

# Year 3

## Small Steps Guidance and Examples

Block 2: Addition and Subtraction

**White Rose Maths**

# Overview

## Small Steps

- Add and subtract multiples of 100
- Add and subtract 3-digit numbers and ones – not crossing 10
- Add 3-digit and 1-digit numbers – crossing 10
- Subtract a 1-digit number from a 3-digit number – crossing 10
- Add and subtract 3-digit numbers and tens – not crossing 100
- Add a 3-digit number and tens – crossing 100
- Subtract tens from a 3-digit number – crossing 100
- Add and subtract 100s
- Spot the pattern – making it explicit
- Add and subtract a 2-digit and 3-digit number – not crossing 10 or 100
- Add a 2-digit and 3-digit number – crossing 10 or 100
- Subtract a 2-digit number from a 3-digit number – cross the 10 or 100
- Add two 3-digit numbers – not crossing 10 or 100
- Add two 3-digit numbers – crossing 10 or 100
- Subtract a 3-digit number from a 3-digit number – no exchange
- Subtract a 3-digit number from a 3-digit number – exchange
- Estimate answers to calculations
- Check

## NC Objectives

Add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three digit number and hundreds.

Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.

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.

# Add & Subtract Multiples of 100

## Notes and Guidance

Within this small step, children are introduced, for the first time, to numbers greater than 100.

In year 2 children would have been exposed to the bar model when working with fact families.

Using concrete manipulatives and pictorial representations throughout is important so the children can see the value of hundreds.

## Mathematical Talk

What is the same and what is different about 2 ones and 3 ones, 2 tens and 3 tens and 2 hundreds and 3 hundreds?

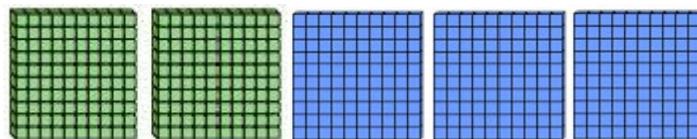
How many different ways can you represent  $200 + 300$ ?

## Varied Fluency

1

2 ones and 3 ones is equal to 5 ones

2 tens and 3 tens is equal to 5 tens



So 2 hundreds and 3 hundreds is equal to ..... hundreds

2

Complete each box for  $400 + 500$

Build it and draw it	Write it in words
Put it in a part whole model	Write it as a number sentence

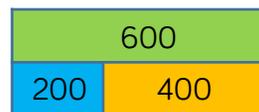
Build it and draw it	Write it in words
Put it in a part whole model	Write it as a number sentence

Four hundreds and five hundreds is equal to nine hundreds

$900 = 400 + 500$

3

Use the bar model to complete the number sentences.



$\underline{\quad} + \underline{\quad} = 600$	$600 = \underline{\quad} + \underline{\quad}$
$\underline{\quad} + \underline{\quad} = 600$	$600 = \underline{\quad} + \underline{\quad}$
$\underline{\quad} - \underline{\quad} = 400$	$400 = \underline{\quad} - \underline{\quad}$
$\underline{\quad} - \underline{\quad} = 200$	$200 = \underline{\quad} - \underline{\quad}$

# Add & Subtract Multiples of 100

## Reasoning and Problem Solving

The answer is 800

How many ways can you get to the answer using multiples of 100?

Possible answers:

$$1,000 - 200$$

$$900 - 100$$

$$800 + 0$$

Etc.

Write a sensible story for the calculation:

$$500 + 400 = 900$$

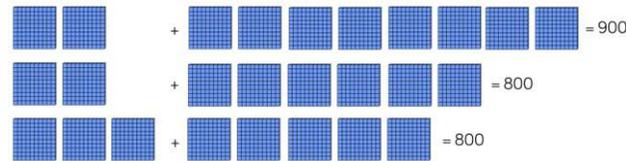
Open ended.

Example answer:

A school has 500 boys and 400 girls. How many children are there altogether?

Which is the odd one out?

Explain why.



Possible answers:

The odd one out could be  $300 + 500 = 800$  because it does not have the number 200 in the calculation.

The odd one out could also be  $200 + 700 = 900$  because the answer is not 800

## 3-digit Numbers and Ones

### Notes and Guidance

During this small step, children are adding and subtracting ones from a 3-digit number. At this stage it is important that the children don't exchange or cross the ten, so they can build number sense. For example, if a child is completing  $214 - 3$  and  $214 + 3$  they should learn that they can ignore the hundreds and tens at this stage. Therefore, all I need to do it  $4 + 3$  and  $4 - 3$ . The use of the column method can be used at this stage but mental arithmetic is the best strategy.

### Mathematical Talk

Which column do I need to focus on? Do we need to make and use the whole number? Why?

How can you explain your method? Is there another way of checking?

What do we do when there are no ones left?

Can you use  $<$  and  $>$  to compare Sam and Tim's team points?

### Varied Fluency

1

H	T	O
● ●	●	● ● ●

Use the place value counters to complete the number sentences.

$$214 - 3 = \boxed{\phantom{000}}$$

$$214 + 3 = \boxed{\phantom{000}}$$

2

Complete

<p><b>Calculate it</b></p> <p>Five hundred and forty-six subtract six</p>	<p><b>Build it and draw it</b></p>
<p><b>Write it as a calculation</b></p>	<p><b>Explain it</b></p>

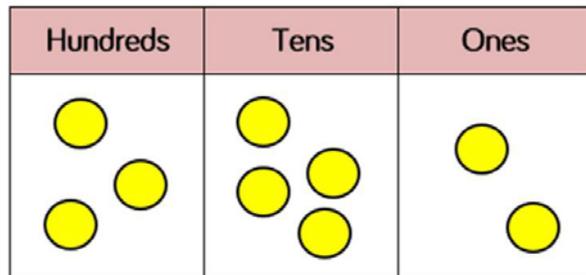
3

Sam has 534 team points and gets four more. Tim has 534 team points and loses four of his. How many team points does each child have? Who has most?

# 3-digit Numbers and Ones

## Reasoning and Problem Solving

Sally has added or subtracted ones to get this answer.



What could her calculation have been?

Her starting numbers are between and include 340 to 350

Did you use a strategy?

