Receipt Roll: Long Multiplication Masters

Teacher		**Class**	Year 5
Subject	Maths	**Topic**	Long multiplication
Date		**Room**	
Lesson length	60 minutes	**Country**	United Kingdom

Pupils learn short and long multiplication for large numbers. They solve a sticker order and write a shop receipt.

Curriculum links

- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers [1]
- use the formal written methods of short and long multiplication for larger numbers [1]

Learning objectives

- Students will multiply 4-digit numbers by 1-digit numbers using short multiplication.
- Students will multiply up to 4-digit numbers by 2-digit numbers using long multiplication.

Success criteria

- I can make one neat row for a 1-digit multiplier.
- I can use a zero holder for the tens row.
- I can add both rows to get the correct total.

What students already know

Show 23 x 4 on mini whiteboards. Ask: what is 23 x 4 and how did you partition it?

Key words

long multiplication	a written column method that finds the total for a two-digit number in two rows then adds them [5]
short multiplication	a written column method that finds the total for a one-digit number in one row [1]
partial product	a small answer made along the way that is added with others for the final total [12]
placeholder	a 0 put at the start of the second row to keep place value correct [6]

Materials

- Slides 2-12
- Video clip 1 (0:00-5:00) on Slide 6 and Video clip 3 (0:00-2:01) on Slide 8
- Worksheet Task B
- Blank receipt slips, squared paper, pencils
- Mini whiteboards, pens and place-value grids
- Times-table grids for reference

Before the lesson

- Print Worksheet Task B and blank receipt slips, one per pair plus spares
- Test Slide 6 Video clip 1 (0:00-5:00) and Slide 8 Video clip 3 (0:00-2:01) with sound
- Prepare squared paper, pencils, mini whiteboards and times-table grids
- Write 1,236 x 24 model in large columns for guided practice
- Set out pairs and clear aisles for moving to show receipts

Lesson outline

0–8 min **Starter** 8 min · Whole class

Hook pupils with the sticker order and recall short multiplication.

YOU DO

1. Show Slide 2 and read the goals: one neat row for 1 digit, zero holder for 2 digits.
2. Show Slide 5 mystery: 24 packs, 1,236 stickers in each pack. How many in all?
3. Ask pairs to estimate first using 1,200 x 25, then recall 23 x 4 on whiteboards.
4. Link estimate to check: exact work must be close to the estimate.

STUDENTS DO

1. Listen to the hook and read Slide 2 goals with the teacher.
2. Write an estimate for 1,236 x 24 on whiteboards and hold up.
3. Solve 23 x 4 and explain partitioning to a partner.

Say: A shopkeeper orders 24 packs of notebooks. Each pack holds 1,236 stickers. How many stickers is that? Let's write the receipt. First we estimate, then we multiply properly. An estimate of 1,200 times 25 is 30,000, so our answer should be near 30,000.

Worked example: Estimate: 1,236 is close to 1,200 and 24 is close to 25. 12 x 25 = 300, so 1,200 x 25 = 30,000. Recall: 23 x 4 = (20 x 4) + (3 x 4) = 80 + 12 = 92.

Ask: What is a sensible estimate for 1,236 x 24? (About 30,000, because 1,200 x 25 = 30,000.) · Do we need short or long multiplication for 1,236 x 24? (Long multiplication, because 24 is a 2-digit number so we need two rows [1].)

Check understanding: Check all whiteboards for estimates near 30,000 and 23 x 4 = 92. If recall is weak, practise 2-digit x 1-digit once more before moving on.

Support: Give times-table grids and ask for 20 x 4 then 3 x 4 to build 23 x 4. **Stretch:** Ask: is 1,982 x 31 closer to 2,000 or 60,000, and what round numbers prove it?

Use: Slides 2-3, 5

8–20 min **Teach** 12 min · Whole class

Model how partitioning links to the two rows of long multiplication.

YOU DO

1. Show Slide 4 steps: line up columns, times the ones, put 0 then times the tens, add both rows.
2. Model 23 x 14 in columns, thinking aloud about place value and exchanges.
3. Play Slide 6 Video clip 1 (0:00-5:00) to show where the zero holder goes.
4. Match each part to Slide 3: first row is ones, second row is tens, both are partial products [12].

STUDENTS DO

1. Watch the model and video and point to ones row and tens row.
2. Chant the order with the teacher: ones first, zero, tens, add.
3. Copy 23 x 14 in neat columns on squared paper.

Say: Long multiplication splits the smaller number into tens and ones, multiplying each part then adding the results [6]. The column method needs a zero placeholder on the tens row [6]. So 23 times 14 is 23 times 4 plus 23 times 10, then add.

Worked example: 23 x 14: Step 1: 23 x 4 = 92, write 92 as first row. Step 2: put 0 as placeholder, then 23 x 10 = 230, write 230 as second row. Step 3: 92 + 230 = 322. Answer 322.

Ask: Why do we have two rows for 23 x 14? (One row is 23 x 4 and the other is 23 x 10, then we add them [6].) · What does the 3 in 230 really mean? (30, because we multiplied by 10 not 1, so digits move one place left.)

