Addition and Subtraction

Selected National Curriculum Programme of Study Statements

Pupils should be taught to:

- add and subtract numbers mentally, including:
    - a 3-digit number and ones
    - a 3-digit number and tens
    - a 3-digit number and hundreds
- add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

The Big Ideas

Relating numbers to 5 and 10 helps develop knowledge of the number bonds within 20. For example, given $8 + 7$, thinking of 7 as $2 + 5$, and adding the 2 and 8 to make 10, then the 5 to 15. This should then be applied when calculating with larger numbers.

Subtraction bonds can be thought of in terms of addition: for example, in answering $15 - 8$, thinking what needs to be added to 8 to make 15. Counting on for subtraction is a useful strategy that can also be applied to larger numbers.

Mastery Check

Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?', 'What happens if …?', and checking that pupils can use the procedures or skills to solve a variety of problems.

Mastery	Mastery with Greater Depth
What do you notice? Is there a relationship between the calculations? $500 + 400 =$ $\quad$ $523 + 400 =$ $\quad$ $523 + 28 =$ $400 + 500 =$ $\quad$ $423 + 500 =$ $\quad$ $423 + 28 =$ $300 + 600 =$ $\quad$ $323 + 600 =$ $\quad$ $323 + 28 =$ $200 + 700 =$ $\quad$ $223 + 700 =$ $\quad$ $223 + 28 =$ $100 + 800 =$ $\quad$ $123 + 800 =$ $\quad$ $123 + 48 =$	For positive integers are the following statements always, sometimes or never true? - The sum of 2 odd numbers is even. - The sum of 3 odd numbers is even. - Adding 5 to a number ending in 6 will sum to a number ending in 1. - Adding 8 to a number ending in 2 will always sum to a multiple of 10. Explain why in each case.
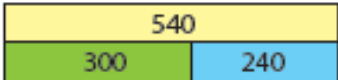
Mastery	Mastery with Greater Depth
Write the four number facts that this bar model shows. 540 300 240 ☐ + ☐ = ☐ ☐ + ☐ = ☐ ☐ − ☐ = ☐ ☐ − ☐ = ☐	Flo and Jim are answering a problem: Danny has read 62 pages of the class book, Jack has read 43. How many more pages has Danny read than Jack? Flo does the calculation 62 + 43. Jim does the calculation 62–43. Who is correct? Explain how you know. *Pupils might demonstrate using a bar model to explain their reasoning.*
Using coins, find three ways to make £1.	Sophie has five coins in her pocket. How much money might she have? What is the greatest amount she can have? What is the least amount she can have? If all the coins are different: What is the greatest amount she can have? What is the least amount she can have?

Mastery	Mastery with Greater Depth
Solve calculations using a place value grid and equipment alongside a column method to demonstrate understanding.	There are six 3-digit addition calculations shown below.

Hundreds place   Tens place   Ones place

325
+ 247
_____

Sam has completed these calculations, but he is incorrect.
Explain the errors he has made.

325   355
+ 247   − 247
_____   _____
581   112

There are six 3-digit addition calculations shown below.

a) 124   b) 644   c) 366
   + 233   + 172   + 277
   _____   _____   _____

d) 579   e) 791   f) 567
   + 221   + 163   + 233
   _____   _____   _____

Which calculations have no carry digits?

Which calculations have a carrying digit only once?

Which calculations have a carrying digit twice?

Which calculation has the largest answer?

Which calculation has the smallest answer?

Check that children are looking at the numbers involved, rather than doing the calculations.

Complete these calculations. What do you notice?

3 + 7 =   8 + 2 =   6 + 4 =

30 + 70 =   80 + 20 =   60 + 40 =

33 + 7 =   88 + 2 =   66 + 4 =

333 + 7 =   888 + 2 =   666 + 4 =

300 + 700 =   800 + 200 =   600 + 400 =

☐ ☐ ☐ + ☐ ☐ ☐ =

Throw a 1 to 6 dice and each time record the digit in one of the place holders. The aim is to get the sum as low as possible. Repeat to find different answers.

Could you have done it in a different way?

Compete against a friend and compare your answers.