Do you see a pattern?

Possible answers

$$340 + 2$$

$$341 + 1$$

$$342 + 0$$

$$343 - 1$$

$$344 - 2$$

$$345 - 3$$

$$346 - 4$$

$$347 - 5$$

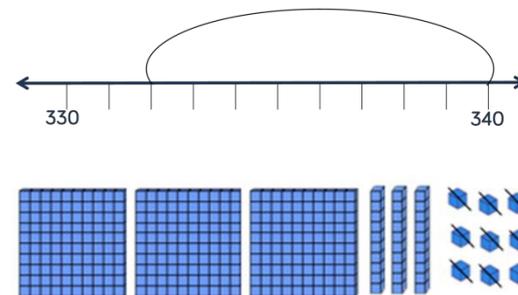
$$348 - 6$$

$$349 - 7$$

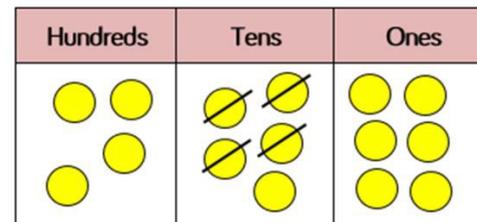
$$350 - 8$$

When the ones digit in the 3-digit number increases, the ones we subtract decreases.

Which image does not represent  $339 - 8$ ?



Sara thinks the chart shows  $456 - 4$ . Do you agree?



Explain why.

The number lines does not because it starts at 340 not 339

No, I disagree. Sara has subtracted 4 tens not 4 ones.

## Add 3-digits & 1-digit Numbers

### Notes and Guidance

Within this small step, children are adding ones to a 3-digit number, with exchanging. During this step children must understand that when adding ones it can affect the ones column and the tens column.

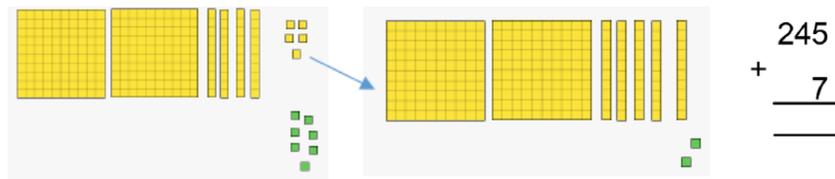
Children must also know that we can only hold single digits in each column anything over must be exchanged. The use of 0, e.g.  $145 - 5$  is important so they know to use zero as a place holder.

### Mathematical Talk

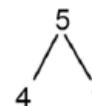
When you add ones to a number does it always, sometimes or never affect the tens column?

### Varied Fluency

- 1 Solve  $245 + 7$



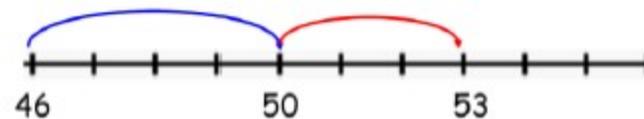
- 2 Calculate three hundred and seventy nine add five.



$$379 + 1 = 380$$

$$380 + 4 = 384$$

- 3 Use a number line to calculate  $346 + 7$



$$46 + 7 = 53$$

$$300 + 53 = 353$$

# Add 3-digit & 1-digit Numbers

## Reasoning and Problem Solving

Which questions are harder to calculate?

$$234 + 3 =$$

$$506 + 8 =$$

$$455 + 7 =$$

$$521 + 6 =$$

Explain your answer.

Mark these answers and explain the mistakes that have been made.

The second and third are harder as an exchange needs to be made.

The top right is incorrect because they have completed a subtraction.  
The bottom left is incorrect because the extra ten has not been added on.  
The bottom right is incorrect because they've not exchanged.

Always, sometimes, never?

When 7 and 5 are added together in the ones column, the digit in the ones column of the answer will always be 2

What other digits would always give a 2 in the ones column? Prove it.

Always

$$1 + 1$$

$$2 + 0$$

$$9 + 3$$

$$8 + 4$$

$$6 + 6$$

will also always give a 2 in the ones column.

# Subtract 1-digit from 3-digits

## Notes and Guidance

Within this small step, children are still focusing on 3-digits and ones but they will now use exchanging to help them.

Before this small step, they would have explored that 321 is 3 hundreds, 2 tens and 1 one but that it is also 3 hundreds, 1 ten and 11 ones.

If children are not secure on regrouping, it is important to revisit this before subtracting.

## Mathematical Talk

How can we change the number 321 to help us subtract 4?

**Why is this method not the most efficient, for this example?**

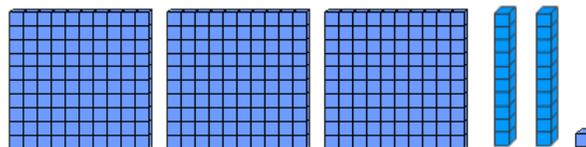
	3	2	1		3	<del>2</del>	<sup>1</sup> 1
-			4				4
					3	1	7

$21 - 4 = 17$  so the answer is 317  
Can you think of another method?

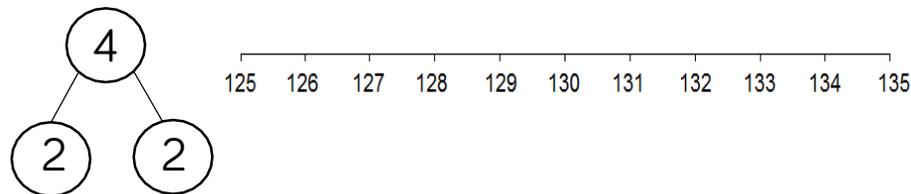
What calculation is the word problem representing? What does each number represent in the word problem?

## Varied Fluency

1 Using Base 10 solve  $321 - 4$



2 How could this part whole model help you solve  $132 - 4$ ? Show me on a number line.



3 Red Team had 672 team points this year and won the House Cup.

Blue Team finished second with 7 less points than the red team.

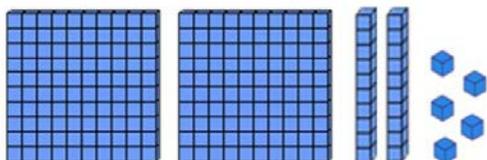
How many points did the Blue team finish on?

