Divide Like a Pro With Long Division

Teacher		**Class**	Grade 6
Subject	Math	**Topic**	Long division
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn to fluently divide 3-digit numbers by 2-digit divisors. They estimate, play quotient bingo, and check every answer.

Curriculum links

- Fluently divide multi-digit numbers using the standard algorithm.

Learning objectives

- Students will fluently divide 3-digit by 2-digit numbers using the standard algorithm.
- Students will estimate quotients using easy multiples before dividing exactly.
- Students will check division by multiplying quotient by divisor and explaining remainders.

Success criteria

- I can divide 3-digit by 2-digit numbers with neat, ordered steps.
- I can estimate first using 10x, 20x and other easy multiples.
- I can check my answer with multiplication and explain any leftover.

What students already know

Ask: What is 10 x 12? 20 x 12? 40 x 12? Students call out or show on whiteboards to check fast multiplication facts for 12.

Key words

dividend	the large amount that gets split up [4]
divisor	the number you split by, or how many groups you make [4]
quotient	the answer that sits on top after splitting is done [4]
remainder	the small amount left over after sharing fairly [4]
estimate	a close guess that is near the right answer [4]
long division	a way of splitting large numbers by working in smaller groups [4]

Materials

- Bingo cards with quotients, markers, problem slips
- Whiteboards and markers
- Printed Worksheet Task C
- Slides 1-12 and video clips ready to play
- Multiplication table for 12

Before the lesson

- Print bingo cards with quotients and problem slips including 576 ÷ 12 [4] and 432 ÷ 12 [5]
- Print copies of Worksheet Task C for pairs
- Test Video clip 1 (0:00–4:30) and Video clip 2 (0:00–5:00) and load Slides 1-12
- Set out markers, whiteboards, and multiplication table for 12

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Lesson outline

0–5 min **Starter** 5 min · Whole class

Activate multiplication facts and set up the fluency race goal.

YOU DO

1. Greet the class and say the hook to frame the lesson as a race for accuracy.
2. Show Slides 1-2 and point to the division frame with a 3-digit number inside.
3. Ask what each part does and cold-call for dividend, divisor, and quotient.
4. Do rapid-fire 12s: 10 x 12, 2 x 12, 20 x 12 for quick recall.

STUDENTS DO

1. Listen to the hook and read the frame on Slide 2 with a partner.
2. Name inside, outside, and top as dividend, divisor, and quotient.
3. Answer 12s facts aloud and on fingers or whiteboards.

Say: First team to get four in a row with correct division wins. Ready to race with division? Today we will fluently find quotients for 3-digit by 2-digit division. The dividend is the amount you want to divide and the divisor is the number we divide by [4].

Ask: In 672 ÷ 12, what is 672 and what is 12? (672 is the dividend, the amount to split; 12 is the divisor, the number we divide by.) · What is 10 x 12 and 20 x 12, and how does that help division? (120 and 240; 10 x 12 = 120 [4] and 20 x 12 = 240 [4] give close multiples to estimate the quotient.)

Check understanding: Hands up for correct dividend and divisor names; if mixed up, point again to inside, outside, and top and repeat with 144 ÷ 3.

Support: Show labeled frame with arrows: inside = to split, outside = split by, top = answer. **Stretch:** Ask students to predict if 672 ÷ 12 will be more or less than 50 using 50 x 12 = 600.

Use: Slides 1-2

5–17 min **Teaching** 12 min · Whole class

Model the standard algorithm with estimate, divide, multiply, subtract, bring down.

YOU DO

1. Play Video clip 1 to show the repeat steps for long division.
2. Model 576 ÷ 12 [4] on the board, writing the dividend inside the bracket and divisor outside [7].
3. Think aloud the estimate using 10 x 12 = 120, 40 x 12 = 480, and 50 x 12 = 600, since an estimate means to find a value close enough [4].
4. Finish the steps neatly, recording each subtraction underneath the dividend [4], then check with 48 x 12 = 576.

STUDENTS DO

1. Watch the clip and track where to divide first and hear multiply, subtract, bring down.
2. Copy the model layout and say each step quietly with the teacher.
3. Verify the check that quotient x divisor = dividend.

Say: Long division is the same small step on repeat. Divide, multiply, subtract, bring down, then repeat until no digits are left. We break the large number down into smaller groups [4] and keep our subtraction work straight under the dividend.

