



MISSISSIPPI
EXEMPLAR
Units & Lessons
MATHEMATICS

Grade 5



Lesson 1: Adding Like Fractions and Mixed Numbers

Focus Standard(s): 5.NF.1

Additional Standard(s): 5.NF.2

Standards for Mathematical Practice: SMP.2, SMP.3, SMP.4, SMP.5

Estimated Time: 60 minutes

Resources and Materials:

- Fraction tiles/bars
- Index cards or half sheets of recycled paper
- Interactive board/projector/document camera
- Paper for graphic organizers
- Regular size Hershey Bar (or other candy that is easily broken in half)
- Snack-size Hershey Bars (or other candy that is easily broken in half)
- Tape
- Jigsaw Method: <https://www.youtube.com/watch?v=euhtXUgBEts>
- My Favorite No: <https://www.teachingchannel.org/videos/class-warm-up-routine>

Lesson Target(s):

- Students will fluently add fractions and mixed numbers with like denominators.
- Students will solve word problems with mixed numbers with like denominators.

Guiding Questions(s):

- Is the size of the whole important when adding fractions?
- Why is it important to simplify fractions?
- How is adding like fractions similar to adding whole numbers?

Vocabulary

Academic Vocabulary:

- add
- denominator
- fraction
- improper fraction
- like fraction
- mixed number
- model
- numerator
- proper fraction
- simplify
- sum

Instructional Strategies for Academic Vocabulary:

- Introduce words with student-friendly definition and pictures
- Model how to use the words in discussion
- Read and discuss the meaning of word in a mathematical context
- Write/discuss using the words
- Act out the words or attach movements to words.

Symbol



Type of Text and Interpretation of Symbol

Instructional support and/or extension suggestions for students who are EL, have disabilities, or perform well below grade level and/or for students who perform well above grade level

✓

Assessment (Pre-assessment, Formative, Self, or Summative)

Instructional Plan

Understanding Lesson Purpose and Student Outcomes:

Students will recall prior knowledge of adding and subtracting fractions and mixed numbers with like denominators, solving word problems involving fractions and mixed numbers with like denominators, and recognizing and generating equivalent fractions.

Anticipatory Set/Introduction to the Lesson: Do You Want Half?

Remind students that when talking about fractions, it is important to understand that fractions can only be compared when they are parts of the same size whole.

Take out a bag of snack size candy bars where students can see them but have a large candy bar of the same kind hidden from sight. (Hershey bars work very well for this demonstration.)

T: Would you like a whole candy bar or a half? If you would like a whole candy bar, raise your hand? (Most if not all students will raise their hand for a whole candy bar)

Pass out a whole candy bar to the students with their hands raised.

T: I'm trying to watch how much candy I eat so I think I will just have a half candy bar.

Take out the large candy bar, break it in half, and eat it. When students make statements such as "That's not fair!" or "You didn't tell us there was a big candy bar!", begin a class discussion about the importance of the size of the whole (SMP.2).

Prompting Questions:

- Why isn't it fair?
- What assumptions did you make?
- How can you apply this experience to working with fractions?

Note: The conclusion should be that when talking about or comparing fractions, it is important to refer to the same size whole.

Activity 1: My Favorite No

Students solve addition and subtraction problems using "My Favorite No" as a strategy to correct mistakes and to encourage recall.

Note: Before beginning this lesson, if you are not familiar with this strategy, watch the video "[My Favorite No](#)".

Display/write these two problems:

$$\frac{1}{6} + \frac{4}{6} = \underline{\quad\quad} \qquad 2\frac{3}{4} + 3\frac{2}{4} = \underline{\quad\quad}$$

Pass out index cards to each student and give them two minutes to work the problems.

For students who are EL, have disabilities, or perform well below grade level:

- Teacher will read aloud the problems and questions to students with accommodations.
- When doing "My Favorite No," give students fraction tiles to compare answers.

Note: Students who have mastered this skill will do the first problem quickly but may struggle with the second problem since adding the fractions gives an improper fraction and they must decompose the fraction.

Go through the "No" stack looking for misconceptions such as the following:

1. Believing that fraction numerators and denominators can be treated as separate whole numbers

$$\frac{1}{6} + \frac{4}{6} = \frac{5}{12} \qquad 2\frac{3}{4} + 3\frac{2}{4} = 5\frac{5}{8}$$

2. Leaving the sum of the second equation in the form of an improper fraction

$$2\frac{3}{4} + 3\frac{2}{4} = 5\frac{5}{4}$$

3. Multiplying, ignoring, or doing something else incorrect with the whole numbers in the second equation

Smile when you find cards with common misconceptions and say encouraging statements such as, “Oh, I’m so glad someone did this so we can learn from it!” or “So many people make this mistake, but we can learn how to do it correctly!” Show the incorrect work for the first problem. Do not fix it. Students free talk (open discussion) about why the work is not correct. Any student who says the work or answer you displayed is incorrect must offer a reason why it is incorrect and how to correct it (SMP.3). Students may choose manipulatives such as fraction tiles or circles to justify their arguments (SMP.5).