# Subtract 1-digit from 3-digits

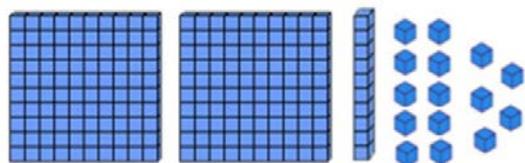
## Reasoning and Problem Solving

Tom and Freddie use Base 10 to solve  $225 - 8$

Tom's method



Freddie's method



Explain which diagram you would use and why to solve the calculation.

Both methods can get the answer of 217 but I would choose Freddie's because he has already exchanged one of his tens for ten ones.

Write a sensible story for the calculation  $852 - 8 = 844$

Open ended.  
Example answer:  
852 people attend a football match. 8 people leave.  
How many people are left?

Explain how you would solve these calculations:

$$564 - \square = 558$$

$$\square - 8 = 725$$

$$352 = 361 - \square$$

For  $564 - ? = 558$ , I would count from 58 to 64  
For  $? - 8 = 725$ , I would add 8 on to 725  
For  $352 = 361 - ?$ , I would count from 352 to 361

## 3-digit Numbers and Tens

### Notes and Guidance

Within this small step, children are now looking at what happens to a 3-digit number when a multiple of 10 is added or subtracted.

Different representations such as base 10, arrow cards, place value charts should be used. The use of the column method is exemplified, in this example, but children should explore whether or not this is needed and explain why. Mental methods should be encouraged throughout.

### Mathematical Talk

How else can you represent this calculation?

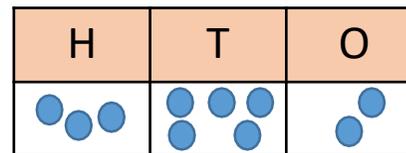
Do we need to make this number?

How is the similar and different to subtracting ones?  
What do you notice about the columns that change?

Why don't we have to calculate for each? Give a reason.

### Varied Fluency

1



Use the place value counters to complete the number sentences.

$$452 + 4 \text{ tens} = \boxed{\phantom{000}} \quad 452 - 2 \text{ tens} = \boxed{\phantom{000}}$$

2

Complete to solve 793 subtract 70

<p>Calculate it</p> <table border="1"> <tbody> <tr> <td></td> <td>7</td> <td>9</td> <td>3</td> </tr> <tr> <td>-</td> <td></td> <td>7</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		7	9	3	-		7	0					<p>Build it and draw it</p>
	7	9	3										
-		7	0										
<p>Write a sensible word problem</p>	<p>Explain it</p>												

3

Complete using  $<$ ,  $>$  or  $=$

$773 + 1$	<input type="radio"/>	$773 + 10$
$653 + 10$	<input type="radio"/>	$653 - 10$
$647 + 10$	<input type="radio"/>	$657 - 10$
$721 + 10$	<input type="radio"/>	$653 + 10$

Do you need to calculate?

# 3-digit Numbers and Tens

## Reasoning and Problem Solving

Balraj



589 – 70 is equal to 582

Spot the mistake.

Balraj has subtracted 7 ones instead of 7 tens.

Choose one calculation that can complete all of the following statements.

$456 - 10 <$

$466 + 1 >$

$466 + 0 =$

Possible answers:

$496 - 30$

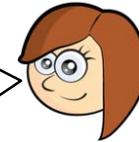
$406 + 60$

$416 + 50$

Any calculation with an answer of 466

When I calculated  $392 - 20$  I used my known fact  $9 - 2 = 7$

Charlotte



Explain Charlotte's method.

Charlotte was able to use this fact because 9 tens subtract 2 tens is like doing 9 ones subtract 2 ones. We do not need to subtract any ones or hundreds so those columns will stay the same.

## Add 3-digit Numbers and Tens

### Notes and Guidance

Children add multiples of 10, to a 3-digit number with exchanging.

During this small step they will recognise that when adding tens, it can change the tens and hundreds column. The column addition method has not been used within this small step because it is not the most efficient method.

Children should be counting in tens.

### Mathematical Talk

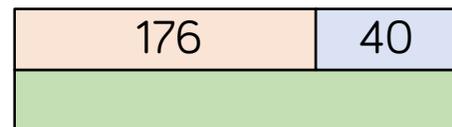
What shall we do if we have 10 or more tens? Can we make an exchange?

If we know how to count in tens, do we always need to use the column method or other methods? Would it be easier for us to just count up in our heads?

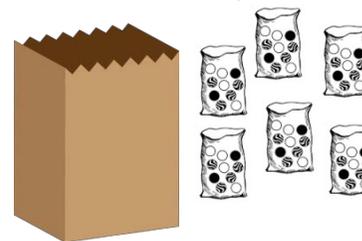
Draw on knowledge of inverse to be able to work out missing number problems.

### Varied Fluency

- 1 Complete the bar model.



- 2 Miss Wilson has 237 marbles in her bag. She adds 6 more bags of 10 marbles. How many will she have when she puts them in her bag? Write the calculation for this problem.



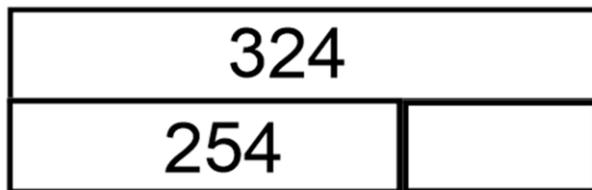
- 3 Can you think of three different ways to work out  $364 + 90$ ?

**Column addition, count in tens mentally, add 100 then subtract 10**

# Add 3-digit Numbers and Tens

## Reasoning and Problem Solving

Write a sensible number story to represent this bar model.



Sort these calculations.  
You can sort them in different ways.  
Justify your answer.

$$\begin{array}{l} 257 + 60 \\ 70 + 637 \\ 40 + 234 \\ 20 + 391 \end{array}$$

324 sandwiches are ordered for a school trip.  
254 are eaten.  
How many are left?

Etc.