Check understanding: Pupils hold up boards showing 92, 230 and 322 in columns. Reteach alignment if rows are not lined up by place value.

Support: Use colour to highlight the ones calculation in one colour and the tens calculation in another.
Stretch: Ask pupils to predict how 234 x 14 changes the partial products with a 3-digit number.

Use: Slides 3-4, 6 and Video clip 1 (0:00-5:00)

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20–32 min **Guided practice** 12 min · Whole class

Practise the full 4-digit by 2-digit method together with neat columns.

YOU DO

1. Show Slide 7 big order: 1,236 x 24 = 29,664, close to 1,200 x 25.
2. Model 1,236 x 24 step by step: 1,236 x 4, then 0 holder, then 1,236 x 20, then add.
3. Play Slide 8 Video clip 3 (0:00-2:01) to spot how columns stay lined up.
4. Check the final add and compare to the 30,000 estimate for sense.

STUDENTS DO

1. Copy each row with the teacher on squared paper, calling out exchanges.
2. Check place value after the zero holder is written.
3. Compare 29,664 to 30,000 and give thumbs up if sensible.

Say: The column method allows you to multiply up to 4-digit numbers by 2-digit numbers [5]. Keep digits in straight columns. We use formal written methods of short and long multiplication for larger numbers [1]. Always check against the estimate.

Worked example: 1,236 x 24: 1,236 x 4 = 4,944, write as row 1. Put 0, then 1,236 x 20 = 24,720, write as row 2. Add: 4,944 + 24,720 = 29,664. Estimate 30,000, so sensible.

Ask: What is the second row really showing? (1,236 x 20 = 24,720, which is ten times bigger than 1,236 x 2.) · Why must we add a zero first on the second row? (Because we are multiplying by tens, so a zero holder keeps place value [6].)

Check understanding: Scan rows for 4,944 and 24,720 aligned. If the zero is missing, model that error and re-add to show the total is wrong.

Support: Provide a place-value grid and write small exchanges above the next column. **Stretch:** Ask: what would change in layout for 1,236 x 34, and which total will be larger?

Use: Slides 7-8 and Video clip 3 (0:00-2:01)

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32–52 min **Main activity** 20 min · Pairs

Multiply a 4-digit number by a 2-digit number to solve the price problem.

YOU DO

1. Show Slide 9 task: solo 124 x 6, then pairs 345 x 23 and 1,236 x 24 with receipt.
2. Give out Worksheet Task B, receipt slips and squared paper; remind pairs to show both rows, zero holder and total.
3. Circulate, check exchanges and column alignment, and prompt estimation before calculating.
4. Select two pairs to show receipts with both rows of working and final total.

STUDENTS DO

1. Solo: solve 124 x 6 with short multiplication and self-check carries.
2. Pairs: solve 345 x 23 and 1,236 x 24 on squared paper, then complete a receipt slip showing both rows, zero holder and total stickers.
3. Trade and mark with a partner using the model, checking digits and addition.

Say: First work on your own to do 124 times 6 with one row. Then with your partner do 345 times 23 and the big sticker order 1,236 times 24. Show both rows, the zero holder and the total, then write the receipt. Your estimate tells you if the answer is sensible.

Worked example: 124 x 6 = 744 in one row: 6 x 4 = 24 write 4 carry 2, 6 x 2 = 12 plus 2 = 14 write 4 carry 1, 6 x 1 = 6 plus 1 = 7. 345 x 23: 345 x 3 = 1,035; 345 x 20 = 6,900; total 7,935.

Ask: How do you know to use one row or two rows? (One row for a 1-digit multiplier, two rows for a 2-digit multiplier.) · What must you write before the tens row? (A zero placeholder, or the tens row is ten times too small [6].)

Check understanding: Collect receipts and check for 1,236 x 24 = 29,664 with 4,944 + 24,720 shown. If many miss alignment, stop and remodel the tens row.

Support: Provide the first partial product (1,236 x 4 = 4,944) and let pupils complete the tens row and the addition. **Stretch:** Add a second order of 1,236 x 34 and ask which total is larger and by how much, without a calculator at first.

Use: Slide 9 and Worksheet Task B

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52–60 min **Plenary** 8 min · Whole class

Secure why the zero holder matters and revisit the success criteria.

YOU DO

1. Show Slide 10: multiply by the ones, then by the tens, then add.
2. Use Slide 11 think, pair, share: why do we put a zero at the start of the second row?
3. Use Slide 12 true or false to test two rows, ones plus tens, and missing zero.
4. Return to Slide 2 goals and ask pupils to rate I can statements.

STUDENTS DO

1. Think, pair, share the reason for the zero, then share with the class.
2. Vote true or false for each Slide 12 statement and explain why.
3. Self-assess against I can statements with thumbs up or sideways.

Say: Long multiplication uses two rows for a 2-digit number. Ones row plus tens row makes the total. You cannot leave out the zero holder. Multiply by the ones, then by the tens, then add.

