Year group:	3
Type of test:	End of Year
Test content:	Arithmetic
Power Maths topic:	Books 3A–3C Revision of Year 1 Revision of Year 2

Q	ANSWER	MARK	INCORRECT ANSWERS AND MISCONCEPTIONS	EVIDENCE OF GREATER DEPTH
1	**17**	1	**Possible incorrect answer 18 (An answer like this may suggest children have counted back in 1s and included 20 when counting)** Children may try to use a counting strategy rather than using their knowledge of number bonds to derive additions and subtractions. This revision topic is covered in Book 2A, Unit 2, Lesson 6.	
2	**20**	1	**Possible incorrect answer 15 or 25 (An answer like this may suggest children have counted too many or too few 5s)** When counting up in 5s, children may be unsure which 10 comes next, especially with higher numbers with which they are less familiar. They may be able to count '…15, 20, 25, 30, 35…' and then become uncertain. Sometimes they may revert to the previous 10 or skip to the next one. This is because they are trying to keep track of what the next 10 will be as well as remembering the pattern of ending in 5 and then 0. This revision topic is covered in Book 2A, Unit 5, Lesson 7.	Children can work out multiplication sentences involving multiplying by 5 and can link this to an array, a number line and a repeated addition sentence.

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3	**100**	1	**Possible incorrect answer 90 or 110 (An answer like this may suggest children have counted in 10s; they may have included 30 when counting or lost count)** This revision topic is covered in Book 1C , Unit 16, Lesson 8.	Children can use their understanding of number bonds to 10 to find number bonds to 100. They can demonstrate their understanding of number bonds through the use of concrete, pictorial and abstract representations, and can write number bonds as addition calculations and as the inverse subtractions.
4	**30**	1	**Possible incorrect answer 25 or 35 (An answer like this may suggest children have either lost count when counting in 5s or do not know which 10 comes next)** When counting up in 5s, children may be unsure which 10 comes next, especially with higher numbers with which they are less familiar. They may be able to count '…15, 20, 25, 30, 35…' and then become uncertain. Sometimes they may revert to the previous 10 or skip to the next one. This is because they are trying to keep track of what the next 10 will be as well as remembering the pattern of ending in 5 and then 0. This revision topic is covered in Book 2A, Unit 5, Lesson 7.	Children can work out multiplication sentences involving multiplying by 5 and can link this to an array, a number line and a repeated addition sentence. Children can explain how to use one multiplication fact to work out another multiplication fact without starting from 0.
5	**25**	1	**Possible incorrect answer 35 (An answer like this may suggest children have transposed the 1s digits)** When subtracting, children may swap the numbers around and subtract the smaller number of 1s from the larger number; for example, when working out 32 – 16, children may mentally subtract two 1s from six 1s. This revision topic is covered in Book 2A, Unit 3, Lesson 6.	Children can confidently use base 10 equipment or other resources to exchange when subtracting. They can explain what they have done with concrete resources in combination with mental calculations.

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6	**¾**	1	**Possible incorrect answer ⅜ (An answer like this may suggest children know that a whole is ¼ but think the denominators need to be added too)** **Possible incorrect answer ²⁄₄ (An answer like this may suggest children do not know that a whole is ¼)** When comparing fractions that make one whole, such as ⅓ and ¼, children may think the whole has to look different. They may think the whole that has been split into quarters has to be bigger because there are more parts. This revision topic is covered in Book 2B, Unit 10, Lesson 11.	Children can recognise a whole by seeing whether the numerator and denominator are the same and can understand that a whole as a fraction with the same numerator and denominator can represent the same whole as another fraction made up of a different number of equal parts. Children can fill in missing number sentence scaffolds in order to make one whole.
7	**63**	1	**Possible incorrect answer 69 (An answer like this may suggest children have added 10 and then added another 3 instead of subtracting 3)** **Possible incorrect answer 62 (An answer like this may suggest children have used a counting strategy but included 56 when counting)** Children are likely to confuse whether they should add or subtract in the final stage of a mental calculation. For example, they may add 20 rather than 19 but then add another 1 to the total, rather than subtracting. This revision topic is covered in Book 2C, Unit 12, Lesson 8.	Children can add or subtract a multiple of 10 to or from a number to represent a near multiple of 10 and then adjust the total appropriately to reflect the actual calculation.