Possible ways to sort:  
Odds and evens  
Over and under 500  
Exchanging and not exchanging

Which is the odd one out? Why?

$$\begin{array}{l} 336 + 80 \\ 453 + 60 \\ 347 + 70 \\ 285 + 80 \end{array}$$

285 + 80 is the odd one out because in all the others the tens columns add up to 11 tens.

## Subtract Tens from 3-digits

### Notes and Guidance

Within this small step children are subtracting multiples of 10 from a 3-digit number, with exchanging.

The examples show different ways this concept could be taught using number lines and part-whole models. The column method could be used, however, it is not the most efficient method.

Counting backwards in tens or using 100 to help will support mental strategies.

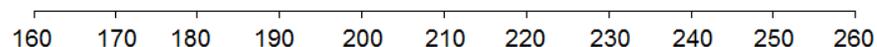
### Mathematical Talk

How can we use the number line?

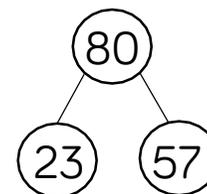
Why are the numbers 23 and 57 shown on the part-whole model? Is there another question we can use to test this strategy?

### Varied Fluency

- Count back in tens to solve the calculation  $240 - 70$



- How can the part whole model, help you solve five hundred and twenty-three subtract eighty?



- Solve  $425 - 90$  using the calculations below

$$425 - 100 = \boxed{\phantom{000}}$$

$$\boxed{\phantom{000}} + 10 =$$

# Subtract Tens from 3-digits

## Reasoning and Problem Solving

Find the missing numbers and explain how you found them.

$$13\boxed{\phantom{0}} - 50 = 85$$

$$334 - \boxed{\phantom{00}} = 294$$

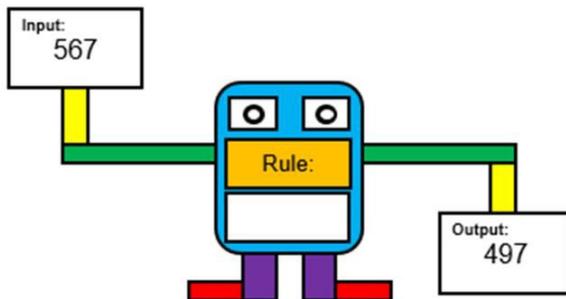
$$545 = \boxed{\phantom{00}} - 70$$

135 because I know when subtracting a tens number the ones stay the same.

40 because I counted in tens four times from 294

475 because I did the calculation  
 $545 - 70$

Sally thinks the rule for the function machine is subtract 60  
 Is she correct? Explain.



She is incorrect because  
 $567 - 60 = 507$

The rule is subtract 70

I used \_\_\_\_\_ to help me.

How many different methods could you use to solve  $837 - 90 =$

Share your methods with a partner.

Possible methods:

$$837 - 100 = 737$$

$$737 + 10 = 747$$

$$90 = 37 \text{ and } 53$$

(could show in part whole model)

$$837 - 37 = 800$$

$$800 - 53 = 747$$

Expanded or formal written methods

## Add and Subtract 100s

### Notes and Guidance

Before this small step, children would have added 100s together e.g.  $300 + 500$ . This will be built upon, along with the skill of adding ones and tens to solve calculations such as  $234 + 500$

It is important to build 'number sense' and ask the children why the column method isn't the most effective method to solve questions like the ones modelled. We can 'bypass' the tens and ones column because of the zeros in 500

### Mathematical Talk

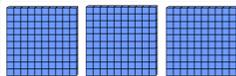
What do you notice when we add and subtract 100s from a 3 digit number?

What is the calculation that matches the word problem? What does each number in your calculation represent?

Is there more than one way to complete the questions?

### Varied Fluency

- 1 Use the place value grid to help you work out two hundred and thirty-four add three hundred.

Hundreds	Tens	Ones
		
		

- 2 Harriet has saved £675. She has saved £200 more than Tom. How much does Tom have?
- 3 Complete each with a calculation that either adds or subtracts 100s.

<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;">401 + 300</div>	<div style="border: 1px solid black; border-radius: 15px; width: 40px; height: 40px; display: inline-block;"></div>	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;">961 - 200</div>	<div style="border: 1px solid black; border-radius: 15px; width: 40px; height: 40px; display: inline-block;"></div>	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;">105 + 100</div>	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;">393 - 200</div>
Smallest		Greatest		Smallest	Greatest

# Add and Subtract 100s

## Reasoning and Problem Solving

$$306 + 300 = 906 - 300$$

Sammy



She is correct because both give an answer of 606

Is she correct?

Explain how you know.

Terry starts with the number 356  
He adds a multiple of 100  
His new number is greater than 500  
but less than 800  
Complete the table.

He couldn't have added 100, 500 or 600 but he could have added 200, 300 or 400

Numbers he couldn't have added	Number he could have added

Write a more than and less than word problem to describe the calculation  $725 - 300$

Example answers:

More than:

Tim has raised £725. He has raised £300 more than his target. What was his target?

Less than:

Amy spent £725 on a laptop. Tina spent £300 on a laptop. How much more did Amy spend?

## Pattern Spotting

### Notes and Guidance

This small step consolidates adding ones, tens and hundreds. This is an important step for children to apply their skills taught, together.

It is important in this step that children don't end up with the misconception that adding and subtracting ones only affects the ones column, because they need to identify it can affect the tens column too.

### Mathematical Talk

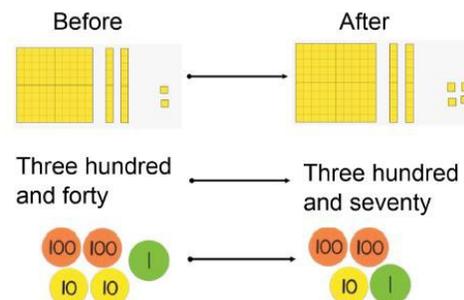
What do you notice? Which strategy can we use to add these numbers?

Do we need to write a zero in the hundreds column when there are no hundreds left?

Do we always need to work out each calculation or can we use what we already know?

### Varied Fluency

- 1 What has happened to each starting number? How do you know?



- 2 Work out
- |           |            |             |
|-----------|------------|-------------|
| $253 + 2$ | $253 + 20$ | $253 + 200$ |
| $253 - 2$ | $253 - 20$ | $253 - 200$ |
- What is the same and what is different about each calculation?

