Two Steps, Letter Unknown, Check It

Teacher		**Class**	Grade 4
Subject	Math	**Topic**	Multi-step word problems
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn to solve two-step problems in order and explain remainders. They practice with strips, letter equations, and rounding checks.

Curriculum links

- Estimate, represent, solve, and explain solutions to single-step and multistep real-life problems that involve multiplication with whole numbers [1]
- Use strategies (like rounding, compatible numbers, place value) and algorithms, including the standard algorithm, to estimate and find the quotient of two whole numbers, given a one-digit divisor and a two- or three-digit dividend, with and without remainders [1]
- Use strategies (like rounding to the nearest 100 or 1,000, using compatible numbers, and other number relationships) to estimate a solution for single-step or multistep addition or subtraction problems with whole numbers [1]

Learning objectives

- Students will solve two-step problems with whole numbers using all four operations.
- Students will write step equations with a letter for the unknown amount.
- Students will interpret remainders and estimate with rounding to check answers.

Success criteria

- I can do step 1 then step 2 in order to find the final answer.
- I can write n equations to show the unknown in each step.
- I can explain leftovers and use rounding to check if answers fit.

What students already know

Ask: 3 x 12 = ? and 24 - 10 = ? Show on whiteboards. Listen for quick multiplication and subtraction facts needed for first two-step.

Key words

equation	a number sentence with = that shows two amounts are the same [13]
unknown	the number we have not found yet, shown by a letter like n [14]
remainder	what is left over after sharing into equal groups [7]
estimate	a close guess found by using round numbers [1]
multi-step	needing more than one calculation to reach the end [6]

Materials

- Short problem cards, paper strips, pencils
- Counters and small cups for tables

Before the lesson

- Print problem cards, paper strips, and Worksheet Task B and Task C for pairs

Created with LessonDino.com · AI lesson planner with checkable sources

- Whiteboard and markers
- Slides 1-2, 4, 6-7, 9-12
- Video clip 1 (0:00–3:08) on slide 6
- Printed Worksheet Task B and Task C
- Test Slides 1-2, 4, 6-7, 9-12 and Video clip 1 (0:00–3:08) sound and image
- Set out counters, small cups, pencils, and partly filled bar models for support
- Clear desks for laying two paper strips in order

Lesson outline

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

Hook students and recall one-step facts needed for two-step solving.

YOU DO

1. Say hook: I have a problem that tricks almost everyone — they stop after step one. Can you go all the way to step two?
2. Show Slides 1-2 with question: A shopkeeper packs 4 boxes of 6 pencils. She sells 10. How many are left?
3. Ask students to read twice and tell a partner what the final question asks.
4. Collect quick ideas without solving fully yet.

STUDENTS DO

1. Read Slide 2 twice with partner.
2. Tell partner the final question in own words.
3. Share one idea of what to find first.

Say: Good solvers read the problem twice so they understand the story. We will plan what to find first and second. Today you will solve a two-step problem in order and find the final answer.

Worked example: Slide 2 check: Step 1: 4 x 6 = 24 pencils packed. Step 2: 24 - 10 = 14 pencils left. Let n = number left, so n = 14.

Ask: What is the final question asking for? (How many pencils are left after selling some.) · What would we need to find first? (How many pencils were packed in total, 4 x 6.)

Check understanding: Thumbs up if you can say the final question. If not, reread together and underline the question.

Support: Point to the question sentence and read it aloud together. **Stretch:** Ask: what third step could follow, like selling 4 more?

Use: Slides 1-2

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

Model breaking a story into steps and writing letter equations.

YOU DO

1. Show Slide 10 solver plan: Read, Plan, Solve, Check.
2. Play Video clip 1 (0:00–3:08) on Slide 6 and tell class to listen for first step, then next and spot the letter for unknown.
3. Model example card on board with two strips and equations using letter n for the final unknown amount [13].
4. Define key words on Slide 7 and model a quick rounding check [1].

STUDENTS DO

1. Watch video and note first step and next step.
2. Copy the two equations with a and n on whiteboards.
3. Say with teacher the estimate using rounded numbers.

Say: We break the story into smaller, manageable parts and plan what to find first and second [3]. We write one equation for each step, using drawings and equations with a symbol for the unknown number to represent the problem [14]. Then we round to see if our exact answer is close.

Worked example: Card: A class packs 3 boxes with 12 notebooks in each box, then gives away 5 notebooks. How many are left? Step 1 finds the product of a two-digit factor and a one-digit factor [1]: Let a = total packed. a = 3 x 12 = 36. Step 2 subtracts: Let n = number left. n = 36 - 5 = 31 notebooks left. Estimate check: 3 x 10 = 30, so 31 is close.

Ask: Why do we find 3 x 12 before subtracting? (We need the total first, then we can take away 5.) · What does n stand for here? (The final unknown amount left, 31 notebooks.) · How does 30 help us check 31? (30 is an estimate with rounding, so 31 is reasonable and close.)

Check understanding: Hold up whiteboards showing a = 36 and n = 31. Reteach order if equations are flipped.

