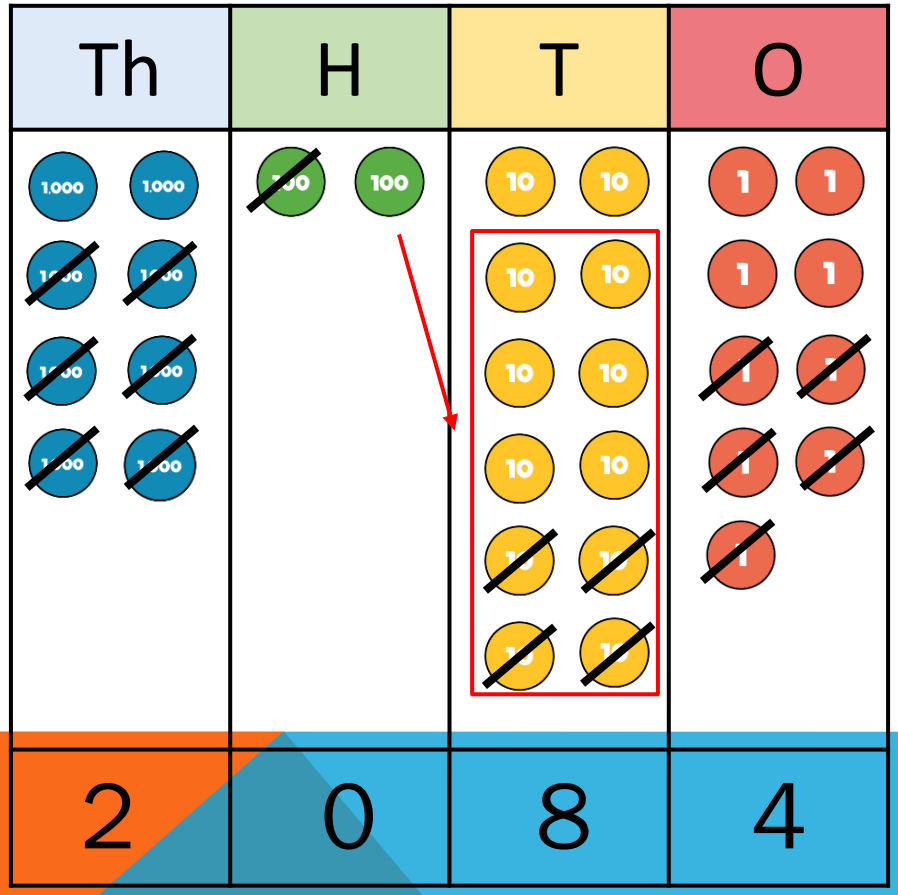
	H	T	O
	2	3	4
−	1	2	3
	1	1	1

	H	T	O
	2	$^{2}\not{3}$	$^{1}4$
−	1	2	5
	1	0	9

4 ones subtract 3 ones is equal to 1 one.