Ask: Why do we put a zero at the start of the second row? (Because we multiply by tens, so the zero moves digits one place left [6].) · What happens if the zero is left out? (The second row is ten times too small, so the total is wrong [6].)

Check understanding: Use true or false votes; if pupils say you can leave out the zero holder, show 24,720 vs 2,472 and re-add to prove the error.

Support: Give sentence starter: First multiply by the ones... Next put a zero because... **Stretch:** Ask: with 34 x 121 how many rows are needed and why? Listen for three rows: ones, tens, hundreds.

Use: Slides 10-12

Common mistakes

Mistake	How to spot it	How to fix it
Leaving out the zero placeholder on the tens row	Second row starts directly under ones, e.g. 2,472 instead of 24,720	Write 0 first and say times 20 not times 2; the row is ten times too small without it [6]
Not lining up columns by place value	Digits drift left or right and addition is wrong even when tables are right	Use squared paper and place-value grid, one digit per square, check ones under ones
Forgetting to add both partial products or losing exchanges	Only one row given as answer, or final add does not match rows	Circle each step used, write small carries above, then add 4,944 + 24,720 [6]

Support

- Provide the first partial product (1,236 x 4 = 4,944) and let pupils complete the tens row and the addition.

Stretch

- Add a second order of 1,236 x 34 and ask which total is larger and by how much, without a calculator at first.

For the LSE or teaching assistant

Stay with target pair in main activity. Prompt estimate first, check zero holder and column alignment, scribe alignment if needed.

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Check for understanding

Question	Answer
Work out 132 x 5 using short multiplication.	660 in one row.
Work out 23 x 14 using long multiplication. Show both rows.	92 + 230 = 322.
True or false: you can leave out the zero holder and still get the right total?	False, missing zero makes the tens row ten times too small [6].

Homework

Complete two questions from Worksheet Task B and write the estimate that proves each answer is sensible.

Sources

1. National curriculum in England: mathematics programmes of ... · gov.uk · https://www.gov.uk/government/publications/national-curriculum-in-england-mathematics-programmes-of-study/national-curriculum-in-england-mathematics-programmes-of-study
2. Year 5 Maths Curriculum map 2023-2024 · westend.lancs.sch.uk · https://westend.lancs.sch.uk/wp-content/uploads/2025/01/Year-5-Maths-curriculum-overview-24_25.pdf
3. Long multiplication - yorksj.ac.uk · yorksj.ac.uk · https://www.yorksj.ac.uk/media/content-assets/study-skills/maths-and-statistics/core-skills/Long-Multiplication-Factsheet.pdf
4. Long multiplication - York St John University · yorksj.ac.uk · https://www.yorksj.ac.uk/media/content-assets/study-skills/maths-and-statistics/core-skills/Long-Multiplication-Worksheet.pdf
5. Long multiplication - KS2 Maths - Learning with BBC Bitesize · bbc.co.uk · https://www.bbc.co.uk/bitesize/articles/z4chnrd
6. Long Multiplication Practice | Free Daily Questions | MathsDaily · mathsdaily.co.uk · https://mathsdaily.co.uk/long-multiplication-practice
7. Long Multiplication | Grid Method | Maths Made Easy - MME Revise · mmerevise.co.uk · https://mmerevise.co.uk/gcse-maths-revision/long-multiplication/
8. How to do long multiplication using Napier's method – KS3 ... · bbc.co.uk · https://www.bbc.co.uk/bitesize/articles/z297jsg
9. Kids Math: Long Multiplication - Ducksters · ducksters.com · https://www.ducksters.com/kidsmath/long_multiplication.php
10. Kids Math: Multiplication Tips and Tricks - Ducksters · ducksters.com · https://www.ducksters.com/kidsmath/multiplication_tips_tricks.php
11. Multiplication Facts for Kids · kids.kiddle.co · https://kids.kiddle.co/Multiplication
12. Multiplication strategies for larger numbers and long ... - NCETM · ncetm.org.uk · https://www.ncetm.org.uk/classroom-resources/primm-223-multiplication-strategies-for-larger-numbers-and-long-multiplication/
13. How to do long multiplication | Method and practice questions ... · doodlelearning.com · https://doodlelearning.com/maths/skills/multiplication/long-multiplication
14. How to Do Long Multiplication: 2 Step-by-Step Methods - wikiHow · wikihow.com · https://www.wikihow.com/Do-Long-Multiplication
15. Teach Long Multiplication - Math Kids Club · games.math-kids.club · https://games.math-kids.club/games/teach-longmultiplication.html
16. Long Multiplication - Definition, Facts, Example, Quiz | Math ... · workybooks.com · https://www.workybooks.com/resources/math-vocabulary/long-multiplication
17. How to Do Long Multiplication | DreamBox - DoodleLearning · dreambox.com · https://www.dreambox.com/math/skills/multiplication/long-multiplication
18. Long Multiplication - Math is Fun · mathsisfun.com · https://www.mathsisfun.com/numbers/multiplication-long.html
19. How To Do Long Multiplication I Wiki I Twinkl ZA - Twinkl · twinkl.co.za · https://www.twinkl.co.za/teaching-wiki/long-multiplication