Reasoning and Problem Solving
Step 5: Long Division 1

Teaching Note:

All questions that include long division already written out have an example of expanded method and formal method questions.

National Curriculum Objectives:

Mathematics Year 6: (6C7c) Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context
Mathematics Year 6: (6C8) Solve problems involving addition, subtraction, multiplication and division

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Solve a word problem involving long division of a 3-digit number by a 2-digit number no greater than 20. Key multiplication facts given. No remainders.
Expected Solve a word problem involving long division of a 3-digit number by a 2-digit number. Key multiplication facts grid partially completed. No remainders.
Greater Depth Solve a word problem involving long division of a 3-digit number by a 2-digit number. No key multiplication facts grids given. No remainders.

Questions 2, 5 and 8 (Problem Solving)
Developing Identify the missing digits of long division calculations, dividing a 3-digit number by 2-digit numbers no greater than 20. Key multiplication facts given. No remainders.
Expected Identify the missing digits of long division calculations, dividing a 3-digit number by 2-digit numbers. Key multiplication facts grid partially completed. No remainders.
Greater Depth Identify the missing digits of long division calculations, dividing a 3-digit number by 2-digit numbers. No key multiplication facts grids given. No remainders.

Questions 3, 6 and 9 (Reasoning)
Developing Identify and explain the errors in long division calculations dividing a 3-digit number by 2-digit numbers no greater than 20. Key multiplication facts given. No remainders.
Expected Identify and explain the errors in long division calculations dividing a 3-digit number by 2-digit numbers. Key multiplication facts grid partially completed. No remainders.
Greater Depth Identify and explain the errors in long division calculations dividing a 3-digit number by 2-digit numbers. No key multiplication facts grids given. No remainders.

More Year 6 Four Operations resources.

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Long Division 1

1a. A group of 12 children win 156 lollies at the school fair. They want to share them equally. Using long division, work out how many lollies each child receives. If another child joins the group, how many lollies would they receive now?



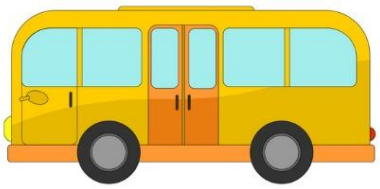
Key facts	
1 x 12 =	12
2 x 12 =	24
3 x 12 =	36
4 x 12 =	48
5 x 12 =	60
10 x 12 =	120

D

PS

Long Division 1

1b. There are 270 children that need to be split equally onto 18 minibuses for a trip. Using long division, work out how many children will be on each minibus.
If 3 minibuses break down, how many children would be on each bus now?



Key facts	
1 x 18 =	18
2 x 18 =	36
3 x 18 =	54
4 x 18 =	72
5 x 18 =	90
10 x 18 =	180

D

PS

2a. Work out which numbers or digits have been covered by the splats.

			1	■	
1	1	1	8	7	
	–	■	■	0	(x ■)
		0	7	7	
	–		7	7	(x 7)
				0	

Key facts	
1 x 11 =	11
2 x 11 =	22
3 x 11 =	33
4 x 11 =	44
5 x 11 =	55
10 x 11 =	110

D

PS

2b. Work out which numbers or digits have been covered by the splats.

		0	■	3
1	2	2	7	6
	–	2	4	↓
		0	■	6
	–		■	■
				0

Key facts	
1 x 12 =	12
2 x 12 =	24
3 x 12 =	36
4 x 12 =	48
5 x 12 =	60
10 x 12 =	120

D

PS

3a. Bessie knows she has made an error with this long division but she can't find the mistake.
Explain the mistake Bessie has made.

			1	7	
1	3	2	0	8	
	–	1	3	0	(x 10)
		0	7	8	
	–		7	8	(x 7)
				0	

Key facts	
1 x 13 =	13
2 x 13 =	26
3 x 13 =	39
4 x 13 =	52
5 x 13 =	65
10 x 13 =	130

D

R

3b. Kelvin knows he has made an error in his formal division but he can't find the mistake.
Explain the mistake Kelvin has made.

		0	1	1
1	1	1	5	4
	–	1	1	↓
		1	1	0
	–	1	1	0
				0

Key facts	
1 x 11 =	11
2 x 11 =	22
3 x 11 =	33
4 x 11 =	44
5 x 11 =	55
10 x 11 =	110

D

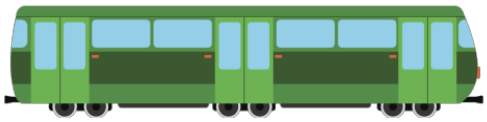
R

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Long Division 1

4a. Each day, 990 train carriages travel on a train track. Each train has 15 carriages. Using long division, work out many trains there are altogether.
If the trains had 18 carriages each, how many trains would there be now?

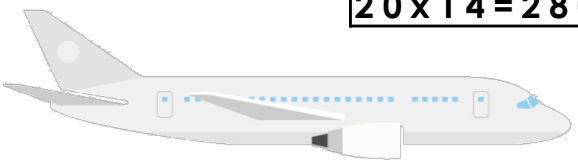
Key facts
2 x 15 = 30
5 x 15 = 75
10 x 15 = 150
20 x 15 = 300



E PS

4b. There are 798 passengers in an airport. Each day there are 14 flights. Using long division, work out how many passengers are on each plane.
If 5 new planes arrive at the airport, how many passengers would be on each now?

