Year group:	3
Type of test:	End of Half Term
Term:	Autumn 1
Test content:	Reasoning
Power Maths topic:	Book 3A, Units 1 and 2

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
1	**470**	1	**Possible incorrect answer 461 (An answer like this may suggest children have counted up in ones)** Children may miscount because they are trying to keep track of too many things. For example, when counting on seven 50s from 300, they may find it difficult to keep track of how many 50s they have counted and where they are. This topic is covered in Unit 1, Lesson 6.	
2	**<**	1	**Possible incorrect answer > (An answer like this may suggest children have compared the first digits of the numbers)** Children may not think about the place value of a digit. For example, when comparing 586 and 84 they may think 84 is greater than 586 because the first digit of 84 is 8 and the first digit of 586 is 5. This topic is covered in Unit 1, Lesson 9.	Children can compare two 3-digit numbers using <, > and = signs. Children compare the numbers by first considering the 100s, then the 10s (if needed) and then the 1s. Children can also work out the missing digits in numbers.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
3	**47, 407, 740**	1	**Possible incorrect answer 407, 47, 740 (An answer like this may suggest children have looked at the first digits and then the second digits, without considering their place value)** Children may not think about the place value of a digit. For example, when ordering 850, 98 and 700 they may think 98 is the greatest number because 9 is the greatest first digit. This topic is covered in Unit 1, Lesson 10.	Children can order three or more 3-digit numbers. Children can also work out the missing digits in numbers listed in order.
4	**6**	1	**Possible incorrect answer 500 or 700 (An answer like this may suggest children have found the difference between, or total of, 600 and 100)** Children may lack conceptual understanding of the written vocabulary and so therefore choose the incorrect operation to solve the problem. Children may revert to a favoured operation when trying to solve a problem, instead of using the correct one, because they find the correct operation more challenging. This topic is covered in Unit 1, Lesson 1.	Children can count in 100s from 0 to 1,000 and back again. They understand what 100 is and know the different ways of representing it. They can write numbers in both numerals and words.
5	**50, 200**	1	**Possible incorrect answer for the second number 100 (An answer like this may suggest children have miscounted)** Children may miscount because they are trying to keep track of too many things. For example, when counting on seven 50s from 300, they may find it difficult to keep track of how many 50s they have counted and where they are. This topic is covered in Unit 1, Lesson 11.	Children can count forwards and backwards in 50s from 0 to 1,000, starting at any multiple of 50. They can work out how many 50s are in a number by counting up to that number. Children can start to pattern spot and identify numbers that are in the pattern.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
6	**An indication that the correct answer should be 500 + 7 + 20 = 527, or an explanation that Emily has confused the 10s and 1s.**	1	**Possible incorrect answer Emily is correct (An answer like this may suggest that children have not taken into account each number's place value and so added incorrectly)** Children, through lack of understanding of place value, may assume that the first digit in each number in the calculation (5, 7 and 2) can be placed in the order they are in to create a 3-digit number (572). Children may assume that the calculation is written in descending value (hundreds, then tens, then ones), rather than the mixed up order they are presented, and so misread the given numbers. This topic is covered in Unit 1, Lessons 3 and 4.	Children can organise their work on a place value grid and show multiple ways of writing 3-digit numbers.
7	**6** and **9** or **7** and **8 in either order**	1	**Possible incorrect answer 5 and 10, 4 and 11, 3 and 12, 2 and 13, 1 and 14 or 0 and 15 (An answer like this may suggest children do not understand the term 'digit')** **Possible incorrect answer 5 and 0, 4 and 1 or 3 and 2 in any order (An answer like this may suggest children have added the 1s correctly but do not know they need to exchange ten 1s for a 10)** Children may not understand place value. This topic is covered in Unit 2, Lesson 2.	Children can add a 1-digit number to a 3-digit number by adding the 1s digits of both numbers. Children can subtract a 1-digit number from a 3-digit number by subtracting the 1-digit number from the 1s of the 3-digit number in calculations that do not require exchange.
8	**10 more: 134** and **307** **Number: 766** and **498** **2 marks for all 4 correct. 1 mark for 2 or 3 correct.**	2	**Possible incorrect answer 133, 306, 767 and 499 (An answer like this may suggest children have used a counting up/down strategy but included the given starting number when counting up/down)** **Possible incorrect answer 786 and 518 (An answer like this may suggest children have added 10 to 776 and 508)** When answering a question such as '527 is 100 more than ___', children may think they have to find 100 more. Children need to see that 527 is the value after the increase, therefore they need to do the inverse. This topic is covered in Unit 1, Lesson 7.	Children can find 1, 10, or 100 more or less than a given number, including cases that involve an exchange. Children recognise which digit(s) will change. Children can also find the original number following an increase or decrease of 1, 10 or 100 by considering the inverse.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
