Reasoning and Problem Solving
Step 6: Division to Solve Problems

National Curriculum Objectives:

Mathematics Year 6: (6C8) Solve problems involving addition, subtraction, multiplication and division
Mathematics Year 6: (6F9c) Use written division methods in cases where the answer has up to two decimal places

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Explain whether a given calculation would solve the given problem where there may be up to one exchange.
Expected Explain whether a given calculation would solve the given problem where there may be up to two exchanges.
Greater Depth Explain whether a given calculation would solve the given problem where there may be various exchanges. The problems include two steps.

Questions 2, 5 and 8 (Reasoning)
Developing Identify and explain errors in two comparison statements where the answer has up to two decimal places.
Expected Identify and explain errors in three comparison statements where the answer has up to two decimal places.
Greater Depth Identify and explain errors in three comparison statements where the answer has up to two decimal places. Each example has two steps.

Questions 3, 6 and 9 (Problem Solving)
Developing Complete the number sentence with three given digits where the divisor is provided. The solution has one decimal place.
Expected Choose the correct digits to complete the number sentence where the divisor is provided. The solution has two decimal places.
Greater Depth Choose the correct digits to complete the number sentence where the divisor is not provided. The solution has two decimal places.

More Year 6 Decimals resources.

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1a. Lex thinks that he should calculate £4.26 ÷ 4 to solve this problem. Is he correct? Explain your thinking and solve the problem.

> Mark, Kim and Jo share a meal deal which costs £4.26. How much do they pay each?

PS

1b. Gem thinks that she should calculate £47.60 ÷ 3 to solve this problem. Is she correct? Explain your thinking and solve the problem.

> Liam and 3 friends have collected £47.60 by washing cars for their neighbours. If they share the money equally, how much will each take home?

PS

2a. Tom has written the following comparisons.

A   22.4   ÷   7   =   15.5   ÷   5

B   3.9   ÷   3   <   6.18   ÷   6

Is he correct?
Find and explain any errors.

R

2b. Amy has written the following comparisons.

A   24.8   ÷   2   =   36.6   ÷   3

B   50.5   ÷   5   >   40.8   ÷   4

Is she correct?
Find and explain any errors.

R

3a. Use the digit cards to complete the calculation.

9   1   9

☐☐ ÷ 2 = ☐ . 5

PS

3b. Use the digit cards to complete the calculation.

7   5   8

3☐ ÷ 2 = 1 ☐ . ☐

PS

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Reasoning and Problem Solving – Division to Solve Problems – Year 6 Developing

Division to Solve Problems

4a. Jake thinks that he should calculate 5 ÷ £7.80 to solve this problem. Is he correct? Explain your thinking and solve the problem.

> A pack of fruit drinks contains 5 bottles. The whole pack costs £7.80. What does one bottle cost?

PS

4b. Sanna thinks that she should calculate 4.50 ÷ 6 to solve this problem. Is she correct? Explain your thinking and solve the problem.

> Alex cooks for 4.5 hours and makes 6 large pies. How long does one pie take to make?

PS

5a. Dara has written the following comparisons.

A   301   ÷   7   =   126   ÷   3

B   93.5   ÷   5   <   74.4   ÷   4

C   184   ÷   8   >   144   ÷   6

Is he correct?
Find and explain any errors.

R

5b. Amelie has written the following comparisons.

A   42.8   ÷   4   >   64.8   ÷   6

B   271.8   ÷   9   >   241.6   ÷   8

C   43.05   ÷   5   <   60.27   ÷   7

Is she correct?
Find and explain any errors.

R

6a. Use the digit cards to complete the calculation.

| 5 | 9 | 1 | 4 |

☐☐ ÷ 4 = 4 . 7 ☐

PS

6b. Use the digit cards to complete the calculation.

| 3 | 1 | 8 | 6 |

☐ . ☐ ÷ 5 = ☐ . 3 6

PS

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Reasoning and Problem Solving – Division to Solve Problems – Year 6 Expected

Division to Solve Problems

7a. Fiaz thinks that he should calculate 87.48 ÷ 12 then divide the answer by 9. Is he correct? Explain your thinking and solve the problem.