Worked example: 576 ÷ 12 = 48. Estimate about 50 because 50 x 12 = 600. Divide: 57 ÷ 12 goes 4 times. Multiply: 4 x 12 = 48. Subtract: 57 - 48 = 9. Bring down 6 to make 96. Repeat: 96 ÷ 12 goes 8 times. Multiply: 8 x 12 = 96. Subtract: 96 - 96 = 0. Quotient 48, remainder 0. Check: 48 x 12 = 576.

Ask: After 57 - 48 = 9, what do we do next and why? (Bring down the next digit to make 96 and repeat divide, multiply, subtract until no digits are left [3].) · How do we know 48 is correct? (Multiply back: 48 x 12 = 576, so quotient x divisor + remainder = dividend.)

Check understanding: All students hold up whiteboards showing 4 as first quotient digit; reteach place value if many show 5 or 40 in wrong place.

Support: Give a 1x to 9x list for 12 so students pick digits faster, since multiplication facts are useful in solving division problems [5]. **Stretch:** Ask students to explain why we start with 57, not 5, using multiples like 1 hundred x 12 = 1,200 is too big.

Use: Video clip 1 (0:00–4:30), Slides 3-4

17–30 min **Guided practice** 13 min · Pairs

Practice choosing digits with multiples and keeping place value neat.

YOU DO

1. Show Slides 7-8 and play Video clip 2 on 2-digit divisors.
2. Guide pairs through 432 ÷ 12 [5]: list 10 x 12 = 120, 20 x 12 = 240 [4], 30 x 12 = 360 to estimate about 30-40.
3. Circulate as pairs solve on whiteboards, reminding them to write multiples alongside the subtraction and set out the algorithm correctly [5].
4. Stop to fix one common placement error on the board.

STUDENTS DO

1. With a partner, list multiples, estimate, then solve 432 ÷ 12 step by step.
2. Compare layout and correct any digit placed over the wrong column.
3. Start Worksheet Task B first two problems showing divide, multiply, subtract, and bring down.

Say: List easy multiples to choose digits, estimate before you divide, and check subtraction and place value. Talk with your partner: how many groups of 12 fit, then multiply that digit by the divisor, subtract to see what is left, and bring down.

Worked example: 432 ÷ 12 = 36. Estimate 30 to 40 because 30 x 12 = 360 and 40 x 12 = 480. 43 ÷ 12 goes 3 times, 3 x 12 = 36, 43 - 36 = 7, bring down 2 to make 72. 72 ÷ 12 goes 6 times, 6 x 12 = 72, 72 - 72 = 0. Check: 36 x 12 = 432.

Ask: What estimate helps you pick the first digit for 432 ÷ 12? (About 30-40 because 30 x 12 = 360 and 40 x 12 = 480 are close to 432.) · Where does the 3 in 36 go and why? (Over the tens place above the 3 in 43, because 43 tens were split, not 4 hundreds.)

Check understanding: Scan whiteboards for 36 with neat subtraction lines; pull a small group to re-model regrouping alongside the subtraction [4] if digits are misaligned.

Support: Post 1x, 2x, 4x, 5x, and 10x multiples so students can derive nearby multiples [5] without heavy multiplying. **Stretch:** Give 672 ÷ 12 [5] and ask students to predict the number of quotient digits before starting.

Use: Video clip 2 (0:00–5:00), Slides 7-8, Worksheet Task B

30–50 min **Main activity** 20 min · Groups

Build fluency solving 3-digit by 2-digit division accurately under game pressure.

YOU DO

1. Hand out bingo cards, markers, and problem slips like 576 ÷ 12 [4] and 432 ÷ 12 [5].
2. Read Slide 9 task: estimate first and list helpful multiples, then divide, multiply, subtract, bring down, then check by multiplying quotient x divisor.
3. Run the Quotient Bingo Race in teams, drawing slips, solving fully, and covering matching quotients.
4. Declare winners only after checking work shows the full long division where the quotient is the result after division [4].

STUDENTS DO

1. In teams, draw a slip, estimate, list multiples, and solve with the standard steps.
2. Cover the quotient on the bingo card and keep the written work for checking.
3. Challenge for four in a row, then prove wins with multiplication checks.