9	**234**	1	**Possible incorrect answer 246 (An answer like this may suggest children have transposed the 1s digits to work out 9 – 3)** **Possible incorrect answer 235 (An answer like this may suggest children have used a counting strategy and included 243 when counting down from 243)** Children may subtract the digits in the wrong order. For example, when calculating 243 – 9, children may subtract 3 from 9, because they think you have to subtract the smaller digit from the larger one. This is one of the most common errors when learning to subtract. This topic is covered in Unit 2, Lesson 4.	Children can explain how to exchange one 10 for ten 1s to subtract a 1-digit number. Children can justify their reasoning using their knowledge of number bonds within 20.
10	**Shey has not exchanged ten of the 10s for 100 and then added it on to give 721.**	1	**Possible incorrect answer 703 (An answer like this may suggest children have misconstrued twelve 10s as 102 and found 102 + 601 = 703)** Children may find the flexible partitioning of the 10s required to bridge the hundred challenging. Children may have difficulty with exchange when bridging the 100s. For example, they may forget to include the exchanged digit or misconstrue thirteen 10s as 103. This topic is covered in Unit 2, Lesson 6.	Children can add multiples of 10 and recognise when they need to exchange ten 10s for one 100.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
11	**First number 6, 7, 8 or 9 and second number any digit OR first number 5 and second number 2, 1 or 0**	1	**Possible incorrect answer first digit 0–4 (An answer like this may suggest children have misunderstood the meaning of the > sign)** **Possible incorrect answer any first digit and the second box left empty (An answer like this may suggest children have not looked at the place value of the digits 4 and 5 in the second number)** Children may not think about the place value of a digit. For example, when comparing 586 and 84 they may think 84 is greater than 586 because the first digit of 84 is 8 and the first digit of 586 is 5. This topic is covered in Unit 1, Lesson 9.	Children can compare two 3-digit numbers using <, > and = signs. Children compare the numbers by first considering the 100s, then the 10s (if needed) and then the 1s. Children can also work out the missing digits in numbers.
12	**9 and 7 or 8 and 8**	1	**Possible incorrect answer any two digits that total 7 (An answer like this may suggest children have not realised a 10 needs to be carried across from 9 + 2 in the ones column as they total 11. Following this, they may miss that a 100 must be carried across from the tens column into the hundreds column)** Children may find it confusing where an exchange has a `knock-on' effect, such as in 128 + 73, where the exchange of 1s also causes an exchange of 10s. Children may become confused where they have to exchange both 10s and 1s in the same calculation. This topic is covered in Unit 2, Lesson 9.	Children can identify the missing digits in a column addition, including where exchange is required.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
13	**Taylor subtracted the 10s in the wrong order.**	1	**Possible incorrect answer the answer should be 367 (An answer like this may suggest children have used a counting in 10s strategy and included 417 when counting)** Children may resort to counting in 10s, rather than using knowledge of bonds and place value. Children may find it challenging when there is a 0 in the 1s or 10s place of the 3-digit number they are subtracting from. This topic is covered in Unit 2, Lesson 5.	Children can explain how to subtract a multiple of 10 from a 3-digit number in terms of the place value of the digits. Children can explain why, for example, when you subtract 30 from 654, the 10s digit decreases by 3.
14	**76 (minutes left)** Award 1 mark for 137 – 29 = 108 or 137 – 32 = 105 , or evidence of an attempt made to add 29 and 32 then subtract the total from 137, but with the wrong final answer.	2	**Possible incorrect answer 120 (An answer like this may suggest children have transposed the 1s digits to work out 9 – 7 = 2, so 137 – 29 = 112, and then transposed the 10s digits to work out 30 – 10 = 20, so 112 – 32 = 120)** **Possible incorrect answer 198 (An answer like this may suggest children have found 137 + 29 + 32)** Children may find it difficult to represent exchange in written column methods: they may not understand why certain digits are crossed out and small digits are written next to other digits. Children may find it difficult where an exchange is required but there is a 0 in the tens column. This topic is covered in Unit 2, Lesson 10.	Children can use column subtraction written methods to complete subtractions of a 2-digit number from a 3-digit number where exchange is needed.

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
15	**288** Award 1 mark for 400 – 23 = 377 or 400 – 89 = 311, or evidence of an attempt made to add 23 and 89 then subtract the total from 400, but with the wrong final answer.	2	**Possible incorrect answer 466 (An answer like this may suggest children have transposed the 1s and 10s digits to work out 23 – 0 = 23 so 400 – 23 = 423 and then transposed the 1s and 10s digits again to work out 89 – 23 = 66, so 423 – 89 = 466)** **Possible incorrect answer 512 (An answer like this may suggest children have worked out 400 + 23 + 89)** Children may find it difficult to represent exchange in written column methods: they may not understand why certain digits are crossed out and small digits are written next to other digits. Children may find it difficult where an exchange is required when there is a 0 in the tens column. This topic is covered in Unit 2, Lesson 10.	Children can use column subtraction written methods to complete subtractions of a 2-digit number from a 3-digit number where exchange is needed.

Mark range	Level
0 – 3	Below
4 – 6	Towards
7 – 10	Expected
11 – 13	Secure
14 – 15	Towards greater depth
16 – 18	Greater depth