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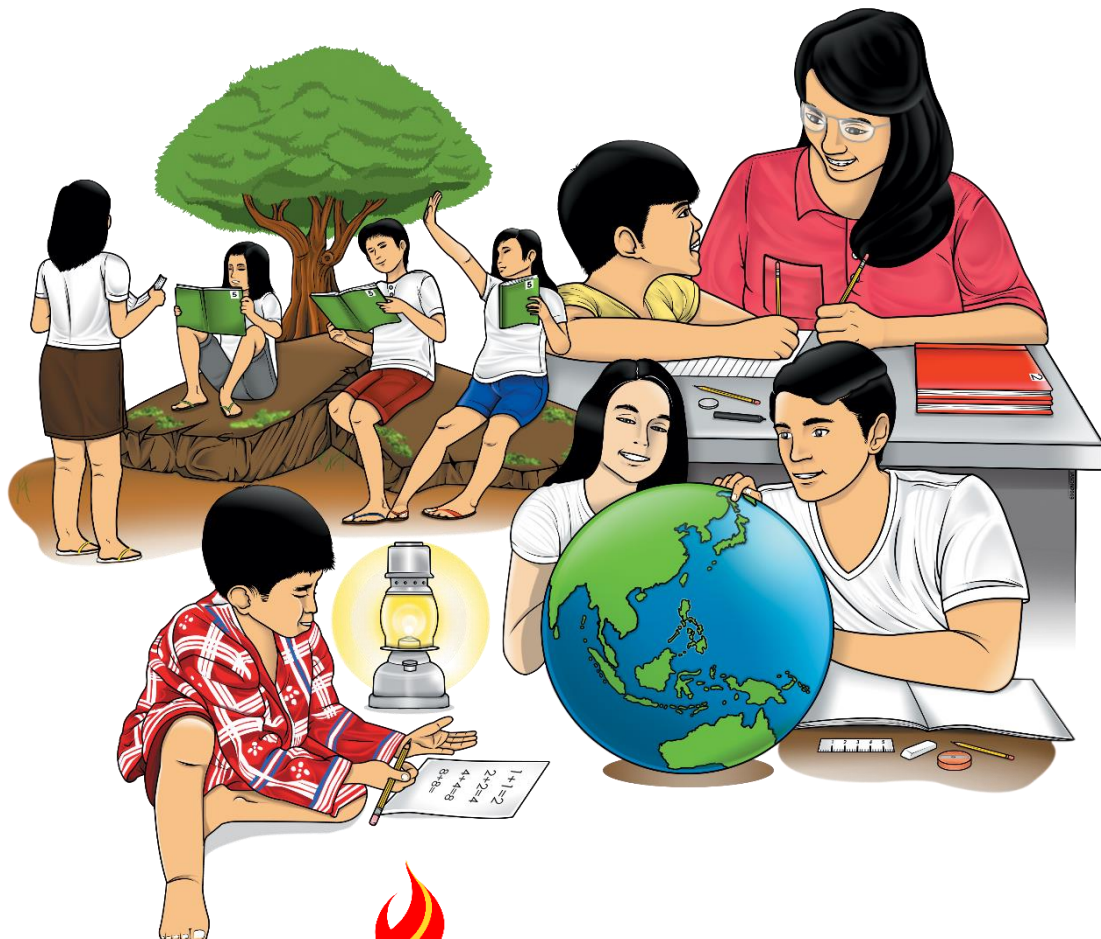
Mathematics

Quarter 1 – Module 8:
Adding and Subtracting
Fractions and Mixed Fractions

ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode, Quarter 1 – Module 8: Adding and Subtracting Fractions and Mixed Fractions
First Edition, 2020

5

Mathematics
Quarter 1 – Module 8:
Adding and Subtracting Fractions and Mixed Fractions

Introductory Message

For the Facilitator:

Welcome to the Math Grade 5 Alternative Delivery Mode (ADM) Module 8 on Adding and Subtracting Fractions and Mixed Fractions!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners to meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher
This contains helpful tips or strategies that will help you in guiding the learners.

As a Facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the Learner:

Welcome to the Mathematics 5 Alternative Delivery Mode (ADM) Module 8 on Adding and Subtracting Fractions and Mixed Fractions!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:

	What I Need to Know	This will give you an idea of the skills or competencies you are expected to learn in the module.
	What I Know	This part is composed of a 10-item activity to check what you already know about the lesson to take. If you get all the answers correct (100%) you may decide to skip this module.
	What's In	This is a brief drill or review to help you link the current lesson with the previous one.
	What's New	In this portion, the new lesson will be introduced to you in various ways: a story, a song, a poem, a problem opener, an activity, or a situation.
	What is It	This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.
	What's More	This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.
	What I Have Learned	This includes questions or fill in the blank sentence/paragraph to process what you have learned from the lesson.
	What I Can Do	This section provides an activity that will help you transfer your new knowledge or skill in real-life situations or concerns.
	Assessment	This is another 10-item task that aims to evaluate your level of mastery in achieving the learning competency.

	Additional Activities	In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.
	Answer Key	This contains answers to all activities in the module.

At the end of this module you will also find:

References: This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Do not forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instructions carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain a deep understanding of the relevant competencies. You can do it!

What I Need to Know

In this module, you are going to learn to add and subtract fractions and mixed fractions without and with regrouping. Adding and subtracting fractions help you to know how many portions of a whole you need, have, or want.

After going through this module, you are expected to:

- add fractions and mixed fractions without and with regrouping; and
- subtract fractions and mixed fractions without and with regrouping.