Say: You get points for a smart estimate and more for the right answer. For each slip, estimate first to find a value close to the right answer [5], then solve with divide, multiply, subtract, and bring down [7]. Show every subtraction underneath and keep digits lined up.

Worked example: Team draws 576 ÷ 12. They write 40 x 12 = 480 and 50 x 12 = 600, estimate about 48, solve to get 48 with remainder 0, cover 48 on the card, and prove it with 48 x 12 = 576.

Ask: What multiples did you list and what did you estimate? (For example 10 x 12 = 120, 20 x 12 = 240, 40 x 12 = 480, 50 x 12 = 600; estimate near 50 for 576 ÷ 12.) · How do you prove your quotient is correct? (Multiply back: dividend = divisor x quotient + remainder, using a = b x q + r with r smaller than the divisor [8].)

Check understanding: Check winning cards by reviewing each solution; if subtraction or place value is off, team fixes that step before bingo counts.

Support: Provide a multiplication table for 12 and allow checking with 10 x 12 = 120 and 20 x 12 = 240 [4].
Stretch: Require winners to prove each win by checking with multiplication using dividend = divisor x quotient + remainder.

Use: Slide 9, Worksheet Task C

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50–60 min **Plenary** 10 min · Whole class

Confirm key ideas, voted habits, and fluency with remainders.

YOU DO

1. Show Slide 10 and model the 5-second check: quotient x divisor + remainder = dividend, so 48 x 12 = 576 proves it.
2. Run Slide 11 vote on which habit makes you fastest and most accurate.
3. Use Slide 12 true-false to settle dividend meaning and that you repeat until no digits are left [3].
4. Give exit ticket on whiteboards.

STUDENTS DO

1. Vote, defend their habit choice, and answer true-false with thumbs up or down.
2. Complete three exit problems on whiteboards and hold up answers.
3. State one step they will keep neat next time.

Say: Every division can be checked in seconds. Knowing multiplication facts cold, estimating first, keeping work neat, and always checking keeps you fast and accurate. A remainder is an amount left after the division [4] and must be smaller than the divisor.

Ask: In 672 ÷ 12, 672 is the dividend — true or false? (True; dividend is the amount you split.) · Long division stops after one subtract step — true or false? (False; repeat until no digits are left to bring down [3].)

Check understanding: Read all whiteboard exit answers; reteach estimate or check step tomorrow if more than a third miss.

Support: Show the small check 10 = 3 x 3 + 1 to see a = b x q + r with r smaller than the divisor [8]. **Stretch:** Ask what changes if the same numbers are about money in dollars versus pencils in a box.

Use: Slides 10-12

Common mistakes

Mistake	How to spot it	How to fix it
Quotient digit written over the wrong place value	First digit over hundreds instead of tens, giving 408 instead of 48	Estimate first [5] and ask how many groups fit in the first two digits; long division records regrouping alongside the subtraction [4].
Forgetting to bring down the next digit and stopping early	Work stops after 57 - 48 = 9 with no 96 step	Repeat divide, multiply, subtract, and bring down until no digits are left [3][7].
Remainder larger than the divisor	Claims 576 ÷ 12 = 47 remainder 12	Check that remainder is an amount left after division [4] and must fit a = b x q + r with r smaller than the divisor [8]; choose a larger quotient digit.

Support

- Provide handwritten 1x to 10x multiple lists and a multiplication table for 12, because known facts help estimate the answer [5].
- Give a half-finished example with estimate and first subtract step done so students complete the rest.

Stretch

- Require checking every answer with dividend = divisor x quotient + remainder and explaining the leftover in one sentence.
- Add a 4-digit dividend or a zero-in-quotient problem and ask students to predict quotient digits before solving.

For the LSE or teaching assistant

Stay with the bingo teams needing most help; prompt them to say multiples aloud, point to the next digit to bring down, and check each subtraction line.

Check for understanding

Question	Answer
Solve 576 ÷ 12. Show estimate and check.	48, remainder 0; estimate about 50; check 48 x 12 = 576.
Solve 432 ÷ 12. Show estimate and check.	36, remainder 0; estimate 30-40; check 36 x 12 = 432.
In 918 ÷ 17, you get quotient 54 remainder 0. How do you prove it?	54 x 17 = 918, so quotient x divisor + remainder = dividend.

Homework

Solve four 3-digit by 2-digit problems showing estimate, full steps, and multiplication check.

Sources

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