

Lesson Exemplar for Mathematics

Quarter 3
Lesson

6

Lesson Exemplar for Mathematics Grade 4
Quarter 3: Lesson 6 (Week 6)
SY 2024-2025

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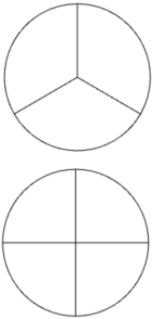
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MATHEMATICS / QUARTER 3 / GRADE 4

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners should have knowledge and understanding of addition and subtraction of dissimilar fractions.
B. Performance Standards	By the end of the quarter, the learners are able to represent, compare, and order dissimilar fractions. (NA)
C. Learning Competencies and Objectives	1. Solve word problems involving the addition of dissimilar fractions. 2. Subtract dissimilar fractions using models.
D. Content	Word Problems Involving Addition of Dissimilar Fractions Subtraction of Dissimilar Fractions
E. Integration	• Concept of Equality, Equity, Justice, Prudence • SGD 5. Gender Equality

II. LEARNING RESOURCES
TeachableMath. (2022, May 6). Fraction Shape Maker - TeachableMath. https://teachablemath.com/apps/fraction-shape-maker/ The Math Learning Center. (n.d.). Fractions by the Math Learning Center. https://apps.mathlearningcenter.org/fractions/ Toy Theater. (2022, April 29). Fraction bars. Toy Theater Learn • Create • Play. https://toytheater.com/fraction-bars/

III. TEACHING AND LEARNING PROCEDURE	NOTES TO TEACHERS
A. Activating Prior Knowledge DAY 1 1. Short Review Activity 1(Drill) <i>Sample Activity (Individual).</i> Use flashcards to drill learners on equivalent fraction facts. Instructions. Find the missing number to complete the pairs of equivalent fractions. $1. \frac{2}{3} = \frac{?}{21}$ $2. \frac{5}{9} = \frac{25}{?}$ $3. \frac{?}{14} = \frac{1}{7}$	Activity 1 is intended to recall equivalent fractions. *Add more items to Activity 1.

	DAY 2 Activity 2 (Drill) <i>Sample Activity (Individual).</i> Use flashcards to drill learners on converting improper fractions to mixed numbers and vice versa. Instructions. Find the missing number to complete the pairs of equivalent fractions. 1. $1 = \frac{?}{5}$ 2. $2\frac{2}{3} = \frac{?}{3}$ 3. $? \frac{3}{5} = \frac{13}{5}$ 2. Feedback (Optional)	Activity 2 is intended to recall how to convert improper fractions to mixed numbers and vice versa. These concepts and procedures are necessary for subtracting dissimilar fractions. *Add more items to Activity 2. Constantly monitor and give feedback on steps on how to solve word problems involving the addition of dissimilar fractions.
B. Establishing Lesson Purpose	1. Lesson Purpose DAY 1 Activity 3 (for sub-topic 1). Leftover Pizza Let learners study the problem below. <i>Situation.</i> At a birthday party, two equally sized pizzas were ordered. There is $\frac{1}{3}$ of one pizza left over and $\frac{3}{4}$ of the other pizza is left over. What fraction of a whole pizza is left over in total? Also, what fraction of a whole pizza has been eaten? Guide Questions: - How many pizzas were ordered for the birthday party? - If $\frac{1}{3}$ of one pizza is left over, what part of a whole pizza has been eaten? Illustrate by shading the leftover part and the part that has been eaten. - If $\frac{3}{4}$ of the other pizza is left over, what part of a whole pizza has been eaten? Illustrate by shading the leftover part and the part that has been eaten. - If one pizza has $\frac{1}{3}$ left over and the other has $\frac{3}{4}$ left over, how can we find the total amount left over? - How can we find the total amount that has been eaten? 	The intention of Activity 3 is to reinforce conceptual understanding of adding dissimilar fractions via modeling and procedures. Important Note. Elicit to the learners the importance of transforming dissimilar fractions using the concept of equivalent fractions so that their understanding is not too procedural or mechanical.