What I Know

Hi, Mathletes! Do you still remember the rules on how to add and subtract similar and mixed fractions? You may apply these skills to answer the test below.

Directions: Perform the operations as indicated. Write each answer in simplest form on a separate sheet of paper.

1) $\frac{3}{9} + \frac{1}{9} + \frac{4}{9}$

2) $\frac{5}{8} + \frac{7}{8}$

3) $8\frac{9}{20} + \frac{7}{20}$

4) $9\frac{5}{8} + 4 + 2\frac{3}{8}$

5) $12\frac{5}{14} + 10\frac{7}{14} + \frac{3}{14}$

6) $12\frac{1}{4} - 6\frac{3}{4}$

7) $8 - \frac{2}{3}$

8) $12 - 4\frac{2}{5}$

9) $150\frac{3}{5} - 10 - 129\frac{4}{5}$

10) $83\frac{3}{7} - 79\frac{4}{7}$

Adding Fractions and Mixed Numbers Without Regrouping

To add similar fractions, add the numerators and write the sum over the common denominator.

To add fractions and whole numbers, add the whole numbers first, then add the fractions.

To add whole and mixed numbers, add the whole numbers first and then the fractions or convert the mixed number into improper fraction first before adding.

What's In

In the previous module, you have learned the different kinds of fractions.

❖ Fractions with the same denominators are called *similar fractions*.
❖ Fractions with different denominators are called *dissimilar fractions.*
❖ A fraction whose numerator is less than its denominator is called a *proper fraction.*
❖ A fraction with a numerator that is equal to or greater than the denominator is called an *improper fraction.*
❖ A fraction with a numerator of 1 is called a *unit fraction.*
❖ A combination of a whole number and a fraction is called *mixed number.*

Below are examples of proper fractions, improper fractions, and mixed fractions.

Directions: You may use colored pens or crayons to identify the type of fraction in doing the activity below. Color the balloons **red** if proper fractions, **blue** for improper fractions, and **green** for mixed number.

$2\frac{8}{12}$ $\frac{8}{3}$ $\frac{3}{4}$ $\frac{9}{5}$ $2\frac{1}{2}$
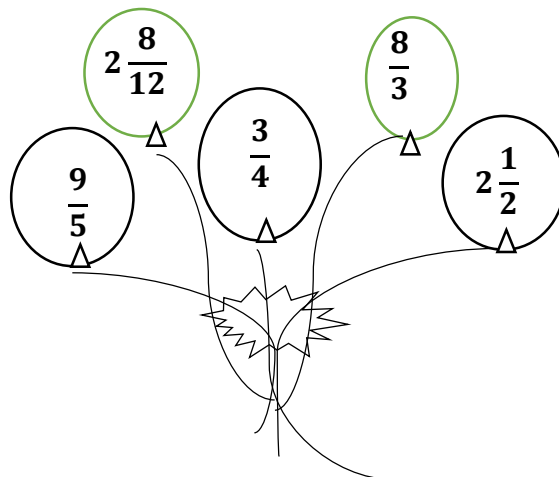
What's New

From the previous lesson, you learned about the different kinds of fractions. This time, you are going to deal with adding fractions and mixed numbers **without regrouping**. This lesson involves addition of dissimilar fractions, similar fractions, proper fractions, improper fractions, whole numbers and mixed numbers.

Analyze the sample problems below:

Martha is fond of creating arts and crafts. During the quarantine she has been making a scrapbook and all she needed to buy are ribbons to finish it up. Martha bought $3\frac{1}{2}$ m of yellow ribbon and $\frac{2}{5}$ blue ribbon. How many meters of ribbon did she buv?

Lino won a bag of candies from a birthday party weighing $4\frac{5}{12}$ g. while his younger sister Lina, got $5\frac{1}{3}$ g. When they reached home, they added all their candies in a clear container. How much did the siblings have in all?

What Is It

To understand more, carefully study the steps on how to add dissimilar fractions without regrouping.

Consider the sample problems above:

Adding mixed numbers with dissimilar fractions can be done by following the steps below:

Problem 1:

We want to know how many meters of ribbons Martha bought. To solve for the sum of $3\frac{1}{2} + \frac{2}{5}$, here are the following steps:

STEP 1: Align the fractions and compare the denominators.

$$3\frac{1}{2}$$

$$\frac{2}{5}$$

Different Denominators

STEP 2: Find the Least Common Denominator (LCD). Rename the given as similar fractions.

$$3\frac{1}{2} \; x \; \frac{5}{5} \;\; = \;\; 3\frac{5}{10}$$

$$+ \; \frac{2}{5} \; x \; \frac{2}{2} \;\; = \;\; \frac{4}{10}$$

LCD

STEP 3: Add the fractions. Write the whole number before the fraction sum.

$$3\frac{1}{2} = 3\frac{5}{10}$$

$$+ \frac{2}{5} = \frac{4}{10}$$

$$3\frac{9}{10}$$

Answer: Martha bought $3\frac{9}{10}$ m of ribbon.

Problem 2:

We want to know how much amount of candies Lino and Lina have. To solve for the sum of $4\frac{5}{12} + 5\frac{1}{3}$, here are the following steps:

STEP 1: Simply add the whole numbers.

$$4\frac{5}{12} + 5\frac{1}{3} = 9$$

STEP 2: Find the Least Common Denominator (LCD).