Support: Give a card with a partly filled bar model that shows the total and the removed amount, so students can see equal groups or take-away [12]. **Stretch:** Ask students to write one combined equation with parentheses, like n = (3 x 12) - 5.

Use: Slides 6-7, 10; Video clip 1 (0:00–3:08)

17–35 min **Main Activity** 18 min · Pairs

Solve two-step problems in order and show each step with strips.

YOU DO

1. Hand out short problem cards, paper strips, and pencils plus Worksheet Task B.
2. Remind pairs to read each card twice and write the steps before they calculate, because multi-step problems need more than one calculation to solve [6].
3. Show how to lay the two paper strips in order and write one equation for each step, using the letter n for the final unknown amount.
4. Circulate, prompt pairs to say what step 1 finds and why it is needed before calculating [12].

STUDENTS DO

1. Read card twice, underline final question, plan Step 1 then Step 2.
2. Lay strips in order and solve Task B problems with n equations.
3. Label each answer and check it answers the final question [13].

Say: Read twice, then plan first, next, last before you touch numbers. Lay your strips in order and write n = ... for the mystery number. Do one step at a time and keep your answer from each step.

Worked example: Slide 9 Task 1: Pencils: 3 packs x 8 plus 5 more. Let a = pencils in packs. a = 3 x 8 = 24. Let n = total now. n = 24 + 5 = 29 pencils. Estimate: 3 x 8 is about 3 x 10 = 30, so 29 is reasonable, a little less than 30.

Ask: What did your Step 1 find and why did you need it? (Step 1 found the middle total, needed before the second action.) · How do you know you answered the final question? (Reread question and check label matches what was asked [12].)

Check understanding: Collect one strip pair per team and check equations have a and n in order. Fix order on board if reversed.

Support: Give a card with a partly filled bar model that shows the total and the removed amount, so students can see how the sections stand for equal groups or take-away. **Stretch:** Add a third step to the same card, like packing 4 more notebooks, and ask students to write all three equations.

Use: Slide 9; Worksheet Task B

35–50 min **Remainder and Estimate Check** 15 min · Groups

Interpret division leftovers and judge answers with rounding.

YOU DO

1. Show Slide 4: 25 students need seats. Vans hold 6 each. Model 25 ÷ 6 with counters into cups, a one-digit divisor and a two-digit dividend [1].
2. Circle remainder and model sentence: 25 ÷ 6 = 4 R1, so need 5 vans because you cannot leave anyone behind, interpreting the remainder and its effect on the answer [7].
3. Model estimate: 298 + 412 - 105 rounds to 300 + 400 - 100 = 600 using rounding to nearest 100 [1]. Solve exactly 605 and describe as closer to 600 [1].
4. Hand Worksheet Task C for both steps and remainder meaning.

STUDENTS DO

1. Put counters into equal groups in cups, record division and circle remainder.
2. Write one sentence saying if answer rounds up, drops remainder, or uses remainder.
3. Round each number, estimate first, then solve exactly and give thumbs up if close.

Say: Division leftovers matter in real stories. Sometimes we round up, drop it, or use it as the answer. After solving, we round to estimate and ask if the exact answer is close.

Worked example: Example 1: 26 students, 8 fit at each table. 26 ÷ 8 = 3 R2, so need 4 tables because the 2 leftover students still need a seat. Example 2: 298 + 412 - 105 = 605. Estimate 300 + 400 - 100 = 600, so 605 is reasonable, between 600 and 610, a little more than 600.

Ask: 25 ÷ 6 = 4 R1. Why are 4 tables not enough? (1 student is left without a seat, so need 5 tables.) · When would the remainder itself be the answer? (When question asks what is left, like loose pencils after packing boxes.) · How does rounding help? (It gives an estimate to check the exact answer is reasonable [1].)

Check understanding: Groups hold estimate first, then exact answer. If far apart, recalculate together.

Support: Start with 20 ÷ 6 and 22 ÷ 6 using cups, so students can see the leftover counters before they decide to add one more group. **Stretch:** Give 27 erasers packed 6 to a box — how many full packs and how many loose are left? Answer 4 R3.

Use: Slides 4, 11; Worksheet Task C

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

Return to objectives and check two-step order and leftovers.

YOU DO

1. Show Slide 12 true or false and read each statement together.
2. Revisit Slide 10 solver plan and ask students to say steps in order.
3. Give 3-question exit ticket on paper and collect.

STUDENTS DO

1. Vote true or false and explain why with partner.
2. Say solver steps: Read, Plan, Solve, Check.
3. Complete exit ticket on their own.

Say: Today we planned first then next, wrote n for the mystery number, and checked leftovers and size. Tell me in order what good solvers do, then show it on your exit ticket.

Ask: In multi-step problems you do step 1 before step 2 in order. True? (True, order matters to get right answer.) · 25 ÷ 6 = 4 R1 means 4 tables are enough. True? (False, need 5 tables for 25 students.)

Check understanding: Count votes and ask one student to justify each. Reteach remainder round-up if many vote wrong.

