



MATH

WORKBOOK

Grid Method

THE MATHS  HUB
ADVICE TUITION ASSESSMENT

Long Multiplication: Grid Method

The grid method is a way of multiplying large numbers by breaking them down into smaller, easier-to-manage chunks. It uses a grid to organise the calculation, so you never have to hold more than one small multiplication fact in your head at a time.

How to use the grid method

- **Estimate.** Round each number to 1 significant figure and estimate the answer.
- **Partition.** Split each number into its place value parts.
- **Draw a grid.** Label the columns with one number's place value parts and the rows with the other number's place value parts.
- **Multiply.** Multiply the value at the start of each row by the value at the top of each column. Write each product in the correct box.
- **Add.** Add all the products to find the total.
- **Check.** Compare your answer with your estimate to check that it's reasonable.
- **State.** Clearly write the final answer.

Worked example: 86×43

Step 1 — Estimate

86 rounds to 90. 43 rounds to 40. $90 \times 40 = 3\,600$, so the answer should be close to 3 600.

Step 2 — Partition

$86 = 80 + 6$ $43 = 40 + 3$

Steps 3 and 4 — Draw a grid and multiply

$\times$	80	6
40	3200	240
3	240	18

Step 5 — Add

$3\,200 + 240 + 240 + 18 = 3\,698$

Step 6 — Check

3 698 is close to the estimate of 3 600, so the answer is reasonable. ✓

Step 7 — State

$86 \times 43 = 3\,698$

Part A: Two-Digit $\times$ One-Digit (Grid Given)

The grid has been started for you. Estimate first, then partition the two-digit number and multiply along each row and column to fill in the grid. Add your two products together, then check your answer against your estimate.

1) 34×6

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $34 = 30 + 4$

$\times$	30	4
6		

Add: _____ + _____ = _____

Answer: $34 \times 6 =$ _____

Close to my estimate? Yes / No

2) 47×3

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $47 = 40 + 7$

$\times$	40	7
3		

Add: _____ + _____ = _____

Answer: $47 \times 3 =$ _____

Close to my estimate? Yes / No

3) 58×4

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $58 = 50 + 8$

$\times$	50	8
4		

Add: _____ + _____ = _____

Answer: $58 \times 4 =$ _____

Close to my estimate? Yes / No

Part B: Two-Digit × One-Digit (Practice)

Estimate first. Then draw your own partition — write the place value parts along the top and side of the grid — and multiply and add as before. Finish by checking your answer against your estimate.

1) 62×7

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

Add: _____ + _____ = _____

Answer: $62 \times 7 =$ _____

Close to my estimate? Yes / No

2) 39×5

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

Add: _____ + _____ = _____

Answer: $39 \times 5 =$ _____

Close to my estimate? Yes / No

3) 84×3

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

Add: _____ + _____ = _____

Answer: $84 \times 3 =$ _____

Close to my estimate? Yes / No

4) 76×6

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

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Add: _____ + _____ = _____

Answer: $76 \times 6 =$ _____

Close to my estimate? Yes / No

5) 93×4

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

Add: _____ + _____ = _____

Answer: $93 \times 4 =$ _____

Close to my estimate? Yes / No

6) 68×5

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

Add: _____ + _____ = _____

Answer: $68 \times 5 =$ _____

Close to my estimate? Yes / No

Part C: Two-Digit × Two-Digit (Grid Given)

Now both numbers are two digits, so the grid has four boxes. Estimate first, then partition each number, multiply to fill in all four boxes, and add them all together. Check your answer against your estimate.

1) 56×32

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $56 = 50 + 6$ $32 = 30 + 2$

$\times$	50	6
30		
2		

Add all four boxes: _____ + _____ + _____ + _____ = _____

Answer: $56 \times 32 =$ _____

Close to my estimate? Yes / No

2) 68×24

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $68 = 60 + 8$ $24 = 20 + 4$

$\times$	60	8
20		
4		

Add all four boxes: _____ + _____ + _____ + _____ = _____

Answer: $68 \times 24 =$ _____

Close to my estimate? Yes / No

Part D: Two-Digit × Two-Digit (Practice)

Estimate first. Then draw your own partition for both numbers, complete the grid, and find the total. Check your answer against your estimate.