- 3 Fill in the missing numbers.

$$433 - \dots\dots\dots = 133$$

$$\dots\dots\dots = 40 + 473$$

# Pattern Spotting

## Reasoning and Problem Solving

Jonah completes column addition to solve  $251 + 4$

	2	5	1
+			4
	2	5	5

Is this the most efficient method?

Explain what Steve could have done.

Tell Steve how he can use your strategy to solve  $241 + 40$  and  $241 + 400$

The best strategy is to complete  $1 + 4$ , which is 5 and the 2 hundreds and 5 tens stay the same.

When adding 40 it is the tens column which Steve needs to look at because 40 is 4 tens.

When adding 400, he needs to look at the hundreds column because 400 is 4 hundreds.

Does adding and subtracting ones to a 3-digit number only affect the ones column?

Does adding and subtracting tens to a 3-digit number only affect the tens column?

Research and justify your answer by giving examples.

What is the pattern?

Start									
1	2	3	1	2	7	1	6	3	5
5	4	1	5	4	5	5	8	1	9

Can you pick a number and use the pattern?

No the ones can change the ones column and any column to the left e.g.  $123 + 9$  and  $402 - 4$

The tens column can change itself and the hundreds column e.g.  $456 + 50$  and  $456 - 60$

When adding and subtracting from any column, it can only affect its own column and columns to the left.

The pattern is  
 $+4,$   
 $+40,$   
 $+400$

## 2-digit and 3-digit Numbers

### Notes and Guidance

In this small step it is important to focus on the position of numbers and place value.

The placement of numbers is also key - i.e 'Does it matter which number goes on top?'

The use of Base 10 equipment will support understanding at this stage.

### Mathematical Talk

Where would these digits go on the place value chart? Why?

When we subtract, why do we not make both numbers?  
Why do we make both numbers when we add?

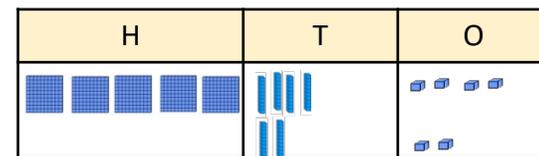
Can you represent \_\_\_ using the equipment?

Why are the numbers partitioned in this way?  
How can this help you?

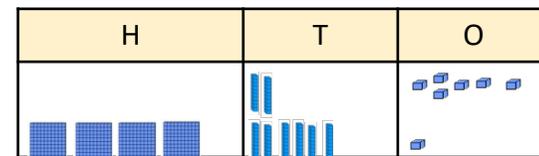
### Varied Fluency

- 1 Match the calculation to the correct representation.

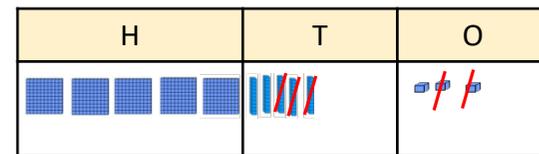
$$26 + 461 = 487$$



$$585 = 553 - 32$$



$$26 + 461 = 487$$



- 2 Represent the following calculations using Base 10.

$$388 - 44$$

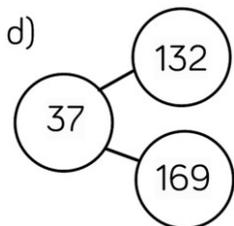
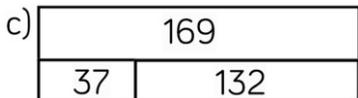
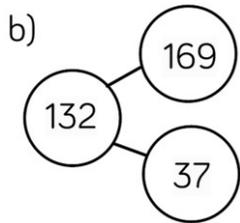
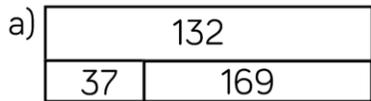
$$167 + 32$$

$$265 - 43$$

# 2-digit and 3-digit Numbers

## Reasoning and Problem Solving

Emma has 169 sweets in a jar.  
She gave 37 to Ben.  
Which model represents this problem?



C is correct because  
 $37 + 132 = 169$

37 is a part, 132 is a part and 169 is the whole

Explain the mistake Joey has made.

$$\begin{array}{r} \text{H T O} \\ 231 \\ + 63 \\ \hline \hline \end{array}$$

Monica and Rachel have some sweets.  
Monica has 77 and Rachel has 121 They have written the calculation differently

Monica	Rachel
1 2 1	7 7
+ 7 7	+ 1 2 1
_____	_____

Who is correct?

Joey has put 63 in the wrong place value columns. The 6 is 6 tens but it is in the hundreds column. The 3 is 3 ones but it is in the tens column.

Both are correct because addition is commutative and can be added either way round.

## Add 2-digit & 3-digit Numbers

### Notes and Guidance

Children add 3 and 2 digit numbers that cross both the 10 and 100 barrier. They will build upon the previous small steps and the concept of 'exchange' is explored.

In this small step it is important to focus on the position of numbers and place value. The placement of numbers is also key- i.e 'Does it matter which number goes on top?'

The use of Base 10 equipment will support understanding at this stage.

### Mathematical Talk

What happens when we have 10 Ones? Can we exchange them for anything? Why?

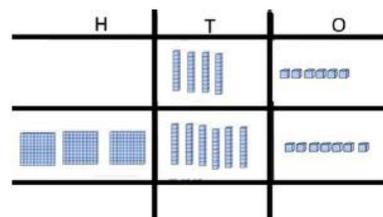
Where does this Ten go? How does that help us?

What happens when we have 10 Tens? Can we exchange them for anything? Why?

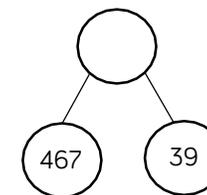
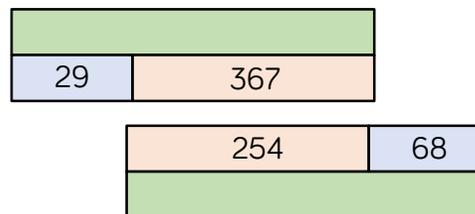
Where does this Hundred go? How does that help us?

