



# 3.F.15 MASTER TEACHER NOTES

SE 3.3D, 3.1A,  
3.1B, 3.1C,  
3.1D, 3.1E,  
3.1F

## Compose & Decompose Fractions 0–1 Using Unit Fractions (Strip Diagrams)



**Purpose** Activities 14–16 help students see that all fractions are made up of unit fractions. This activity focuses on strip diagrams.

**Note:** Encourage students to use their fraction manipulatives to build the fractions given in Problems #1–#4 and to act out the scenarios in Problems #5–#8.

- |  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> Introduction        | <input type="checkbox"/> Addition       | <input checked="" type="checkbox"/> Manipulatives   | <input checked="" type="checkbox"/> Teacher-Facilitated   |
| <input type="checkbox"/> Investigation       | <input type="checkbox"/> Subtraction    | <input checked="" type="checkbox"/> Pictorial Model | <input checked="" type="checkbox"/> Tutoring/Intervention |
| <input checked="" type="checkbox"/> Practice | <input type="checkbox"/> Multiplication | <input type="checkbox"/> Properties of Operations   | <input checked="" type="checkbox"/> Small group           |
| <input type="checkbox"/> Posttest            | <input type="checkbox"/> Division       | <input type="checkbox"/> Choose a Method            | <input type="checkbox"/> Centers                          |
|  |   |   | <input type="checkbox"/> Challenge!                       |



### Setting Up For Instruction

- Make 1 copy of **3.F.15 Master** for each student.
- Prepare Problem #1 so it can be projected using your classroom technology.
- Gather **fraction manipulatives** for students to use as needed.



### Thought Extenders

- What fraction are you given?
- How can you use your manipulatives to create that fraction?
- How would you draw a model? How many parts would you partition the whole into? How many parts would you shade?
- How many fractional parts does it take to make the whole?
- How can you group unit fractions to make a fraction?
- How could you write your fraction as the sum of unit fractions?
- How do your picture and your manipulatives relate to the equation you wrote?



### How-To Guide

1. Put students in pairs and hand out materials.
2. Model Problem #1 for students.

Guiding Questions for Discussion:

- What fraction are we given in Problem #1?  $\frac{3}{8}$
  - How could we use our fraction manipulatives to create the fraction  $\frac{3}{8}$ ? Place 3 one-eighth size pieces together
  - What does eating  $\frac{3}{8}$  of the licorice stick mean? *The length of the licorice stick is divided into eighths. Carly ate 3 of them.*
  - How would we write that as a fraction? *A numerator of 3 and a denominator of 8;  $\frac{3}{8}$*
  - How could we use unit fractions to write an equation equivalent to  $\frac{3}{8}$ ?  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{3}{8}$
3. Have students work together to complete the remaining problems.



### Counting Fractional Parts Isn't Just About Counting Fractional Parts (3.1C, 3.1D, 3.1F, 3.1G)

In the content extra for activity 3.F.13 Master (PG. 99), we looked at the importance of teaching students to count using the unit fraction. As students repeat the unit fraction (also known as *iterating*), it's important to help them focus on more than just counting. Students need to be developing their number sense about the relationship between the parts and the whole.

To build number sense, make sure students count with understanding, thinking about how many unit fractions it would take to build the whole. Students should be able to explain how many fourths it takes to make 1 whole, 2 wholes, etc., just like they should be able to explain how many ones are in the whole number 8.

This understanding may not develop naturally, so you must highlight for students the connection between the naming of the parts (e.g., fifths) and how many of them it takes to make the whole (5). Doing this reinforces the purpose of the parts of a fraction: the numerator *counts*, and the denominator tells what fractional part *is being counted*. As students practice composing and decomposing fractions, help them develop their part-to-whole understanding by frequently asking them questions such as "What size pieces are you counting?" and "How many of those size pieces would it take to make 1 whole?" Developing this understanding now will pay off in a big way later as students start to work with improper fractions and mixed numbers when they enter 4th grade.



### 3.F.15 MASTER ANSWER KEY (PG. 1 OF 3)

Directions: Fill in the missing information for each row in the table below.

