Supporting your child's learning:
Addition and Subtraction in Years 3, 4, 5 and 6

Concrete - students should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial - students should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.

Abstract - with the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence.

To master an area of Mathematics, all children need to be able to approach different types of problems.

	Fluency	Reasoning	Problem Solving

Year 3

Fluency	Reasoning	Problem Solving

Fluency

Mental strategies:
173 + 8 =
173 + 80 =
173 + 800 =

831 – 7 =
831 – 70 =
831 – 700 =

Jottings:
Write a calculation statement for the bar model below

125	
87	38

Draw a bar model for this calculation:
56 + 23 + 19 =

Formal written method:
Write the addition calculation shown in the grid:

Hundreds	Tens	Ones

How many addition and subtraction calculation statements can you write from this bar model?

437	
281	156

Franky has 432 sweets, Charley has 263 sweets. How many sweets do they have altogether? If Franky gives Charley 84 sweets, how many do they each have now?

Reasoning

Mental Strategies:

Are these number sentences true or false?
296 + 6 = 312
503 – 60 = 444
651 + 250 = 701
Justify your answers.

Jottings:
Always, sometimes, never?
When you add 8 to a whole number ending in 7, your answer ends with 5.
Explain your answer.

Which questions are easy, which are hard and why?
623 + 10 =   830 – 100 =
810 – 120 =   592 + 10 =

Formal written method:

Franky saved £324 in his bank account. He then spent £145 on a new bike. Does the calculation below show how much money he has left? Explain your answer.
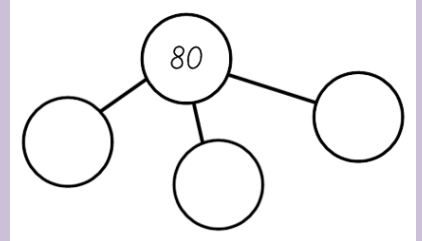

Problem Solving

Mental Strategies:

Always, sometimes, never?
2 even numbers add up to make an even number.
3 even numbers add up to make an odd number.

Jottings:
How many different ways can you complete this part whole model?

Formal written method:

The answer to an addition question is 117. All the digits used are either 1 or 8. Fill in the boxes:

117 = ☐☐ + ☐☐ + ☐☐

☆ + ☆ = 80

☆ + ◯ + ◯ + ◯ = 94

Work out the value of each star and circle.

Year 4

Column 1 (Fluency)
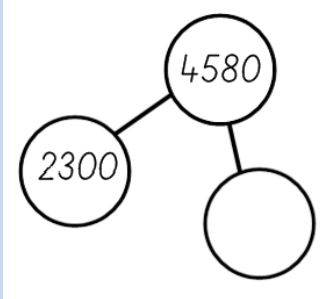
Sort these questions into ones you would solve mentally and ones you would solve with a written method:

64 + 46 =   560 + 280 =

733 + 745 =   3005 – 99 =

302 – 199 =   2999 + 350 =

Formal written method:
Complete the part whole model below:

Using the inverse operation:

Franky has 435 books, Charley has 238 books. How many books do they have altogether? Show how you can check using the inverse operation.

Estimating:

Estimate the answers to these calculation statements:

3064 + 2311 =
6403 + 5390 =

Solving two step problems:

There are 4567 people at the football match. 765 are children, how many adults are there?

Franky draws a diagram to help. Circle the correct diagram.

4567	
adults	765

adults	
765	4567

765	
4567	adults

Use the correct diagram to help you solve the problem.
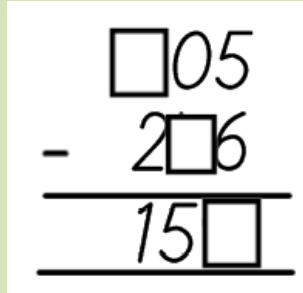
Column 2 (Reasoning)

Formal written method:

Charley adds 3 numbers together that total 6045.

'They all have 4 digits. They are all multiples of 5

What could the numbers be? Prove it.
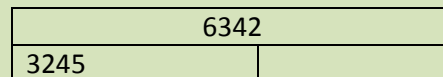Find the missing numbers:

Using the inverse operation:
Always, sometimes, never?
The difference between two even numbers is even.

Look at this bar model:

6342	
3245	

Which calculation statements match the bar model above? Explain how you know.
6342 – 3245 = 3097
3097 + 6342 = 3245
6342 – 3097 = 3245
3245 + 3097 = 6342

Solving two step problems:

Franky and Charley are working out the answer to the same calculation:

450 + 376 + 150 =

They have both used different strategies.

Franky's method	Charley's method
450 + 376 = 826	450 + 150 = 600
826 + 150 = 976	600 + 376 = 976
Answer 976	Answer 976

Which do you prefer and why

Column 3 (Problem Solving)

Formal written method:

All of the digits below are either 1 or 2. Can you work out each digit?

3334 = ???? + ????

Estimate and use inverse operation:

Use the symbols < or > to complete the statement below

4563 – 654		3541 + 564
5406 – 2001		4300 + 1340
2135 - 94 +3		2154 – 70 + 6
4931 + 324		5634 – 324

Solving two step problems:

A library has 1343 books at the start of the day.
During the day 864 books were taken out on loan and 342 were returned.
How many library books are now in the library?

Three chicks lay some eggs.