	DAY 2 Activity 4 (for sub-topic 2). How Many Really? <i>Think-Pair-Share.</i> Let learners review the concepts of improper fractions and mixed numbers. <i>Sample Activity (Pair)</i> By pair, let learners illustrate their understanding using fraction strips. Guide Questions: - How many $\frac{1}{2}$s are there in $\frac{7}{2}$? Show using fraction strips - How many $\frac{1}{7}$s are there in $\frac{15}{7}$? Show using fraction strips. - How many $\frac{1}{5}$s are there in 1? Show using fraction strips. - How many $\frac{1}{3}$s are there in 2? Show using fraction strips. - How many $\frac{1}{3}$s are there in $2\frac{2}{3}$? Show using fraction strips. - How many $\frac{1}{4}$s are there in $3\frac{3}{4}$? Show using fraction strips. 2. Unlocking Content Area Vocabulary	Activity 4 is intended to reinforce the conceptual understanding of improper fractions and mixed numbers. <i>Pedagogical Strategy.</i> Use fraction strips/bars to model if learners have difficulty visualizing the concept. This is particularly helpful in subtracting dissimilar fractions.
C. Developing and Deepening Understanding	DAY 1 SUB-TOPIC 1: Word Problems Involving Addition of Dissimilar Fractions 1. Explicitation After doing Activities 1 and 3, introduce steps in solving word problems involving addition of dissimilar fractions. To solve word problems involving the addition of dissimilar fractions, the following steps are followed: - What are the given facts? - What is asked? - What is the number sentence? - What is the answer to the problem? 2. Worked Example Example 1. A baker used $2\frac{1}{4}$ cups of flour for pancakes and $3\frac{1}{3}$ cups of flour for doughnuts. How many cups of flour in all were used by the baker? Solution:	<i>Important Note.</i> Help learners be familiar with the procedure by modeling how to “Think Aloud”. Read the steps, and let them repeat. <i>Model how to cognitively encode the procedures in their working memory.</i> Example. (Use this as a think-aloud protocol) When solving word problems, I need to show GANA: Given Asked Question Number Sentence Answer

Given. What are the given facts?

$2\frac{1}{4}$ cups of flour for pancakes and $3\frac{1}{3}$ cups of flour for doughnuts

Asked Question. What is asked?

How many cups of flour in all were used by the baker?

Number Sentence. What is the number sentence?

Operation: Addition

Total number of cups = $2\frac{1}{4} + 3\frac{1}{3}$

Answer. What is the answer to the problem?

Total number of cups = $2\frac{1}{4} + 3\frac{1}{3}$
 $= (2 + 3) + (\frac{1}{4} + \frac{1}{3})$

LCD: 12

$$\begin{aligned} &= 5 + (\frac{3}{12} + \frac{4}{12}) \\ &= 5 + (\frac{3+4}{12}) \\ &= 5 + (\frac{7}{12}) \\ &= 5\frac{7}{12} \end{aligned}$$

There are a total of $5\frac{7}{12}$ cups of flour used by the baker.

Example 2. Mrs. Gomez bought $\frac{3}{4}$ kilogram of chicken breast, $1\frac{1}{2}$ kilograms of chicken wings, and $2\frac{1}{4}$ kilograms of chicken legs. How many kilograms of chicken parts in all did Mrs. Gomez buy?

Solution:

Given. What are the given facts?

$\frac{3}{4}$ kilogram of chicken breast, $1\frac{1}{2}$ kilograms of chicken wings, and $2\frac{1}{4}$ kilograms of chicken legs

Asked Question. What is asked?

How many chicken parts in all did Mrs. Gomez buy?

Number Sentence. What is the number sentence?

Operation: Addition

Total number of kilograms of chicken parts = $\frac{3}{4} + 1\frac{1}{2} + 2\frac{1}{4}$

Answer. What is the answer to the problem?

