



Accelerate Math Success



Teacher Edition

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Adding/Subtracting Fractions with Unlike Denominators

Week at a Glance

This week students continue *Number Worlds,* Level G, Operations with Fractions. Students will model the addition and subtraction of fractions using models and various manipulatives. Students will add and subtract fractions by finding a common denominator.

Skills Focus

- Add and subtract fractions and mixed numbers using models and manipulatives.
- Find common denominators of fractions using manipulative models and multiplication by $\frac{a}{a}$.
- Reduce fractions using manipulative models and dividing by $\frac{a}{a}$.

How Students Learn

Provide students with a multitude of rich experiences where they can develop a meaning for fractions and the effect that operations have on fractions. Help students develop strategies for computing fractions that include a variety of representations for fractions, including concrete representations, pictures, and symbols.

English Learners 💷

For language support, use the **English Learner Support Guide**, pages 78–79, to preview lesson concepts and teach academic vocabulary. **Number Worlds** Vocabulary Cards are listed as additional materials in many lessons and can be used to preteach and reinforce academic vocabulary.



Home, page 20, to each student. Encourage students to share and complete the activity with their caregivers.

Letter	to Home
Out Andre. The of all agest the same barries and the another than the same barries and the another the same barries and the same barries and the another the same barries and the same barries	Formation services of a service

Weekly Planner

Lesson	Learning Objectives	
pages 292–293	Students can understand mixed numbers and improper fractions.	
2 pages 294–295	Students can convert between improper fractions and mixed numbers.	
3 pages 296–297	Students can find common denominators of fractions and add fractions.	
299–299	Students can find common denominators of fractions and subtract fractions.	
5 pages 300–301	Review and Assess Students review skills learned this week and complete the weekly assessment and project.	
Project pages 302-303	Students can add fractions with unlike denominators and change an improper fraction to a mixed number.	

Key Standard for the Week

Domain: Number and Operations – Fractions

Cluster: Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example*, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (*In general*, a/b + c/d = (ad + bc)/bd.)

Materials		Technology
 Program Materials Student Workbook, pp. 17–19 Practice, p. 80 Activity Card 4E, An Improper Mix 	Additional Materials fraction bars* Vocabulary Card 26, <i>improper fraction</i> Vocabulary Card 33, <i>mixed number</i> 	Teacher Dashboard Building Fraction Bake 2 S Fraction Tool
 Program Materials Student Workbook, pp. 20–21 Practice, p. 81 Activity Card 4F, Change and Match 	Additional Materials fraction bars* index cards Vocabulary Card 26, <i>improper fraction</i> Vocabulary Card 33, <i>mixed number</i> 	Teacher Dashboard Fraction Tool Number Line Tool
 Program Materials Student Workbook, pp. 22–23 Practice, p. 82 Activity Card 4G, Trade and Join Trade and Join Fraction Cards 	 Additional Materials fraction tiles* Vocabulary Card 20, equivalent fractions 	Teacher Dashboard Building Fraction Word Problems 2 S Fraction Tool
 Program Materials Student Workbook, pp. 24–25 Practice, p. 83 Activity Card 4H, Trade and Remove Trade and Join Fraction Cards 	 Additional Materials fraction tiles* Vocabulary Card 20, equivalent fractions 	Teacher Dashboard Building Fraction Word Problems 3 S Fraction Tool
 Program Materials Student Workbook, pp. 26–27 Weekly Test, Assessment, pp. 51–52 		Review previous activities.
Program Materials Student Workbook, p. 28	 Additional Materials common ingredients from recipes (salt, pepper, baking soda, baking powder) recipes self-stick notes 	
	*Available from McCraw Hill Education	



WEEK 2 Adding/Subtracting Fractions with Unlike Denominators

Find the Math

In this week, introduce students to strategies for converting between mixed numbers and improper fractions and for adding and subtracting fractions with unlike denominators.

Use the following to begin a guided discussion:

How are fractions used in recipes? Possible answers: They are used to tell how much of each ingredient to use, such as ¹/₂ teaspoon of salt; they are used to tell how much time to cook or do something, as in the direction "Chill for 1¹/₂ hours."

Have students complete Student Workbook, page 17.

Lesson 1

Objective

Students can understand mixed numbers and improper fractions.

Standard 🚥

5.NF.1 Use equivalent fractions as a strategy to add and subtract fractions. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc) bd.)

Vocabulary

- denominator
 mixed number
- improper fraction
 • numerator

Creating Context

Write on the board: fraction $= \frac{numerator}{denominator} = \frac{part}{whole}$. Use shaded pictures to show examples of fractions less than one. For each, guide students to identify the numerator and denominator and to explain the meaning of each number.

Materials

- **Additional Materials**
- fraction bars
- Vocabulary Card 26, improper fraction
- Vocabulary Card 33, mixed number

Prepare Ahead

Combine two fraction bar groups into one superset.

1 WARM UP

Prepare

- Write examples of fractions less than one on the board, such as $\frac{1}{2}$, $\frac{3}{4}$, $\frac{2}{3}$, and $\frac{3}{8}$. Invite students to name other examples.
- Point out that each of these fractions names a value less than one—a part of one whole.
- You can also use fractions to name values that are greater than one. There are two ways to do this—with improper fractions and with mixed numbers.



