Same-Whole Fraction Stories

Teacher		**Class**	Grade 4
Subject	Math	**Topic**	Adding fractions
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn to add and subtract like-denominator fractions from the same whole. They build bar models with strips and write matching equations.

Curriculum links

- develop an understanding of fraction equivalence, addition, and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers [2]

Learning objectives

- Students will solve addition word problems with like denominators using a model and an equation.
- Students will solve subtraction word problems with like denominators using a model and an equation.
- Students will explain why fractions must refer to the same whole to add or subtract.

Success criteria

- I can build a model for like-denominator addition and write the equation.
- I can build a model for like-denominator subtraction and write the equation.
- I can check that both fractions come from the same whole.

What students already know

Show 3/4 of a bar. Ask: What does the top number tell us? What does the bottom number tell us? Listen for counting pieces and same-size pieces.

Key words

fraction	a part of one whole thing, like 3/8 of a pan
numerator	top number; how many pieces we count [6]
denominator	bottom number; how big the pieces are [6]
same whole	one pan or ribbon that does not change size [6]
equation	numbers and an = sign that show the math work

Materials

- Slides 1-12 for display
- Video clip 1 Adding and Subtracting Fractions on slide 6
- pre-cut paper fraction strips in eighths
- pencils
- word-problem sheet
- Worksheet Task A copies, one per student
- whiteboard and markers

Before the lesson

- Print Worksheet Task A: Bar models, one per student
- Print word-problem sheet with 3/8 + 2/8 and 7/8 - 4/8 stories about same ribbon, pan, and trail
- Cut paper fraction strips in eighths, one whole strip plus eighths per pair, plus pre-shaded sets for support
- Test slide 6 Video clip 1 (0:00-4:22) for sound and picture
- Set desks for pairs with space to lay strips on a whole strip

Lesson outline

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

Hook students with the ribbon story and recall what fractions show.

YOU DO

1. Display Slide 1: Adding Fractions: Same-Whole Stories.
2. Say the hook: We have one long paper ribbon for our class project. If we use part in the morning and part in the afternoon, how can we figure out how much we used in all?
3. Hold up one whole paper strip and two small eighth pieces to show morning and afternoon use.
4. Ask pairs to whisper one idea for finding the total.

STUDENTS DO

1. Look at the whole strip and pieces.
2. Whisper an idea to a partner about counting pieces from the same whole.

Say: Look at this one long ribbon. We used a morning piece and an afternoon piece from this same ribbon. Turn and tell your partner how you could figure out how much we used in all. We will build it like strip builders.

Ask: What whole are we using? (The one long paper ribbon, the same one for both parts.) · If pieces are both eighths, what stays the same when we add? (The bottom number stays the same because the piece size stays the same.)

Check understanding: Hands up if both parts come from the same ribbon. If unsure, point again to the one whole strip and repeat the hook question.

Support: Point to the whole strip and say: this is the whole, both pieces come from here. **Stretch:** Ask: what if we used 7/8 in the morning and 6/8 later, more than one ribbon?

Use: Slide 1

5–15 min **Teaching** 10 min · Whole class

Teach the same-whole and same-pieces rule for adding and subtracting.

YOU DO

1. Display Slide 2 and read the big idea: If wholes and pieces match, add tops, keep bottoms.
2. Display Slide 3 and read the fact: 4 tenths + 3 tenths = 7 tenths, just like apples! and Same bottom means same size, so you only count tops.
3. Display Slide 4 Same Whole Rules cards and stress Both parts come from one same-size whole, because fractions represent parts of a whole [6].
4. Model 2/7 + 3/7 = 5/7 with a bar divided in sevenths [5].

STUDENTS DO

1. Repeat the big idea with the teacher.
2. Copy 2/7 + 3/7 = 5/7 and shade two parts then three parts on a sevenths bar.

Say: If the whole is the same and the pieces are the same size, adding is easy. We add the top numbers and keep the bottom number the same. In Grade 4, students develop understanding of addition and subtraction of fractions with like denominators [2].

Worked example: 2/7 + 3/7: Step 1 check same whole and same denominator 7. Step 2 add tops 2 + 3 = 5. Step 3 keep bottom 7. Answer 5/7 [5].

Ask: Why do we keep the 7 the same in 2/7 + 3/7? (Because the pieces are still sevenths, same size, we only count more tops.) · Can we add 1/4 of a tiny circle and 1/4 of a huge circle as 2/4? (No, because they are not from one same-size whole.)

Check understanding: Show thumbs up if 2/7 + 3/7 = 5/7 and thumbs down if 2/7 + 3/7 = 5/14. Reteach tops add, bottoms stay if many choose 5/14.

