

TEACHER + STUDENT RESOURCE

# Grade 5 mathematics

## Rename, estimate, combine



### NC.5.NF.1 | Number and Operations - Fractions

Current North Carolina standards for 2026-27 and 2027-28. Newly adopted 2026 standards begin in 2028-29.

Seven teaching sections; 30 multiple-choice and 30 open/modeling tasks; scripts, original visual models, reusable organizers, worked keys, and evidence records.

Choose a small core across several lessons. This bank is not a single 60-question assignment.

# Free sample | Contents

NC.5.NF.1 | Fifth Grade mathematics

This sample contains 19 complete selected pages from the 111-page resource, plus this sample contents page. Original printed page numbers are retained. Gaps are intentional.

Included original pages: 1-14, 29-30, 59, 74-75

Representative activities

M01: sample PDF page(s) 15; original page(s) 14

M02: sample PDF page(s) 15; original page(s) 14

O01: sample PDF page(s) 16; original page(s) 29

O02: sample PDF page(s) 17; original page(s) 30

Selected teacher prompts and keys: original page(s) 59, 74-75

Using this sample

Read the preparation and access guidance before using a selected activity.

Keep teacher keys and private preparation pages separate from student copies.

Use the original resource contents to see the scope of the complete packet.

Complete paid download

The complete resource includes the full PDF task bank and teaching materials.

## TEACHER GUIDE

# Contents and planning

Standard and targets: page 3. Access and prerequisites: page 4. Teacher model: page 5. Seven lesson scripts: pages 6-12. Student organizer: page 13. Choice bank: pages 14-28. Open/modeling bank: pages 29-58. Worked keys begin on page 59. Scoring, evidence record, and sources follow the keys.

Use four sessions of approximately 20-30 minutes: warm-up/model; shared/partner reasoning; independent/reteach; exit/transfer. Times guide instruction, never score speed. Use the selected M and O in each script, then draw from alternatives over time.

Each student must construct and explain models individually. Partner work includes separate records. Model-based responses after teacher demonstration are practice evidence, not unaided assessment.

Materials: pencils, crayons, paper strips, blank paper, and the supplied organizer. Adults handle optional cutting. Models show mathematical relationships, not physical measurement templates.

Visual supports include equal-area wholes, partition grids, and length models with explicit unit lengths. Teacher diagrams explain the operation; student workspaces preserve the learner's responsibility to construct the model.

Practices: MP2 connect quantities and symbols; MP3 justify and critique; MP4 model contexts; MP6 attend to units and equal parts.

## TEACHER GUIDE

# Standard and targets

**Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths.**

- Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
- Solve one- and two-step word problems in context using area and length models to develop the algorithm. Represent the word problem with an equation.

A | I can add and subtract related fractions, including mixed numbers.

B | I can estimate with benchmarks and judge reasonableness.

C | I can solve one- and two-step contexts with area and length models and equations.

Evidence: student-created representations, equations, contextual units, and an explanation linking the model to the operation. Choice recognition alone is insufficient.

## TEACHER GUIDE

## Prerequisites and access

Review the meaning of one whole, equal partitions, numerator and denominator, equivalence, and multiplication/division as related operations. Use congruent paper wholes to test whether parts are equal.

Use related denominator families only: 2, 4, 8; 3, 6, 12; 5, 10, 100. Include mixed numbers, mental benchmark estimates, and one- and two-step contexts.

Allow neutral reading of directions, enlarged copies, AAC, signing, oral explanation, and exact transcription of student-directed construction. Do not choose partitions, supply arithmetic, or point to an answer during independent evidence. Record access separately from answer-supplying hints.

If a learner combines denominators, rebuild the unit. If division direction is reversed, name the total and either the number of equal shares or the size of each group. If mixed numbers are mishandled, rename each as a count of unit fractions.

For reteach, use fewer larger equal pieces and ask the learner to reconstruct the whole. For extension, use another representation, test a proposed rule, and explain why the methods agree.

Record N/O when evidence is absent, inaccessible, or insufficient. Use zero only for an interpretable observed incorrect response. Do not score spelling, handwriting, accent, or neatness.