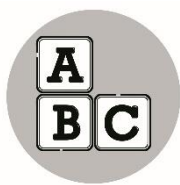$$\frac{5}{12} + \frac{1}{3} = \frac{5+4}{12} = \frac{9}{12}$$

STEP 3: Reduce the answer $\dfrac{9}{12}$ to the lowest term, since both the numerator and denominator has a common factor greater than one. In this case, it is **3**.

$$\frac{9}{12} \div \frac{3}{3} = \frac{3}{4}$$

STEP 4: Finalize the answer by combining $\dfrac{3}{4}$ with the whole number **9.**

$$4\,\frac{5}{12} + 5\,\frac{1}{3} = 9\,\frac{3}{4}$$

Answer: Lina and Lino's candies all in all is $9\,\dfrac{3}{4}$ grams.

What's More

There is a saying that goes "practice makes perfect." So, perform the activity below:

Activity 1: Add then reduce the lowest term whenever possible. Write your answers in your Activity Notebook.

1) $43\frac{1}{2}$
    $+\ \ \frac{5}{8}$
    _____

2) $13\frac{3}{10}$
    $+\ \ \frac{1}{2}$
    _____

3) $3\frac{1}{2}$
    $+\ \frac{1}{5}$
    _____

4) $4\frac{1}{3}$
    $+\ 3\frac{2}{5}$
    _____

5) $3\frac{2}{5}$
    $+1\frac{3}{5}$
    _____

Activity 2: Add then reduce to the lowest term whenever possible.

1) $\frac{4}{8} + \frac{3}{8} =$ _____

2) $\frac{2}{3} + \frac{4}{9} =$ _____

3) $\frac{1}{2} + 7\frac{3}{8} =$ _____

4) $\frac{9}{16} + \frac{2}{16} =$ _____

5) $3\frac{4}{25} + 2\frac{2}{25} =$ _____

Activity 3: Add then reduce to the lowest term whenever possible.

1) $\frac{3}{9} + \frac{2}{9} =$ _____

2) $\frac{8}{15} + \frac{4}{15} =$ _____

3) $\frac{5}{10} + \frac{6}{10} =$ —

4) $\frac{1}{2} + \frac{2}{3} + \frac{1}{4} =$ _____

5) $4\frac{4}{10} + 6\frac{3}{10} =$ _____

What I Have Learned

Fill in the blanks each item, based on what you have learned in this lesson,

In adding _____ fractions, the _____ are the only ones being added. The _____ must be written above the common _____, and the answers should be expressed in the _____ form as much as possible.

Below are the steps in adding dissimilar fractions:

Convert _____ fractions into similar fractions. In converting dissimilar fractions to _____ fractions, we need to get the _____. Add the _____ numbers and fractional parts. _____ whenever possible

What I Can Do

Congratulations you have reach this far! Now, let's apply what you have gained in a possible day-to-day situation.

Directions: Find the solutions in the situation below. Use a separate sheet to answer the activity.

Going to Tacloban City, Mary travels $3\frac{2}{3}$ hrs by van and another $2\frac{1}{5}$ hrs by tricycle. How long does it take Mary to get to Tacloban City?

What's In

In the previous lesson, you have learned how to add fractions and mixed numbers without regrouping. Can you still recall how? Let's check.

Directions: Answer the word problem below following the steps provided in Lesson 1. Show your solutions in a separate sheet of paper.

A group of environmentalists went on hiking in the mountains of Calbayog City. They hiked to see the tourist's spots there and to check if the tourists have been responsible in taking care of nature. After walking a distance of $3\frac{1}{4}$ km, they rested and had their lunch at Tabokno Falls. Then, they hiked for $2\frac{1}{2}$ km more. In returning home, a resident in the place showed them a shorter way which was $3\frac{1}{4}$ km only. How many kilometers did they hike in all?

What's New

This lesson, you are going to deal with adding fractions and mixed numbers **with regrouping**. This lesson involves addition of dissimilar fractions, similar fractions, proper fractions, improper fractions, whole numbers and mixed numbers.

In Mathematics, **regrouping** is a term used to describe the process of changing groups of ones into tens to make adding easier.

Study the sample problems below:

Aleng Mila is a famous tailor in the city. She is sewing a dress for Ms. Togonon's wedding. Aleng Mila used $4\frac{2}{3}$ meters of white cloth and $5\frac{1}{2}$ meters of red cloth. How many meters of cloth did she use in all?

What Is It

To understand more, carefully study the steps on how to add similar and dissimilar fractions with regrouping.

Consider the sample problem above:

Adding mixed numbers with dissimilar fractions with regrouping can be done by following the steps below:

Problem 3:

We want to know how many meters Aleng Mila used for the wedding dress. To solve for the sum of $4\frac{8}{12} + 5\frac{1}{2}$, here are the following steps:

STEP 1: Align the fractions and compare the denominators.

$$4\frac{2}{3}$$
$$5\frac{1}{2} \longrightarrow \text{Different Denominators}$$

STEP 2: Find the Least Common Denominator (LCD). Divide the LCD to the denominator of each dissimilar fraction then multiply to the numerator.

$$\frac{2}{3} + \frac{1}{2} = \frac{4+3}{6} = \frac{7}{6} \text{ or } 1\frac{1}{6} \longrightarrow$$ Since $\frac{7}{6}$ is an improper fraction we need to regroup and change it to mixed fraction by dividing 7 by 6.

STEP 3: Add the whole numbers.

$$4 + 5 = 9$$

STEP 4: Add the fractions.

$$9 + 1\frac{1}{6} = 10\frac{1}{6}$$

Answer: Aleng Mila used $10\frac{1}{6}$ meters of cloth for the wedding dress.

Problem 4:

Sarah is preparing to go home to her province from Manila as one of the locally stranded individuals. She checked the weight of her two luggage to make sure that she will not exceed in her baggage allowance. Her first luggage weighed $2\frac{3}{5}$ kg, the second luggage is $6\frac{2}{3}$ kg. How much is the total weight of her baggage?