> A chocolate company is working out its costs. A multi-pack of chocolate boxes costs £87.48. Each multi-pack contains nine boxes and each box contains 12 luxury chocolates. How much does each chocolate box and each chocolate cost?

GD

PS

7b. Benji thinks that he should calculate £3.97 ÷ 7 then subtract the answer from £20. Is he correct? Explain your thinking and solve the problem.

> Luke posts 7 parcels. The postage costs the same for each parcel. He pays with a £20 note and gets £3.97 change. How much does each parcel cost to post?

GD

PS

8a. Armani has written the following comparisons.

A.   14 ÷ 8   =   10.5 ÷ 6   >   12.81 ÷ 7

B.   129 ÷ 12   >   93.61 ÷ 11   =   76.59 ÷ 9

C.   109.9 ÷ 7   <   136.8 ÷ 9   >   181.2 ÷ 12

Is he correct?
Find and explain any errors.

GD

R

8b. Katie has written the following comparisons.

A.   38.4 ÷ 12   >   16 ÷ 5   >   39.71 ÷ 11

B.   13.5 ÷ 2   >   75.35 ÷ 11   =   82.2 ÷ 12

C.   87.9 ÷ 6   =   131.85 ÷ 9   >   118 ÷ 8

Is she correct?
Find and explain any errors.

GD

R

9a. Use the digit cards to complete the calculation. The divisor is less than 5.

| 9 | 3 | 5 | 7 | 9 | 4 |

☐☐ ÷ ☐ = ☐ . ☐☐

GD

PS

9b. Use the digit cards to complete the calculation. The divisor is greater than 6.

| 8 | 4 | 5 | 7 | 8 | 3 |

☐☐ ÷ ☐ = ☐ . ☐☐

GD

PS

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Reasoning and Problem Solving – Division to Solve Problems – Year 6 Greater Depth

Developing

1a. He is incorrect. He should calculate £4.26 ÷ 3 which means they pay £1.42 each.

2a. A is incorrect: 3.2 > 3.1
B is incorrect: 1.3 > 1.03

3a. 19 ÷ 2 = 9.5

Expected

4a. He is incorrect. He should calculate £7.80 ÷ 5 which equals £1.56 per bottle.

5a. A is incorrect: 43 > 42
B is incorrect: 18.7 > 18.6
C is incorrect: 23 < 24

6a. 19 ÷ 4 = 4.75

Greater Depth

7a. He is incorrect. He should calculate £87.48 ÷ 9 then divide the answer £9.72 by 12. This means each chocolate box costs £9.72 and each chocolate costs 81p.

8a. A is incorrect: the second calculation should be 1.75 < 1.83
B is correct.
C is incorrect: the first calculation should be 15.7 > 15.2

9a. 39 ÷ 4 = 9.75

Developing

1b. She is incorrect. She should calculate £47.60 ÷ 4 which means they each take home £11.90.

2b. A is incorrect: 12.4 > 12.2
B is incorrect: 10.1 < 10.2

3b. 37 ÷ 2 = 18.5

Expected

4b. She is correct. 4.5 and 4.50 are the same. So 4.50 ÷ 6 = 0.75 hours or 45 minutes to make each pie.

5b. A is incorrect: 10.7 < 10.8
B is incorrect: 30.2 = 30.2
C is correct: 8.61 = 8.61

6b. 6.8 ÷ 5 = 1.36

Greater Depth

7b. He is incorrect. He should calculate £20.00 - £3.97 then divide the answer by 7. This means all seven parcels cost £16.03 to post. £16.03 ÷ 7 = £2.29 to post each parcel.

8b. A is incorrect: 3.2 = 3.2 < 3.61
B is incorrect: the first calculation should be 6.75 < 6.85
C is incorrect: the second part of the calculation should be 14.65 < 14.75

9b. 38 ÷ 8 = 4.75