 The recipe calls for ²/₃ cup mozzarella cheese, ¹/₄ cup Parmesan cheese, and ¹/₄ cup provolone cheese.
 Which two of these three fractions are easiest to add? Explain.
 Possible answer: ¹/₄ and ³/₄ are easiest to add because they have the same denominator.

Student Workbook, p. 17

2 ENGAGE

Develop: An Improper Mix

"Today we are going to use fraction bars to model both improper fractions and mixed numbers." Follow the instructions on the Activity Card **An Improper Mix.** As students complete the activity, be sure to use the Questions to Ask.

4E	An Improper Mix
Objective	Introduce the Activity
Students can understand mixed	 Pair students and give each pair a superset of fraction bars.
numbers and improper fractions.	Today we are going to use fraction bars to explore improper fractions
Materials	and mixed numbers.
Additional Materials	Begin the Activity
 fraction bars 	 Write ³/₃ on the board.
 Vocabulary Card 26, improper fraction 	 Why is this an improper fraction? The numerator is greater than the
 Vocabulary Card 33, mixed 	denominator. More students for these 1 have in a new and to coul to model 3
i kan kan	• The stand of the y-the stand of the stand
Alternative Groupings	 Tell students to place a 1-bar below their models. Make sure the two rows of bars are aligned on the left.
Whole Class: Draw fraction bars on the board to model an	 Is ³/₂ greater than 17 How do you know? Possible answer: Yes; the model

Activity Card 4E

Whole Class: Draw fraction bars on the board to model an improper fraction. Have the entire class write the improper fraction and mixed number that the model represents.

Small Group: Have students complete the activity in groups of three. Taking turns, one student makes the model, one student writes the improper fraction, and one student writes the mixed number.

Progress Monitoring

Alternative Groupings

If... students forget to include the fraction part of the mixed number,

Then... have them write mixed number = whole number + fraction less than one on a sheet of paper and refer to it as they complete the activity.

Practice

Have students complete **Student Workbook**, pages 18–19. Guide students through the Key Idea example and the Try This exercises.

Interactive Differentiation

Consult the **Teacher Dashboard** for grouping suggestions. You can also use performance on the Engage activity to guide students.

Independent Practice

Building Blocks

For additional practice, have students complete Fraction Bake 2. In this activity, students combine unit fractions to create fractions greater than one in order to follow a recipe.

Supported Practice

For additional support, use the Fraction Tool with students.

- Have students place five $\frac{1}{3}$ -bars in a row to model $\frac{5}{3}$.
- Have students use the "5 thirds" label along the bottom of the tool to read the fraction modeled. Write $\frac{5}{3}$ on the board.
- Discuss why $\frac{5}{3}$ is an improper fraction.
- Use the cursor tool to select the first three $\frac{1}{3}$ -bars. Press the Combine button. A 1-bar will replace the selected $\frac{1}{3}$ -bars.
- Have students use the "1 whole + 2 thirds" label along the bottom of the tool to read the mixed number modeled.
- Discuss why $1\frac{2}{3}$ is a mixed number.
- Repeat the activity with other examples until students demonstrate a good understanding of what improper fractions and mixed numbers are.

3 REFLECT

Think Critically

Review students' answers to the Reflect prompt at the bottom of **Student Workbook**, page 19, and then review the Engage activity.

► How are improper fractions and mixed numbers alike? Possible answer: Both are numbers used to name a value greater than one.

4 ASSESS

Informal Assessment

Use the online or print Student Record, *Assessment*, page 128, to record informal observations.

An Improper Mix	
Did the student	
respond accurately?	respond with confidence?
respond quickly?	□ self-correct?

Additional Practice

For additional practice, have students complete *Practice*, page 80.









Student Workbook, pp. 18–19

WEER 2 Adding/Subtracting Fractions with Unlike Denominators

Lesson 2

Objective

Students can convert between improper fractions and mixed numbers.

Standard CCSS

5.NF.1 Use equivalent fractions as a strategy to add and subtract fractions. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc) bd.)

Vocabulary

improper fraction

Creating Context

Have students create a poster on which they define *improper fraction* and *mixed number* and use pictures to show examples of each.

mixed number

Materials

Additional Materials

- fraction bars
- index cards
- Vocabulary Card 26, improper fraction
- Vocabulary Card 33, mixed number

Prepare Ahead

Combine two fraction bar groups into one superset.

1 WARM UP

Prepare

Review the difference between mixed numbers and improper fractions. Have students write one improper fraction and one mixed number and share the fractions with the class.

Just the Facts

Review multiplication facts. Have students show *thumbs up* if the product is correct and *thumbs down* if the product is incorrect. If the product is incorrect, have one volunteer give the correct answer. Use facts such as the following:

- ▶ **4** × **5** = **20** thumbs up
- ▶ **5** × **2** = **7** *thumbs down*; 10
- ▶ **6** × **6** = **12** *thumbs down*; 36
- ▶ 8 × 7 = 56 thumbs up

ENGAGE

Develop: Change and Match

"Today we are going to change mixed numbers to improper fractions and improper fractions to mixed numbers." Follow the instructions on the Activity Card **Change and Match.** As students complete the activity, be sure to use the Questions to Ask.



Alternative Grouping

Pair: Taking turns, one student models an improper fraction, and the other student uses the model to convert the improper fraction to a mixed number. The next turn, one student models a mixed number, and the other student converts it to an improper fraction.

