

Lesson 3 Multiplication by 2-digit Whole Numbers

Learning Outcomes:

- Multiply whole numbers by 2-digit whole numbers
- Estimate products
- Solve word problems

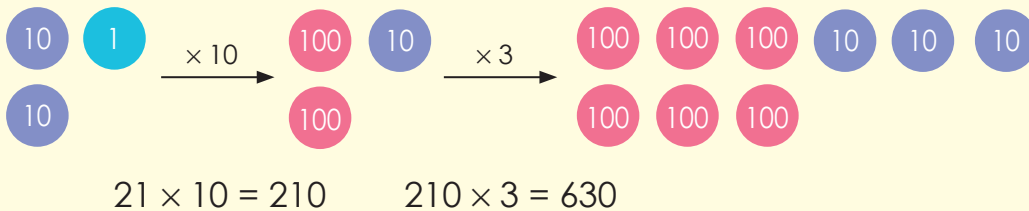
Multiplying 2-digit whole numbers by tens

Learn



Multiply 21 by 30.

Method 1

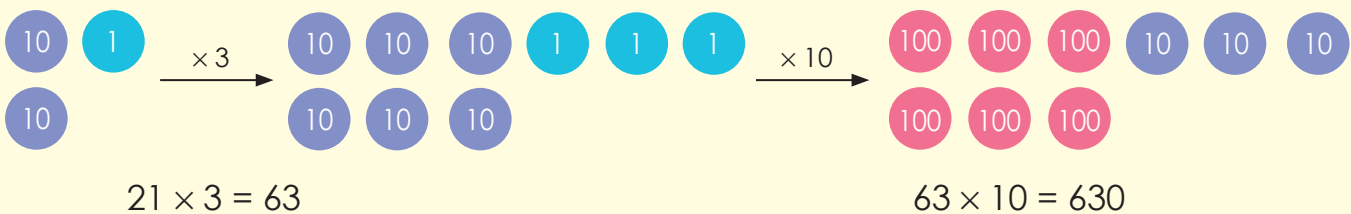


$$\begin{aligned} 21 \times 30 &= 21 \times 10 \times 3 \\ &= 210 \times 3 \\ &= 630 \end{aligned}$$

$$30 = 10 \times 3$$



Method 2



$$\begin{aligned} 21 \times 30 &= 21 \times 3 \times 10 \\ &= 63 \times 10 \\ &= 630 \end{aligned}$$

$$30 = 3 \times 10$$



Method 3

① Multiply 21 by 0 ones.

$$\begin{array}{r} 21 \\ \times 30 \\ \hline 0 \\ \hline \end{array}$$

② Multiply 1 one by 3 tens.

$$\begin{array}{r} 21 \\ \times 30 \\ \hline 30 \\ \hline \end{array}$$

③ Multiply 2 tens by 3 tens.

$$\begin{array}{r} 21 \\ \times 30 \\ \hline 630 \\ \hline \end{array}$$

$$21 \times 30 = 630$$

Multiplying 3-digit whole numbers by tens

Learn



Multiply 462 by 30.

Method 1

$$\begin{aligned} 462 \times 30 &= 462 \times 10 \times 3 \\ &= 4620 \times 3 \\ &= 13\,860 \end{aligned}$$

Method 2

$$\begin{aligned} 462 \times 30 &= 462 \times 3 \times 10 \\ &= 1386 \times 10 \\ &= 13\,860 \end{aligned}$$

Method 3

① Multiply 462 by 0 ones

$$\begin{array}{r} 462 \\ \times 30 \\ \hline 0 \\ \hline \end{array}$$

② Multiply 2 ones by 3 tens.

$$\begin{array}{r} 462 \\ \times 30 \\ \hline 60 \\ \hline \end{array}$$

③ Multiply 6 tens by 3 tens.

$$\begin{array}{r} 462 \\ \times 30 \\ \hline 860 \\ \hline \end{array}$$

④ Multiply 4 hundreds by 3 tens.

$$\begin{array}{r} 462 \\ \times 30 \\ \hline 13860 \\ \hline \end{array}$$

$$462 \times 30 = 13\,860$$

Practice 8



1. Multiply.

a) $56 \times 40 = 56 \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$
 $= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$
 $= \underline{\hspace{2cm}}$

$$\begin{array}{r} 56 \\ \times 40 \\ \hline \end{array}$$

b) $123 \times 50 = 123 \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$
 $= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$
 $= \underline{\hspace{2cm}}$

$$\begin{array}{r} 123 \\ \times 50 \\ \hline \end{array}$$

2. Multiply.

a)
$$\begin{array}{r} 29 \\ \times 70 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 379 \\ \times 60 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 760 \\ \times 30 \\ \hline \end{array}$$

Multiplying 2-digit whole numbers by 2-digit whole numbers

Learn



Multiply 43 by 26.