Desani lays twice as many as Arden.
Chelsea lays 8 more than Desani.
They lay 48 eggs in total.
How many eggs does Chelsea lay?

Fluency	Reasoning	Problem Solving

Year 5

Column 1 (Fluency)

Mental strategies:

Work out the missing numbers:

☐ - 85 = 155
630 + ☐ = 954
☐ = 306 - 99

Formal written methods:
Calculate 3245 + 5467 using place value counters.

Solve 3056 – 1945 using place value counters.

Franky has 1456 stickers, Charley has 3506 stickers. How many stickers do they have altogether? Show how you can check using the inverse operation.

Charley earns £36,099 a year. Franky earns £23,098 a year. How much do they earn altogether?
They have to pay £12,567 in rent a year. How much money are they left with after paying their rent?

Multi-step problems:

When Archie opened his book, he saw two numbered pages.
The sum of these two pages was 473. What would the next the next page number be?

324 + ☐ + 67 = 543

Ash and Elle share £560 between them. Ash received £100 more than Elle. How much money did Elle receive?

Column 2 (Reasoning)

Mental strategies:

Laura has £10.
She spends £8.78 at the local shop. Would she use column subtraction to find the answer? Why?

True or false? Give your reasons.

4.8 + 0.6 = 4.14
7.1 – 0.8 = 6.20

Formal written methods:

There are mistakes in the following calculations.

```
  5674        3056
 + 435       - 562
 ─────       ─────
  5009        3514
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Explain the mistakes then make corrections to find the correct answers.

A five digit number and a four digit number have difference of 5,467. Write three possible pairs of numbers.

Multi-step problems:

On Monday Dee got paid £105 for a day's work.
On Tuesday Dee got paid £34 more than she did on Monday.
On Wednesday Dee got paid £9 less than she did on Monday.
How much did Dee get for the three days' work?
How many calculations do you need to complete to find the answer?
Does it matter what order you complete the calculations in?

Column 3 (Problem Solving)

Mental strategies:

If 5,365 is the answer, what's the question?
Write 3 addition calculations.
Write 3 subtraction calculations.

Formal written methods:

Find the missing numbers in the calculations below:

Multi-step problems:

At the beginning of the day, a grocer has 239 apples. He receives another 144 from his supplier and sells 307 during the day.

Khalid calculates how many apples the grocer has by the end of the day:

307 – 239 + 68, 68 + 144 = 212 apples left. Explain the mistake Khalid has made.

On Sunday, Jacob spent 86 minutes on his maths homework and 37 minutes reading. On Tuesday, he spent 69 minutes on his project.

What calculations will you use to find the difference between the time he spent on homework on Sunday and Tuesday?

Fluency	Reasoning	Problem Solving

Year 6

Mental calculations:

Work out the missing numbers

6,323 + 1000 = 7598 - [ ]

[ ] - 2000 = 5620 + 6005

Charley had 60 socks that needed putting into pairs. He bought 3 more packs containing 6 pairs in each. How many socks does he have now?

Multi-step problems:

Work out the missing numbers:

Choose digits to go in the empty boxes to make these number sentences true.
14 781 – 6[ ]53 = 8528
23·12 + 22· [ ] = 45·23

Work out the missing numbers:
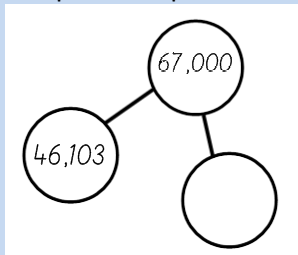
5,345 + 2,2134 = 8,534 – [ ]

[ ] + 4,097 = 7,001 – 1,254

Draw a bar model to show this problem.
The local library ordered 2,650 new books on Monday. On Tuesday they ordered double their previous order. On Wednesday they order half of what they ordered on Monday. How many books will arrive in their delivery?

Complete the part whole model.

Mental calculations:

Khalid says:

'Whatever digits we put in these boxes:

[ ] + 25 = [ ] - 50

They will always be positive numbers.'

Do you agree? Explain.

Multi-step problems:

Mr Green drives a lorry. Last week he drove 197 miles, 232 miles and 164 miles on his three journeys.

This week he drove 309 miles and 265 miles on his two journeys.

What was the difference in mileage between this week and last week?

Here is a bar model.

523,123	

Select two 6-digit numbers to complete the bar model.

How did you select your numbers?

Abdul says 'If I add any three 3-digit numbers together it will always make a 4-digit number.'

Do you agree? Explain.

Mental calculations:

*
Peter paid £21 for 5 presents. For A and B he paid a total of £6. For B and C he paid a total of £10. For C and D he paid a total of £7. For D and E he paid a total of £9. How much did Peter pay for each present?

Multi-step problems:

Can you use five of the digits 1 to 9 to make this number sentence true?

[ ][ ].[ ] + [ ].[ ] = 31.7
Can you find other sets of five of the digits 1 to 9 that make the sentence true?

Two numbers have a difference of 2·38
What could the numbers be if:
the two numbers add up to 6?
one of the numbers is three times as big as the other number?

Jasmine and Kamal have been asked to work out 5748 + 893 and 5748 – 893.
Jasmine says, '893 is 7 less than 900, and 900 is 100 less than 1000, so I can work
out the addition by adding on 1000 and then taking away 100 and then taking
away 7.'
What answer does Jasmine get, and is she correct?