

Multiplying Multi-Digit Whole Numbers: practice solutions, Grade 4 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Multiples of 10 and 100



- a. $3 \times 4 = 12$ and one zero: $30 \times 4 = 120$.
- b. $8 \times 7 = 56$ and two zeros: $8 \times 700 = 5,600$.
- c. $9 \times 4 = 36$ and three zeros: $9 \times 4,000 = 36,000$.
- d. $6 \times 5 = 30$ and two zeros: $60 \times 50 = 3,000$.

2 Missing factors

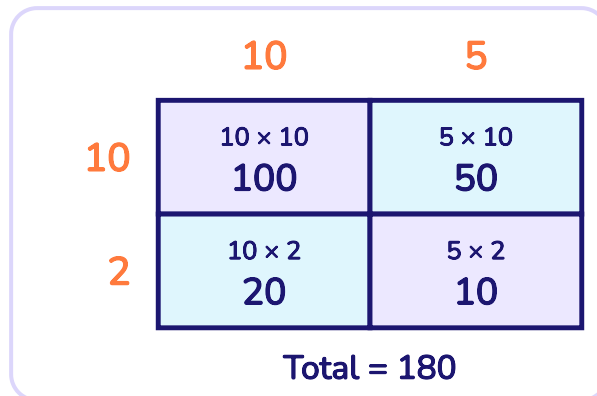


- a. $7 \times 7 = 49$, so the missing number is 70.
- b. $6 \times 6 = 36$, so the missing number is 6.
- c. $5 \times 9 = 45$, so the missing number is 9,000.
- d. $8 \times 8 = 64$, so the missing number is 8.

3 Complete the area model



Split $15 = 10 + 5$ and $12 = 10 + 2$.



$100 + 20 + 50 + 10 = 180$. So $15 \times 12 = 180$.

4 Expanded form



$2,314 = 2,000 + 300 + 10 + 4$.

$2,000 \times 3 = 6,000$, $300 \times 3 = 900$, $10 \times 3 = 30$, $4 \times 3 = 12$.

$6,000 + 900 + 30 + 12 = 6,942$. The product is 6,942.

5 True or false?



- a. False. $4 \times 3 = 12$, but there is one more zero: $4 \times 30 = 120$.
- b. True. $6 \times 5 = 30$ and two zeros give 3,000.
- c. False. $2 \times 2 = 4$ and two zeros give $20 \times 20 = 400$. The student added instead of multiplying.
- d. True. $3 \times 7 = 21$ and three zeros give 21,000.

6

Muffins at the bakery

$$60 \times 8 = 6 \times 8 \text{ tens} = 48 \text{ tens} = 480.$$

There are **480 muffins** on 8 trays.

7

Name the property

- a. Commutative property: the order changes.
- b. Associative property: the grouping changes.
- c. Distributive property: 13 is split into **10 + 3**.
- d. Identity property: multiplying by 1 does not change the number.
- e. Zero property: any number times 0 is 0.

8

4-digit times 1-digit

- a. $1,000 \times 5 = 5,000$, $200 \times 5 = 1,000$, $30 \times 5 = 150$, $8 \times 5 = 40$. The sum is $5,000 + 1,000 + 150 + 40 = 6,190$.
- b. $7,000 \times 6 = 42,000$, $0 \times 6 = 0$, $50 \times 6 = 300$, $2 \times 6 = 12$. The sum is $42,000 + 300 + 12 = 42,312$.

9

Two 2-digit numbers

$$34 \times 20 = 680 \text{ and } 34 \times 6 = 204.$$

$$680 + 204 = 884. \text{ So } 34 \times 26 = 884.$$

10 Area model for 42 times 31



Split $42 = 40 + 2$ and $31 = 30 + 1$.

	40	2
30	40×30 1,200	2×30 60
1	40×1 40	2×1 2
	Total = 1,302	

$1,200 + 40 + 60 + 2 = 1,302$. So $42 \times 31 = 1,302$.

