Answers - Short multiplication and division

Year: Year 4

Answer to Question 1

a. Move the digits one place left: 64 × 10 = **640**.
b. 35 × 100 = **3 500** (two places left).
c. 7 × 6 = 42, so 7 × 60 = **420**.
d. 9 × 4 = 36, so 9 × 400 = **3 600**.
e. 8 × 3 = 24, so 8 × 300 = **2 400**.

Answer to Question 2

a. Estimate: 20 × 4 = 80. Ones: 3 × 4 = 12, write 2 and carry 1. Tens: 2 × 4 + 1 (carried) = 9, write 9. Answer: **92**.
b. Estimate: 40 × 5 = 200. Ones: 6 × 5 = 30, write 0 and carry 3. Tens: 3 × 5 + 3 (carried) = 18, write 18. Answer: **180**.
c. Estimate: 50 × 6 = 300. Ones: 8 × 6 = 48, write 8 and carry 4. Tens: 4 × 6 + 4 (carried) = 28, write 28. Answer: **288**.
d. Estimate: 80 × 3 = 240. Ones: 5 × 3 = 15, write 5 and carry 1. Tens: 7 × 3 + 1 (carried) = 22, write 22. Answer: **225**.

Answer to Question 3

a. Ones: 4 × 3 = 12, write 2 and carry 1. Tens: 3 × 3 + 1 (carried) = 10, write 0 and carry 1. Hundreds: 2 × 3 + 1 (carried) = 7, write 7. Answer: **702**.
b. Ones: 5 × 6 = 30, write 0 and carry 3. Tens: 0 × 6 + 3 (carried) = 3, write 3. Hundreds: 4 × 6 = 24, write 24. Answer: **2 430**.
c. Ones: 8 × 7 = 56, write 6 and carry 5. Tens: 6 × 7 + 5 (carried) = 47, write 7 and carry 4. Hundreds: 3 × 7 + 4 (carried) = 25, write 25. Answer: **2 576**.
d. Ones: 5 × 4 = 20, write 0 and carry 2. Tens: 4 × 4 + 2 (carried) = 18, write 8 and carry 1. Hundreds: 2 × 4 + 1 (carried) = 9, write 9. Thousands: 1 × 4 = 4, write 4. Answer: **4 980**.

Answer to Question 4

a. Tens: 9 ÷ 4 = 2 remainder 1. Ones: 16 (1 carried to the next digit 6) ÷ 4 = 4. Answer: **24**. Check: 24 × 4 = 96.
b. Hundreds: 2 is less than 5, so there is no hundreds digit in the answer; carry 2 to

the next column. Tens: 25 (2 carried to the next digit 5) ÷ 5 = 5. Ones: 5 ÷ 5 = 1. Answer: **51**. Check: 51 × 5 = 255.

c. Hundreds: 7 ÷ 6 = 1 remainder 1. Tens: 13 (1 carried to the next digit 3) ÷ 6 = 2 remainder 1. Ones: 18 (1 carried to the next digit 8) ÷ 6 = 3. Answer: **123**. Check: 123 × 6 = 738.
d. Hundreds: 9 ÷ 8 = 1 remainder 1. Tens: 10 (1 carried to the next digit 0) ÷ 8 = 1 remainder 2. Ones: 24 (2 carried to the next digit 4) ÷ 8 = 3. Answer: **113**. Check: 113 × 8 = 904.