STEP 1: Add the whole numbers.

$$2\frac{3}{5} + 6\frac{2}{3} = 2 + 6 = 8$$

STEP 2: Compare the denominators and find the Least Common Denominator (LCD), if they have different denominators. In this case, since both denominators are prime numbers, just multiply the denominators. Their product is their denominator.

$$\frac{3}{5}$$
$$\frac{2}{3}$$ ⟶ Different Denominators

$$\frac{3}{5} + \frac{2}{3} = \frac{\Box}{15}$$
$$x$$

STEP 3: Add the fractions. Write the whole number before the fractions' sum.

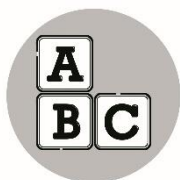$$2\frac{3}{5} + 6\frac{2}{3} = 8\frac{9+10}{15} = 8\frac{19}{15}$$

STEP 4: Regroup by simplifying the improper fraction $\frac{19}{15}$ to mixed fraction.

$$\frac{19}{15} \ or \ 1\frac{4}{15}$$

STEP 5: Simplify the answer by combining **8** and $1\frac{4}{15}$.

$$8 + 1\frac{4}{15} = 9\frac{4}{15}$$

Answer: Sarah's total baggage is $9\frac{4}{15}$ kilos.

What's More

It's easy right? Now that you have understood how to add fractions and mixed numbers with regrouping, answer the activities below.

Activity 1: Add then regroup the following. Write your answers in your Activity Notebook.

1) $3\frac{3}{8}$ 2) $2\frac{3}{8}$ 3) $1\frac{3}{4}$ 4) $1\frac{3}{5}$ 5) $2\frac{4}{8}$

  $+\ 2\frac{6}{8}$ $+1\frac{3}{4}$ $+6\frac{2}{3}$ $+2\frac{7}{10}$ $+1\frac{3}{4}$

Activity 2: Add, regroup then reduce to the lowest term whenever possible.

1) $5\frac{2}{3}+2\frac{2}{2}=$ _____ 2) $4\frac{5}{10}+2\frac{3}{5}=$ _____ 3) $3\frac{5}{6}+1\frac{2}{3}=$ _____

4) $6\frac{8}{10}+\frac{7}{20}=$ _____   5) $2\frac{3}{8}+6\frac{3}{4}=$ _____

Activity 3: Add, regroup then reduce to the lowest term whenever possible.

1) $9\frac{3}{5}+4\frac{2}{4}=$ _____

2) $2\frac{9}{15}+\frac{8}{15}=$ _____

3) $\frac{5}{10}+3\frac{7}{10}=$ _____

4) $9\frac{6}{7}+\frac{1}{2}=$ _____

5) $2\frac{4}{5}+7\frac{8}{10}=$ _____

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What I Have Learned

In adding similar and dissimilar fractions, _____ first the whole numbers if there is/are any.

In _____ similar fractions, the numerators are the only ones being _____. If the sum of the _____ is greater than the denominator, then you have to regroup by changing the _____ fraction to mixed fraction. The answers should be expressed in the simplest _____ as much as possible.

In adding _____ fractions with regrouping, first, you need to convert dissimilar fractions into _____ fractions by getting the LCD. After _____, add the whole _____ and fractional parts. Simplify the answer whenever possible.

What I Can Do

Directions: Analyze and answer the word problem below. Use a separate sheet of paper for your solutions.

In a family reunion, there were different Filipino desserts (kakanin) that were served on the table. Tomas ate $1\frac{3}{8}$ slices of bibingka. Susan ate $1\frac{6}{8}$ slices of sapin-sapin. How much kakanin did both of them eat?

Lesson 3

Subtracting Fractions and Mixed Numbers Without Regrouping

What's In

In the previous lesson, you have learned how to add fractions and mixed numbers with regrouping. Let's check if you can still remember.

Directions: Answer the word problem below following the steps provided in Lesson 2. Show your solutions in a separate sheet of paper.

On weekends, Julia and Julio help their mother with the household chores. Julia works for $2\frac{3}{4}$ hours. Julio works for $1\frac{3}{8}$ hours. How many hours did the two work?

What's New

This lesson, you are going to learn how to subtract fractions and mixed numbers **without regrouping**. This lesson involves subtraction of dissimilar fractions, similar fractions, proper fractions, improper fractions, whole numbers and mixed numbers.

Consider the real situation below:

Rio arranges his reading books and magazines in the bookshelves. He has filled $2\frac{2}{3}$ of the bookshelves with his reading books and magazines. One-fourth $\left(\frac{1}{4}\right)$ of the bookshelves has magazines. What part of the bookshelves has Ria's reading books?

? *What Is It*

To understand more, carefully study the steps on how to subtract dissimilar fractions without regrouping.

Consider the problem above:

Subtracting mixed numbers with dissimilar fractions can be done by following the steps below:

Problem 5:

We want to know what part of the shelves has the reading books of Rio.