11 Estimate first



a. Estimate: $60 \times 30 = 1,800$. Exact:

$63 \times 28 = 63 \times 20 + 63 \times 8 = 1,260 + 504 = 1,764$. The exact answer is close to the estimate.

b. Estimate: $6,000 \times 4 = 24,000$. Exact:

$5,000 \times 4 + 900 \times 4 + 10 \times 4 + 7 \times 4 = 20,000 + 3,600 + 40 + 28 = 23,668$. It is a little less than the estimate because 5,917 was rounded up.

12 Find the mistake



Check with an estimate: $3,000 \times 4 = 12,000$ and 3,205 is more than 3,000, so the product should be more than 12,000 by at least 800 or so.

Partial products: $3,000 \times 4 = 12,000$, $200 \times 4 = 800$, $0 \times 4 = 0$, $5 \times 4 = 20$. Total: $12,000 + 800 + 20 = 12,820$.

Mia forgot the 800 from the hundreds place. The correct product is **12,820**.

13 Seats in the stadium



$$48 \times 65 = 48 \times 60 + 48 \times 5 = 2,880 + 240 = 3,120.$$

The section has **3,120** seats.

14 Mental math with properties



a. $7 \times 98 = 7 \times 100 - 7 \times 2 = 700 - 14 = 686.$

b. $6 \times 102 = 6 \times 100 + 6 \times 2 = 600 + 12 = 612.$

c. $25 \times 12 = 25 \times 4 \times 3 = 100 \times 3 = 300.$

15 Farm stand sales



Apples: $36 \times 14 = 360 + 144 = 504$, so 504 dollars.

Pears: $27 \times 18 = 270 \times 2 - 27 \times 2 = 540 - 54 = 486$, so 486 dollars.

Total: $504 + 486 = 990$. The stand earns **\$990**.

16 Cargo ship



a. $2,000 \times 7 = 14,000$, $400 \times 7 = 2,800$, $60 \times 7 = 420$, $8 \times 7 = 56$. Sum:
 $14,000 + 2,800 + 420 + 56 = 17,276$ containers.

b. $20,000 - 17,276 = 2,724$. The company still needs to move **2,724** containers.

17 The missing digit



Try the possible numbers. $40 \times 23 = 920$, which is too small. $45 \times 23 = 1,035$, still too small. $46 \times 23 = 46 \times 20 + 46 \times 3 = 920 + 138 = 1,058$.

The hidden digit is **6**, and the number is 46.

18 Which is greater?

$$35 \times 48 = 35 \times 50 - 35 \times 2 = 1,750 - 70 = 1,680.$$

$$36 \times 47 = 36 \times 50 - 36 \times 3 = 1,800 - 108 = 1,692.$$

$$36 \times 47 \text{ is greater by } 1,692 - 1,680 = 12.$$

19 Fundraiser goal

a. $80 \times 60 = 4,800$, so about 4,800 dollars.

b. $78 \times 62 = 78 \times 60 + 78 \times 2 = 4,680 + 156 = 4,836$ dollars.

c. No, because $4,836 < 5,000$. The band is missing $5,000 - 4,836 = 164$ dollars.

20 Garden area

a. $85 \times 27 = 85 \times 20 + 85 \times 7 = 1,700 + 595 = 2,295$. The area is **2,295 square feet**.

b. The length is $3 \times 85 = 255$ feet. The area is $255 \times 27 = 5,100 + 1,785 = 6,885$ square feet. This is also $3 \times 2,295$, so the answer makes sense.

21 Greatest product

Put the two greatest digits, 5 and 4, in the tens places. Then try the ones digits:

$$52 \times 43 = 2,236 \text{ and } 53 \times 42 = 2,226.$$

Check: $52 \times 43 = 2,080 + 156 = 2,236$. Any other arrangement with smaller tens digits gives a smaller product. The greatest product is **2,236**.



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