## TEACHER MODEL

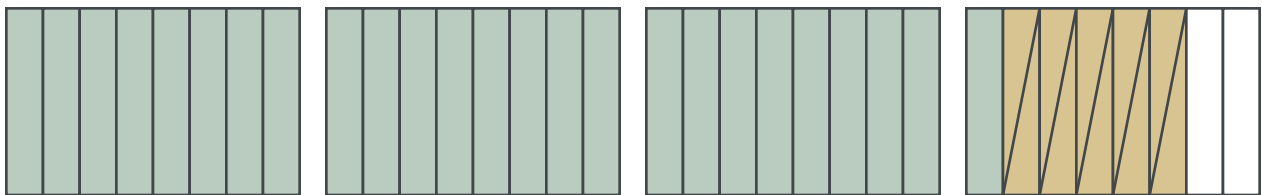
# See the operation

Say: “First name the whole and the question. I will keep each unit whole the the same size, make equal parts, and connect my model to an equation.”

A ribbon is  $3\frac{3}{4}$  meters long. A piece  $\frac{5}{8}$  meters long is removed. How much ribbon remains?

$3\frac{3}{4} - \frac{5}{8} = 3\frac{1}{8}$ . Rename with equal-size parts:  $\frac{30}{8} - \frac{5}{8} = \frac{25}{8} = 3\frac{1}{8}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $4 - \frac{1}{2} = 3\frac{1}{2}$ ; compare with the exact result  $3\frac{1}{8}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $\frac{1}{4}$ , so the exact result is within  $\frac{1}{2}$  of this estimate.

## Worked area model



1 whole

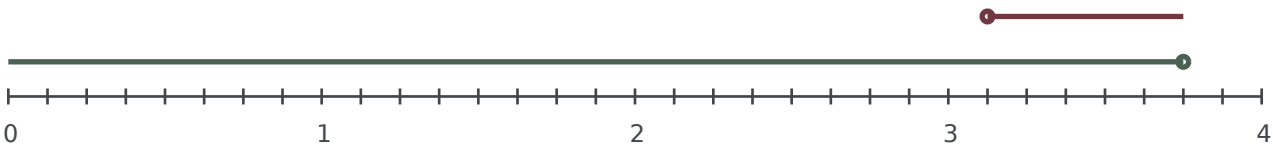
1 whole

1 whole

1 whole

All colored parts = start. Hatched gold = removed. Sage = left.

## Worked length model



0-to-1 is one whole unit; every small interval has length  $\frac{1}{8}$ .

Raised segments show start, then change. Endpoint(s) match the equation.

## LESSON SCRIPT | Warm-up

# Notice the unit

**Bank: M01-M04 and O01-O04. Selected core: M01, O01. Transfer: O04.**

0-3 minutes: Ask: “What is the whole? What does one equal part mean?” Let the learner explain before computing.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $30/8 - 5/8 = 25/8 = 3 \frac{1}{8}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $4 - 1/2 = 3 \frac{1}{2}$ ; compare with the exact result  $3 \frac{1}{8}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Selected choice check:  $3 \frac{1}{8}$ . Rename with equal-size parts:  $30/8 - 5/8 = 25/8 = 3 \frac{1}{8}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $4 - 1/2 = 3 \frac{1}{2}$ ; compare with the exact result  $3 \frac{1}{8}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## LESSON SCRIPT | I Do

# Model and think aloud

**Bank: M05-M08 and O05-O08. Selected core: M05, O05. Transfer: O08.**

0-3 minutes: Use page 5. Point from each factor or term to the corresponding part of the drawing. Ask a learner to restate what the answer measures.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $22/6 - 5/6 = 17/6 = 2 \frac{5}{6}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $3 \frac{1}{2} - 1 = 2 \frac{1}{2}$ ; compare with the exact result  $2 \frac{5}{6}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate. Second step:  $2 \frac{5}{6} + 1/3 = 3 \frac{1}{6}$  meters. Final length:  $3 \frac{1}{6}$  meters. Extend both first-step models by  $1/3$ .

Selected choice check:  $2 \frac{5}{6}$ . Rename with equal-size parts:  $22/6 - 5/6 = 17/6 = 2 \frac{5}{6}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $3 \frac{1}{2} - 1 = 2 \frac{1}{2}$ ; compare with the exact result  $2 \frac{5}{6}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## LESSON SCRIPT | We Do

