

Multi-Digit Multiplication: practice solutions, Grade 5 – download the PDF

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

1 Reading exponents



- a) There are three factors of 10, so $10 \times 10 \times 10 = 10^3$.
- b) $10^5 = 100,000$ (a 1 followed by 5 zeros).
- c) $10^2 = 100$ has 2 zeros, the same as the exponent.

2 Shifting digits



- a) 530 b) 5,300 c) 53,000
- d) $10^4 = 10,000$, so $8 \times 10,000 = 80,000$.

3 Multiples of 10



- a) $6 \times 4 = 24$, one zero: 240.
- b) $7 \times 5 = 35$, two zeros: 3,500.
- c) $3 \times 8 = 24$, two zeros: 2,400.
- d) $2 \times 6 = 12$, three zeros: 12,000.

4 Quick estimate



$48 \approx 50$ and $31 \approx 30$, so $50 \times 30 = 1,500$.

The value 1,488 is very close to 1,500, so it is reasonable. (In fact $48 \times 31 = 1,488$.)

5 Fill in an area model



$10 \times 10 = 100$, $2 \times 10 = 20$, $10 \times 3 = 30$, $2 \times 3 = 6$.

Sum: $100 + 20 + 30 + 6 = 156$. So $12 \times 13 = 156$.

6 Two partial products



$23 \times 4 = 92$ and $23 \times 10 = 230$.

$92 + 230 = 322$, so $23 \times 14 = 322$.

7 Pencil boxes



Equal groups, so multiply: 12×24 .

$24 \times 2 = 48$ and $24 \times 10 = 240$, so $240 + 48 = 288$.

There are **288 pencils**.

8 Standard algorithm practice



Estimate: $40 \times 30 = 1,200$ (a bit high, because both numbers were rounded up).

Ones row: $36 \times 7 = 252$. Tens row: $36 \times 20 = 720$.

Total: $252 + 720 = 972$. It is a little under the estimate, as expected.

9 Regrouping twice



Ones row: $58 \times 3 = 174$. Tens row (placeholder zero): $58 \times 40 = 2,320$.

Add: $174 + 2,320 = 2,494$.

10 Estimate, then calculate



a) $70 \times 30 = 2,100$.

b) $73 \times 8 = 584$ and $73 \times 20 = 1,460$, so $584 + 1,460 = 2,044$.

c) Yes: 2,044 is only 56 away from 2,100.

11 Find the mistake



The tens digit 3 stands for 30, so the second row must be $45 \times 30 = 1,350$, not 135. Maya forgot the placeholder zero.

Correct work: $90 + 1,350 = 1,440$. So $45 \times 32 = 1,440$.

An estimate ($50 \times 30 = 1,500$) would have shown that 225 is far too small.

12 Area model with three parts



Top row ($\times 30$): $200 \times 30 = 6,000$, $10 \times 30 = 300$, $4 \times 30 = 120$.

Bottom row ($\times 2$): $200 \times 2 = 400$, $10 \times 2 = 20$, $4 \times 2 = 8$.

Sum: $6,000 + 300 + 120 + 400 + 20 + 8 = 6,848$. So $214 \times 32 = 6,848$.

13 Theater seats



$35 \times 8 = 280$ and $35 \times 20 = 700$, so $280 + 700 = 980$.

The theater has **980 seats**. (Estimate: $30 \times 30 = 900$, close enough.)

14 True or false?



- a) False. $10^4 = 10 \times 10 \times 10 \times 10 = 10,000$.
- b) True. $6 \times 5 = 30$ and there are three zeros to add: **30,000**.
- c) True. $25 \times 4 = 100$, then one more zero gives **1,000**.

15 Big standard algorithm



Estimate: $500 \times 40 = 20,000$.

Ones row: $472 \times 6 = 2,832$. Tens row: $472 \times 30 = 14,160$.

Total: $2,832 + 14,160 = 16,992$. It is below the estimate because both numbers were rounded up.

16 Zero in the middle



Ones row: $805 \times 7 = 5,635$. Tens row: $805 \times 40 = 32,200$.

Total: $5,635 + 32,200 = 37,835$.

The 0 tens in 805 give $0 \times 7 = 0$, which must be written in the tens column so the other digits stay in the right places.

17 Missing factors



- a) $4 \times 7 = 28$, and **28,000** has three zeros, one from 40, so the missing number has two zeros: **700**.
- b) $48 \div 6 = 8$, and **4,800** has two zeros, one from 60, so **80**.
- c) $63 \div 9 = 7$, and **63,000** has three zeros: **7,000**.

18 Juice orders



- a) $36 \times 24 = 864$ ($36 \times 4 = 144$, $36 \times 20 = 720$).
- b) $18 \times 24 = 432$.
- c) $864 + 432 = 1,296$ bottles.
- d) $54 \times 24 = 1,296$ ($216 + 1,080$). Both methods agree.

19 Which is greater?



38×52 : $38 \times 2 = 76$ and $38 \times 50 = 1,900$, so 1,976.

41×49 : $41 \times 9 = 369$ and $41 \times 40 = 1,640$, so 2,009.

Since $2,009 > 1,976$, 41×49 is greater.

20 Powers of 10 in a product



$3,600 = 36 \times 10^2$ and $200 = 2 \times 10^2$.

So $3,600 \times 200 = 36 \times 2 \times 10^2 \times 10^2 = 72 \times 10^4 = 720,000$.

21 Factory jars



Estimate: $100 \times 20 \times 20 = 40,000$ (a rough lower value).

Jars per day: $125 \times 16 = 2,000$. Jars in 24 days: $2,000 \times 24 = 48,000$.

The factory fills 48,000 jars.



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