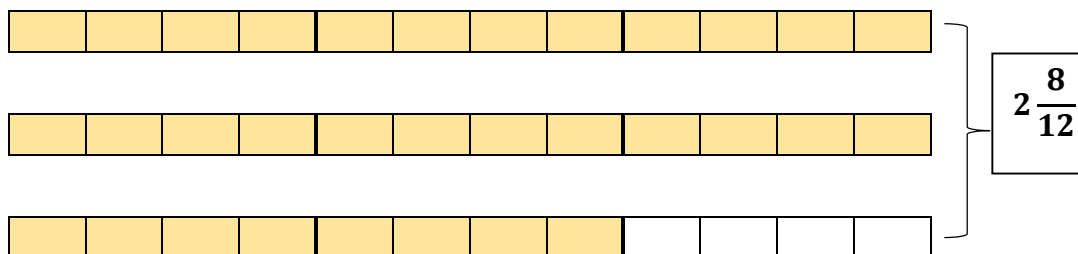To find the part of the reading books in the shelves, subtract $\frac{1}{4}$ from $2\frac{2}{3}$. Here are the steps:

STEP 1: Align the fractions and compare the denominators.
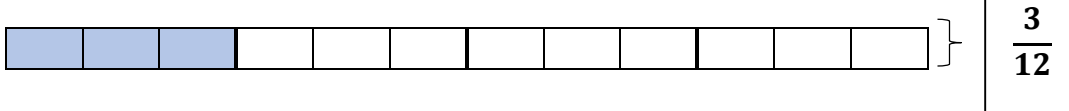
$$2\frac{2}{3}$$
$$\frac{1}{4} \longrightarrow \text{Different Denominators}$$

STEP 2: Find the Least Common Denominator (LCD). Rename the given as similar fractions.

$$2\frac{2}{3} = \frac{\square}{12}$$
$$-\frac{1}{4} = \frac{\square}{12} \longrightarrow \textbf{LCD}$$

By using rectangular bars, we can show that $2\frac{2}{3} = 2\frac{8}{12}$.

$$2\frac{8}{12}$$

13

And $\dfrac{1}{4} = \dfrac{3}{12}$

$\boxed{\dfrac{3}{12}}$

STEP 3: Write equivalent fractions.

$$2\frac{2}{3} = \quad 2\frac{8}{12}$$

$$-\frac{1}{4} = \quad -\frac{3}{12}$$

STEP 4: Subtract the numerators. Write the difference over the common denominator.

$$2\frac{2}{3} = \quad 2\frac{8}{12}$$

$$-\frac{1}{4} = \quad -\frac{3}{12}$$

$$\overline{\qquad\qquad 2\frac{5}{12}}$$

STEP 5: Check if the answer is correct. Add the difference to the subtrahend fraction. The answer should be the same as the minuend.

$$2\frac{5}{12} + \frac{3}{12} = \mathbf{2}\frac{8}{12}$$

Answer: $\mathbf{2}\dfrac{5}{12}$ of the bookshelf is filled with the reading books of Rio.

How about subtracting similar fractions and mixed numbers? The process is just as it is for addition of fractions with like denominators, except you subtract! You subtract the second numerator from the first and keep the denominator the same. Follow the steps below:

Problem 6:

Imagine that you have a Hawaiian pizza with equal-sized pieces. Some of the pizza has already been eaten, so you have a fraction of the pizza remaining. You could represent the pizza pieces with the figure below.
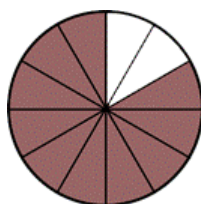
The pizza is cut into 12 equal pieces to start. Two are eaten, so the remaining pizza can be represented with the fraction $\frac{10}{12}$. If three more pieces of pizza are eaten, what fraction of the pizza is left? You can represent that problem with the expression $\frac{10}{12} - \frac{3}{12}$.
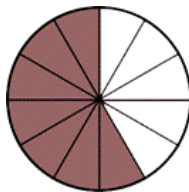
STEP 1: Align the fractions and compare the denominators.

$$\frac{10}{12}$$
$$\frac{3}{12}$$
$\longrightarrow$ The Same Denominators

STEP 2: Subtract the numerators. Write the difference over the denominator.

$$\begin{array}{r} \frac{10}{12} \\ - \frac{3}{12} \\ \hline \frac{7}{12} \end{array}$$

If you go back to the figure above, and we subtract additional 3 pieces, you can see below that $\frac{7}{12}$ of the pizza remains.
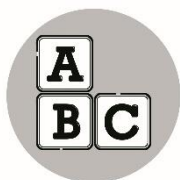

STEP 3: Check if the answer is correct. Add the difference to the subtrahend fraction. The answer should be the same as the minuend.

$$\frac{7}{12} + \frac{3}{12} = \frac{10}{12}$$

Therefore, the answer is $\frac{7}{12}$.

Now, you are ready to answer the activity below. Enjoy!

What's More

Activity 1: Subtract the given similar fractions. Write your answers in your Activity Notebook.

1) $\dfrac{8}{11} - \dfrac{2}{11} =$ _____   **4)** $\dfrac{8}{20} - \dfrac{7}{20} =$ _____

2) $\dfrac{5}{8} - \dfrac{3}{8} =$ _____   **5)** $\dfrac{9}{25} - 2\dfrac{4}{25} =$ _____

3) $1\dfrac{4}{10} - \dfrac{3}{10} =$ _____

Activity 2: Subtract the following dissimilar fractions, then reduce to the lowest term whenever possible.

1) $\quad \dfrac{7}{12}$ **2)** $36\dfrac{2}{15}$ **3)** $6\dfrac{3}{3}$ **4)** $3\dfrac{2}{3}$ **5)** $\quad\dfrac{5}{7}$

$\quad -\dfrac{1}{3}$ $\quad -5\dfrac{1}{10}$ $\quad -\dfrac{1}{4}$ $\quad -\dfrac{1}{2}$ $\quad -4\dfrac{1}{3}$

———   ———   ———   ———   ———

Activity 3: Subtract then reduce to the lowest term whenever possible.