Support: Keep both paper circles visible and label each whole to make the size difference clear. **Stretch:** Ask students to make up their own tricky example where wholes look the same but are not.

Use: Slides 2-4

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15–30 min **Modeling** 15 min · Whole class

Model how a word problem becomes a bar model and an equation.

YOU DO

1. Display Slide 5 question: One pan: one person eats 3/8, another person eats 2/8. How much was eaten?
2. Play Slide 6 Video clip 1 (0:00-4:22) and ask students to spot how bars show same whole and hear how tops add, bottoms stay.
3. Build 3/8 + 2/8 with eighth strips on top of one whole strip, count 5 eighths, write 3/8 + 2/8 = 5/8. Fractions with the same denominator can be added directly by adding the numerators [6].
4. Define key words on Slide 7, then preview Slide 8 for circles and bars adding and subtracting tops.

STUDENTS DO

1. Think, pair, share the pan answer with a partner.
2. Watch the video and raise a hand when the bar shows the same whole.

Say: Watch how the bar is one whole pan. I lay 3 eighths, then 2 more eighths. I count 5 eighths. My equation is 3/8 + 2/8 = 5/8. Think of slices or pie pieces, add the actual number of slices and keep the same kind of slices [7].

Worked example: Pan story 3/8 + 2/8: Step 1 draw one bar for the pan, split in 8 equal parts. Step 2 shade 3 parts, then shade 2 more parts. Step 3 count shaded 5/8. Step 4 write 3/8 + 2/8 = 5/8. Check same whole and same denominator.

Ask: What model and equation fit the pan story? (Bar of 8 parts with 3 shaded plus 2 shaded, 3/8 + 2/8 = 5/8.) · How would 7/8 - 4/8 look in the model? (Start with 7 eighths shaded, take away 4, 3 eighths left, 7/8 - 4/8 = 3/8.) · What is a numerator and denominator? (Numerator is top number; how many pieces we count. Denominator is bottom number; how big the pieces are.)

Check understanding: Mini whiteboards: write the equation for the pan story. Scan for 3/8 + 2/8 = 5/8. Fix denominator errors on the spot.

Support: Mark each landing spot with a dot and say the fraction aloud before moving when counting eighths. **Stretch:** Ask: if the pan story was 7/8 + 6/8, how would you show more than 1 whole?

Use: Slides 5-8, Video clip 1 (0:00-4:22)

30–50 min **Main Activity** 20 min · Pairs

Solve like-denominator word problems by building strip models and writing equations.

YOU DO

1. Hand out eighth strips, pencils, and word-problem sheet for the same ribbon and pan stories.
2. Direct pairs to build 3/8 + 2/8 with strips on top of one whole strip, count eighths, then write the equation, then repeat with subtraction like 7/8 - 4/8.
3. Display Slide 9 task and have pairs draw bars for 2/6 + 3/6 of garden planted and draw bars for 5/8 - 2/8 of trail walked, write an equation for each and check same whole.
4. Circulate, ask for same-whole checks, and select pairs to hold up models.

STUDENTS DO

1. In pairs, build 3/8 + 2/8 and 7/8 - 4/8 with strips and write equations.
2. Complete Slide 9 bar drawings and Worksheet Task A: Use the bar model to show each same whole. Write an equation for each story.

Say: Work with your partner. Lay your eighth pieces on the whole strip. Count the eighths and write the equation. Then do the garden and trail stories. Check that both fractions come from the same whole and same pieces.

Worked example: Trail story 5/8 - 2/8: Step 1 lay 5 eighth pieces on the whole strip. Step 2 take away 2 eighths. Step 3 3 eighths remain. Step 4 write 5/8 - 2/8 = 3/8. Garden story 2/6 + 3/6 = 5/6, pieces are sixths of the same garden.

Ask: How do you know to keep 8 as the bottom number? (All pieces are eighths from the same whole, same size, so only tops change [6].) · How does the model show subtraction 5/8 - 2/8? (Shade 5 eighths, cross out 2 eighths, 3 eighths are left.)

Check understanding: Each pair holds up their strip model and reads the matching equation, such as 2/7 + 3/7 = 5/7 [5]. Check same whole, same denominator, correct tops.

Support: Give strips already shaded for 3/8 and 2/8 so students only join and count them. **Stretch:** Give a total greater than 1 whole to model and rename, like 7/8 + 6/8.

Use: Slide 9, Worksheet Task A

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

Compare adding and subtracting and check who can solve same-whole problems.