① Multiply 43 by 6.

$$\begin{array}{r} 1 \\ 43 \\ \times 26 \\ \hline 258 \end{array}$$

② Multiply 43 by 20.

$$\begin{array}{r} 1 \\ 43 \\ \times 26 \\ \hline 258 \\ 860 \end{array}$$

③ Add.

$$\begin{array}{r} 1 \\ 43 \\ \times 26 \\ \hline 258 \leftarrow 43 \times 6 \\ 860 \leftarrow 43 \times 20 \\ \hline 1118 \leftarrow 43 \times 26 \end{array}$$

$$43 \times 26 = 1118$$

Practice 9



1. Multiply.

$$\begin{array}{r} 36 \\ \times 12 \\ \hline \end{array}$$

← 36×2

← 36×10

← 36×12

$$\begin{array}{r} 50 \\ \times 29 \\ \hline \end{array}$$

← 50×9

← 50×20

← 50×29

$$\begin{array}{r} 67 \\ \times 43 \\ \hline \end{array}$$

← 67×3

← 67×40

← 67×43

2. Multiply.

$$\begin{array}{r} 53 \\ \times 22 \\ \hline \end{array}$$

$$\begin{array}{r} 81 \\ \times 37 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \\ \times 49 \\ \hline \end{array}$$

Multiplying 3-digit whole numbers by 2-digit whole numbers

Learn



Multiply 317 by 48.

① Multiply 317 by 8.

$$\begin{array}{r} 15 \\ 317 \\ \times 48 \\ \hline 2536 \end{array}$$

② Multiply 317 by 40.

$$\begin{array}{r} 152 \\ 317 \\ \times 48 \\ \hline 2536 \\ 12680 \end{array}$$

③ Add.

$$\begin{array}{r} 152 \\ 317 \\ \times 48 \\ \hline 2536 \leftarrow 317 \times 8 \\ 12680 \leftarrow 317 \times 40 \\ \hline 15216 \leftarrow 317 \times 48 \end{array}$$

$$317 \times 48 = 15216$$

Practice 10



1. Multiply.

$$\begin{array}{r} 306 \\ \times 61 \\ \hline \end{array}$$

← 306×1

← 306×60

← 306×61

$$\begin{array}{r} 102 \\ \times 79 \\ \hline \end{array}$$

← 102×9

← 102×70

← 102×79

$$\begin{array}{r} 369 \\ \times 34 \\ \hline \end{array}$$

← 369×4

← 369×30

← 369×34

2. Multiply.

$$\begin{array}{r} 820 \\ \times 25 \\ \hline \end{array}$$

$$\begin{array}{r} 699 \\ \times 17 \\ \hline \end{array}$$

$$\begin{array}{r} 476 \\ \times 44 \\ \hline \end{array}$$

Estimating products

Learn

a) Estimate the value of 84×15 .

$84 \approx 80$ (Round 84 to the nearest ten.)

$15 \approx 20$ (Round 15 to the nearest ten.)

$$\begin{aligned} 84 \times 15 &\approx 80 \times 20 \\ &= 1600 \end{aligned}$$

$$\begin{aligned} 8 \times 2 &= 16 \\ 80 \times 20 &= 1600 \end{aligned}$$



b) Estimate the value of 66×192 .

$66 \approx 70$ (Round 66 to the nearest ten.)

$192 \approx 200$ (Round 192 to the nearest hundred.)

$$\begin{aligned} 66 \times 192 &\approx 70 \times 200 \\ &= 14\,000 \end{aligned}$$

$$\begin{aligned} 7 \times 2 &= 14 \\ 70 \times 200 &= 14\,000 \end{aligned}$$



Practice 11



1. Multiply.

$$8 \times 6 = \underline{\hspace{2cm}}$$

$$80 \times 6 = \underline{\hspace{2cm}}$$

$$80 \times 60 = \underline{\hspace{2cm}}$$

$$8 \times 60 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 80 \\ \times 60 \\ \hline \end{array}$$

$$800 \times 6 = \underline{\hspace{2cm}}$$

$$800 \times 60 = \underline{\hspace{2cm}}$$

$$8 \times 600 = \underline{\hspace{2cm}}$$

$$80 \times 600 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 800 \\ \times 60 \\ \hline \end{array}$$

$$\begin{array}{r} 600 \\ \times 80 \\ \hline \end{array}$$



2. Estimate and then multiply.

$$67 \times 59 \approx \underline{70} \times \underline{60}$$

$$= \underline{\hspace{2cm}}$$

$$\begin{array}{r} 67 \\ \times 59 \\ \hline \end{array}$$

3. Estimate and then multiply.

a) $45 \times 71 \approx \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$

$$= \underline{\hspace{2cm}}$$

$$\begin{array}{r} 45 \\ \times 71 \\ \hline \end{array}$$

b) $404 \times 93 \approx \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$

$$= \underline{\hspace{2cm}}$$

$$\begin{array}{r} 404 \\ \times 93 \\ \hline \end{array}$$

Solving word problems

Learn



There are 188 pages in a notebook. How many pages are there in 41 such notebooks?

$$188 \times 41 = 7708$$

There are 7708 pages altogether.

$$188 \times 41 \approx 200 \times 40 \\ = 8000$$

7708 is about 8000.

My answer is reasonable.



Practice 12



Solve the word problems. Show your work clearly.
Estimate to check if your answer is reasonable.



1. Daniel sold 62 pairs of shoes. Each pair of shoes cost \$88. How much did he sell all the shoes for?

2. Jenny has 13 bottles. She puts 125 marbles in each bottle. How many marbles does Jenny have altogether?

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