

White

**Rose
Maths**

Autumn - Block 2

Addition & Subtraction

Overview

Small Steps

- ▶ Add whole numbers with more than 4 digits (column method)
- ▶ Subtract whole numbers with more than 4 digits (column method)
- ▶ Round to estimate and approximate
- ▶ Inverse operations (addition and subtraction)
- ▶ Multi-step addition and subtraction problems

NC Objectives

Add and subtract numbers mentally with increasingly large numbers.

Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). 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.

Add More than 4-digits

Notes and Guidance

Children will build upon previous learning of column addition. They will now look at numbers with more than four digits and use their place value knowledge to line the numbers up accurately.

Children use a range of manipulatives to demonstrate their understanding and use pictorial representations to support their problem solving.

Mathematical Talk

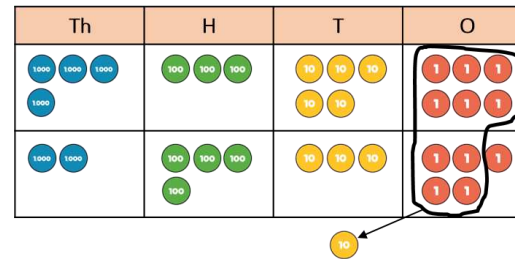
Will you have to exchange? How do you know which columns will be affected?

Does it matter that the two numbers don't have the same amount of digits?

Which number goes on top in the calculation? Does it affect the answer?

Varied Fluency

Ron uses place value counters to calculate $4,356 + 2,435$



	Th	H	T	O
	4	3	5	6
+	2	4	3	5
	6	7	9	1

Use Ron's method to calculate:

	3	2	4	6	1
+		4	3	5	2

	4	8	2	7	6
+		5	6	1	3

Jack, Rosie and Eva are playing a computer game. Jack has 3,452 points, Rosie has 4,039 points and Eva has 10,989 points.

How many points do Jack and Rosie have altogether?

How many points do Rosie and Eva have altogether?

How many points do Jack and Eva have altogether?

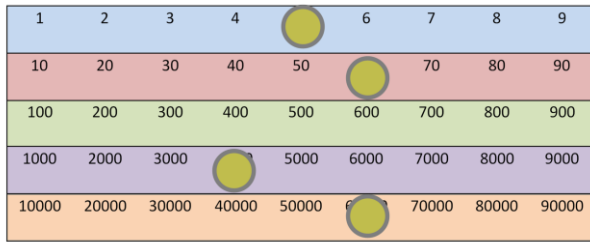
How many points do Jack, Rosie and Eva have altogether?

Add More than 4-digits

Reasoning and Problem Solving

Amir is discovering numbers on a Gattegno chart.

He makes this number.



Amir moves one counter three spaces on a horizontal line to create a new number.

When he adds this to his original number he gets 131,130

Which counter did he move?

He moved the counter on the thousands row, he moved it from 4,000 to 7,000

Work out the missing numbers.

	?	4	?	3	?
+	2	?	5	?	2
	7	8	5	2	9

$$54,937 + 23,592 = 78,529$$

Subtract More than 4-digits

Notes and Guidance

Building on Year 4 experience, children use their knowledge of subtracting using the formal column method to subtract numbers with more than four digits. Children will be focusing on exchange and will be concentrating on the correct place value.

It is important that children know when an exchange is and isn't needed. Children need to experience '0' as a place holder.

Mathematical Talk

Why is it important that we start subtracting the smallest place value first?

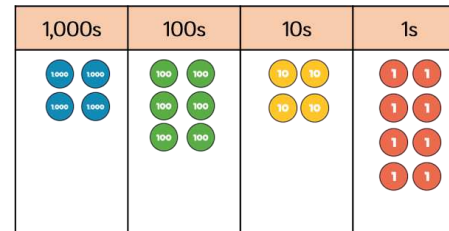
Does it matter which number goes on top? Why? Will you have to exchange? How do you know which columns will be affected?

Does it matter that the two numbers don't have the same amount of digits?

