

Grade 5 - Dividing by Two-Digit Divisors - Lesson

Common Core 5.NBT.B.6 · maths-pdf.fr/en/

To divide a whole number by a two-digit number, subtract easy multiples of the divisor from the dividend and add up how many you used. These are partial quotients. Estimate first with compatible numbers, keep going until what is left is smaller than the divisor, and write that leftover as the remainder.

Grade 5 · Common Core State Standards: **5.NBT.B.6**

Key facts

- The dividend is divided by the divisor to give the quotient.
- Partial quotients break the answer into easy pieces that add up to the quotient.
- An area model shows the dividend as an area with the divisor as one side.
- A remainder is always smaller than the divisor.
- Check by multiplying the quotient by the divisor and adding the remainder.

What are the parts of a division problem?

In $1,872 \div 24 = 78$, 1,872 is the **dividend**, 24 is the **divisor** and 78 is the **quotient**. If the dividend cannot be split evenly, the amount left over is the **remainder**. The remainder is always less than the divisor.

How do you divide with partial quotients?

Partial quotients let you subtract easy multiples of the divisor. Divide $1,872 \div 24$.

1. Pick an easy multiple that fits: $24 \times 50 = 1,200$. Subtract: $1,872 - 1,200 = 672$.
2. Pick another: $24 \times 20 = 480$. Subtract: $672 - 480 = 192$.
3. Pick another: $24 \times 8 = 192$. Subtract: $192 - 192 = 0$.
4. Add the partial quotients: $50 + 20 + 8 = 78$.

The quotient is **78**.

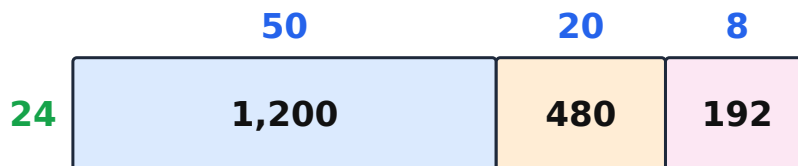
$$\begin{array}{r}
 24 \overline{) 1872} \\
 \underline{- 1200} \quad 24 \times 50 \\
 672 \\
 \underline{- 480} \quad 24 \times 20 \\
 192 \\
 \underline{- 192} \quad 24 \times 8 \\
 0
 \end{array}$$

Quotient: $50 + 20 + 8 = 78$

Subtract friendly multiples of 24 until nothing is left.

How does an area model show division?

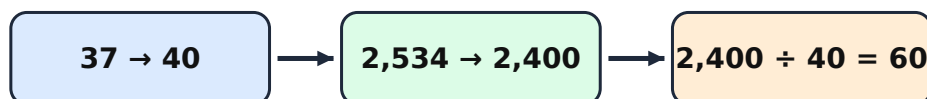
Think of 1,872 as the area of a rectangle. One side is 24. The other side is the quotient. You build the area in parts: 1,200, 480 and 192. The widths of the parts are 50, 20 and 8, which add to 78.



$50 + 20 + 8 = 78$ is the missing width.

How do you estimate a quotient?

Round the divisor to a friendly number. Then choose a dividend close to the real one that you can divide easily. These are called **compatible numbers**. For $2,534 \div 37$, use $2,400 \div 40 = 60$. The real quotient should be close to 60. Good compatible dividends are multiples of the rounded divisor, such as 2,400, 2,800 or 3,200 when the divisor is about 40.

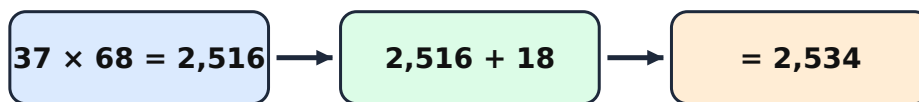


The estimate is about 60.

What do you do with a remainder?

Keep dividing until what is left is less than the divisor. For $2,534 \div 37$: take out 60 groups ($37 \times 60 = 2,220$), leaving 314. Take out 8 more groups ($37 \times 8 = 296$), leaving 18. The answer is **68**

R 18. Check: $37 \times 68 + 18 = 2,534$. In a word problem, think about what the remainder means.



Multiply, then add the remainder.

The meaning depends on the question. If 250 students ride buses that hold 48, five full buses leave 10 students behind, so you need 6 buses. If you put 500 stickers on album pages with 35 on each page, the 10 stickers that are left are simply left over.

Questions about dividing by two-digit divisors

What are partial quotients?

Partial quotients are the parts of the answer that you find one at a time. You subtract friendly multiples of the divisor, like 24×50 , and then add the multipliers. For $1,872 \div 24$ they are 50, 20 and 8, which add to 78.

How do I know when to stop dividing?

Stop when what is left is smaller than the divisor. If the leftover is 0, the division is exact. If the leftover is not 0, it is the remainder.

How do I check a division answer?

Multiply the quotient by the divisor and add the remainder. You should get the dividend. For $475 \div 22 = 21 \text{ R } 13$, $22 \times 21 + 13 = 475$.

What do I do with a remainder in a word problem?

Read the question. Sometimes you ignore the remainder, sometimes you round the answer up, and sometimes the remainder is the answer. For 250 students and buses that hold 48, you need 6 buses because 5 buses leave 10 students behind.

How do I estimate a quotient?

Use compatible numbers: round the divisor and change the dividend to a nearby number that divides easily. For $3,185 \div 49$ use $3,000 \div 50 = 60$.