Total number of kilograms of chicken parts = $\frac{3}{4} + 1\frac{1}{2} + 2\frac{1}{4}$

LCD: 4

$$= (1 + 2) + \left(\frac{3}{4} + \frac{1}{2} + \frac{1}{4}\right)$$

$$= 3 + \left(\frac{3}{4} + \frac{2}{4} + \frac{1}{4}\right)$$

$$= 3 + \left(\frac{3+2+1}{4}\right)$$

$$= 3 + \left(\frac{6}{4}\right)$$

$$= 3 + \left(1\frac{2}{4}\right)$$

$$= 4\frac{2}{4} \text{ or } 4\frac{1}{2}$$

There are a total of $4\frac{1}{2}$ kilograms of chicken parts bought by Mrs. Gomez.

Example 3. Dan painted his bedroom wall in two days. On the first day, he used $\frac{2}{3}$ liters of white paint for the first coating. On the second day, he used $\frac{3}{5}$ liters of gray paint for the final coating. How many liters of paint were used on his bedroom wall?

Solution:

Given. What are the given facts?

Day 1: Dan used $\frac{2}{3}$ liters of white paint.

Day 2: Dan used $\frac{3}{5}$ liters of gray paint.

Asked Question. What is asked?

How many liters of paint were used on his bedroom wall?

Number Sentence. What is the number sentence?

Operation: Addition

Total number of liters of paint = $\frac{2}{3} + \frac{3}{5}$

Answer. What is the answer to the problem?

Total number of liters of paint = $\frac{2}{3} + \frac{3}{5}$

LCD: 15

$$= \frac{10}{15} + \frac{9}{15}$$

$$= \frac{10+9}{15}$$

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

There are a total of $1\frac{4}{15}$ liters of paint used for painting Dan's bedroom wall.

Note. Prompt learners to recall reducing fractions in their simplest form.

Example 4. Sara is mixing three liquids in three equally sized containers, as shown below. After pouring all the liquids into a blank container of the same size as the other containers, will she be able to fill the fourth container?



Solution:

Given. What are the given facts?

Container 1 is $\frac{2}{4}$ parts full.

Container 2 is $\frac{1}{6}$ parts full.

Container 3 is $\frac{1}{3}$ parts full.

Asked Question. What is asked?

After pouring all the liquids into a blank container of the same size as the other containers, will she be able to fill the fourth container completely?

Number Sentence. What is the number sentence?

Operation: Addition

Total parts of liquid = $\frac{2}{4} + \frac{1}{6} + \frac{1}{3}$

Answer. What is the answer to the problem?

Total parts of liquid = $\frac{2}{4} + \frac{1}{6} + \frac{1}{3}$

LCD: 12

$$\begin{aligned} &= \frac{6}{12} + \frac{2}{12} + \frac{4}{12} \\ &= \frac{6+2+4}{12} \\ &= \frac{12}{12} \\ &= 1 \end{aligned}$$

After pouring all the liquids into the fourth container, she was able to fill it completely.

*Add more worked examples.

3. Lesson Activity

Let learners answer the following:

Instructions. Answer the following problems. Show your complete solution. *If the sum is an improper fraction, convert it to a mixed number.*

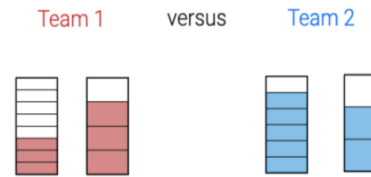
Example 1. Teams 1 and 2 were given two equally sized water containers. The diagram below shows how much water was poured into the containers of Team

Note. This activity can be done in pairs or smaller groups (3 to 4 members). Let learners communicate mathematically through collaborative problem-solving.

1 and Team 2. Competing with each other, they successfully filled the containers in three minutes.