YOU DO

1. Display Slide 10 and compare Adding: Tops grow: 2/7 + 3/7 = 5/7 with Subtracting: Tops shrink: 5/7 - 3/7 = 2/7.
2. Take a quick vote with Slide 11: Which visual model helps you most? Bar strips, circle pies, number line.
3. Give Slide 12 Quick quiz: A jug has 1/4 + 2/4 used. How much used? Find 7/10 - 4/10. What is left?
4. Link answers back to objectives and collect Worksheet Task A.

STUDENTS DO

1. Vote for favorite model and explain why in one sentence to a partner.
2. Answer quiz questions on whiteboards: 3/4 of the jug and 3/10.

Say: Adding makes the tops grow and the total gets bigger. Subtracting makes the tops shrink and the leftover gets smaller. The bottom stays the same when the whole and pieces stay the same. Adding like fractions means thinking of slices, adding the slices, and checking what kind of slices they were [7].

Worked example: Jug 1/4 + 2/4 = 3/4 of the jug. 7/10 - 4/10 = 3/10 left. Garden 5/8 planted, then 2/8 more is planted: 5/8 + 2/8 = 7/8 planted.

Ask: What is the difference between the adding model and subtracting model? (Adding adds shaded parts and total gets bigger, subtracting takes away and leftover gets smaller.) · A garden has 5/8 planted, then 2/8 more is planted. What is planted now? (5/8 + 2/8 = 7/8 of the same garden.)

Check understanding: Whiteboards up for 1/4 + 2/4 and 7/10 - 4/10. If denominators change, remodel with strips quickly.

Support: Post a sentence frame with blanks, like __/8 + __/8 = __/8, for teams to fill in. **Stretch:** Read problems where the answer must be written as a mixed number, like 13/8.

Use: Slides 10-12

Common mistakes

Mistake	How to spot it	How to fix it
Adding or subtracting bottom numbers, e.g., 2/7 + 3/7 = 5/14	Equation shows 14 or 12 on the bottom; model pieces no longer match	Remodel eighths or sevenths and count tops only, because same bottom means same size, so you only count tops. Adding fractions with the same denominator is like adding apples [5].
Combining fractions from different-size wholes, e.g., two different pans	Bars or circles are different lengths or sizes but student still adds tops	Place wholes side by side to show size gap. Remind that fractions represent parts of a whole [6], so both parts must come from one same-size whole [2].
Writing the equation without a model check, wrong operation for the story	Story says eaten then more eaten but equation subtracts, or vice versa	Underline take-away words vs joining words, then match to model: add shaded parts or cross out parts. Simply add or subtract to find the total number of slices when slices are all the same kind [7].

Support

- Give strips already shaded for 3/8 and 2/8 so students only join and count them.
- Provide a half-drawn bar model divided into sixths for students to finish shading.
- Post equation frames like __/8 + __/8 = __/8 and label the one whole.

Stretch

- Give a total greater than 1 whole to model and rename, like 7/8 + 6/8.
- Have students create a two-step story where a subtraction follows an addition, all in twelfths.
- Require one problem whose total is more than 1 whole and show it as a mixed number.

For the LSE or teaching assistant

Stay with the strip-building pairs. Help line up eighths on the whole strip, count aloud, and guide the equation frames. Check same-whole understanding.

Check for understanding

Question	Answer
A jug has 1/4 + 2/4 used. How much of the jug is used?	3/4 of the jug
Find 7/10 - 4/10. What is left?	3/10
Same garden: 2/6 planted in the morning and 3/6 in the afternoon. Write the equation and total.	2/6 + 3/6 = 5/6 of the garden

Homework

Draw a bar for 4/10 + 3/10 of the same whole and write the equation.

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. Maths in a minute: Adding fractions (the easy way) | plus.maths.… · plus.maths.org · http://plus.maths.org/content/comment/5689
4. [2312.09021v1] Odd moments and adding fractions · arxiv.org · https://arxiv.org/abs/2312.09021v1

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5. 4.4: Adding and Subtracting Fractions - Mathematics LibreTexts · math.libretexts.org · https://math.libretexts.org/Bookshelves/Applied_Mathematics/Book%3A_Mathematics_for_Elementary_Teachers_(Manes)/04%3A_Fractions/4.04%3A_Adding_and_Subtracting_Fractions
6. Lesson 1 Adding Fractions · cdnend.americanhighschool.org · http://cdnend.americanhighschool.org/Math and Focus Books/Lesson 1 Adding Fractions .pdf
7. Introduction to Fractions Adding Fractions · mathmammoth.com · https://www.mathmammoth.com/preview/Introduction_to_Fractions_Adding_Fractions.pdf

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