Progress Monitoring

If... students are confused by how to use operations to change mixed numbers to improper fractions or improper fractions to mixed numbers,

Then... have them continue using the fraction bars to model the changes.

Practice

Have students complete **Student Workbook**, pages 20–21. Guide students through the Key Idea example and the Try This exercises.

Interactive Differentiation



Independent Practice

For additional practice, have students use the Fraction Tool to model and convert between improper fractions and mixed numbers. Students should use the Combine button to convert improper fractions to mixed numbers and the Break-Down button to change mixed numbers to improper fractions.

Supported Practice

For additional support, use the Number Line Tool with students.

- Set the number format to $1\frac{1}{2}$.
- Write $\frac{7}{2}$ on the board. Explain that you will use the Number Line Tool to change this improper fraction to a mixed number.
- Set the tool to start at 0 and skip count by $\frac{1}{2}$
- Have students count 7 red hops to model $\frac{7}{2}$.
- ► On what mixed number do you land when you count seven halves? 3¹/₂
- ▶ So what is $\frac{7}{2}$ written as a mixed number? $3\frac{1}{2}$
- Have students start at $4\frac{1}{2}$ on the number line and count red hops to 0.
- **•** Each hop you counted is $\frac{1}{2}$. How many halves are in $4\frac{1}{2}$? 9
- **•** So what is $4\frac{1}{2}$ written as an improper fraction? $\frac{9}{2}$
- Change the skip-count setting to other unit fractions to complete other examples until students can confidently convert between improper fractions and mixed numbers.





Think Critically

Review students' answers to the Reflect prompt at the bottom of **Student Workbook**, page 21, and then review the Engage activity.

Explain how to change an improper fraction to a mixed number and a mixed number to an improper fraction. Possible answer: Break the improper fraction into whole number amounts and remaining fractional amount; exchange each whole-number amount for fractional amounts and then add all the fractions together.

Real-World Application

Knowing how to convert between mixed numbers and improper fractions can help you complete craft projects.

You have 3¹/₂ feet of ribbon. You need to cut it into pieces that are each ¹/₂ foot long. Convert 3¹/₂ to an improper fraction to find how many ¹/₂-foot pieces you can make from 3¹/₂ feet. 3¹/₂ = ⁷/₂; I can make seven ¹/₂-foot pieces.

4 ASSESS

Informal Assessment

Use the online or print Student Record, *Assessment*, page 128, to record informal observations.

Change and Match

Did the student

respond accurately?respond quickly?

respond with confidence?self-correct?

Additional Practice

For additional practice, have students complete *Practice,* page 81.



Practice, p. 81

Week 2 • Adding/Subtracting Fra	ctions with Unlike Denominators
Lesson 2	
Key Idea You can change an improper fraction to a mixed n change a mixed number to an improper fraction. Write $2\frac{3}{4}$ as an improper fraction. $2\frac{3}{4} = [\frac{4}{4} + \frac{4}{4}] + \frac{3}{4} = \frac{11}{4}$ 1. Break the whole number into fractional parts. 2. Add the fraction less than 1.	umber. You can also Write $\frac{11}{4}$ as a mixed number. $\frac{11}{4} = \left[\frac{4}{4} + \frac{4}{4}\right] + \frac{3}{4} = 2\frac{3}{4}$ 1. Break down the improper fractions into fractions equal to 1. This is the whole number. 2. The remaining amount should be a fraction last the 1
Try This Convert the mixed number to an improper fraction.	["]
1. $4\frac{3}{5} = \frac{5}{5} + \frac{5}{5} + \frac{5}{5} + \frac{5}{5} + \frac{3}{5} = \frac{5}{5}$ 2. $3\frac{2}{5} = \frac{5}{5} + \frac{5}{5} + \frac{5}{5} + \frac{2}{5} = \frac{17}{5}$	
Convert the improper fraction to a mixed number. 3. $\frac{14}{5} = \frac{5}{5} + \frac{5}{5} + \frac{4}{5} = \frac{2\frac{4}{5}}{5}$	
4. $\frac{19}{8} = \frac{8}{8} + \frac{8}{8} + \frac{3}{8} = \frac{2\frac{3}{8}}{28}$	

20 Level G Unit 4 Operations with Fractions

Practice Change each improper fraction to a mixed number. Show your work. 5. $\frac{9}{2} = -\frac{4\frac{1}{2}}{2}$	
6. $\frac{16}{3} = \frac{5\frac{1}{3}}{5\frac{1}{3}}$	
7. $\frac{12}{5} = \frac{2\frac{2}{5}}{5}$	
8. $\frac{17}{4} = -\frac{4\frac{1}{4}}{4}$ Change each mixed number to an improper fraction. Show your work.	
9. $2\frac{1}{4} = -\frac{9}{4}$	
10. $3\frac{1}{5} = \frac{16}{5}$	
11. $6\frac{20}{3} = \underline{3}$	
12. $4\frac{26}{6} = -\frac{26}{6}$	
Reflect Why can you change any mixed number to an improper fraction?	
Possible answer: Mixed numbers and improper fractions are just different forms of expressing the same value.	
Week 2 Adding/Subtracting Fractions with Unlike Denominators • Lesson	n2 21

Student Workbook, pp. 20–21

WEEK 2 **Adding/Subtracting Fractions** with Unlike Denominators

Lesson 3

Objective

Students can find common denominators of fractions and add fractions.