1) 45×36

Estimate: _____ × _____ ≈ _____

×		

Add all four boxes: _____ + _____ + _____ + _____ = _____

Answer: $45 \times 36 =$ _____

Close to my estimate? Yes / No

2) 78×23

Estimate: _____ × _____ ≈ _____

×		

Add all four boxes: _____ + _____ + _____ + _____ = _____

Answer: $78 \times 23 =$ _____

Close to my estimate? Yes / No

3) 52×47

Estimate: _____ × _____ ≈ _____

×		

Add all four boxes: _____ + _____ + _____ + _____ = _____

Answer: $52 \times 47 =$ _____

Close to my estimate? Yes / No

4) 91×38

Estimate: _____ $\times$ _____ $\approx$ _____

$\times$		

Add all four boxes: _____ + _____ + _____ + _____ = _____

Answer: $91 \times 38 =$ _____

Close to my estimate? Yes / No

Part E: Spot the Mistake and Check Your Estimate

Spot the mistake

Jake used the grid method to work out 47×26 . Look carefully at his grid — he has made one mistake.

$\times$	40	7
20	800	140
6	240	48

Jake's total: $800 + 140 + 240 + 48 = 1\,228$

Which box has the mistake? _____

What should it say instead? _____

What is the correct answer to 47×26 ? _____

Estimate first

For each calculation, round both numbers to estimate the answer before you work it out exactly. Use your estimate to check your final answer makes sense.

1) 63×29

Estimate: _____ $\times$ _____ = _____

$\times$		

Exact answer: $63 \times 29 =$ _____ Close to my estimate? Yes / No

2) 88×34

Estimate: _____ $\times$ _____ = _____

$\times$		

Exact answer: $88 \times 34 =$ _____ Close to my estimate? Yes / No

Part F: Word Problems

Read each problem carefully. Decide which two numbers you need to multiply, then use the grid method to solve it. Use extra paper or the blank grids in the appendix if you need more space.

1) A cinema has 18 rows of seats, with 24 seats in each row. How many seats are there altogether?

Draw your grid here:

Answer: _____

2) A phone plan uses 45 MB of data per day. How much data is used over 28 days?

Draw your grid here:

Answer: _____

3) A school orders 34 boxes of pens, with 26 pens in each box. How many pens is that in total?

Draw your grid here:

Answer: _____

4) A gym membership costs £27 a month. How much does a full year (12 months) cost?

Draw your grid here:

Answer: _____

Now write and solve your own word problem using the grid method.

Answer: _____

★ **Extension: Three-Digit × Two-Digit**

The grid method works for bigger numbers too — you just need more boxes. Estimate first, then partition the three-digit number into hundreds, tens and ones. Check your answer against your estimate.

1) 214×36

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $214 = 200 + 10 + 4$ $36 = 30 + 6$

$\times$	200	10	4
30			
6			

Add all six boxes together to find the total.

Answer: $214 \times 36 =$ _____

Close to my estimate? Yes / No

2) 326×45

Estimate: _____ $\times$ _____ $\approx$ _____

Partition: $326 = 300 + 20 + 6$ $45 = 40 + 5$

$\times$	300	20	6
40			
5			

Add all six boxes together to find the total.

Answer: $326 \times 45 =$ _____

Close to my estimate? Yes / No

Answer Key

Part	Answers
A	$34 \times 6 = 204$; $47 \times 3 = 141$; $58 \times 4 = 232$
B	$62 \times 7 = 434$; $39 \times 5 = 195$; $84 \times 3 = 252$; $76 \times 6 = 456$; $93 \times 4 = 372$; $68 \times 5 = 340$
C	$56 \times 32 = 1\,792$; $68 \times 24 = 1\,632$
D	$45 \times 36 = 1\,620$; $78 \times 23 = 1\,794$; $52 \times 47 = 2\,444$; $91 \times 38 = 3\,458$
E	Mistake: 7×6 should be 42, not 48. Correct answer: $47 \times 26 = 1\,222$. Estimates: $63 \times 29 \approx 60 \times 30 = 1\,800$ (exact 1 827); $88 \times 34 \approx 90 \times 30 = 2\,700$ (exact 2 992)
F	432 seats; 1 260 MB; 884 pens; £324
Extension	$214 \times 36 = 7\,704$; $326 \times 45 = 14\,670$

Appendix 1: Place Value Partitioning Chart

Before you use the grid method, it can help to check how a number splits into hundreds, tens and ones. Two examples are done for you — practise with the blank rows.

Number	Hundreds	Tens	Ones
47		4	7
283	2	8	3
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Appendix 2: Blank Grid Templates

Use these blank grids for extra practice, or for any question in this workbook where you would like more space.

Two-digit × one-digit

×		

Two-digit × two-digit

×		

Three-digit × two-digit

×			

Appendix 3: Quick Reference Card

Keep this page open while you work through the questions in this book.

The Grid Method — 7 Steps

- 1. Estimate**
- 2. Partition**
- 3. Draw a grid**
- 4. Multiply**
- 5. Add**
- 6. Check**
- 7. State**