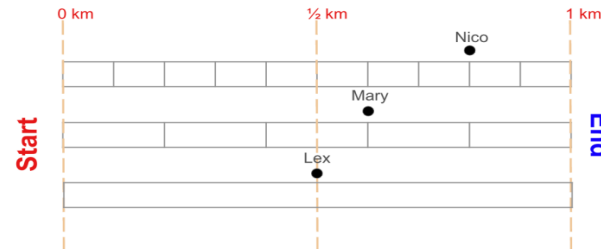
1.1. When their efforts were combined, could Team 1 fill a container? Why? Could Team 2 also fill a container? Why?

1.2. Which team emerged as the winner of the game? Explain.



Example 2: Study the diagram below.

2.1. In how many kilometers (km) altogether do Nico, Mary, and Lex run daily in the morning? Explain.



Daily Morning Run

DAY 2

SUB-TOPIC 2: Subtracting Dissimilar Fractions Using Models

1. Explicitation

Check the prior knowledge of learners by doing Activities 2 and 4. Process and let learners abstract these concepts. When modeling the subtraction of dissimilar fractions using fraction disks, and strips/bars, emphasize the word “take out” from the minuend similar equal parts of the subtrahend.

2. Worked Example

Example 1. What is the difference between $\frac{2}{3}$ and $\frac{1}{4}$?

“I DO”

Solution:

Answer Key:

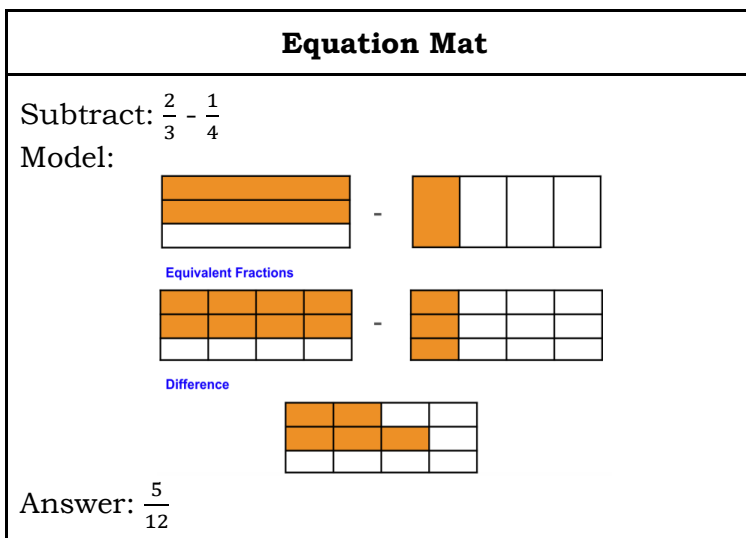
1.1. Team 1 filled $1\frac{1}{8}$ parts of the water container, while Team 2 filled $1\frac{1}{2}$ parts of the water container. Both Team 1 and 2 could fill a water container.

1.2. Team 2 emerged as the winner of the game since $1\frac{1}{2} > 1\frac{1}{8}$.

2.1. Altogether, they run $1\frac{9}{10}$ km daily in the morning.

In the Explicitation part, use the “Equation Mat” pedagogical strategy.

You may use also the pedagogical strategy “**I Do - We Do - You Do**”. The teacher models how to subtract dissimilar fractions. Next, both the teacher and learners do the modeling. Lastly, learners do the modeling with little to no guidance from the teacher on a gradual basis.