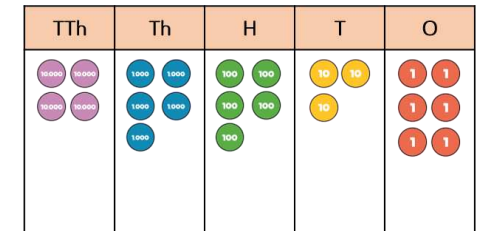
Varied Fluency

Calculate:

$$4,648 - 2,347$$



$$45,536 - 8,426$$



Represent each problem as a bar model, and solve them.

A plane is flying at 29,456 feet.

During the flight the plane descends 8,896 feet.

What height is the plane now flying at?

Tommy earns £37,506 pounds a year.

Dora earns £22,819 a year.

How much more money does Tommy earn than Dora?

There are 83,065 fans at a football match.

45,927 fans are male. How many fans are female?

Subtract More than 4-digits

Reasoning and Problem Solving

Eva makes a 5-digit number.

Mo makes a 4-digit number.

The difference between their numbers is 3,465

What could their numbers be?

Possible answers:

9,658 and 14,023
12,654 and 8,289
5,635 and 10,000

Etc.

Rosie completes this subtraction incorrectly.

$$\begin{array}{r} 28701 \\ - 7621 \\ \hline 21180 \end{array}$$

Explain the mistake to Rosie and correct it for her.

Rosie did not write down the exchange she made when she exchanged 1 hundred for 10 tens. This means she still had 7 hundreds subtract 6 hundreds when she should have 6 hundreds subtract 6 hundreds. The correct answer is 21,080

Estimate and Approximate

Notes and Guidance

Children build on their understanding of estimating and rounding to estimate answers for calculations and problems. The term approximate is used throughout.

Encourage children to consider the most appropriate number to round to e.g. the nearest ten, hundred or thousand. Reinforce the idea that an estimate should be performed quickly by choosing much easier numbers.

Mathematical Talk

Which numbers shall I round to?

Why should I round to this number?

Why should an estimate be quick?

When, in real life, would we use an estimate?

Varied Fluency

Which is best to estimate the total of 22,223 and 5,687?

$$22,300 + 5,700$$

$$22,200 + 5,700$$

$$22,200 + 5,600$$

Here are the attendances from the last 3 months at a rugby club.

Month	Attendance
February	18,655
March	31,402
April	27,092

What is the approximate total of February and March?

What is the approximate difference between March and April?

What is the approximate total of the three months?

April and May had an approximate total of 50,000
Estimate the attendance in May.

Estimate and Approximate

Reasoning and Problem Solving

True or False?

$$49,999 - 19,999 = 50,000 - 20,000$$



Dora

I did not need to use a written method to work this out.

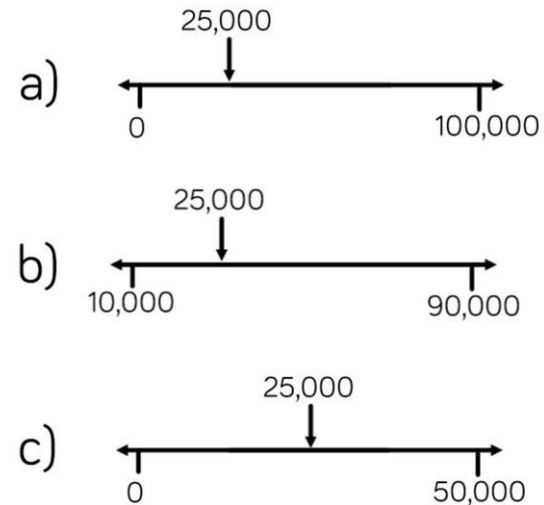
Can you explain why Dora's method work?

Can you think of another example where this method could be used?

True

Dora has used her related number facts. Both numbers on the right have increased by 1 therefore whatever the difference is, it will remain the same as the left hand side.

Which estimate is inaccurate?



Explain how you know.

B is inaccurate. The arrow is about a quarter of the way along the number line so it should be 30,000

Inverse Operations

Notes and Guidance

In this small step, children will use their knowledge of addition and subtraction to check their workings to ensure accuracy.