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8	**317**	1	**Possible incorrect answer 316 (An answer like this may suggest children have added using a counting on strategy and included 312 when counting 5 more than 312)** When counting on, children may include the starting number in the count. **Possible incorrect answer 307 (An answer like this may suggest children have subtracted instead of adding)** In either case, children may not show awareness of when to stop counting and go beyond adding (or mistakenly subtracting) 5. This topic is covered in Book 3A, Unit 2, Lesson 3.	Children may check their calculation with an inverse operation. Children can explain how their understanding of number facts and number bonds can help them to solve this question efficiently.
9	**735**	1	**Possible incorrect answer 745 (An answer like this may suggest children have subtracted the 1s digits in the wrong order)** **Possible incorrect answer 736 (An answer like this may suggest children have used a counting method and included 743 when counting)** Children may subtract the digits in the wrong order. For example, when calculating 234 – 7, they may find 7 – 4, as they think you have to subtract the smaller digit from the larger. This topic is covered in Book 3A, Unit 2, Lesson 4.	Children can explain how to exchange one 10 for ten 1s to subtract a 1-digit number.
10	**0**	1	**Possible incorrect answer 4 (An answer like this is common and may suggest children have answered too quickly and not thought about their response)** Children may think 0 × 4 = 4. This is a common mistake, mainly because children sometimes answer too quickly, without thinking about their response, and they think 4 must be the first answer in the 4 times-table. This topic is covered in Book 3A, Unit 4, Lesson 7.	Children can recognise a multiplication fact from the 4 times-table in a given image. Children should be developing a rapid recall of multiplication facts and associated division facts from the 4 times-table.

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11	**8**	1	**Possible incorrect answer 7 or 9 (An answer like this may suggest children have counted up in 3s but lost count)** This topic is covered in Book 3A, Unit 4, Lesson 3.	Children can form division sentences from a grouping or sharing situation, and they know the difference between grouping and sharing. Children can use repeated subtraction and counting back in 3s to work out the result of a division, as well as seeing how an array can help them.
12	**6**	1	**Possible incorrect answer 5 or 7 (An answer like this may suggest children have counted up in 8s but lost count)** When dividing by 8, children may lose track of the count forwards or backwards. When using the method where they have to halve, halve again and halve again, children may halve only twice (and therefore divide by 4, not 8). This topic is covered in Book 3A, Unit 4, Lesson 9.	Children can form a division sentence from a grouping or sharing situation and know the difference between grouping and sharing. Children can use repeated subtraction and counting forwards or backwards in 8s to work out the result of a division. They also know that a method for dividing by 8 is to halve the number, halve the answer and then halve again.
13	**96**	1	**Possible incorrect answer 94 (An answer like this may suggest children have counted in 8s from 0 and made an error in the process)** **Possible incorrect answer 88 (An answer like this may suggest children have counted in 8s from 0 but lost count)** Children often count in 8s from 0 when working out, for example 11 × 8, even if they already know 10 × 8. This topic is covered in Book 3A, Unit 4, Lesson 8.	Children can form a multiplication sentence involving multiplying by 8 and can work out the answer to a multiplication sentence by knowing its link with repeated addition and using a number line to count up in 8s. They will start to remember some of the multiplication facts for multiplying by 8 and they will know the link between multiplying by 2, by 4 and by 8.
14	**256** Award 1 mark for 336 or 196	2	**Possible incorrect answer 416 (An answer like this may suggest children have added all three numbers)** When representing an addition using place value equipment, both numbers are represented. However, when subtracting, only the whole is represented. This can be confusing for children, as the column subtraction shows the whole and the part as separate numbers. This topic is covered in Book 3A, Unit 2, Lessons 6–7.	Children can add and subtract multiples of 10 and recognise when they need to exchange ten 10s for one 100.