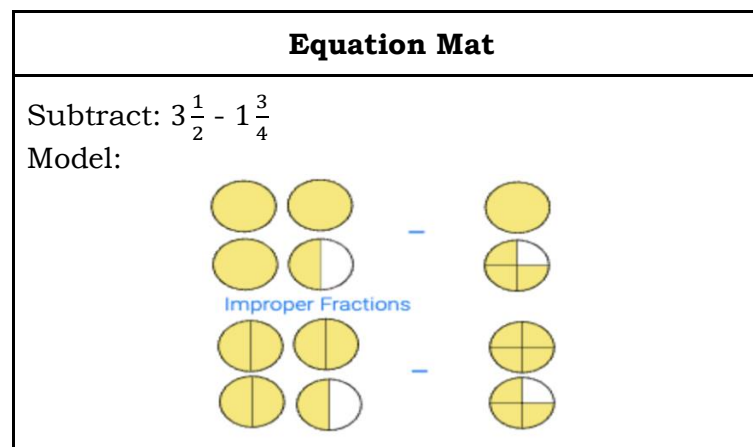
“WE DO”. Subtract $\frac{2}{3}$ from $\frac{3}{4}$

“YOU DO”. Subtract: $\frac{4}{5} - \frac{3}{10}$

Example 2. Subtract $1\frac{3}{4}$ from $3\frac{1}{2}$

“I DO”

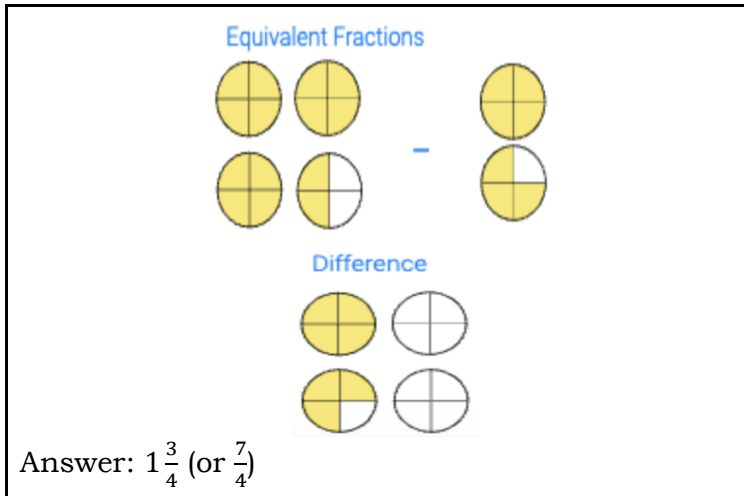
Solution:



Pedagogical Strategy. In worked example 1, after learners were able to model equivalent fractions using fraction bars (better if physical strips), you can ask them to “take out” the minuend (in this case, $\frac{3}{12}$) from the subtrahend (i.e. $\frac{8}{12}$) by crossing out.

*The “We Do” part is intended to gradually teach learners different subtraction strategies or methods using the formal mathematical language (e.g. difference between, subtracted from, etc.)

Notice that for Example 2, the fraction part of the subtrahend is greater than the fraction part of the minuend. Instead of using the process of “regrouping and borrowing” from the whole number of the mixed number to be added to the fraction part of the minuend, it is encouraged to “rewrite” the mixed numbers into improper fractions and then transform them again to equivalent fractions.



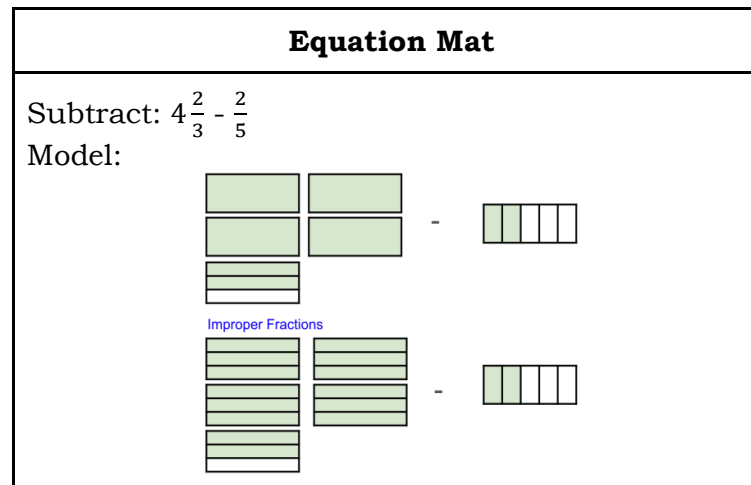
“WE DO”. Find the difference between $2\frac{1}{4}$ and $1\frac{3}{5}$