Standard CCSS

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. (In general, $\frac{a}{b} + \frac{c}{d} = \frac{(ad + bc)}{bd}$.)

Vocabularv

• equivalent fractions denominator

Creating Context

Using correct vocabulary will help all students converse better mathematically. Encourage students to use vocabulary terms in their everyday conversations about math.

Materials

Program Materials Trade and Join Fraction Cards, 1 set per pair

- **Additional Materials** • fraction tiles, 1 set per pair
- Vocabulary Card 20, equivalent fractions

WARM UP

Prepare

- ▶ Add 20 minutes to one hour, and give the answer in minutes. 80 minutes How did you solve this problem? What did you need to do to the one hour? change it into 60 minutes and then add the 20 minutes
- We had to find out what 20 minutes and one hour had in common in order to add them.

Just the Facts

Present ×1 multiplication problems. Tell students to chorally call out each product. Use questions such as the following:

- ▶ What is 12 × 1? 12
- ▶ What is 1 × 8? 8
- What is $\frac{2}{3} \times 1? \frac{2}{3}$

ENGAGE

Develop: Trade and Join

"Today we are going to add fractions by finding their common denominators." Follow the instructions on the Activity Card Trade and Join. As students complete the activity, be sure to use the Questions to Ask.

Alternative Grouping

Individual: Deal each student two cards. Each student can share the final solution with the class.

Progress Monitoring

If... students attempt to add denominators,

Then... remind them that the denominator represents how many equal parts are in the whole.

Practice

Have students complete Student Workbook, pages 22–23. Guide students through the Key Idea example and the Try This exercises.

Interactive Differentiation



Consult the Teacher Dashboard for grouping suggestions. You can also use performance on the Engage activity to guide students.

Independent Practice



For additional practice, have students complete Fraction Word Problems 2. In this activity, students add fractions to solve word problems. Encourage students to use common denominators to find each sum.

Supported Practice

For additional support, use the Fraction Tool with students.

- Select the Addition Mat.
- Write the following problem on the board: $\frac{1}{2} + \frac{1}{3} =$ _____
- To model the problem, tell students to place one $\frac{1}{2}$ bar on the top half of the mat and one $\frac{1}{3}$ bar on the bottom half of the mat.
- Have students find a common denominator of the two fractions by multiplying the denominators. 6
- Tell students to place $\frac{1}{6}$ -bars below the $\frac{1}{2}$ to equal its length.
- What is $\frac{1}{2}$ written with a denominator of 6? $\frac{3}{6}$
- Repeat for the $\frac{1}{3}$ -bar. $\frac{2}{6}$
- On the board, write: $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} =$ _____. Have students find the sum. $\frac{5}{6}$
- Clear the mat and have students model $\frac{1}{2} + \frac{1}{3}$ again.
- What is $\frac{1}{2} + \frac{1}{3}$? $\frac{5}{6}$
- Repeat until students can confidently use common denominators to add unlike fractions.



Activity Card 4G

3 REFLECT

Think Critically

Review students' answers to the Reflect prompt at the bottom of **Student Workbook**, page 23, and then review the Engage activity.

► Why doesn't multiplying by $\frac{3}{3}$ change the original amount of $\frac{3}{5}$? Anything multiplied by 1 is equal to itself. $\frac{3}{3} = 1$

Real-World Application

Suppose Lori jogged $4\frac{3}{8}$ miles on Saturday and $3\frac{4}{5}$ miles on Sunday.

- What is a common denominator of $\frac{3}{8}$ and $\frac{4}{5}$? 40
- ► How many miles did Lori jog altogether during the weekend? 8⁷/₄₀ miles

4 ASSESS

Informal Assessment

Use the online or print Student Record, *Assessment*, page 128, to record informal observations.

Trade and Join

Did the student

respond accurately?

 \Box respond quickly?

Additional Practice

For additional practice, have students complete *Practice*, page 82.

	ĸ	Name		Date
· · · ·	h	Adding/Subtrac	ting	Fractions with
		Unlike Denomin	ator	s: Lesson 3
	1	Brownsville Middle School recycled $\frac{3}{8}$ of a ton of paper this week and $\frac{1}{2}$ of a ton last week. How much paper did they recycle altogether?	2.	The Farmers' Market sold $\frac{3}{2}$ of a ton of com this year. Last year they sold $\frac{1}{2}$ of a ton of com. How much com did they sell altogether?
		16	_	21

□ respond with confidence?

□ self-correct?