Answer to Question 5

a. Tens: 8 ÷ 4 = 2 remainder 0. Ones: 5 ÷ 4 = 1 remainder 1. Answer: **21 remainder 1**. Check: 21 × 4 + 1 = 85.
b. Hundreds: 1 is less than 6, so there is no hundreds digit in the answer; carry 1 to the next column. Tens: 15 (1 carried to the next digit 5) ÷ 6 = 2 remainder 3. Ones: 37 (3 carried to the next digit 7) ÷ 6 = 6 remainder 1. Answer: **26 remainder 1**. Check: 26 × 6 + 1 = 157.
c. Hundreds: 3 is less than 5, so there is no hundreds digit in the answer; carry 3 to the next column. Tens: 36 (3 carried to the next digit 6) ÷ 5 = 7 remainder 1. Ones: 12 (1 carried to the next digit 2) ÷ 5 = 2 remainder 2. Answer: **72 remainder 2**. Check: 72 × 5 + 2 = 362.
d. Hundreds: 7 is less than 8, so there is no hundreds digit in the answer; carry 7 to the next column. Tens: 79 (7 carried to the next digit 9) ÷ 8 = 9 remainder 7. Ones: 70 (7 carried to the next digit 0) ÷ 8 = 8 remainder 6. Answer: **98 remainder 6**. Check: 98 × 8 + 6 = 790.

Answer to Question 6

a. 6 × 28 = **168 chairs**. Ones: 8 × 6 = 48, write 8 and carry 4. Tens: 2 × 6 + 4 (carried) = 16, write 16. Answer: **168**.
b. 144 ÷ 4 = **36 cm**. Hundreds: 1 is less than 4, so there is no hundreds digit in the answer; carry 1 to the next column. Tens: 14 (1 carried to the next digit 4) ÷ 4 = 3 remainder 2. Ones: 24 (2 carried to the next digit 4) ÷ 4 = 6. Answer: **36**.
c. 35 × 7 = **£245**. Ones: 5 × 7 = 35, write 5 and carry 3. Tens: 3 × 7 + 3 (carried) = 24, write 24. Answer: **245**.
d. 90 ÷ 8 = 11 remainder 2 (8 × 11 = 88). **2 children** are left over.

Answer to Question 7

a. 7 × 8 = **56 pens**.
b. 7 × 36: Ones: 6 × 7 = 42, write 2 and carry 4. Tens: 3 × 7 + 4 (carried) = 25, write 25. Answer: **252**. So **252 pencils**.
c. 7 × £3 = £21 and 7 × £4 = £28, so the total is £21 + £28 = **£49**.

d. 28 ÷ 8 = 3 remainder 4, so 3 packs are not enough: **4 packs** are needed (32 pens). Pens left over: 32 − 28 = **4**.

Answer to Question 8

a. 135 × 5: Ones: 5 × 5 = 25, write 5 and carry 2. Tens: 3 × 5 + 2 (carried) = 17, write 7 and carry 1. Hundreds: 1 × 5 + 1 (carried) = 6, write 6. Answer: **675**. **675 m**.
b. 135 × 4: Ones: 5 × 4 = 20, write 0 and carry 2. Tens: 3 × 4 + 2 (carried) = 14, write 4 and carry 1. Hundreds: 1 × 4 + 1 (carried) = 5, write 5. Answer: **540**. **540 m**.
c. 135 × 3 = **405 m**.
d. 1 000 ÷ 270 = 3 remainder 190 (270 × 3 = 810). Three journeys are not enough, so she needs **4 journeys** (4 × 270 = 1 080 m).

Answer to Question 9

a. 144 ÷ 8 = **18 marbles**. Hundreds: 1 is less than 8, so there is no hundreds digit in the answer; carry 1 to the next column. Tens: 14 (1 carried to the next digit 4) ÷ 8 = 1 remainder 6. Ones: 64 (6 carried to the next digit 4) ÷ 8 = 8. Answer: **18**.
b. 150 ÷ 7 = 21 remainder 3. **21 in each bag, 3 left**.
c. 150 ÷ 6 = 25 (6 × 25 = 150). He is **right**.
d. 150 ÷ 25 = **6 bags** (25 × 6 = 150).