1) $\quad \dfrac{9}{10} - \dfrac{7}{10} =$ ____   **2)** $\dfrac{2}{5} - \dfrac{2}{6} =$ ____   **3)** $6\dfrac{4}{5} - 3\dfrac{1}{5} =$ ____

4) $\quad 8\dfrac{2}{3}$ **5)** $7\dfrac{1}{2}$

$\quad -4\dfrac{1}{3}$ $\quad -2\dfrac{1}{3}$

———   ———

What I Have Learned

In _____ similar fractions and mixed numbers, when they _____ are the same, just _____ right away the whole numbers and the _____. If the difference can still be reduced to the lowest term, then _____.

In subtracting dissimilar _____ and _____ numbers, you need to find the least _____ denominator to make them similar. Then subtract the whole numbers and _____. Write the _____ over the common denominator.

What I Can Do

Now, let's apply what you have learned in a real-life situation which involves subtracting fractions and mixed numbers without regrouping.

Directions: Analyze the word problem below. Use a separate sheet of paper for your answer.

John jogs every other day as part of his daily exercise routine to make his body fit. His goal for this week is to run a total of $7\frac{3}{4}$ km. Yesterday, he ran for $2\frac{1}{2}$ km. How far does John need to run the next day to reach his goal?

Lesson 4
Subtracting Fractions and Mixed Numbers with Regrouping

What's In

In the previous lesson, you were taught how to subtract fractions and mixed numbers without regrouping. So, let's review.

Directions: Analyze and answer the given problem below following the steps provided in Lesson 3. Show your solutions in a separate sheet of paper.

The baker needed $10\frac{3}{5}$ kilos of flour for his bread production. But when he checked the pantry, the flour is only $6\frac{2}{7}$ kilos. How much amount of flour does the baker still need?

What's New

In this lesson, you are going to learn how to subtract fractions and mixed numbers **with regrouping**. This lesson involves subtraction of dissimilar fractions, similar fractions, proper fractions, improper fractions, whole numbers and mixed numbers.

Analyze the word problem below:

Roldan and Jaime join the variety show called the biggest weight loss challenge wherein the one with the greatest weight loss after taking all the challenges becomes the winner. Roldan lose $7\frac{1}{6}$ kilos, while Jaime lose $3\frac{5}{6}$ kilos. Who will be announced as the biggest weight-loss winner? How many kilos are their difference?
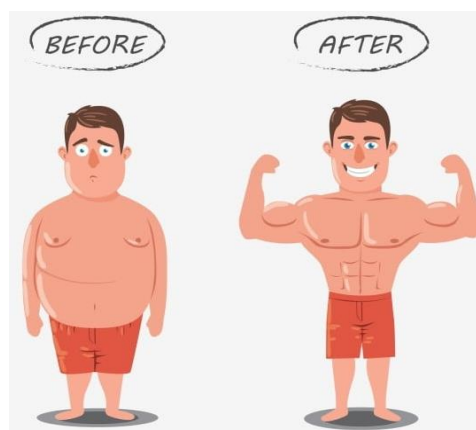
What Is It

Study the steps on how to subtract similar and dissimilar fractions with regrouping.

In subtracting mixed numbers with regrouping, the fraction part of the second mixed number is larger than fraction part of the first mixed number.

To regroup, you borrow from the column directly to the left (make sure to subtract 1 from that column) and add it to the column you're working with. That will give you enough to subtract.

Subtracting mixed numbers with similar fractions can be done by following the steps below:

Consider the problem above:

Problem 7:

　　We want to know who the biggest weight-loss winner is and how much is the difference of Roldan and Jaime's weight.

　　STEP 1: Regroup one of the whole numbers from the first number, writing the first mixed number in a different way.

$$7\frac{1}{6} \implies 7 + \frac{1}{6} \implies 6 + 1 + \frac{1}{6}$$

$$6 + \frac{6}{6} + \frac{1}{6} \implies 6 + \frac{7}{6} \implies 6\frac{7}{6}$$

　　STEP 2: Write an equivalent fraction to the original.

$$6\frac{7}{6} - 3\frac{5}{6}$$

　　STEP 3: Subtract like you normally subtract mixed numbers. Whole numbers first then the fraction parts.

$$
\begin{aligned}
& 6\frac{7}{6} \\
-\ & 3\frac{5}{6} \\
\hline
& 3\frac{2}{6} \implies 3\frac{1}{3}
\end{aligned}
$$

　　STEP 4: Check if the answer is correct. Add the difference to the subtrahend. The sum should be the same as the minuend.

$$
\begin{aligned}
+\ & 3\frac{1}{3} \\
& 3\frac{5}{6} \\
\hline
& 6\ \frac{2+5}{6} = 6\ \frac{7}{6} = 6 + 1\frac{1}{6} \ or \ 7\frac{1}{6}
\end{aligned}
$$

So, the answer is $3\frac{1}{3}$.

　　How about subtracting mixed numbers with regrouping having dissimilar fractions? Follow the steps below:

Problem 8:

Karla was called by her teacher to solve on the board, $7\frac{1}{5} - 3\frac{1}{4} = N$. Karla doesn't know what to do. If you are her classmate and willing to help, how will you answer the given fraction.