Practice, p. 82

Le	sson 3			
Ke	y Idea			
To a	dd fractions that do no	t have the same numbe	r in the denominator,	
To a	dd $\frac{2}{3} + \frac{1}{5}$, rewrite with c	common denominators.	n denominators.	
	$\frac{2}{3} + \frac{1}{5} =$	$= \frac{(2\times5)}{(3\times5)} + \frac{(1\times3)}{(5\times3)}$	$=$ $\frac{10}{15} + \frac{3}{15} = \frac{13}{15}$	
Т	o find a common denominator.	Multiply the numerator and		
	multiply denominators	the denominator of each fraction by the	Add the numerators.	
	to get 15.	other fraction's denominator.		
Try Add ti	This ne fractions by finding	a common denominator	. Show your work.	
1.	$\frac{12}{32}$		$2\frac{1}{2}+\frac{3}{50}=\frac{25}{50}$	
- 8	4		2 5 10	
	42		33	
3. $\frac{5}{12}$	$+\frac{1}{6}=$ 72		4. $\frac{1}{15} + \frac{2}{3} = \frac{45}{45}$	
5. $\frac{1}{r}$ -	$+\frac{3}{4}=\frac{19}{20}$		6. $\frac{1}{2} + \frac{2}{10} = \frac{\frac{14}{20}}{20}$	
5			2	
22 Le	vel G Unit 4 Operations with	Fractions		
22 Le	vel G Unit 4 Operations with	Fractions		
22 Lee Pra Solv	el G Unit 4 Operations with	Fractions m by finding a common	denominator.	
22 Lee Pra Solv Shov 7.	vel G Unit 4 Operations with actice e each addition proble v your work. Andrew ran $\frac{3}{4}$ mile or	Fractions m by finding a common Wednesday and $\frac{1}{2}$ mile	denominator. on Thursday. How many	
22 Lee Pra Solv Show 7.	ee G Unit 4 Operations with actice e each addition proble v your work. Andrew ran $\frac{3}{4}$ mile or miles did her un altoo $\frac{10}{8} = 1\frac{2}{8}$ miles	Fractions m by finding a common Wednesday and $\frac{1}{2}$ mile jether?	denominator. on Thursday. How many	
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Pr: Solv Shov 7. 8.	el G Unit 4 Operations with actice e each addition proble y our work. Andrew ran $\frac{3}{4}$ mile or miles did her un altog $\frac{10}{8} = 1\frac{2}{8}$ miles Clarksville Middle Sch pound of paper today 17	Fractions m by finding a common Wednesday and $\frac{1}{2}$ mile gether? tool recycled $\frac{1}{3}$ pound of p. How much paper did t	denominator. on Thursday. How many paper yesterday and $\frac{3}{8}$ hey recycle altogether?	
22 Lee Pra Solv Shov 7. 8.	actice e each addition proble vyour work. Andrew ran $\frac{3}{4}$ miles $\frac{10}{8} = 1\frac{2}{8}$ miles Clarksville Middle Sch pound of paper today $\frac{17}{24}$ pounds	Fractions m by finding a common Wednesday and $\frac{1}{2}$ mile gether? nool recycled $\frac{1}{3}$ pound of y. How much paper did t	denominator. on Thursday. How many 'paper yesterday and $\frac{3}{8}$ hey recycle altogether?	
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Pr: Solv Shov 7. 8. 9.	A farmer harvested $\frac{3}{40} = 1\frac{1}{20}$ ton	Fractions The provided of the provided of th	denominator. on Thursday. How many 'paper yesterday and $\frac{3}{8}$ hey recycle altogether? is year he harvested $\frac{3}{10}$ narvested altogether?	
22 Let Pr: Solv Shov 7. 8. 9.	Actice e each addition proble your work. Andrew ran $\frac{3}{4}$ mile or miles did her un altor $\frac{10}{8} = 1\frac{2}{8}$ miles Clarksville Middle Sch pound of paper today $\frac{12}{24}$ pounds A farmer harvested $\frac{3}{4}$ ton of grain. How mu $\frac{42}{40} = 1\frac{1}{20}$ ton Hannah used $\frac{1}{2}$ han of	Fractions m by finding a common Wednesday and $\frac{1}{2}$ mile pether? tool recycled $\frac{1}{3}$ pound of p. How much paper did t ton of grain last year. Th ch grain has the farmer l	denominator. on Thursday. How many paper yesterday and $\frac{3}{8}$ hey recycle altogether? is year he harvested $\frac{3}{10}$ harvested altogether?	
22 Lee Pr: Solv Shov 7. 8. 9. 10.	weld Unit 4 Operations with actice e each addition proble your work. Andrew ran $\frac{3}{4}$ miles or miles did he run altog $\frac{10}{8} = 1\frac{2}{8}$ miles Clarksville Middle Sch pound of paper today $\frac{17}{24}$ pounds A farmer harvested $\frac{3}{4}$ ton of grain. How mu $\frac{42}{40} = 1\frac{1}{20}$ ton Hannah used $\frac{1}{2}$ bag of fertilizer Hannah used $\frac{1}{2}$ bag of fertilizer	Fractions Tractions Tracti	denominator. on Thursday. How many 'paper yesterday and $\frac{3}{8}$ hey recycle altogether? is year he harvested $\frac{3}{10}$ harvested altogether?	
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Student Workbook, pp. 22–23

WEEK 2 Adding/Subtracting Fractions with Unlike Denominators

Lesson 4

Objective

Students can find common denominators of fractions and subtract fractions.