YOU DO”. Subtract: $3\frac{1}{3} - 1\frac{1}{12}$

Example 3. Subtract: $4\frac{2}{3} - \frac{2}{5}$

“WE DO”

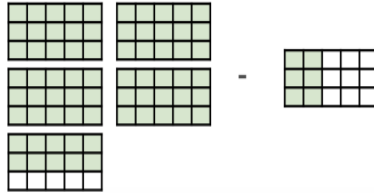
Solution:



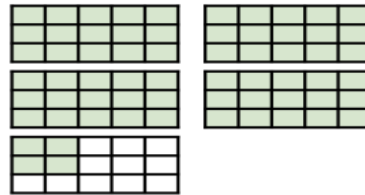
To be able to commit to the memory of learners on how to rewrite mixed numbers to improper fractions, you may ask them the following (see example 2), “How many $\frac{1}{2}$ s are there in $3\frac{1}{2}$? How many $\frac{1}{4}$ s are there in $1\frac{3}{4}$?”

Note. After several examples, you may switch to **“We Do - You Do”** approach and eventually to **“You Do”** approach.

Equivalent Fractions



Difference



Answer: $4\frac{4}{15}$

DAY 3

Example 4. What is the difference between 2 and $\frac{5}{7}$

Solution:

Equation Mat

Subtract: $2 - \frac{5}{7}$

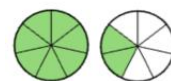
Model:



Equivalent Fractions



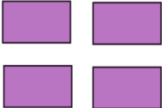
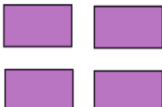
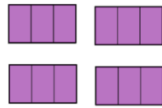
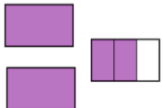
Difference



Answer: $1\frac{2}{7}$

Example 5. Subtract $2\frac{2}{3}$ from 5

Solution:

Equation Mat	
Subtract: $5 - 2\frac{2}{3}$ Model:  Improper Fractions  Equivalent Fractions  Difference –  Answer: $2\frac{1}{3}$	

3. Lesson Activity

(Pair Activity). Let learners be more familiar with modeling how to subtract dissimilar fractions (two proper fractions, two mixed numbers, and a mixed number and a proper fraction) by giving them more practice exercises.

Instructions. Determine the difference of the following by drawing the figures using fraction strips. *Reduce the difference in its simplest form if possible.*

a. $\frac{11}{12} - \frac{1}{3}$

b. $\frac{3}{5} - \frac{1}{2}$

c. $4\frac{3}{4} - 3\frac{2}{3}$

d. $5\frac{3}{6} - \frac{2}{3}$

e. $3 - 2\frac{3}{5}$

Answer Key:

a. $\frac{7}{12}$

b. $\frac{1}{10}$

c. $1\frac{1}{12}$

d. $4\frac{5}{6}$

e. $\frac{2}{5}$

D. Making Generalizations

1. Learners' Takeaways

DAY 1

For Sub-topic 1:

Ask learners 3 important concepts they have learned in solving word problems involving the addition of dissimilar fractions. Let them start with the phrase

"I learned today ..."

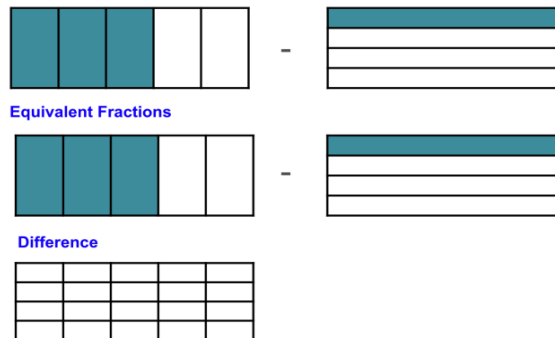
DAY 2

For Sub-topic 2:

Ask learners to provide the next steps in the illustration below:

Number Sentence: _____

Model:



Answer: _____

2. Reflection on Learning

(Homework). Give this same problem to learners.