### Varied Fluency

- 1 Represent  $46 + 367$  using Base 10.



- 2 Use column addition to work out:



- 3 Use column addition to work out

$$248 + 37$$

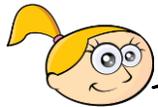
$$476 + 59$$

$$556 - 77$$

# Add 2-digit & 3-digit Numbers

## Reasoning and Problem Solving

Khloe



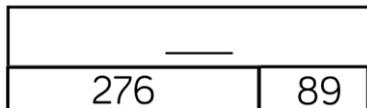
$$265 + 87 = 242$$

Here is her working out.

$$\begin{array}{r} 265 \\ + 87 \\ \hline 242 \end{array}$$

Is she correct?  
Explain why.

Write your own problem which is represented by the bar model.



Khloe is incorrect because she has not exchanged ten ones for one ten when adding 5 and 7

Possible answer: 267 children attended a play. They were accompanied by 89 adults. How many people saw the play in total?

Kourtney, Scott and Mason are working out  $374 + 37 =$

Kourtney



I started at 374 on a number line

I used column method

Scott



Mason



I added 40 and subtracted 3

Which method do you prefer?  
Are there any other ways to work this out?

Children choose their preferred method and explain why.

# Subtract 2-digits from 3-digits

## Notes and Guidance

Children will build upon previous learning of column addition.

The term ‘exchange’ will be key during this small step and their understanding of place value will help them to see when they should be exchanging.

In this small step it is important to focus on the position of numbers and place value.

## Mathematical Talk

What happens when we are subtracting more ones than we have?

Can we exchange anything? (1 ten for 10 ones)

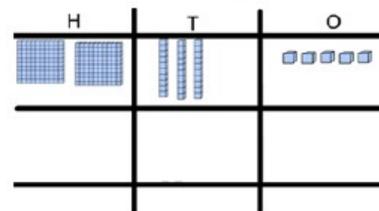
Where do the 10 ones go?

How does this help us solve the problem?

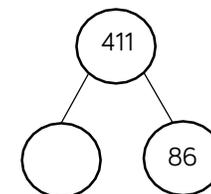
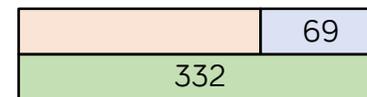
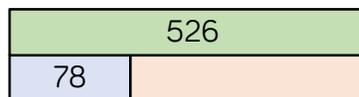
What happens if there are ones remaining after exchanging for 1 ten?

## Varied Fluency

- 1 Represent  $235 - 29$  using Base 10.



- 2 Use column addition to work out:



- 3 Use  $<$ ,  $>$  or  $=$  to make the statements true.

$\begin{array}{r} 215 \\ - 47 \\ \hline \end{array}$	$\bigcirc$	$\begin{array}{r} 234 \\ - 57 \\ \hline \end{array}$	$\begin{array}{r} 452 \\ - 84 \\ \hline \end{array}$	$\bigcirc$	$\begin{array}{r} 411 \\ - 43 \\ \hline \end{array}$
		$\begin{array}{r} 332 \\ - 89 \\ \hline \end{array}$	$\bigcirc$		$\begin{array}{r} 406 \\ - 28 \\ \hline \end{array}$

# Subtract 2-digits from 3-digits

## Reasoning and Problem Solving

Maria thinks  $352 - 89 = 337$

$$\begin{array}{r} \text{H} \quad \text{T} \quad \text{O} \\ 3 \quad 5 \quad 2 \\ \underline{8 \quad 9 \quad -} \\ 3 \quad 3 \quad 7 \end{array}$$

Is she correct?

Explain why.

Maria is incorrect because she has just found the difference between the ones rather than making an exchange. She has done the same with the tens.

Gail, Dave and Lucy are trying to work out  $300 - 57$

Who has the most efficient way of working it out?

Explain how you know.



Gail

I know that take away means difference, so I can do 299 take away 56 and get the right answer.

Dave

I can count on from 57 to 100 (43) and then count on to 300 (200)



Lucy

I can use the column method to work it out and exchange when I need to.

Accept difference answers as long as they are justified. Children might even suggest subtracting 60 and then adding 3

## Add two 3-digit Numbers

### Notes and Guidance

This small step progresses on from previous learning of 1-1 correspondence; as children will need to understand that one 100 counter represents ten 10 counters and one hundred one counters.

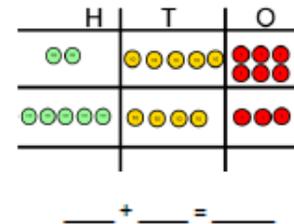
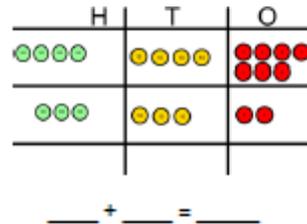
The examples used throughout this step build on children's understanding of Base 10 equipment, as the individual units can no longer be seen.

### Mathematical Talk

Where would these digits go on the place value chart? Why?  
 Why do we make both numbers when we add?  
 Can you represent \_\_\_ using the equipment?  
 Can you draw a picture to represent this?  
 Why are the numbers partitioned in this way?  
 How can this help you?  
 Why is it important to put the digits in the correct column?  
 What is addition?

### Varied Fluency

1 Complete the calculations.



2 Use column addition to work out:

- Three hundred and forty-two add two hundred and Thirty-six.
- Five hundred and sixteen plus three hundred and sixty-two.
- The total of two hundred and forty-seven and four hundred and two.

3 Use column addition to work out:

$$352 + 237$$

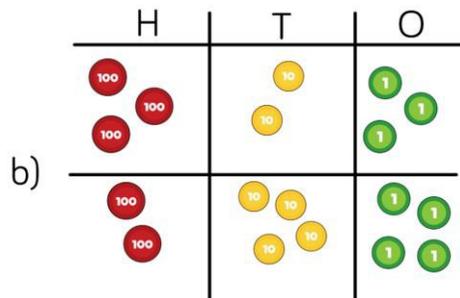
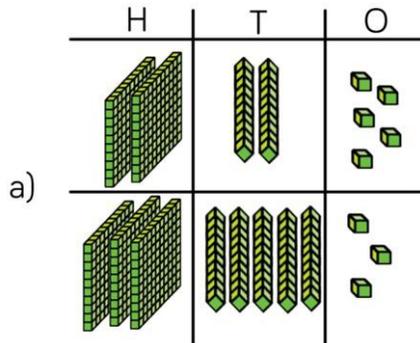
$$458 + 231$$

$$306 + 283$$

# Add two 3-digit Numbers

## Reasoning and Problem Solving

Which creates an answer of 567?