8,229 – 6,145 = 2,084

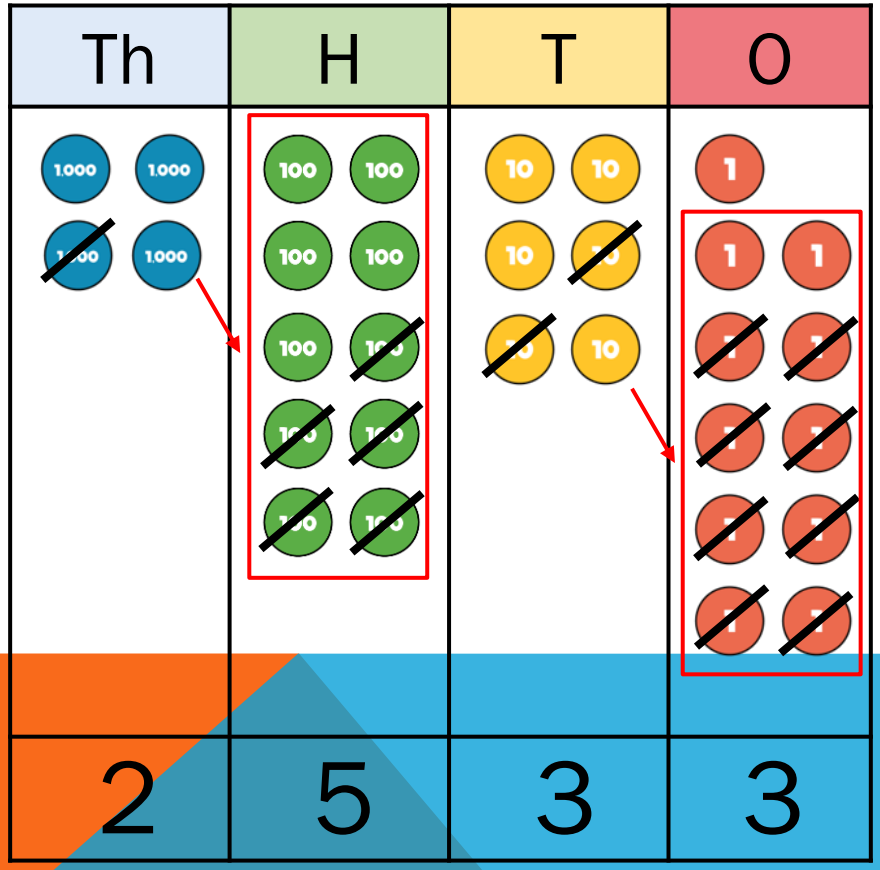
Have a think



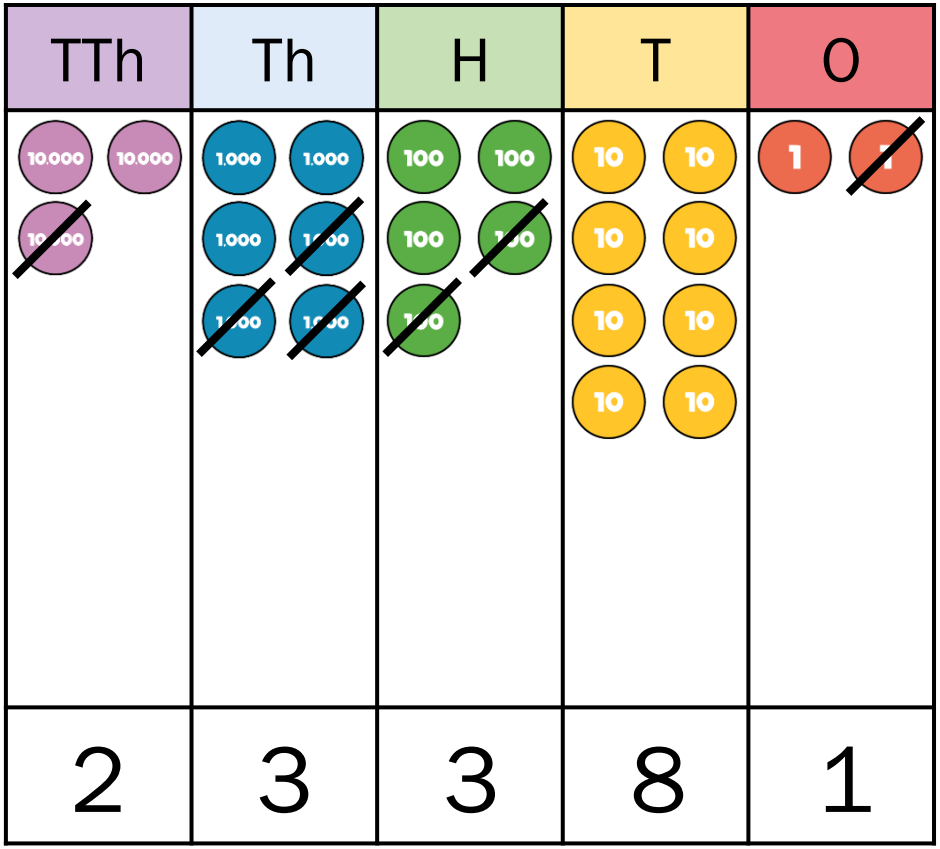
	8	~~2~~ 1	~~2~~ 1	9	
–	6	1	4	5	
	2	0	8	4	