# Build a shared argument

**Bank: M09-M13 and O09-O13. Selected core: M09, O09. Transfer: O13.**

0-3 minutes: Begin the selected O. Ask learners to propose partitions. Test two proposals, then construct one model together and connect it to an equation.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $12/10 + 9/10 = 21/10 = 2 \frac{1}{10}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $1 + 1 = 2$ ; compare with the exact result  $2 \frac{1}{10}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Selected choice check:  $2 \frac{1}{10}$ . Rename with equal-size parts:  $12/10 + 9/10 = 21/10 = 2 \frac{1}{10}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $1 + 1 = 2$ ; compare with the exact result  $2 \frac{1}{10}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## LESSON SCRIPT | Collaborative practice

# Exchange and check

**Bank: M14-M18 and O14-O18. Selected core: M14, O14. Transfer: O18.**

0-3 minutes: Partner A draws while B checks equal units and asks for an explanation. Switch roles. Each learner keeps an individual solution.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $14/6 - 5/6 = 9/6 = 1 \frac{1}{2}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $2 \frac{1}{2} - 1 = 1 \frac{1}{2}$ ; compare with the exact result  $1 \frac{1}{2}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Selected choice check:  $1 \frac{1}{2}$ . Rename with equal-size parts:  $14/6 - 5/6 = 9/6 = 1 \frac{1}{2}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $2 \frac{1}{2} - 1 = 1 \frac{1}{2}$ ; compare with the exact result  $1 \frac{1}{2}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## LESSON SCRIPT | Independent practice

# Observe independently

**Bank: M19-M23 and O19-O23. Selected core: M19, O19. Transfer: O23.**

0-3 minutes: Read only the directions. Say: “Make the required models and explain how they match your equation.” Collect responses before offering hints.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $140/100 + 9/100 = 149/100 = 1\frac{49}{100}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $1\frac{1}{2} + 0 = 1\frac{1}{2}$ ; compare with the exact result  $1\frac{49}{100}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Selected choice check:  $1\frac{49}{100}$ . Rename with equal-size parts:  $140/100 + 9/100 = 149/100 = 1\frac{49}{100}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $1\frac{1}{2} + 0 = 1\frac{1}{2}$ ; compare with the exact result  $1\frac{49}{100}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## LESSON SCRIPT | Small-group reteach

# Rebuild meaning

**Bank: M24-M27 and O24-O27. Selected core: M24, O24. Transfer: O27.**

0-3 minutes: Use a simpler example and physical paper strips. Identify the total, unit, and operation. Return to a fresh item without repeating an answer cue.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $230/100 - 67/100 = 163/100 = 1\ 63/100$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $2\ 1/2 - 1/2 = 2$ ; compare with the exact result  $1\ 63/100$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Selected choice check:  $1\ 63/100$ . Rename with equal-size parts:  $230/100 - 67/100 = 163/100 = 1\ 63/100$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $2\ 1/2 - 1/2 = 2$ ; compare with the exact result  $1\ 63/100$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## LESSON SCRIPT | Exit ticket

# Explain and transfer

**Bank: M28-M30 and O28-O30. Selected core: M28, O28. Transfer: O30.**

0-3 minutes: Choose one M and O. Ask the learner to explain the units and a reason the result is reasonable. Compare evidence with earlier work.

3-8 minutes: ask, “Where is one whole? What does each part represent? How does the operation change the amount?” Draw or build; do not rush to a rule.

8-13 minutes: connect the drawing to symbols, label the answer’s unit, and check by reconstruction, an inverse operation, or a benchmark.

Teacher-only selected solution: Rename with equal-size parts:  $19/10 - 8/10 = 11/10 = 1 \frac{1}{10}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $2 - 1 = 1$ ; compare with the exact result  $1 \frac{1}{10}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Selected choice check:  $1 \frac{1}{10}$ . Rename with equal-size parts:  $19/10 - 8/10 = 11/10 = 1 \frac{1}{10}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $2 - 1 = 1$ ; compare with the exact result  $1 \frac{1}{10}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Listen for equal partitions and the meaning of each number. If the result has the wrong unit, return to what the question asks. For early finishers, request a different model and an explanation of why both agree.