Support: Provide sentence frames: Step 1 finds ___. Let n = ___. **Stretch:** Ask students to add a distractor number to a clean problem and explain why it is not needed [8].

Use: Slides 10, 12

Common mistakes

Mistake	How to spot it	How to fix it
Stopping after Step 1 and giving middle total as final answer	Answer matches first calculation but label does not match final question	Underline final question first and reread to check answer label matches what was asked [12]
Ignoring remainder or dropping it when story needs rounding up	Writes 25 ÷ 6 = 4 R1 and says 4 tables are enough	Act out with counters and ask where leftover students sit; write sentence that remainder means one more group [7]
Picking operation from cue word only without picturing story	Multiplies when sharing equally is needed	Draw bar or cups to picture equal groups, then choose divide or multiply [6]

Support

- Use partly filled bar models and cups with counters to show totals and leftovers
- Read problem twice aloud and underline final question before calculating
- Provide sentence frames for step equations with a and n

Stretch

- Add a third step to the same card and write all three equations
- Write one combined equation with parentheses, like n = (4 x 6) - 3
- Create a two-step question that fits a given answer and trade to solve

For the LSE or teaching assistant

Stay with target pairs in main and remainder stages. Prompt what Step 1 finds, help place bar model sections, and check remainder sentences.

Check for understanding

Question	Answer
A class has 3 packs of 8 markers plus 5 more. Write equations with n and solve.	a = 3 x 8 = 24; n = 24 + 5 = 29 markers
25 students, 6 per table. How many tables and why?	5 tables because 25 ÷ 6 = 4 R1 and 1 student still needs a seat
Estimate 198 + 305 by rounding to nearest 100. Is 503 reasonable?	200 + 300 = 500, so 503 is reasonable, closer to 500

Homework

Solve one two-step problem with n equation and rounding check from Worksheet Task B.

Sources

1. Grade 4 Math Curriculum - Fairfax County Public Schools · fcps.edu · https://www.fcps.edu/academics/elementary/fourth-grade/year-at-a-glance/math
2. Grade 4 Math | SFUSD · sfusd.edu · https://www.sfusd.edu/learning/curriculum/elementary-school/mathematics/grade-4-math
3. Multistep Word Problems - Online Lesson · articulate.strayer.edu · https://articulate.strayer.edu/multistep-word-problems
4. Pirate Math Equation Quest - Small Group Word Problem ... · piratemathequationquest.education.utexas.edu · https://piratemathequationquest.education.utexas.edu/individual-multi.html
5. Solving Multistep Problems: What Will It Take? · files.eric.ed.gov · https://files.eric.ed.gov/fulltext/ED623809.pdf
6. Multi-Step Word Problems | Math | EducaWeb · educaweb.org · https://educaweb.org/math/multi-step-word-problems/
7. Multi-step word problems with whole numbers - Khan Academy · khanacademy.org · https://www.khanacademy.org/math/cc-fourth-grade-math/division/multi-step-word-problems/e/multi-step-word-problems-with-whole-numbers
8. Learn how to deal with multi-step word problems - BBC Bitesize · bbc.co.uk · https://www.bbc.co.uk/bitesize/articles/z8n83qt
9. Multiple-Step Word Problem Worksheets · superteacherworksheets.com · https://www.superteacherworksheets.com/word-problems-multi-step.html
10. Multi-Step Word Problems Worksheets | Free Printable Worksheets · mathfunworksheets.com · https://www.mathfunworksheets.com/worksheets/multi-step-word-problems-worksheets/
11. Multi-Step Word Problems Mastery - Teaching with a Mountain View · teachingwithamountainview.com · https://teachingwithamountainview.com/mastering-multi-step-word-problems/
12. Multi-step Word Problems Worksheets for 4th Grade ... · freeworksheets.com · https://freeworksheets.com/grade-4/multi-step-word-problems/
13. How to Solve Multi-Step Word Problems - Effortless Math · effortlessmath.com · https://www.effortlessmath.com/math-topics/how-to-solve-multi-step-word-problems/
14. 2.MD.B Modeling Multi-Step Word Problems_Ball Throws | OER Commo… · oercommons.org · https://oercommons.org/authoring/47628
15. Solving maths problems - KS2 Maths - Year 4 - BBC Bitesize · bbc.co.uk · https://www.bbc.co.uk/bitesize/articles/zpwwy4j
16. Money Math: Word Problems with Multiplication and Division · ducksters.com · https://www.ducksters.com/money/money_word_problems_multiplication_division.php
17. Money Math: Word Problems with Addition and Subtraction · ducksters.com · https://www.ducksters.com/money/money_word_problems_addition_subtraction.php
18. Multi-Step Word Problems: How to Explain Your Thinking · teachjunkie.com · https://www.teachjunkie.com/math-subject/multi-step-word-problems-explain-your-thinking/
19. How do you solve multi-step word problems? · math-wordproblems.com · https://math-wordproblems.com/lessons/sixth-grade/solving-and-estimation-word-problems/how-do-you-solve-multi-step-word-problems