STEP 1: Find a least common denominator.

$$7\frac{1}{5} - 3\frac{1}{4} = N$$

STEP 2: Rewrite each fraction using the common denominator.

$$\frac{1}{5} \cdot \frac{4}{4} \Longrightarrow \frac{4}{20}$$

$$\frac{1}{4} \cdot \frac{5}{5} \Longrightarrow \frac{5}{20}$$

STEP 3: Write the expression using the mixed numbers with the like denominator.

$$-\ 7\frac{4}{20}$$
$$3\frac{5}{20}$$
$$\overline{}$$

Since the second fraction part, $\frac{5}{20}$, is larger than the first fraction part, $\frac{4}{20}$, regroup one of the whole numbers and write it as $\frac{20}{20}$.

$$7\frac{4}{20} = 6 + 1 + \frac{4}{20}$$
$$= 6 + \frac{20}{20} + \frac{4}{20}$$
$$= 6 + \frac{24}{20}$$
$$= 6\frac{24}{20}$$

STEP 4: Rewrite the subtraction expression using the equivalent fractions.

$$- \ 7\frac{4}{20} \implies \quad \quad - \ 6\frac{24}{20}$$
$$3\frac{5}{20} \implies \quad \quad \quad 3\frac{5}{20}$$

STEP 5: Subtract the whole numbers, subtract the fractions.

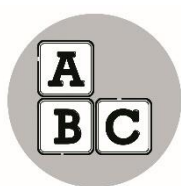$$6\frac{24}{20}$$

6 - 3 = 3

$$- \ 3\frac{5}{20}$$

$$\frac{24}{20} - \frac{5}{20} = \frac{19}{20}$$

$$3\frac{19}{20}$$

STEP 6: Combine the whole number and the fraction.

$$3\frac{19}{20}$$

Therefore, the answer is $3\frac{19}{20}$

Answer the activities below for you to master the lesson. Good luck!

What's More

Activity 1: Subtract the given fractions and mixed numbers. Reduce to the lowest term, if possible. Write your answers in your Activity Notebook.

1) $8 - 4\frac{2}{5} =$ _____

2) $14\frac{3}{4} - 12\frac{7}{8} =$ _____

4) $17\frac{4}{9} - 12\frac{2}{3} =$ _____

5) $2\frac{1}{4} - 1\frac{1}{2} =$ _____

3) $2\frac{2}{3} - \frac{2}{2} =$ _____

Activity 2: Subtract the given fractions and mixed numbers. Reduce to the lowest term, if possible.

1) $3\frac{1}{4} - 2\frac{5}{8} =$ ____

2) $2\frac{1}{4} - 1\frac{3}{4} =$ ____

3) $3\frac{1}{5} - 2\frac{2}{5} =$ _____

4) $9\frac{1}{2} - 5\frac{1}{4} =$ _____

5) $3\frac{2}{6} - 1\frac{5}{6} =$ _____

Activity 3: Subtract and reduce to the lowest term, if possible.

1) $2\frac{1}{8} - 1\frac{5}{8} =$ ____

2) $4\frac{1}{8} - 2\frac{3}{8} =$ ____

3) $3\frac{4}{6} - 2\frac{5}{6} =$ _____

4) $4\frac{3}{4} - 3\frac{5}{6} =$ _____

5) $4\frac{2}{3} - 2\frac{3}{4} =$ _____

What I Have Learned

In subtracting dissimilar (1)_____ and mixed numbers, we have to (2)_____ with (3)_____ denominators. Then (4)_____ the first fraction. Next, is to (5)_____ the whole numbers and (6)_____.

If the answer has a common factor, (7)_____ by reducing it to the (8)_____ term.

To regroup, you borrow from the column directly to the left (make sure to subtract (9)_____ from that column) and (10)_____ it to the column you're working with. That will give you enough to subtract.

What I Can Do

Congratulations! You've reach this far. Three more activities and you are done with this module.

Directions: Understand and answer the word problem below. Use a separate sheet of paper for your answer.

Leah's santan plants grew $18\frac{2}{3}$ inches in one week. Her roses grew $3\frac{3}{4}$ inches in one week. How many more inches did the santan grow in a week than the roses?

Assessment

A. Subtract the fractions in column A, then match with their correct answers in Column B. Write only the letter of your answer on the notebook.

Column A	**Column B**
1) $5\frac{4}{5} - 4\frac{2}{5}$	A. $1\frac{7}{20}$
2) $3\frac{3}{5} - 2\frac{1}{4}$	B. $3\frac{1}{4}$
3) $2\frac{1}{2} - \frac{2}{6}$	C. $1\frac{2}{5}$
4) $7\frac{6}{10} - 2\frac{1}{5}$	D. $3\frac{1}{8}$
5) $4\frac{5}{8} - 1\frac{3}{8}$	E. $5\frac{2}{5}$
	F. $2\frac{1}{6}$

B. Add these fractions. Reduce the sum to the lowest term, when needed.

1) $6\frac{4}{7} + \frac{5}{6} =$

2) $7\frac{3}{20} + \frac{6}{10} =$

3) $\frac{8}{10} + 1\frac{3}{7} =$

4) $12\frac{1}{4} + \frac{5}{12} =$

5) $42\frac{3}{6} + \frac{1}{3} =$

Additional Activities

Directions: Perform the additional activity below. Write each answer in the simplest form in your activity notebook.