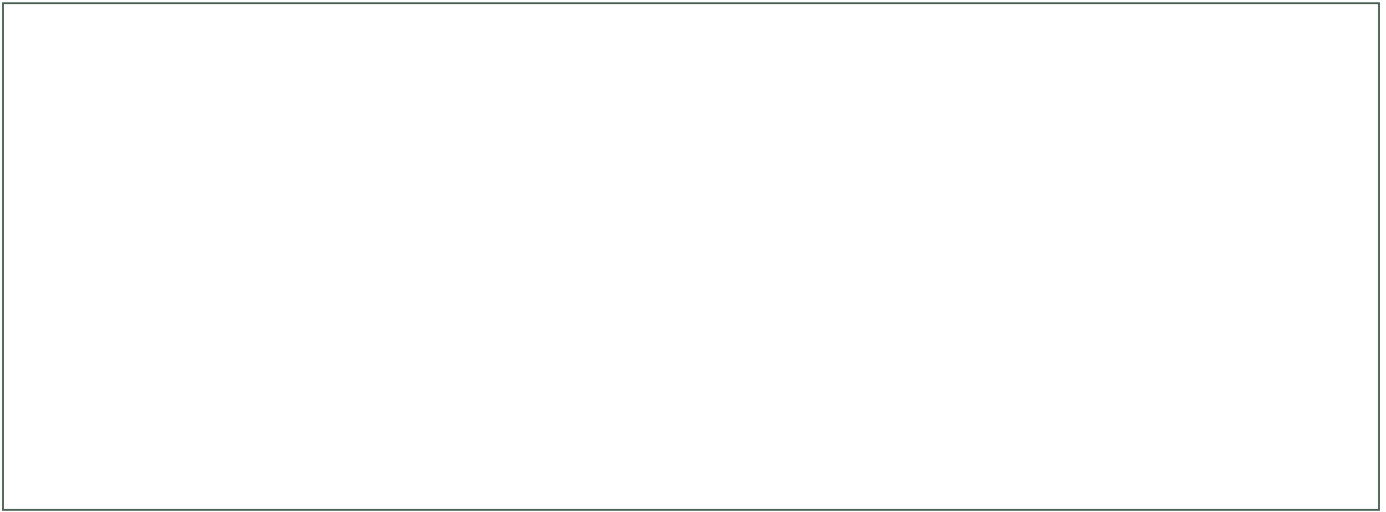
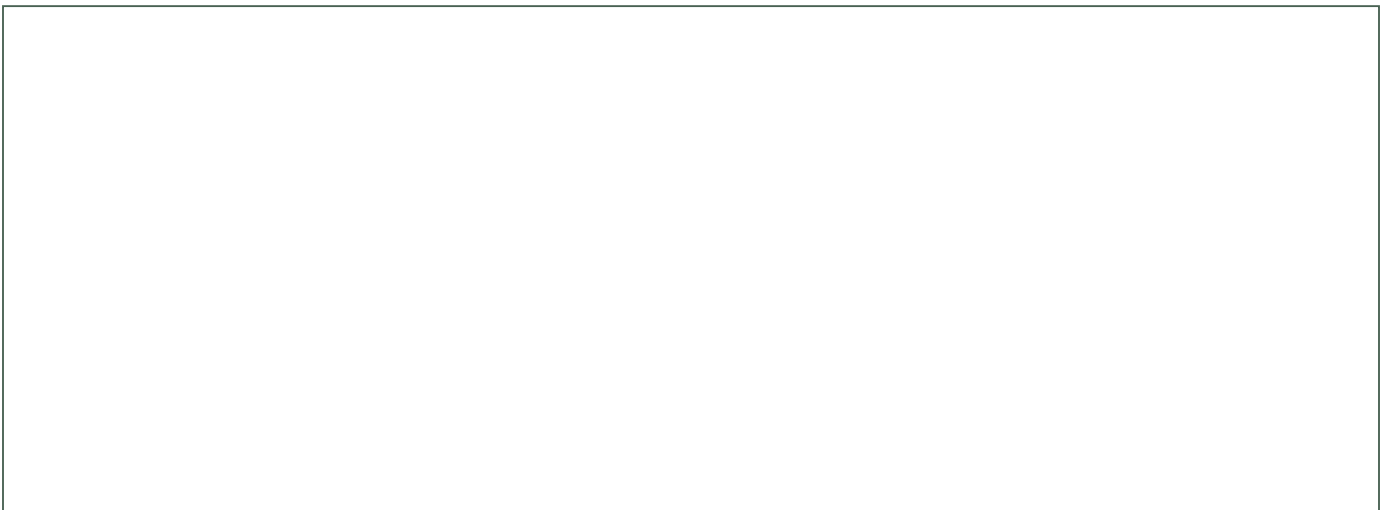
Record the item, representation, equation, explanation, context unit, access support, any answer-supplying prompt, and next teaching step. Modeled work does not establish independent performance.