B is correct because  
it shows  
 $323 + 244 = 567$

A shows  
 $343 + 225 = 568$

Here are three cards.



Rosie and Jim make 3 digit numbers  
using each card once.

Rosie



I have made the  
greatest possible  
number

I have made the  
smallest number  
possible

Jim



Work out the total of the two numbers.

$$432 + 234 = 666$$

## Add two 3-digit Numbers

### Notes and Guidance

Once children are confident adding two 3-digit numbers together with no exchange, they need to be able to add two 3-digit numbers that do cross the 10 and 100 barrier.

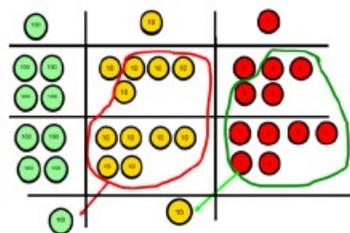
The examples used throughout this step build on children's understanding of Base 10 equipment, as the individual units can no longer be seen.

### Mathematical Talk

- Where would these digits go on the place value chart? Why?
- Why do we make both numbers when we add?
- Can you represent \_\_\_ using the equipment?
- Can you draw a picture to represent this?
- Why are the numbers partitioned in this way?
- How can this help you?
- Why is it important to put the digits in the correct column?
- What is addition?

### Varied Fluency

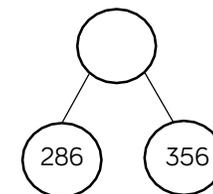
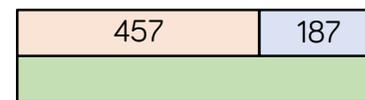
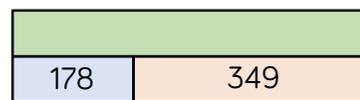
1



What happens when we have 10 ones/tens?  
 Can we exchange them for anything? Why?  
 Where does the ten/hundred go?  
 How does that help us?

2

Use column addition to work out:



3

Joan and Fred play a game. Fred scored 354. Joan scores 478. What was the total of their scores?

Car A drives 248 miles. Car B drives 40 miles more. How many miles do they drive altogether? 

# Add two 3-digit Numbers

## Reasoning and Problem Solving

Roll a 1-6 die.

Fill in a box each time you roll.

$$\square\square\square + \square\square\square =$$

Can you make the total:

- An odd number
- An even number
- A multiple of 5
- The greatest number possible
- The smallest number possible

Discuss the rules with the children and what they would need to roll to get them e.g. To get an odd number only one of the ones should be odd because if both ones have an odd number, it will make an even.

Complete the statements to make them correct.

a)  $487 + 368$    $487 + 468$

b)  $326 + 258$    $325 + 259$

c)  $391 + 600 = 401 + \square$

Explain why you did not have to work out the answers to compare them.

(a)  $<$

(b)  $=$

(c) 90

(a) The starting number is the same so only need to compare the second number in each.

(b) They are the same because the second calculation has subtracted one from the first number and added one to the second.

(c) 401 is ten more than 391 so just need to subtract 10 from 600

# Subtract 3-digits from 3-digits

## Notes and Guidance

It is important for the children to understand that there are different methods of subtraction. In this step children need to explore efficient strategies for subtraction, including:

- counting on (number lines)
- near subtraction
- number bonds

They then need to move on to setting out formal column subtraction supported by practical equipment.

## Mathematical Talk

What is the different between?

What do you notice about the numbers in the calculation?  
(Are they close?)

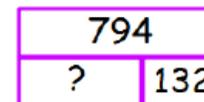
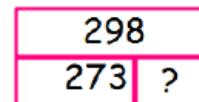
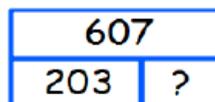
Which strategy would you use and why?

How could you check your answer is correct?

Does it matter which number is at the top of the calculation?

## Varied Fluency

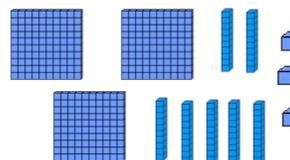
- 1 Using counting on, find the missing value on these bar models.



- 2 There are 246 children on a school bus. 215 of them are girls. How many are boys?  
Show your answer on the place value grid.

Hundreds	Tens	Ones

- 3 Start with:



Then take away 142.

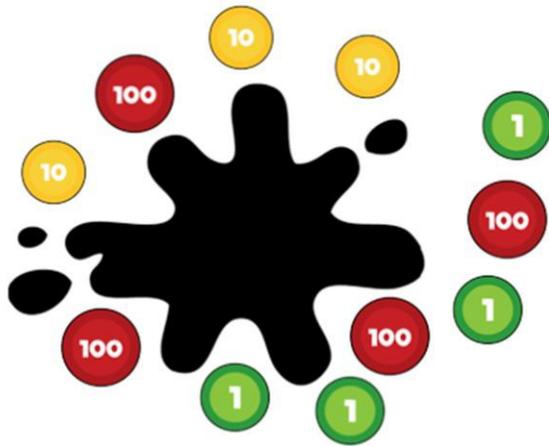
Copy and complete this column subtraction.

$$\begin{array}{r}
 \square \square \square \\
 - 142 \\
 \hline
 \square \square \square
 \end{array}$$

# Subtract 3-digits from 3-digits

## Reasoning and Problem Solving

There are 566 in counters altogether but the splat is covering some.



How many different ways can you make the missing amount?

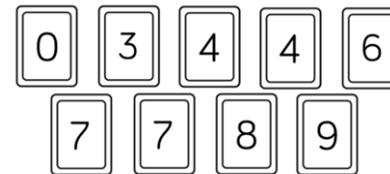
$$566 - 434 = 132$$

Possible answer:  
One 100, three 10s and two 1s

Thirteen 10s and two 1s

132 ones etc.