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15	**400**	1	**Possible incorrect answer 350 or 450 (An answer like this may suggest children do not know that multiplication is commutative or that they can use related facts so have counted in 50s and lost count)** **Possible incorrect answer 40 (An answer like this may suggest children think they need to find 8 × 5 and then 'stick a 0 on the end', but have forgotten to add the 0 because there is one already)** Children may not know multiplication is commutative, so they might solve 5 × 4 and 5 × 40, but not 40 × 5. Children may think that to work out 40 × 5, they need to find 4 × 5 and 'stick a 0 on the end'. This topic is covered in Book 3B, Unit 5, Lesson 2.	Children can link their understanding of known multiplication facts to related calculations and can explain the link between two multiplications such as 3 × 4 and 3 × 40. They demonstrate an understanding of commutativity in multiplication, and can fluently solve a calculation mentally using the related facts.
16	**81**	1	**Possible incorrect answer 30 (An answer like this may suggest children have added instead of multiplying)** Children may revert to a favoured operation if they are unable to successfully use the one needed to solve the question. This topic is covered in Book 3B, Unit 5, Lesson 6.	Children can reliably use the expanded and formal method to multiply a 2-digit number by a 1-digit number involving grouping and exchange. They can link their understanding of place value to their calculations and represent these using concrete, pictorial and abstract representations.
17	**175** **5**	1 1	**Possible incorrect answer 35 (An answer like this may suggest children think the answer is the same for each calculation)** **Possible incorrect answer 170 and 6 (Answers like this may suggest children have incorrectly worked out 35 × 5 and 175 ÷ 35, rather than using the related fact)** Children may think division is commutative, like multiplication. For example, they may write 4 ÷ 24 = 6 instead of 24 ÷ 4 = 6. This topic is covered in Book 3A, Unit 4, Lesson 15.	Children can, given an array or similar, find the set of multiplication and division facts that are associated with it. They can also communicate what each fact tells them about the array. Children can use a given fact to work out other related calculations.

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18	**404**	1	**Possible incorrect answer 394 or 3914 or 3104 (An answer like this may suggest children have not added on the 10 or 100 they have exchanged)** 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. This topic is covered in Book 3A, Unit 2, Lesson 9.	Children can add a 3-digit and a 2-digit number accurately using a written column method.
19	**388**	1	**Possible incorrect answer 412 (An answer like this may suggest children have transposed the digits to work out 2 – 0 and 80 – 70)** Children may find it difficult to represent exchange in written column methods, because they may not understand why certain digits are crossed out and small digits are written next to other digits. This topic is covered in Book 3A, Unit 2, Lesson 10.	Children can use a written column method to subtract a 2-digit number from a 3-digit number where exchange is needed.
20	**904** Award 1 mark for 548, 597 or 663	2	**Possible incorrect answer 8,914 or 894 or 8,104 or 804 (An answer like this may suggest children have started with the 100s column or have not added on the 10 or 100 they have exchanged)** Some children may add mentally, starting with the 100s, then the 10s and then the 1s. If children do not begin by adding the 1s, then the 10s and then the 100s, adding where exchange is required can be difficult and prone to inaccuracy. This topic is covered in Book 3A, Unit 3, Lessons 2 and 3.	Children can explain how the written column method relates to the place value of each digit in the addition. They can write the addition accurately and use the columns to add two or more numbers accurately and efficiently.
21	**891**	1	**Possible incorrect answer 991 (An answer like this may suggest children have started with the 100s and have not added on what they exchanged)** Some children may add mentally, starting with the 100s, then the 10s and then the 1s. If children do not begin by adding the 1s, then the 10s and then the 100s, adding where exchange is required can be difficult and prone to inaccuracy. This topic is covered in Book 3A, Unit 3, Lesson 8.	Given other 3-digit numbers, children can work out the other number needed to total 1,000.

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22	**3 remainder 1**	1	**Possible incorrect answer 1 remainder 3 (An answer like this may suggest children have mixed up the whole and the remainder)** **Possible incorrect answer 2 remainder 4 (An answer like this may suggest children lack understanding that remainder means there are not enough to share)** Children may not understand what a remainder means. They may mix up the whole and the remainder when writing answers formally. This topic is covered in Book 3A, Unit 4, Lesson 14.	Children understand that some divisions may leave a remainder and start to recognise (using their knowledge of times-tables) when a division may lead to a remainder. Children understand that a remainder may result from both equal sharing and equal grouping. They can find the result of a division with a remainder and write it in the form '*a* remainder *b*'.
23	**353**	1	**Possible incorrect answer 447 (An answer like this may suggest children have transposed the digits)** Children may assume that you always subtract the smaller digit from the larger digit, which can lead to problems where a subtraction requires exchange. Children may resort to a written method, even when a mental method is more appropriate. This topic is covered in Book 3A, Unit 3, Lesson 5.	Children can represent column subtractions involving exchange across one or two columns, and explain when and why exchange is necessary. Children can recognise when to use a written method and when a mental method, such as counting up, may be more appropriate.