4,061 − 1,528 = 2,533

Have a think

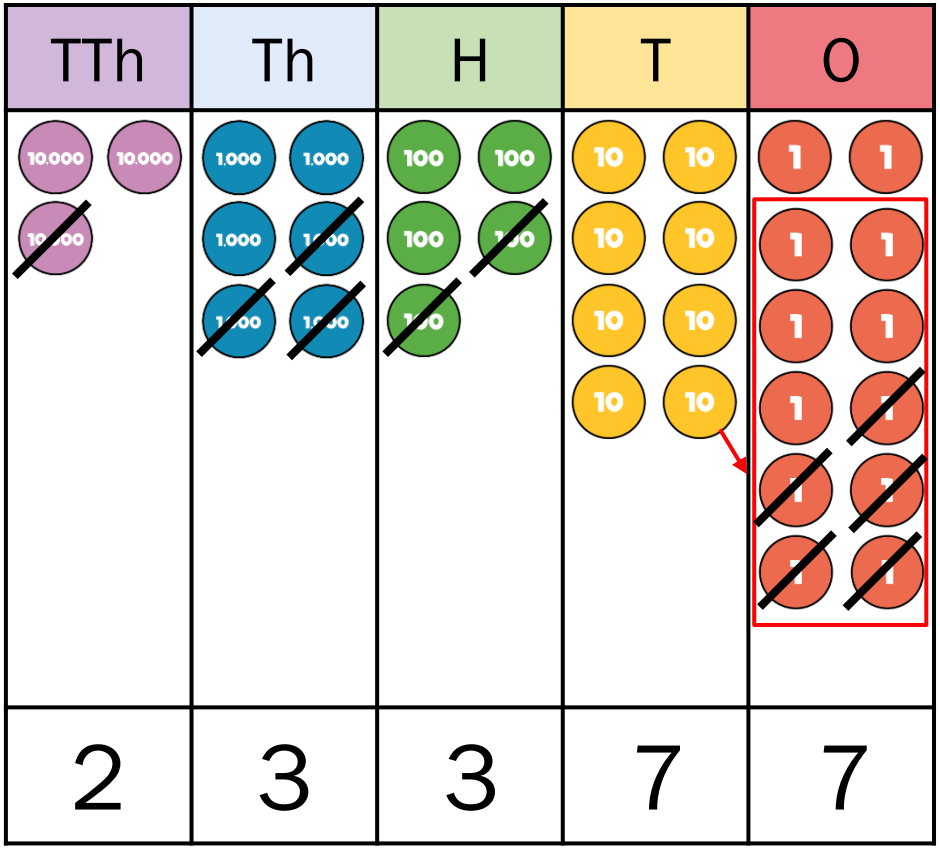


	$^{3}\not{4}$	$^{1}0$	$^{5}\not{6}$	$^{1}1$	
−	1	5	2	8	
	2	5	3	3	



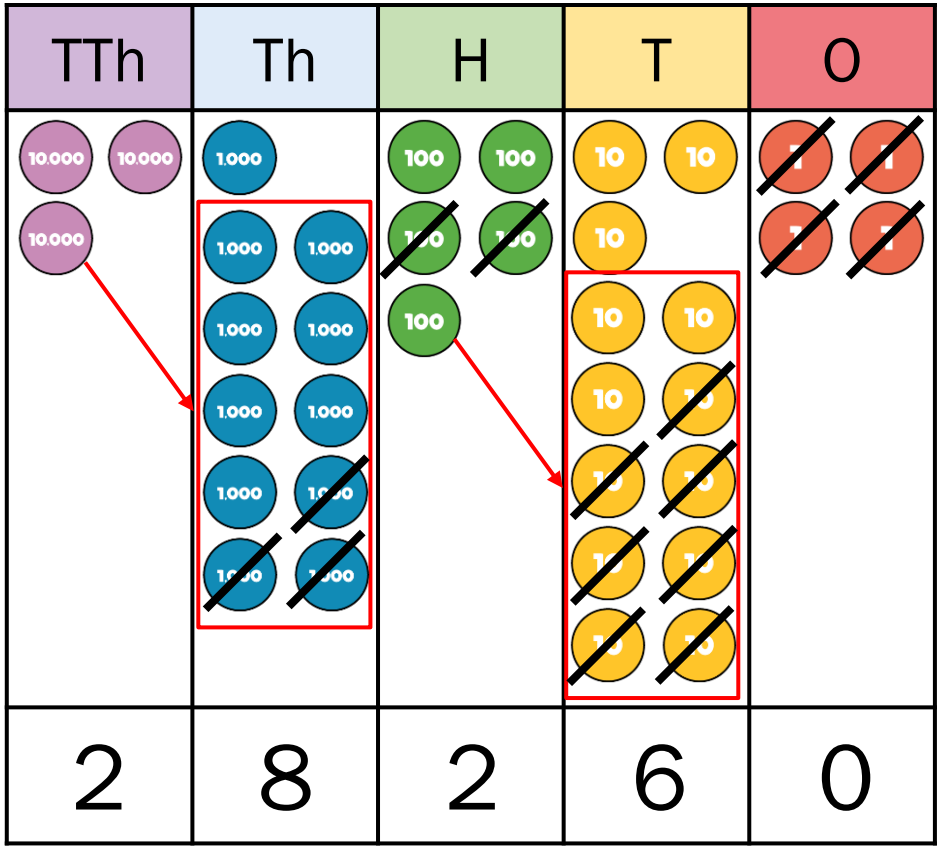
		3	6	5	8	2	
	–	1	3	2	0	1	
		2	3	3	8	1	

In column subtraction we start with the place value column that has the smallest value.



					7		
		3	6	5	$\not{8}^{1}2$		
	–	1	3	2	0	5	
		2	3	3	7	7	

There are not enough __ones__ , so I need to exchange 1 __ten__ for 10 __ones__

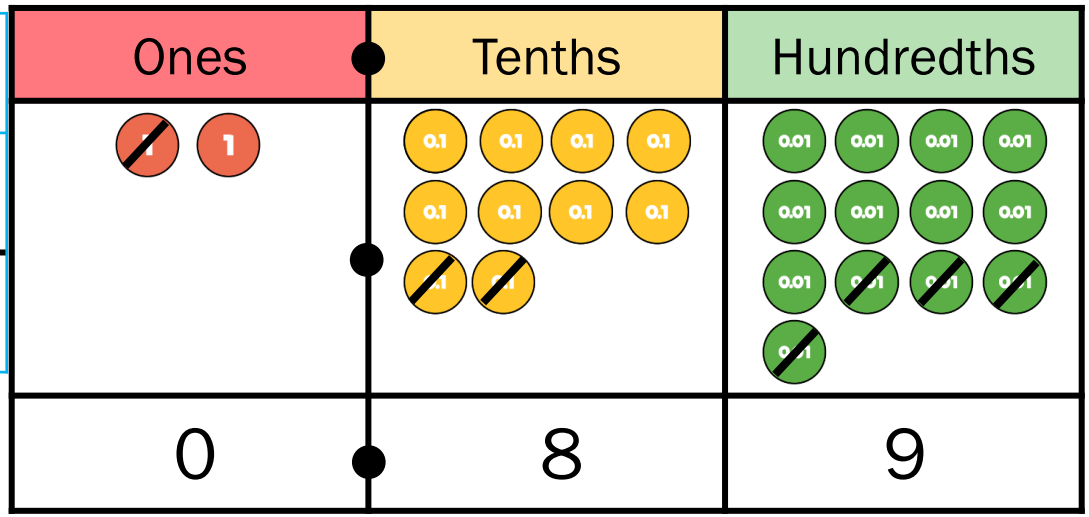


		2		4			
		~~3~~ 1		~~5~~ 13		4	
	–		3	2	7	4	
		2	8	2	6	0	

Have a think

$2.13 - 1.24 = 0.89$

	$1\not{2}^{10}.\not{1}3$		
−	1 .	2	4
	0 .	8	9



Have a think

$$4{,}154 - 1{,}522 =$$

Th	H	T	O
1,000 1,000 1,000 1,000	100	10 10 10 ~~10~~ ~~10~~	1 1 ~~1~~ ~~1~~ ~~1~~ ~~1~~
		3	2

	4	1	5	4	
−	1	5	2	2	
			3	2	

4 thousands − 1 thousand = 3 thousands

4 hundreds − 5 hundreds = ~~3~~ hundreds

5 tens − 2 tens = 3 tens

1 one − 2 ones = ~~3~~ ones

An exchange is not needed

HOW CAN I HELP MY CHILD AT HOME? - MATHEMATICS

- ***Create a positive view of mathematics – be a mathematician together***
- ***Encourage and use apparatus and visual approaches to help learning and understanding.***
- ***Don't introduce formal methods before they have been done in school.***
- ***Use correct language – exchange. Don't use terms like 'borrow.'***
- **Help your child to understand the importance of mathematics in everyday life**
- **Help them to see the value of learning these skills**
- **Value homework activities even if you think your child knows it. They must be fluent and able to apply the skills if learning is to be sustainable**