Answer to Question 10

a. 78 × 3: Ones: 8 × 3 = 24, write 4 and carry 2. Tens: 7 × 3 + 2 (carried) = 23, write 23. Answer: **234**. **234 m**.
b. 78 × 9: Ones: 8 × 9 = 72, write 2 and carry 7. Tens: 7 × 9 + 7 (carried) = 70, write 70. Answer: **702**. **£702**.
c. £702 is more than £500, so he does **not** have enough: he needs £202 more.
d. 4 × £65: Ones: 5 × 4 = 20, write 0 and carry 2. Tens: 6 × 4 + 2 (carried) = 26, write 26. Answer: **260**. **£260**.

Answer to Question 11

a. 8 × 24: Ones: 4 × 8 = 32, write 2 and carry 3. Tens: 2 × 8 + 3 (carried) = 19, write 19. Answer: **192**. **192 rolls**.
b. 192 ÷ 6: Hundreds: 1 is less than 6, so there is no hundreds digit in the answer; carry 1 to the next column. Tens: 19 (1 carried to the next digit 9) ÷ 6 = 3 remainder 1. Ones: 12 (1 carried to the next digit 2) ÷ 6 = 2. Answer: **32**. **32 bags**.

c. 32 × £2 = **£64**.
d. 150 ÷ 6 = 25 exactly, so **25 bags** and **0 extra** rolls.

Answer to Question 12

a. 8 × 45: Ones: 5 × 8 = 40, write 0 and carry 4. Tens: 4 × 8 + 4 (carried) = 36, write 36. Answer: **360**. **360 jelly sweets**.
b. 9 × 36: Ones: 6 × 9 = 54, write 4 and carry 5. Tens: 3 × 9 + 5 (carried) = 32, write 32. Answer: **324**. **324 chocolate drops**.
c. 8 × £3 = £24 and 9 × £2 = £18, so the total is **£42**.
d. 360 ÷ 9: Hundreds: 3 is less than 9, so there is no hundreds digit in the answer; carry 3 to the next column. Tens: 36 (3 carried to the next digit 6) ÷ 9 = 4. Ones: 0 ÷ 9 = 0. Answer: **40**. **40 gift bags**.

Answer to Question 13

a. 2 × £12 = **£24**.
b. 5 × £7 = **£35**.
c. There are 2 + 5 = 7 people, so programmes cost 7 × £3 = £21. Total: £24 + £35 + £21 = **£80**.
d. £100 − £80 = **£20** change.

Answer to Question 14

a. 9 × 125: Ones: 5 × 9 = 45, write 5 and carry 4. Tens: 2 × 9 + 4 (carried) = 22, write 2 and carry 2. Hundreds: 1 × 9 + 2 (carried) = 11, write 11. Answer: **1 125**. **1 125 books**.
b. 6 × 48: Ones: 8 × 6 = 48, write 8 and carry 4. Tens: 4 × 6 + 4 (carried) = 28, write 28. Answer: **288**. **288 books**.
c. 1 125 + 288 = **1 413 books**.
d. 288 ÷ 8: Hundreds: 2 is less than 8, so there is no hundreds digit in the answer; carry 2 to the next column. Tens: 28 (2 carried to the next digit 8) ÷ 8 = 3 remainder 4. Ones: 48 (4 carried to the next digit 8) ÷ 8 = 6. Answer: **36**. **36 books** on each shelf.

Answer to Question 15

a. 94 + 87 + 19 = **200 people**.
b. 200 ÷ 52 = 3 remainder 44 (52 × 3 = 156). Three coaches carry 156 people, which is not enough, so **4 coaches** are needed.
c. 94 + 87 = 181 pupils. 181 × 8: Ones: 1 × 8 = 8, write 8. Tens: 8 × 8 = 64, write 4 and carry 6. Hundreds: 1 × 8 + 6 (carried) = 14, write 14. Answer: **1 448**. **£1**

448.

d. 181 ÷ 6 = 30 remainder 1, so 30 packs give 180 pencils, not enough: **31 packs**. Cost: 31 × £2 = **£62**.