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24	**63 ÷ 4 OR 78 ÷ 5 OR 93 ÷ 6**	1	**Possible incorrect answer 45 ÷ 3 (An answer like this may suggest children have used their knowledge that the inverse of dividing is multiplying, but have multiplied 15 by 3)** **Possible incorrect answer 27 ÷ 4 (An answer like this may suggest children have mixed up the whole and the remainder and found a calculation which gives the answer 3 r 15)** Children may not use their understanding of multiplication tables to predict when there will be a remainder. Children may leave a remainder that is larger than the divisor. This topic is covered in Book 3B, Unit 5, Lesson 10.	Children can explain how they know when there is going to be a remainder. They can give other pairs of numbers that divide to give the answer 15 remainder 3, and can explain how many different answers there will be in the format of 2-digits divided by 1-digit.
25	**296**	1	**Possible incorrect answer 246 or 2456 (An answer like this may suggest children have not added on the exchanged 10s)** **Possible incorrect answer 80 (An answer like this may suggest children do not understand place value and have added 8 × 7 to 8 × 3)** Children may have some misconceptions about place value, and may not be able to place digits in the correct columns; for example, they may think that 25 × 3 is 5 × 3 + 2 × 3. This topic is covered in Book 3B, Unit 5, Lessons 5 and 6.	Children can use the column method of multiplication to solve a range of problems showing fluency by placing digits in their correct place value columns and multiplying in steps, exchanging where necessary. They will be able to confidently explain their methods and reasoning.

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26	**£6 and 54p** or **654p** Award 1 mark for £4 and 54p, 454p or £7	2	**Possible incorrect answer £654 (An answer like this may suggest children do not understand the place value of each digit)** **Possible incorrect answer 43 (An answer like this may suggest children have not understood the place value of each digit and have then transposed the digits before subtracting, 46 – 5 + 2)** **Possible incorrect answer £6 and 64p and 664p (An answer like this may suggest children are not confident with number bonds to 100)** **Possible incorrect answer £2 and 54p or 254p (An answer like this may suggest children have added 46p and £2 before subtracting from £5)** Children may not add the correct numbers. For example, they may add £1 and 88 pence together and find £89 or 89p. Children need to understand the importance of the units. Children may add the pounds and pence separately but leave the pence answer greater than £1. For example, when finding the total of £1 and 89 pence and £2 and 62 pence, children may answer £3 and 151 pence. Children may not be confident with number bonds to 100. For example, they may understand that £1 is equivalent to 100 pence but think that 67 pence subtracted from £1 is 43 pence rather than 33 pence. This topic is covered in Book 3B, Unit 6, Lessons 3 and 4.	Children can subtract amounts of money given in pounds and pence.
27	**$\frac{7}{8}$**	1	**Possible incorrect answer $\frac{7}{0}$ (An answer like this may suggest children know that a whole is $\frac{8}{8}$ but believe that both the numerator and the denominator are added)** Children may believe that both the numerator and the denominator are added within an addition calculation – for example, they may think ½ + ½ = ¾. This topic is covered in Book 3B, Unit 9, Lesson 2.	Children can add a complementary fraction to another fraction to make a whole and represent this as an addition calculation. They can explain what each digit represents in each fraction within the addition calculation, using the appropriate mathematical language.

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28	**13** Accept an answer of 130 mm if the mm is seen.	1	**Possible incorrect answer 49 (An answer like this may suggest children have not converted the 40 mm to cm before adding)** **Possible incorrect answer 130 (An answer like this may suggest children have worked out their answer in the wrong unit)** Children may find conversions between centimetres and millimetres challenging. This topic is covered in Book 3B, Unit 8, Lesson 6.	Children can add pairs of lengths given in millimetres, centimetres, metres or mixed units using appropriate strategies such as the column method for addition.
29	**9**	1	**Possible incorrect answer 6, 12, 24, etc. (An answer like this may suggest children have used the method of repeated doubling to find fraction families)** **Possible incorrect answer 11 (An answer like this may suggest children have added 8 to the numerator 3 because 4 + 8 = 12)** This topic is covered in Book 3C, Unit 10, Lesson 3.	Children can use proportional reasoning to understand equivalent fractions and pairs of fractions, through the relationship between the numerator and denominator of each fraction.
30	**138** Accept an answer of 1 m 38 cm if the m and cm are seen.	1	**Possible incorrect answer 142 (An answer like this may suggest children have correctly converted between units but then transposed the 1s digits)** **Possible incorrect answer 228 (An answer like this may suggest children have incorrectly converted between units, thinking 1 m = 10 cm)** Children may make errors when converting between units. Ensure they understand that, for example, 1 m 50 cm and 150 cm are equivalent. This topic is covered in Book 3B, Unit 8, Lesson 7.	Children can find the difference between pairs of lengths given in metres, centimetres or simple combinations of both units and select the appropriate methods depending on the question.