## REUSABLE STUDENT ORGANIZER

# Model, connect, explain

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Identify the whole, then choose equal partitions. Make area and length models that match your equation.

**A: area model / labeled equal parts****B: length model / equation / interpretation**

## STUDENT CHOICE BANK

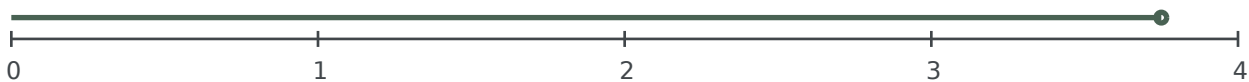
**M01 and M02**

M01 | A ribbon is  $3\frac{3}{4}$  meters long. A piece  $\frac{5}{8}$  meters long is removed. How much ribbon remains?

- A.  $3\frac{1}{8}$
- B.  $4\frac{1}{8}$
- C.  $2\frac{7}{8}$
- D.  $3\frac{1}{4}$

Sketch or check: \_\_\_\_\_

Given first amount:  $3\frac{3}{4}$  units. Continue / partition in your own sketch.



M02 | Find  $1\frac{3}{10} - \frac{37}{100}$ .

- A.  $\frac{19}{20}$
- B.  $\frac{93}{100}$
- C.  $\frac{91}{100}$
- D.  $1\frac{93}{100}$

Sketch or check: \_\_\_\_\_

## STUDENT MODELING | Warm-up

**001 | Show your reasoning**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

A ribbon is  $3\frac{3}{4}$  meters long. A piece  $\frac{5}{8}$  meters long is removed. How much ribbon remains? In A, draw an area model. In B, draw a length model. Define one whole, label equal parts, write an equation, and explain your answer with units. Estimate using 0,  $\frac{1}{2}$ , 1, or nearby whole-number benchmarks; explain whether the exact result is reasonable.

**A: area / set model as requested**

Reference: one whole (add / partition your own models).

**B: length model, equations, explanation**

Reference unit length; extend your model as needed.

## STUDENT MODELING | Warm-up

# 002 | Show your reasoning

Name: \_\_\_\_\_ Date: \_\_\_\_\_

A ribbon is  $1 \frac{3}{10}$  meters long. A piece  $\frac{37}{100}$  meters long is removed. How much ribbon remains? In A, draw an area model. In B, draw a length model. Define one whole, label equal parts, write an equation, and explain your answer with units. Estimate using 0,  $\frac{1}{2}$ , 1, or nearby whole-number benchmarks; explain whether the exact result is reasonable.

**A: area / set model as requested**

Reference: one whole (add / partition your own models).

**B: length model, equations, explanation**

Reference unit length; extend your model as needed.

## TEACHER KEY

# Choice reasoning 1-2

## M01 | A: 3 1/8 | Target C

Rename with equal-size parts:  $30/8 - 5/8 = 25/8 = 3 \frac{1}{8}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $4 - 1/2 = 3 \frac{1}{2}$ ; compare with the exact result  $3 \frac{1}{8}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Option 4  $1/8$ : too large by 1. Ask the learner to show the corresponding equal parts and locate where the count or unit changed; this response alone does not establish a particular misconception.

Option 2  $7/8$ : too small by  $1/4$ . Ask the learner to show the corresponding equal parts and locate where the count or unit changed; this response alone does not establish a particular misconception.

Option 3  $1/4$ : too large by  $1/8$ . Ask the learner to show the corresponding equal parts and locate where the count or unit changed; this response alone does not establish a particular misconception.

## M02 | B: 93/100 | Target A

Rename with equal-size parts:  $130/100 - 37/100 = 93/100 = 93/100$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $1 \frac{1}{2} - 1/2 = 1$ ; compare with the exact result  $93/100$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

Option 19/20: too large by  $1/50$ . Ask the learner to show the corresponding equal parts and locate where the count or unit changed; this response alone does not establish a particular misconception.

Option 91/100: too small by  $1/50$ . Ask the learner to show the corresponding equal parts and locate where the count or unit changed; this response alone does not establish a particular misconception.

Option 1  $93/100$ : too large by 1. Ask the learner to show the corresponding equal parts and locate where the count or unit changed; this response alone does not establish a particular misconception.