Problem. Steve hiked $\frac{2}{3}$ km on Monday and $\frac{5}{6}$ km on Tuesday.

DAY 2

For sub-topic 1. How many kilometers did Steve hike in total?

DAY 3

For sub-topic 2. By how many kilometers did Steve achieve on Tuesday compared to Monday? Explain using fraction strips as models.

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION

NOTES TO TEACHERS

A. Evaluating Learning

DAY 4

1. Formative Assessment

For sub-topic 1.

Solve the following problems. Show your complete solution. *If the sum is an improper fraction, write it as a mixed number. Simplify the fractions if possible.*

- a. Ben has $\frac{2}{3}$ meters of blue ribbon and $\frac{2}{5}$ meters of red ribbon. How much ribbon does Ben have in total?

- b. Charm uses 1 cup of all-purpose cream, $\frac{2}{3}$ cup of condensed milk, and $\frac{1}{2}$ cup of whipped cream in her

fruit salad. How many cups of mixture are there in her fruit salad?

- c. Ana is mixing blue and yellow paint to get a green color. The figure at the right shows the parts of the paints to be mixed. How many cans of green paint can she produce in all after mixing?



Point System. Each item is worth 5 points.
Rubrics.

Point	Remark
5	Provided a complete solution with the correct procedure and arrived at the correct answer.
4	Provided a complete solution with one incorrect procedure but still arrived at the correct answer.
3	Provided a partially completed solution with 2-3 incorrect procedures and arrived at the correct answer.
2	Provided an incomplete solution with 1-2 correct procedures but did not arrive at the correct answer.
1	Provided an incomplete solution with an attempt to solve the problem but did not arrive at the correct answer.
0	Did not attempt to solve the problem.

For sub-topic 2. Worksheet (see attached)

Point System. Each item is worth 5 points. Total Points: 25
Rubrics:

Point	Remark
5	Presented a comprehensive solution demonstrating a clear and accurate modeling process, following the correct procedure, and arriving at the correct answer.
4	Provided a comprehensive solution with a correct model; although one procedure was incorrect, the correct answer was still achieved.
3	Presented a partially completed solution with 2-3 incorrect procedures but demonstrated an attempt at modeling and arrived at the correct answer.
2	Provided an incomplete solution with 1-2 correct procedures but lacked a clear modeling process and did not arrive at the correct answer.
1	Presented an incomplete solution with an attempt to solve the problem, but lacked a clear modeling process and did not arrive at the correct answer.
0	Did not attempt to solve the problem.

Answer Key:

For sub-topic 1.

- a. $1\frac{1}{15}$ meters
b. $2\frac{1}{6}$ cups of mixture
c. $4\frac{1}{10}$ cans of green paint

For sub-topic 2.

1. $\frac{1}{2}$
2. $\frac{1}{12}$
3. $\frac{1}{8}$
4. $\frac{7}{12}$
5. $1\frac{3}{5}$

B. Teacher's Remarks	<i>Note observations on any of the following areas:</i>	Effective Practices	Problems Encountered	The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement, and other related stuff. Teachers may also suggest ways to improve the different activities explored/lesson exemplar.
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			
C. Teacher's Reflection	<i>Reflection guide or prompt can be on:</i> <u>principles behind the teaching</u> <i>What principles and beliefs informed my lesson?</i> <i>Why did I teach the lesson the way I did?</i> <u>students</u> <i>What roles did my students play in my lesson?</i> <i>What did my students learn? How did they learn?</i> <u>ways forward</u> <i>What could I have done differently?</i> <i>What can I explore in the next lesson?</i>			Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.