## Examples of what children should be able to do, in relation to each (boxed) Programme of Study statement

**solve problems with addition and subtraction:**

* **using concrete objects and pictorial representations, including those involving numbers, quantities and measures**
* **applying their increasing knowledge of mental and written methods**

**add and subtract numbers using concrete objects, pictorial representations, and mentally, including:**

* **a two-digit number and ones**
* **a two-digit number and tens**
* **two two-digit numbers**
* **adding three one-digit numbers**
* Use partitioning, counting strategies and knowledge of number bonds to add or subtract a one-digit number or a multiple of 10 to any two-digit number. To work out 86 – 50, for example, they might partition and calculate:

86 – 50 = 80 + 6 – 50 = 80 – 50 + 6 = 30 + 6 = 36

* Similarly, to find the total number of people on a bus with 14 people on the top deck and 8 below, they might use:

14 + 8 = 14 + 6 + 2 = 20 + 2 = 22

* Children add or subtract two-digit numbers using practical and informal methods and their knowledge of the relationships between operations. For example, they count back along a number line to find 64 – 25 or count up from 67 to find the answer to 94 – 67. They represent such calculations as number sentences. They calculate the value of an unknown in a number sentence such as ☐ ÷ 2 = 6 or 85 – ☐ = 29. They recognise, for example, that to answer 85 – ☐ = 29 they could use the related addition 29 + ☐ = 85

**recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100**

* Extend their knowledge and use of number facts, and use partitioning and number bonds to add and subtract numbers mentally to answer questions such as 60 – ☐ = 52 or 35 = 20 + ☐. They make jottings where appropriate to support their thinking.
* Answer problems such as:
	+ Look at this number sentence: ☐ + ☐ = 20. What could the two missing numbers be? What else?
	+ Can you tell me all the pairs of numbers that make 20?

**show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot**

* Understand that addition can be done in any order and use this to solve an addition by rearranging the numbers to simplify the operation. They need to understand that two numbers can be taken away from each other but that the answers will not be the same.

**recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems**

* Check their addition and subtraction with a calculation that uses the inverse operation.
* Answer questions, such as:
	+ Look at this number sentence: 74 – 13 = 61

Write three more number sentences using these numbers. How do you know, without calculating, that they are correct?

* + What addition facts can you use to help you calculate these?

12 – 5, 19 – 8

Explain how the addition facts helped you.

* + I think of a number, I subtract 19 and the answer is 30. What is my number? How do you know?

## Non-Statutory Guidance

Pupils extend their understanding of the language of addition and subtraction to include sum and difference.

Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100; 100– 70 = 30 and 70 = 100 – 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition.

Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.