Key facts
2 x 14 = 28
5 x 14 = 70
10 x 14 = 140
20 x 14 = 280



E PS

5a. Work out which numbers or digits have been covered by the splats.

			3	[splat]	
1	9	5 6	1 6	5	
	–	[splat]	8	0	(x 20)
		1 2	1 8	5	
	–	1	9	0	(x 10)
			[splat]	5	
		–	[splat]	5	(x [splat])
				0	

Key facts
2 x 19 = 38
5 x 19 = 95
10 x 19 = 190
20 x 19 = 380

E PS

5b. Work out which numbers or digits have been covered by the splats.

		0	[splat]	9
1	6	4	6	4
	–	3	[splat]	↓
		1	[splat]	4
	–	[splat]	[splat]	4
				0

Key facts
2 x 16 = 32
5 x 16 = 80
10 x 16 = 160
20 x 16 = 320

E PS

6a. Jake knows he has made an error with this long division but he can't find the mistake.
Explain the mistake Jake has made.

			4	4	
1	3	5	8	5	
	–	5	2	0	(x 40)
			6	5	
	–		6	5	(x 4)
				0	

Key facts
2 x 13 = 26
5 x 13 = 65
10 x 13 = 130
20 x 13 = 260

E R

6b. Laura knows she has made an error in her formal division but she can't find the mistake.
Explain the mistake Laura has made.

		1	0	8
1	7	2 3	1 0	6
	–	1	7	↓
		1	3	6
	–	1	3	6
				0

Key facts
2 x 17 = 34
5 x 17 = 85
10 x 17 = 170
20 x 17 = 340

E R

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Long Division 1

7a. There are 442 seeds in a bag and 17 pots to plant them in. Using long division, work out how many seeds will be in each pot.
If 4 of the flower pots break, how many would be in each pot now?



PS

7b. There are 810 chocolate coins to divide between 18 children. Using long division, work out how many chocolate coins each child receives.
If 3 of the children leave, how may would each child get now?



PS

8a. Work out which numbers or digits have been covered by the splats.

			[splat]	7		
1	6	4	3	2		
	–	3	[splat]	0	(x [splat])	
		~~1~~	^{1}1	2		
	–		[splat]	0	(x 5)	
			3	2		
		–	3	2	(x [splat])	
				0		

PS

8b. Work out which numbers or digits have been covered by the splats.

		0	[splat]	6
1	8	4	6	8
	–	[splat]	[splat]	↓
		1	0	[splat]
	–	1	0	[splat]
				0

PS

9a. Rebecca knows she has made an error with this long division but she can't find the mistake.
Explain the mistake Rebecca has made.

			2	6	
1	4	5	0	4	
	–	4	2	0	(x 20)
		0	8	4	
	–		8	4	(x 6)
				0	

R

9b. Julian knows he has made an error in his formal division but he can't find the mistake.
Explain the mistake Julian has made.

		0	2	7
1	6	4	6	4
	–	3	2	↓
		1	4	4
	–	1	4	4
				0

R

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Reasoning and Problem Solving
Long Division 1

Developing

1a. 13; 12

2a.

				1	7	
1	1	1	8	7		
	–	1	1	0	(x 10)	
		0	7	7		
	–		7	7	(x 7)	
				0		

3a. Bessie has incorrectly calculated 78 ÷ 13 as 7 rather than 6. The answer should be 16, not 17.

Expected

4a. 66; 55

5a.

				3	5	
1	9	~~5~~^{5}	^{1}6	5		
	–	3	8	0	(x 20)	
		~~1~~^{1}2	^{1}8	5		
	–	1	9	0	(x 10)	
			9	5		
		–	9	5	(x 5)	
				0		

6a. Jake has incorrectly calculated 65 ÷ 13 as 4 rather than 5. The answer should be 45, not 44.

Greater Depth

7a. 26; 34

8a.

				2	7	
1	6	4	3	2		
	–	3	2	0	(x 20)	
		~~1~~	^{1}1	2		
	–		8	0	(x 5)	
				3	2	
		–	3	2	(x 2)	
				0		

9a. Rebecca has incorrectly calculated 420 ÷ 14 as 20 rather than 30. The answer should be 36, not 26.

Reasoning and Problem Solving
Long Division 1

Developing

1b. 15; 18

2b.

			0	2	3	
1	2	2	7	6		
	–	2	4	↓		
		0	3	6		
	–		3	6		
				0		

3b. Kelvin has not carried the 4 ones to the next number and has then incorrectly subtracted the hundreds and tens.

Expected

4b. 57; 42

5b.

			0	2	9	
1	6	4	6	4		
	–	3	2	↓		
		1	4	4		
	–	1	4	4		
				0		

6b. Laura has added in an unnecessary zero between the 1 and 8 in the answer.

Greater Depth

7b. 45; 54

8b.

			0	2	6	
1	8	4	6	8		
	–	3	6	↓		
		1	0	8		
	–	1	0	8		
				0		

9b. Julian has incorrectly calculated 144 ÷ 16 as 7 rather than 9. The answer should be 29, not 27.

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