Use the digit cards to complete the calculation.



-		
=		

The digits in the shaded boxes are odd.

Is there more than one answer?

Possible answers:

$$987 - 647 = 340$$

$$879 - 473 = 406$$

# Subtract 3-digits from 3-digits

## Notes and Guidance

This step focuses on a more formal/written method for subtraction where previous strategies may not be appropriate. Children will explore column subtraction using concrete manipulative.

It could be seen that this previous step is easier for many children as there is no ambiguity where to put the numbers.

## Mathematical Talk

Which method would you use for this calculation and why?

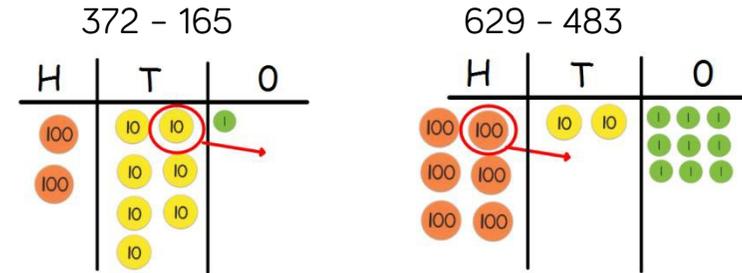
What happens when you can't subtract 9 from 7? 50 from 30 etc

How would you teach somebody else to use column subtraction with exchange?

Why do we exchange? When do we exchange?

## Varied Fluency

- 1 Complete these subtractions using counters.



- 2 Complete these column subtractions showing exchanges.

	6	8	3
-	2	3	4

	2	3	7
-	1	9	5

	5	0	7
-	4	5	1

## Subtract 3-digits from 3-digits

## Reasoning and Problem Solving

Work out the missing digits

(a)

5	1	3
-	2	18
3	1	5

(b)

9	0	8
-	2	8
2	4	6

(a)  $533 - 218$

(b)  $504 - 258$

Kassie is working out  $406 - 289$ 

Here is her working out:

<sup>3</sup> <del>4</del>	0	<sup>1</sup> 6
-	2	89
	7	

<sup>2</sup> <del>4</del>	0	<sup>1</sup> 6
-	2	89
0	2	7

Explain her mistake.

What should the answer be?

Kassie has exchanged from the hundred column to the ones so there are 106 ones in the ones column. She should have exchanged 1 hundred for 10 tens and then 1 ten for 10 ones.

$406 - 289 = 117$

## Estimate Answers

## Notes and Guidance

It is an important skill for children to see the reasonableness of their answer.

While rounding is not formally introduced until Y4, it is helpful that children can refer to 'near numbers' to see whether an estimate is sensible.

## Mathematical Talk

What would you estimate this to be? Why did you choose this number?

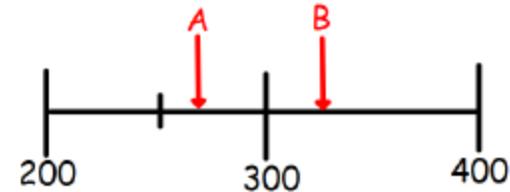
Why is /isn't this a sensible estimation to an answer?

How did they work out this answer?

Could you do it in a different/better way?

## Varied Fluency

- 1 Estimate the position of arrows A and B on the number line.



- 2 Which of these is a sensible estimation to the number of sweet in a jar?

602   597   600



- 3 Match each number to it's 'near number'.

497	200
304	500
684	700
217	300

# Estimate Answers

## Reasoning and Problem Solving

Amrish



I estimate  $143 - 95$  will be 50 because I will subtract 100 from 150

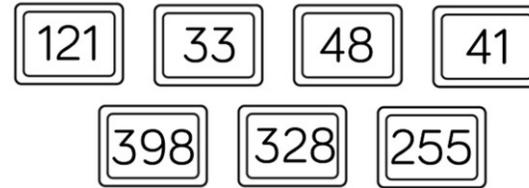
Is this a good estimate? Why?

Are there any other ways he could have estimated?

Yes, because he found two numbers close to the original numbers.

He could have rounded to the nearest 10 and calculated  $140 - 100 (= 40)$

Use the number cards to make different calculations with an estimated answer of 70



Possible answers:

$$121 - 48 \\ (120 - 50)$$

$$41 + 33 \\ (40 + 30)$$

$$398 - 328 \\ (400 - 330)$$

## Check Answers

### Notes and Guidance

In this step, children need to explore ways of checking to see if an answer is reasonable.

Checking using inverse is to be encouraged so that children are using a different method and not just potentially repeating an error, for example, if they add in a different order.

## Mathematical Talk

How can you tell if your answer is sensible?

Does knowing if a number is close to a multiple of 100 help when adding and subtracting 3-digit numbers?  
How does it help?

Does it help to check your answer if you spot which numbers are near to multiples of 10?  
How does counting 10's, 50's and 100's help?

## Varied Fluency

1

$$34 + 45 = 79$$

Use a subtraction to check the answer to the addition.

2

Hannah has baked 45 cakes for a bun sale. She sells 18 cakes. How many does she have left?

Show your answer using a bar model and check your answer by using an addition.

3

Write all the calculations you could make using these cards.



# Check Answers

## Reasoning and Problem Solving

James



If I add two numbers together, I can check my answer by using a subtraction of the same numbers after  
e.g.

To check  $23 + 14$   
I can do  $14 - 23$

Is he always right?  
Explain why.

No, because you cannot have part subtract whole. The whole (greatest number) needs to be at the start of the subtraction then you subtract a part to find the remaining part.

I completed an addition and then used the inverse to check my calculation.

When I checked my calculation, the answer was 250

One of the other numbers was 355

What could the calculation be?

$$\boxed{?} + \boxed{?} = \boxed{?}$$

$$\boxed{\phantom{000}} - \boxed{\phantom{000}} = \boxed{250}$$

Possible answers:

$$355 - 105 = 250$$

$$605 - 355 = 250$$

So the calculation could have been:

$$250 + 105 = 355$$

$$250 + 355 = 605$$