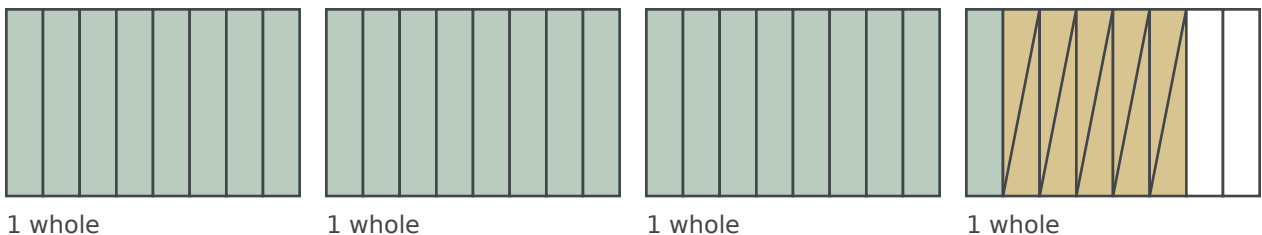
## TEACHER WORKED KEY

# 001 | Models and meaning

## Target A | Add and subtract related fractions, including mixed numbers.

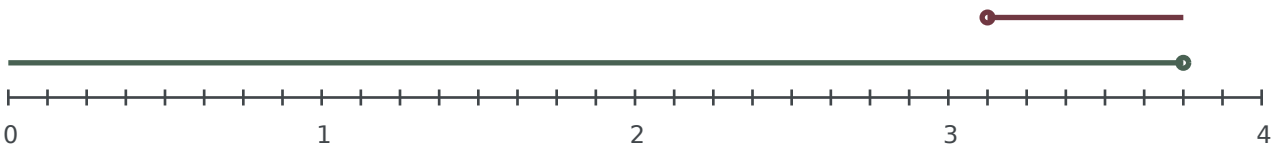
Rename with equal-size parts:  $30/8 - 5/8 = 25/8 = 3 \frac{1}{8}$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $4 - 1/2 = 3 \frac{1}{2}$ ; compare with the exact result  $3 \frac{1}{8}$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

### Worked area model



All colored parts = start. Hatched gold = removed. Sage = left.

### Worked length model



0-to-1 is one whole unit; every small interval has length  $1/8$ .

Raised segments show start, then change. Endpoint(s) match the equation.

Accept equivalent fractions and any accurate model satisfying the requested representation. Record explanation and units separately from arithmetic. All wholes use equal units; parts must be equal.

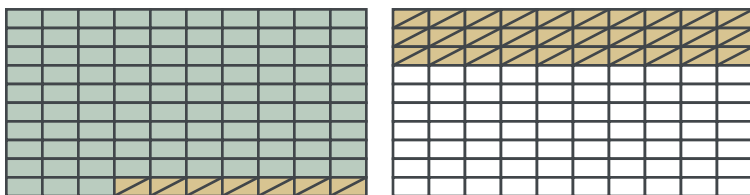
## TEACHER WORKED KEY

# 002 | Models and meaning

## Target B | Estimate with benchmarks and judge reasonableness.

Rename with equal-size parts:  $130/100 - 37/100 = 93/100 = 93/100$ . The unit whole stays unchanged. A nearest-half benchmark estimate is  $1 \frac{1}{2} - \frac{1}{2} = 1$ ; compare with the exact result  $93/100$ . This is reasonable: rounding each term to the nearest half changes it by at most  $1/4$ , so the exact result is within  $1/2$  of this estimate.

### Worked area model

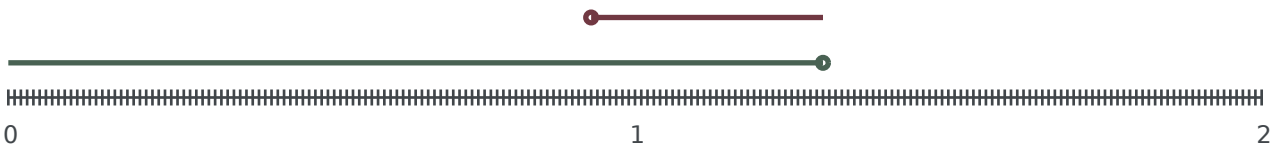


1 whole

1 whole

All colored parts = start. Hatched gold = removed. Sage = left.

### Worked length model



0-to-1 is one whole unit; every small interval has length  $1/100$ .

Raised segments show start, then change. Endpoint(s) match the equation.

Accept equivalent fractions and any accurate model satisfying the requested representation. Record explanation and units separately from arithmetic. All wholes use equal units; parts must be equal.