Standard

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

Vocabulary

```
    denominator

                       • equivalent fractions
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Creating Context

Words such as "equivalent" may be unfamiliar to many students. Help students define words which are unfamiliar and relate them to words and phrases they recognize.

Materials

Program Materials

Additional Materials

- fraction tiles, 1 set per pair
 - Vocabulary Card 20, equivalent fractions

WARM UP

Trade and Join Fraction Cards

Prepare

Remind students that an easy way to find a common denominator of 2 fractions is to multiply each fraction's numerator and denominator by the other fraction's denominator.

Have students find a common denominator for several pairs of fractions and mixed numbers.

- $\frac{1}{2}$ and $\frac{5}{3}$ 6
- $\frac{1}{4}$ and $\frac{3}{8}$ 32
- $\frac{1}{6}$ and $\frac{7}{10}$ 60
- $\frac{1}{3}$ and $\frac{5}{6}$ 18

Just the Facts

Present $\times 2$ multiplication facts. Tell students to chorally call out each product. Use facts such as the following:

- ▶ What is 7 × 2? 14
- ▶ What is 2 × 8? 16
- ▶ What is 2 × 4? 8
- ▶ What is 9 × 2? 18

ENGAGE

Develop: Trade and Remove

"Today we are going to subtract fractions using fraction builder tiles." Follow the instructions on the Activity Card Trade and Remove. As students complete the activity, be sure to use the Questions to Ask.

4 H	Trade and Remove
Objective Students can find common denominators of fractions and subtract fractions.	 Introduce the Activity You can only take away apples from apples and oranges from oranges. The denominators of two fractions must be the same before you subtract the amount in the numeraters.
Materials Program Materials Trade and Join Fraction Cards	 Begin the Activity Distribute a set of fraction tiles to each pair of students. Guide them to work together to sort and arrange the pieces by fractional arrounts.
Additional Materials - fraction tiles, 1 set per pair	 Create a deck of the Trade and Join Fraction Cards. Deal one card to each player.
Vocabulary Card 20, equivalent fractions Alternative Grouping Indiadash Deal each student tee	Working in pairs, have students create equivalent fractions with common denominators. Remind students they can use their fraction tiles to help create equivalent fractions with common denominators. Once they have equivalent fractions with common denominators.
	turo franti

Activity Card 4H

Individual: Deal each student two cards. Students can share problems with a partner, small group, or the class.

Progress Monitoring

Alternative Grouping

If... students struggle to subtract fractions,

Then... have them use fraction tiles to model the problems and the solutions.

Practice

Have students complete Student Workbook, pages 24–25. Guide students through the Key Idea example and the Try This exercises.

Interactive Differentiation



Consult the Teacher Dashboard for grouping suggestions. You can also use performance on the Engage activity to guide students.

Independent Practice



For additional practice, have students complete Fraction Word Problems 3. In this activity, students subtract fractions to solve word problems. Encourage students to use common denominators to find each difference and to write it in simplest form.

Supported Practice



For additional support, use the Fraction Tool with students.

- Select the Subtraction Mat in the Fraction Tool.
- Write the following problem on the board: $\frac{3}{4} \frac{1}{3} =$ _____
- To model the problem, tell students to place three $\frac{1}{4}$ -bars on the top half of the mat.
- **•** To subtract $\frac{1}{3}$, you need to take away a $\frac{1}{3}$ -bar from this model. **Can you do it? Explain.** Possible answer: No; there are no $\frac{1}{3}$ -bars to take away.
- **•** How can we change the fractions so we can subtract $\frac{1}{3}$? Possible answers: Make them both have the same denominator; use a common denominator.
- Have students find the common denominator by multiplying the denominators. 12
- Have students use the tool to change $\frac{3}{4}$ and $\frac{1}{3}$ to twelfths. $\frac{9}{12}$, $\frac{4}{12}$
- On the board, write $\frac{3}{4} \frac{1}{3} = \frac{9}{12} \frac{4}{12} = \frac{4}{12} \frac{4}{12} = \frac{4}{12}$. Clear the mat have students place $\frac{9}{12}$ on the top half and move $\frac{4}{12}$ to the bottom half to model the subtraction.
- What is $\frac{9}{12} \frac{4}{12}$? $\frac{5}{12}$ So what is $\frac{3}{4} \frac{1}{3}$? $\frac{5}{12}$ Repeat until students can confidently use common denominators to subtract unlike fractions.

3 REFLECT

Think Critically

Review students' answers to the Reflect prompt at the bottom of **Student Workbook**, page 25, and then review the Engage activity.

- How does finding a common denominator help when subtracting fractions? It allows you to subtract equal amounts.
- ► Describe how to find a common denominator.

Real-World Application

► Rebecca is measuring the amount of rainfall received for a science experiment. Last week, she measured a total of 4¹/₁₆ inches of rain. So far this week, Rebecca has measured 4¹/₈ inches of rain. How much more has it rained this week than last week? ¹/₁₆ inch

4 ASSESS

Informal Assessment

Use the online or print Student Record, *Assessment*, page 128, to record informal observations.

Trade and Remove

Did the student

□ respond accurately?

□ respond quickly?

respond with confidence?self-correct?

Additional Practice

complete *Practice,* page 83.

For additional practice, have students

Adding/Subtracting Fractions with Unlike Denominators: Lesson 4 Selve sach subtraction problem by Irmings a common denominator.	Name	Date
Unlike Denominators: Lesson 4 Selve each subtraction problem by finding a common denominator.	Adding/Subtracting Fraction	ons with
Solve each subtraction problem by finding a common denominator. Show your work. Reduce your solution.	Unlike Denominators: Les	son 4