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31	**$\frac{7}{10}$**	1	**Possible incorrect answer 1 remainder 3 or $1\frac{3}{7}$ (An answer like this may suggest children have transposed the digits)** Children may find it difficult to understand how tenths can be combined, or to use the language required to describe this quantity. This topic is covered in Book 3B, Unit 9, Lesson 4.	Children can describe how more than one object can be split into 10 equal parts. They can explain what fraction of one of the wholes they are dealing with when more than one whole is combined. They understand how to represent such a calculation as a division calculation and how to find unknown quantities within such calculations.
32	**$\frac{3}{5}$**	1	**Possible incorrect answer $\frac{3}{10}$ (An answer like this may suggest children have added the numerators and the denominators)** Children may try to add fractions by adding both the numerators and the denominators (for example, $\frac{2}{5} + \frac{1}{5} = \frac{3}{10}$). Children may be confused by a whole being made of different fractions. This topic is covered in Book 3C, Unit 10, Lesson 6.	Children can count fraction steps of a constant size, using their understanding of fractions as numbers. This will help them to add fractions with the same denominator. They can find pairs of fractions that total 1.
33	**2,030**	1	**Possible incorrect answer 230 (An answer like this may suggest children have incorrectly converted 2 l to 200 ml)** **Possible incorrect answer 2,003 or 2,300 (An answer like this may suggest children are not secure in place value of 4-digit numbers)** If children are not fully secure in place value of 4-digit numbers, they may make errors when converting, particularly when there are fewer than 100 millilitres in a mixed unit measure. This topic is covered in Book 3C, Unit 14, Lesson 3.	Children know that 1 litre is the same as 1,000 ml and ½ litre equals 500 ml. Children can convert measurements between litres/millilitres and millilitres.

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34	**$\frac{11}{15}$**	1	**Possible incorrect answer $\frac{11}{0}$ (An answer like this may suggest children have subtracted both the numerators and the denominators)** When subtracting fractions, children may subtract both the numerators and the denominators. For example, they may think $\frac{3}{5} - \frac{2}{5} = \frac{1}{0}$, because $3 - 2 = 1$ and $5 - 5 = 0$. Children may think that whole numbers have the same denominator as the fraction subtracted, for example, $1 - \frac{3}{8} = \frac{1}{8} - \frac{3}{8} = \frac{2}{8}$. With this misconception, children will often move the numerators around before subtracting. This topic is covered in Book 3C, Unit 10, Lesson 7.	Children draw on their understanding of fractions as numbers and of counting in fraction steps of a constant size. This will help them make sense of subtracting fractions with the same denominator. They can find the difference between two fractions with the same denominator.
35	**1,700**	1	**Possible incorrect answer 301 kg and 400 g (An answer like this may suggest children have mis-read the question and incorrectly added the 1 and 300)** **Possible incorrect answer 701 (An answer like this may suggest children have added the values without converting any units)** **Possible incorrect answer 800 (An answer like this may suggest children have incorrectly converted 1 kg to 100 g)** Children may not add the kilograms and grams separately. This topic is covered in Book 3C, Unit 13, Lesson 5.	Children can use efficient strategies to add and subtract mixed-value masses. They can explain their methods and give reasons why they have used a particular method.

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36	**1 l 150 ml**	1	**Possible incorrect answer 1 l 250 ml (An answer like this may suggest children do not know number bonds to 1,000)** Children may not be able to make the link between bonds to 10 and bonds to 100 and 1,000. This topic is covered in Book 3C, Unit 14, Lesson 5.	Children can add and subtract capacities across a litre boundary. Children can use what they know about converting between litres and millilitres, as well as number bonds to 1,000 to solve addition and subtraction problems in the context of capacity.

Mark range	Level
0 – 12	Below
14 – 19	Towards
20 – 29	Expected
30 – 33	Secure
34 – 37	Towards greater depth
38 – 40	Greater depth