Answer to Question 16

a. 23 × 6: Ones: 3 × 6 = 18, write 8 and carry 1. Tens: 2 × 6 + 1 (carried) = 13, write 13. Answer: **138**. **138 tulips**.
b. 17 × £5: Ones: 7 × 5 = 35, write 5 and carry 3. Tens: 1 × 5 + 3 (carried) = 8, write 8. Answer: **85**. **£85**.
c. Tulips: 23 × £4 = £92. Daisies: £85. Roses: 12 × £9 = £108. Total: 92 + 85 + 108 = **£285**.
d. Roses £108 and tulips £92. She is **right**: £108 − £92 = **£16** more.
e. 100 ÷ 8 = 12 remainder 4, so 8 equal rows would hold 96 daisies, with 4 left over. It **cannot** make equal rows with all 100.

Answer to Question 17

a. 4 × £8 = **£32**.
b. 4 × £6 = **£24**.
c. £32 + £24 = **£56**. This is less than £95, so it is **not enough**.
d. £95 − £56 = £39 more. 39 ÷ 7 = 5 remainder 4, so 5 weeks give £35, which is not enough: he needs **6 weeks**.
e. 95 ÷ 5 = 19 exactly (5 × 19 = 95), so she is **right**.

Answer to Question 18

a. 24 ÷ 8 = **3**, so each ingredient is 3 times bigger.
b. Flour: 120 × 3 = **360 g**. Sugar: 96 × 3 = **288 g**. Eggs: 3 × 3 = **9**.
c. 1 500 ÷ 360 = 4 remainder 60 (360 × 4 = 1 440), so **4 batches**.
d. 12 ÷ 9 = 1 remainder 3, so **1 batch**.
e. 4 batches need 4 × 9 = 36 eggs. 36 ÷ 6 = **6 boxes**.

Answer to Question 19

a. 6 × 24: Ones: 4 × 6 = 24, write 4 and carry 2. Tens: 2 × 6 + 2 (carried) = 14, write 14. Answer: **144**. **144 children**.
b. 144 × £4: Ones: 4 × 4 = 16, write 6 and carry 1. Tens: 4 × 4 + 1 (carried) = 17, write 7 and carry 1. Hundreds: 1 × 4 + 1 (carried) = 5, write 5. Answer: **576**. **£576**.
c. Costs: £90 + £35 = £125. Profit: £576 − £125 = **£451**.
d. 451 ÷ 4: Hundreds: 4 ÷ 4 = 1 remainder 0. Tens: 5 ÷ 4 = 1 remainder 1. Ones:

11 (1 carried to the next digit 1) ÷ 4 = 2 remainder 3. Answer: **112 remainder 3**. **£112 each** with **£3 left over**.

e. 3 sessions: 3 × 24 = **72 children**. Money: 72 × £4 = £288. Costs are still £125, so the profit is £163. **Yes**, it still makes a profit.

Answer to Question 20

a. The multiplier has a big effect, so a big multiplier is useful, but the hundreds digit matters too. Try the best arrangements: 863 × 4 = 3 452, 843 × 6 = 5 058 and 643 × 8 = 5 144. The largest is **643 × 8 = 5 144**. Ones: 3 × 8 = 24, write 4 and carry 2. Tens: 4 × 8 + 2 (carried) = 34, write 4 and carry 3. Hundreds: 6 × 8 + 3 (carried) = 51, write 51. Answer: **5 144**.

b. Use the smallest digit as the multiplier and the smallest digits in the highest columns: 468 × 3 = **1 404**. Ones: 8 × 3 = 24, write 4 and carry 2. Tens: 6 × 3 + 2 (carried) = 20, write 0 and carry 2. Hundreds: 4 × 3 + 2 (carried) = 14, write 14. Answer: **1 404**.

c. The multiplier multiplies every column, so the biggest digit, 8, is best as the multiplier. 863 × 4 = 3 452 uses the multiplier 4, which is much smaller than 8. With the multiplier 8 the other digits 6, 4 and 3 make 643 for the biggest number. A computer check of all 24 arrangements agrees with this.