	Solve each subtraction problem by finding a cor Show your work. Reduce your solution.	nmon denominator.

Practice, p. 83

Lesson 4			
Key Idea			- 1
To subtract fractions with o	different numbers in the denon	iinators, you need	
to write the fractions so th To subtract $\frac{2}{3} - \frac{1}{r}$, rewrite	ey have common denominator with common denominators.	5.	
$\frac{2}{2} - \frac{1}{5}$	$= \frac{(2 \times 5)}{(2 \times 5)} - \frac{(1 \times 3)}{(5 \times 5)} =$	$\frac{10}{15} - \frac{3}{15} = \frac{7}{15}$	
3 5 To find a common	(3×5) (5×3) Multiply the	15 15 15	
denominator,	numerator and	5 I	
denominators	the denominator of each fraction by the	Subtract the numerators.	
to get 15.	other fraction's denominator.		
Frv This			
Subtract the fractions by fin	ding a common denominator.	how your work.	
7 1 36	• 9	2 25 50	
$\frac{1}{12} - \frac{1}{3} = \frac{50}{50}$	2. 10	$-\frac{1}{5} = -\frac{1}{50}$	
15		3	
5. $\frac{8}{9} - \frac{1}{3} = $ 27	4. $\frac{4}{5}$	$-\frac{1}{2} = 10$	
4 Level G Unit 4 Operations with	Fractions		
Practice			
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Student Workbook, pp. 24–25

WEER 2 Adding/Subtracting Fractions with Unlike Denominators

Lesson 5 Review

Objective

Students review skills learned this week and complete the weekly assessment and project.

Standard 🚥

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

Vocabulary

Review vocabulary introduced during the week.

Creating Context

Add new vocabulary to the bulletin board you created at the end of the previous week. This provides an excellent way for students to have a visual display of their new math vocabulary.

1 WARM UP

Prepare

- Which operation can you use to change an improper fraction to a mixed number? division
- Which two operations can you use to change a mixed number to an improper fraction? multiplication and addition
- How do you add or subtract fractions that have unlike denominators? Possible answer: Rewrite both fractions using a common denominator. Then add or subtract.
- What is one way to find a common denominator of two fractions? Possible answer: Multiply the two denominators together.



Practice

Have students complete Student Workbook, pages 26–27.





Student Workbook, pp. 26–27



Think Critically

Review students' answers to the Reflect prompt at the bottom of **Student Workbook**, page 27.

Discuss the answer with the group to reinforce Week 2 concepts.

Formal Assessment 🧹

Students may take the weekly assessment online.

As an alternative, students may complete the weekly test on **Assessment**, pages 51–52. Record progress using the Student Assessment Record, **Assessment**, page 128.

Going Forward

Use the **Teacher Dashboard** to view results of the online assessments, to input the results of print student assessments, and to review progress before making decisions about next steps. Use the weekly test results and observations to determine the next steps for each student.

Retention	
Student displays good grasp of this week's concepts and skills.	Have students use the Fraction Tool to independently practice converting between mixed numbers and improper fractions and adding and subtracting unlike fractions.
Remediation	
Student is still struggling with the week's concepts and skills.	Identify the skill that the student struggles with. Use the Supported Practice lesson for that skill to reteach the skill using an alternative strategy.

Suggestions for Re-Evaluation: If a student has struggled without success for several weeks, use observations and test results to place the student at a level in which he or she can find success and build confidence to move forward.

Name Date Adding/Subtracting Fractions with Unlike Denominators	WEEK 2
Write the improper fraction and mixed number that match each figure. 1. $3\frac{13}{4}$ $3\frac{1}{4}$	
2. $\frac{33}{6} 5\frac{3}{6} \text{ or } 5\frac{1}{2}$	
Write the improper fraction that is the same as the mixed number. 3. $2\frac{4}{5} = -\frac{14}{5}$	
4. $9\frac{1}{4} = \frac{37}{4}$	
5. $4\frac{3}{7} = \frac{31}{7}$	
6. $8\frac{7}{10} = \frac{87}{10}$	
S S	Level G Unit 4 Week 2 51
Name Date Adding/Subtracting Fractions with Unlike Denominators Find a common denominator and add the fractions. Show your work.	:e
7. $\frac{1}{3} + \frac{1}{5} = \frac{15 - 15 - 15}{14} = \frac{13}{14}$ 8. $\frac{1}{2} + \frac{3}{7} = \frac{7}{14} + \frac{6}{14} = \frac{13}{14}$	
9. A recipe calls for $\frac{1}{4}$ cup of orange juice and $\frac{1}{12}$ cup lemon juice. How much juice is used in the recipe? $\frac{1}{4} + \frac{1}{12} = \frac{3}{12} + \frac{1}{12} = \frac{4}{12}$ or $\frac{1}{3}$ cup	
Find a common denominator and subtract the fractions. Show your work. 10. $\frac{3}{4} - \frac{1}{5} = \frac{15}{20} - \frac{4}{20} = \frac{11}{20}$	8
11. $\frac{7}{8} - \frac{3}{4} = \underline{\frac{7}{8} - \frac{6}{8} = \frac{1}{8}}$	nying to OK Caratill Education. But
12. Two schools are raising the same amount of money for wildlife rescue. One school is $\frac{2}{5}$ of the way to their goal. The other school is $\frac{1}{4}$ of the way to their goal. How far apart are the two schools in terms of their goals? $\frac{3}{5} - \frac{1}{4} = \frac{12}{20} - \frac{5}{20} = \frac{7}{20}$	veision hype teid to appendies for dans soon use.
52 Level G Unit 4 Week 2	Assessment nr 51-52

Project Preview

This week, students learned to change improper fractions to mixed numbers and mixed numbers to improper fractions. They also learned to add and subtract fractions with unlike denominators. The project for this unit requires students to work with recipes to extend their knowledge of fractions to the real world. This week, students will use what they learned to find the total amount of one ingredient they would need if all students were to make their own recipes.

Project-Based Learning

Standards-driven Project-Based Learning is effective in building deep content understanding. Project-Based Learning increases long-term retention of concepts and has been shown to be more effective than traditional instruction. By completing a project to answer an essential question, students are challenged to apply and demonstrate mastery of concepts and skills by expressing understanding through discussion, research, and presentation.