1) $\frac{4}{5} + \frac{1}{8} =$

2) $\frac{8}{9} - \frac{1}{6} =$

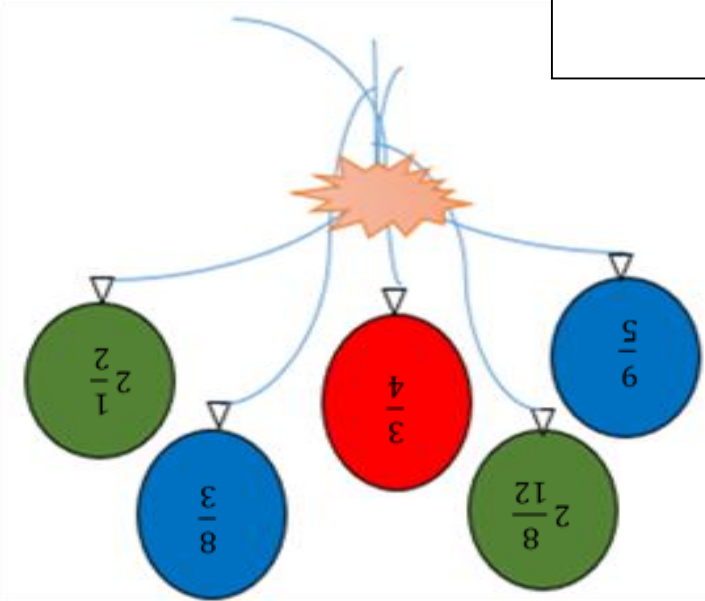3) $3\frac{2}{7} + 5\frac{1}{5} =$

4) $7\frac{2}{3} - 3\frac{4}{5}$

5) $\frac{1}{4} + 8\frac{2}{3} + 4\frac{1}{10} =$

Answer Key

What I Know

1. $\frac{8}{9}$
2. $\frac{3}{2}$ or 1 1/2
3. $8\frac{4}{5}$
4. 16
5. $23\frac{1}{14}$
6. $5\frac{1}{2}$
7. $7\frac{1}{3}$
8. $7\frac{3}{5}$
9. $10\frac{4}{5}$
10. $3\frac{6}{7}$

What's More (Lesson 1)

Act 1:
1. $\frac{7}{10}$
2. $\frac{9}{7}$
3. $\frac{3}{4}$
4. $7\frac{11}{15}$
5. 5

Act 2:
1. $\frac{7}{8}$
2. $1\frac{1}{9}$
3. $7\frac{2}{8}$
4. $13\frac{1}{4}$
5. $123\frac{23}{45}$

Act 3:
1. $\frac{9}{5}$
2. $13\frac{4}{5}$
3. $1\frac{1}{10}$
4. $1\frac{2}{5}$
5. $10\frac{7}{10}$

What I Can Do

(Lesson 1)
$13\frac{5}{15}$

(Lesson 2)
$3\frac{1}{8}$

(Lesson 3)
$5\frac{1}{4}$

(Lesson 4)
$14\frac{11}{12}$

What I Have Learned

(Lesson 1)	(Lesson 2)	(Lesson 3)	(Lesson 4)
1. similar	1. add	1. subtracting	1. fractions
2. numerators	2. adding	2. denominators	2. rename
3. sum	3. added	3. subtract	3. common
4. denominator	4. numerators	4. numerators	4. regroup
5. simplest	5. improper	5. simplify	5. subtract
6. dissimilar	6. form	6. fractions	6. numerators
7. similar	7. dissimilar	7. mixed	7. simplify
8. LCD	8. similar	8. common	8. lowest
9. whole	9. regrouping	9. numerators	9. 1 (one)
10. simplify	10. numbers	10. difference	10. add

What's In (Lesson 2)

$\frac{9}{4}$ or 1 = 8 + 1 = 9

(Lesson 3)
$4\frac{1}{8}$

(Lesson 4)
$4\frac{11}{35}$

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What's More (Lesson 2)

Act 1:	Act 2:	Act 3:
1. $8\frac{2}{3}$	1. $6\frac{1}{8}$	1. $14\frac{1}{10}$
2. $4\frac{1}{8}$	2. $7\frac{1}{10}$	2. $3\frac{2}{15}$
3. $8\frac{5}{12}$	3. $5\frac{1}{2}$	3. $4\frac{1}{5}$
4. $4\frac{3}{10}$	4. $7\frac{3}{20}$	4. $10\frac{5}{14}$
5. $4\frac{1}{4}$	5. $9\frac{1}{8}$	5. $10\frac{3}{5}$

What's More (Lesson 3)

Act 1:	Act 2:	Act 3:
1. $\frac{6}{11}$	1. $\frac{3}{12}$	1. $\frac{2}{10}$
2. $\frac{1}{4}$	2. $31\frac{1}{30}$	2. $\frac{1}{15}$
3. $1\frac{1}{10}$	3. $6\frac{3}{4}$	3. $3\frac{3}{5}$
4. $\frac{1}{20}$	4. $4\frac{1}{3}$	4. $4\frac{1}{3}$
5. $2\frac{1}{5}$	5. $4\frac{8}{21}$	5. $5\frac{1}{6}$

What's More (Lesson 4)

Act 1:	Act 2:	Act 3:
1. $3\frac{3}{5}$	1. $3\frac{5}{8}$	1. $\frac{4}{8}$
2. $1\frac{7}{8}$	2. $\frac{1}{2}$	2. $1\frac{3}{4}$
3. $3\frac{2}{3}$	3. $3\frac{4}{5}$	3. $3\frac{5}{6}$
4. $4\frac{7}{9}$	4. $4\frac{1}{4}$	4. $4\frac{11}{12}$
5. $\frac{3}{4}$	5. $1\frac{3}{6}$	5. $1\frac{11}{12}$

Assessment

A.
1. C
2. A
3. F
4. E
5. B

B.
1. $7\frac{17}{42}$
2. $7\frac{3}{4}$
3. $2\frac{8}{35}$
4. $8\frac{3}{14}$
5. $1\frac{1}{10}$

Additional Activities

1. $\frac{37}{40}$
2. $\frac{13}{18}$
3. $8\frac{17}{35}$
4. $3\frac{13}{15}$
5. $12\frac{3}{4}$

What's In (Lesson 1)

$2\frac{1}{2}$ $\frac{8}{3}$ $\frac{3}{4}$ $2\frac{8}{12}$ $\frac{5}{9}$

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