They use the commutative law to see that addition can be done in any order but subtraction cannot.

Mathematical Talk

How can you tell if your answer is sensible?

What is the inverse of addition?

What is the inverse of subtraction?

Varied Fluency

- When calculating $17,468 - 8,947$, which answer gives the corresponding addition question?

$$8,947 + 8,631 = 17,468$$

$$8,947 + 8,521 = 17,468$$

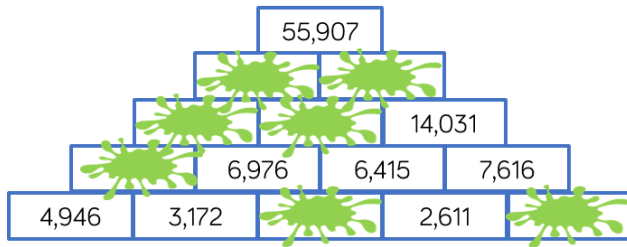
$$8,251 + 8,947 = 17,468$$

- I'm thinking of a number.
After I add 5,241 and subtract 352, my number is 9,485
What was my original number?
- Eva and Dexter are playing a computer game.
Eva's high score is 8,524
Dexter's high score is greater than Eva's.
The total of both of their scores is 19,384
What is Dexter's high score?

Inverse Operations

Reasoning and Problem Solving

Complete the pyramid using addition and subtraction.



From left to right:

Bottom row:
3,804, 5,005

Second row:
8,118

Third row:
15,094, 13,391

Fourth row:
28,485, 27,422

Mo, Whitney, Teddy and Eva collect marbles.



Mo

I have 1,648 marbles.

I have double the amount of marbles Mo has.



Whitney



Teddy

I have half the amount of marbles Mo has.

In total they have 8,524 marbles between them.

How many does Eva have?

Eva has 2,756 marbles.

Multi-step Problems

Notes and Guidance

In this small step children will be using their knowledge of addition and subtraction to solve multi-step problems.

The problems will appear in different contexts and in different forms i.e. bar models and word problems.

Mathematical Talk

What is the key vocabulary in the question?

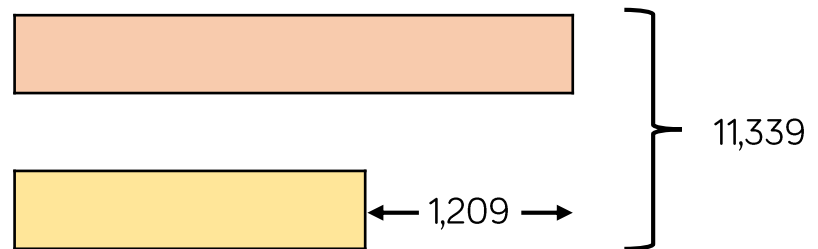
What are the key bits of information?

Can we put this information into a model?

Which operations do we need to use?

Varied Fluency

- When Annie opened her book, she saw two numbered pages. The sum of these two pages was 317. What would the next page number be?
- Adam is twice as old as Barry. Charlie is 3 years younger than Barry. The sum of all their ages is 53. How old is Barry?
- The sum of two numbers is 11,339. The difference between the same two numbers is 1,209. Use the bar model to help you find the numbers.



Multi-step Problems

Reasoning and Problem Solving

A milkman has 250 bottles of milk.

He collects another 160 from the dairy, and delivers 375 during the day.

How many does he have left?



Tommy

My method:

$$375 - 250 = 125$$

$$125 + 160 = 285$$

Do you agree with Tommy?
Explain why.

Tommy is wrong.
He should have added 250 and 160, then subtracted 375 from the answer.

There are 35 bottles of milk remaining.

On Monday, Whitney was paid £114

On Tuesday, she was paid £27 more than on Monday.

On Wednesday, she was paid £27 less than on Monday.

How much was Whitney paid in total?

How many calculations did you do?

Is there a more efficient method?

£342

Children might add 114 and 27, subtract 27 from 114 and then add their numbers.

A more efficient method is to recognise that the '£27 more' and '£27 less' cancel out so they can just multiply £114 by three.