Essential Question

HOW can fractions help me solve real-world problems involving partial amounts?

Project Evaluation Criteria

Review project evaluation criteria with students prior to beginning the project.

Exceeds Expectations

- □ Project result is explained and can be extended.
- □ Project result is explained in context and can be applied to other situations.
- Project result is explained using advanced mathematical vocabulary.
- Project result is explained and extended and shows advanced knowledge of mathematical concepts and skills.

Meets Expectations

- □ Project result is explained.
- □ Project result is explained in context.
- □ Project result is explained using mathematical vocabulary.
- □ Project result is described, and mathematics is used correctly.
- Project result is explained and shows satisfactory knowledge of mathematical concepts and skills.

Does Not Meet Expectations

- □ Project result is not explained.
- □ Project result is explained, but it is out of context.
- Project result is explained, but mathematical vocabulary is oversimplified.
- □ Project result is described, but mathematics is not used correctly.
- □ Project result is not explained and/or extended or shows less than satisfactory knowledge of mathematical concepts and skills.



Objective

Students can add fractions with unlike denominators and change an improper fraction to a mixed number.

Standard (

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

Materials

- **Additional Materials**
- common ingredients from recipes
- (salt, pepper, baking soda, baking powder)
- recipes
- self-stick notes

Prepare Ahead

Look through the recipes the students are using. Find an ingredient that is common in many of the recipes but is not a mixed number. Examples may include salt, pepper, baking soda, or baking powder. Bring the ingredient to class and use it as an accessible visual for students.

Best Practices

- Pair oral directions with accessible pictures, icons, or written words for student needs.
- Coach, demonstrate, and model.
- Create an energetic environment.



Introduce

If you cook or bake a lot, you need to make sure you have enough of each ingredient on hand.

- What common ingredients used in cooking are normally kept around the house?
- Why does it make sense to keep those ingredients in the house as opposed to buying them each time a recipe is made?

Explore

- Today you are going to find out how much salt the entire class needs if all students were to make their recipes.
- Look at your original recipe, not the one you wrote after doubling the recipe last week. Find how much salt is needed in your recipe. Some recipes may not need salt.
- Have students write the amount of salt needed for their recipe on a self-stick note. If students do not need salt, have them write zero on their note.
- Have students place the notes on the board.
- What are some ways we can organize these numbers? Answers will vary. Possible answers: by like numbers, by like denominators
- Invite students to come to the board and move the notes to organize the numbers.
- Now we need to add these numbers to find how much salt we need as a class.
- Have students work in pairs to add the numbers. Encourage students to add fractions with like denominators first. For numbers with unlike denominators, encourage students to only add two or three fractions at a time to make it easier to find common denominators.
- After students have found the improper fraction, have them change it to a mixed number.
- Have students keep this paper and the total they found with the recipes from last week.
- Complete Student Workbook, page 28, to answer questions about data organization and how you completed this part of the project.

Wrap Up

- Allow students time to discuss any challenges they had with this activity.
- Discuss students' answers to the Reflect prompt at the bottom of **Student Workbook**, page 28.

You may want students to type their answers and an explanation of how they found their answers to create electronic portfolios of their work.

If time permits, allow each student to share any thoughts about the activity. For example: Not much salt is needed in any one recipe, but for all the recipes combined we need a lot of salt.

Project Revising Recipes

Answer the following questions.

- 1. How many students have recipes that use salt?
 Answers will vary.
- 2. Explain how you organized the numbers. Answers will vary. Possible answer: I put all of the fractions that had the same denominator together and all of the fractions with different denominators together.
- 3. Describe the process you used to add more than one fraction together.
 Answers will vary. Possible answer: You need to make sure you have
 common denominators before you can add fractions together.
- Explain how you found common denominators when there were more than two fractions.
 Answers will vary. Possible answer: I multiplied the denominators together to find a common denominator.
- How much total salt is needed for the class? Answers will vary.

Reflect Describe how fractions are used in cooking or baking. Use real-world examples in your answer. Answers will vary. Possible answer: Fractions tell you how much of a whole is needed. Usually you do not need a whole teaspoon of salt but only a part of a teaspoon. The fraction tells you how much of a whole you need.

28 Level G Unit 4 Operations with Fractions

Student Workbook, p. 28

Teacher Reflect

- Did students use brainstorming methods to create and organize their ideas?
- □ Was I able to answer questions when students did not understand?

□ Did students focus on the major concept of the activity?





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- **ASSESS** student progress with dynamic assessment and online reporting.







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