Description	Fraction	Model	Composition & Decomposition
1 Carly ate $\frac{3}{8}$ of a licorice stick.	$\frac{\boxed{3}}{\boxed{8}}$		$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{3}{8}$
2 Sam ran $\frac{2}{4}$ of the way around the track.	$\frac{\boxed{2}}{\boxed{4}}$		$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$
3 Cleo ate $\frac{5}{6}$ of a granola bar.	$\frac{5}{6}$		$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{5}{6}$
4 Look for descriptions that involve length or distance. Student may use 1 instead of $\frac{3}{3}$ .	$\frac{\boxed{3}}{\boxed{3}}$		$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{\boxed{3}}{\boxed{3}}$

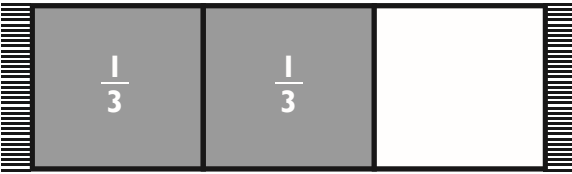


### 3.F.15 MASTER ANSWER KEY (PG. 2 OF 3)

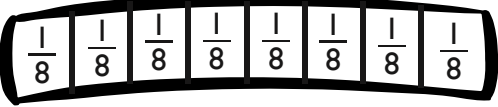
**Directions:**

1. Use the model to solve each problem.
2. Write the composition or decomposition using unit fractions.
3. Write the solution to the problem.

- 5 Queen Amygdala was planning for royal guests from planet Synapse. She told the seamstresses to sew a long, red carpet to welcome the guests. The seamstresses sewed  $\frac{1}{3}$  of the carpet each day for 2 days. If they sewed the same amount on both days, how much of the carpet had they made by the end of the second day?

Model	Composition & Decomposition
	$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$
<p><b>Solution</b> They had made <math>\frac{2}{3}</math> of the carpet by the end of the second day.</p>	

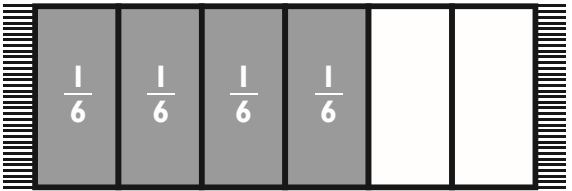
- 6 The Queen also wanted fancy banners. The royal painters worked a full week (weekdays and all weekend). If they painted  $\frac{7}{8}$  of the banner by the end of the week, and they painted the same amount each day, how much of the banner did they paint in one day?

Model	Composition & Decomposition
	$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{7}{8}$
<p><b>Solution</b> They painted <math>\frac{1}{8}</math> of the banner each day.</p>	




### 3.F.15 MASTER ANSWER KEY (PG. 3 OF 3)

- 7 The visiting royalty finally arrived! When their spaceship door opened, the kingdom was shocked: they were Synapse Slugs! The slugs oozed their way up the long, red carpet. It took them 4 hours to go  $\frac{4}{6}$  of the way up the carpet. If they went the same distance each hour, how far did they go in one hour?

Model	Composition & Decomposition
	$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{4}{6}$
<b>Solution</b> They went $\frac{1}{6}$ of the way up the carpet in one hour.	

- 8 When the Synapse Slugs reached Queen Amygdala, the kingdom erupted in applause! They cheered  $\frac{1}{2}$  an hour for each of the Synapse Slug princes (there were two of them). How long did they cheer in all?

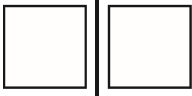

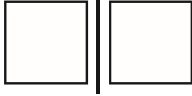

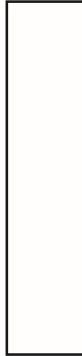
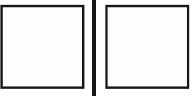
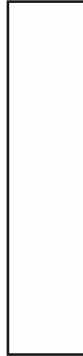
Model	Composition & Decomposition
	$\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$
<b>Solution</b> They cheered $\frac{2}{2}$ (1 whole) hour for the slugs.	



### 3.F.15 MASTER (PG. 1 OF 3)

Name: \_\_\_\_\_


Directions: Fill in the missing information for each row in the table below.

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<p>1 Carly ate <math>\frac{3}{8}</math> of a licorice stick.</p>			
<p>2 Sam ran <math>\frac{2}{4}</math> of the way around the track.</p>			$= \frac{2}{4}$
<p>3 Cleo ate <math>\frac{5}{6}</math> of a granola bar.</p>	$\frac{5}{6}$		
<p>4</p>			$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{\square}{\square}$


**Directions:**

1. Use the model to solve each problem.
2. Write the composition or decomposition using unit fractions.
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Model	Composition & Decomposition
	
<b>Solution</b>	

- 6** The Queen also wanted fancy banners. The royal painters worked a full week (weekdays and all weekend). If they painted  $\frac{7}{8}$  of the banner by the end of the week, and they painted the same amount each day, how much of the banner did they paint in one day?


Model	Composition & Decomposition
	
<b>Solution</b>	



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Model	Composition & Decomposition
	
<b>Solution</b>	

- 8 When the Synapse Slugs reached Queen Amygdala, the kingdom erupted in applause! They cheered  $\frac{1}{2}$  an hour for each of the Synapse Slug princes (there were two of them). How long did they cheer in all?

Model	Composition & Decomposition
	
<b>Solution</b>	