Repeat the analysis with the second problem.

Note: When using the word “numerator,” touch your hands to your head. When using the word “denominator,” touch your hands to your hips or thighs. Encourage students to do the same. This helps students connect the word to the placement above or below the fraction bar.

Activity 2: Jigsaw with a Word Problem

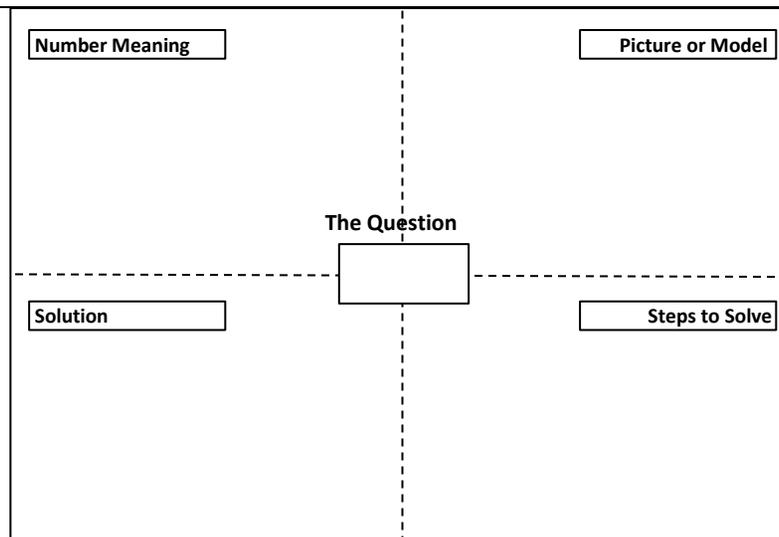
Students use the Jigsaw strategy to solve word problems with addition of like fractions and mixed numbers.

Note: If you are not familiar with the Jigsaw method, watch the video found at: <https://www.youtube.com/watch?v=euhtXUgBEts>

Divide students into heterogeneous family groups and assigns each student a role in the family:

- Number Meaning: What do the numbers represent?
- Picture or Model: What does this story look like?
- Steps to Solve: Use words not numbers.
- Solution: Clear and precise calculations.

Instruct students to fold a piece of paper in fourths, unfold, and label as shown below:



For students who are EL, have disabilities, or perform well below the grade-level text band:

- Teacher will assist students with accommodations in folding paper and assign Picture or Model to the student to complete that section of the graphic organizer
- Students will be working in heterogeneous groups and peer coaching will be available.

Extensions for students with high interest or working above grade level:

- Students will be given the task of writing the steps for solving the problem without the use of digits or word numbers.

Explain the role of each member of the family:

- Number Meaning: write every number from the story (they may be in any form or may be inferred numbers) and what they describe.
- Picture or Model: draw and label a picture showing the meaning of the situation (SMP.4).
- Steps to Solve: list the chronological order for solving the problem without using numbers but using the words that describe what the numbers stand for (e.g., multiply the number of students by the number of books).
- Solution: use precise calculations to solve.

Display this word problem on the board and have students copy it in their math notebooks:

“Ben’s dad told Ben he can play video games for $8\frac{1}{2}$ hours this week. On Monday he played for $\frac{1}{2}$ hour and on Tuesday he played for $1\frac{1}{2}$ hours. On Wednesday Ben played for twice as long as he’d played on Monday. How much time does Ben have left to play video games this week?”

In family groups, students read the story, identify the question, and write the question in the box in the center of their paper. Students move to their expert groups based on their assigned roles. In the expert groups, students discuss and complete their assigned part of the graphic organizer. It is not important that all students agree, but each student must be able to justify their reasoning and critique the reasoning of others (SMP.3).

Signal when students should return to their family group. Students return to their family group and teach their assignment to the rest of their family.

- ✓ Monitor student discussion, listening for students communicating and defending their mathematical reasoning and critiquing the reasoning of others. Probe students to think further about their answers and guiding students through misunderstandings shared by the group (SMP.3).

Prompting Questions:

- Number meaning: I see that you have $8\frac{1}{2}$ hours, $\frac{1}{2}$ hour, and $1\frac{1}{2}$ hours from the problem. Where did you find 1 hour in the problem?
- Picture or Model: What made you choose to use ____ to model the problem?
- Steps to Solve: I see that you chose to solve the problem using ____ (operation). Can you think of another operation you could have used? (subtraction or missing addend)
- Solution: How did you use the information shared by the other members of the family to solve the problem?

Each family will have a delegate present one organizer to the class.

Reflection and Closing:

- ✓ Ask students to reflect on the most important things to remember from today’s lesson.

Prompting Questions:

- Why does the size of the whole matter when we talk about fraction?
- When we add fractional parts, what does the sum look like?
- When might you need to add fractions in the real world?

Homework

Students should look for instances in the real world where adding fractions is helpful or necessary. Findings can be added to a graffiti wall in the classroom daily.

For training or questions regarding this unit,
please contact one of the following:

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