PBS Lesson Series

Math: Grade 4, Lesson 6, Fractions

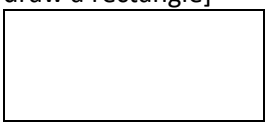
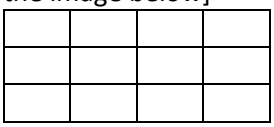
Lesson Focus: Compose Fractions
Practice Focus: Students will focus on practicing composing fractions in order to write the sum of fractions in more than one way.
Objective: Students will decompose fractions as a sum of fractions with the same denominators.
Key Vocabulary: numerator, denominator, fraction, unit fraction
TN Standards: 4.NF.B.3
Teacher Materials:

- Whiteboard and markers
- Student Practice Packet

Student Materials:

- Paper and a pencil, and a surface to write on

Teacher Do	Student Do
Opening (1 min) **Hello! Welcome to Tennessee's At Home Learning Series for math! Today's lesson is for all our 4th graders out there, though all children are welcome to tune in. This lesson is the sixth in our series.** **My name is ____ and I'm a ____ grade teacher in Tennessee schools! I'm so excited to be your teacher for this lesson! Welcome to my virtual classroom!** **If you didn't see our previous lesson, you can find it on the TN Department of Education's website at www.tn.gov/education. You can still tune in to today's lesson if you haven't see any of our others. But, it might be more fun if you first go back and watch our other lessons since we'll be talking about things we learned previously.** **Today we will be learning about composing fractions in mathematics! Before we get started, to participate fully in our lesson today, you will need:** • **Paper and a pencil, and a surface to write on** • **Student packet for Math, Grade 4, Lesson 6 which can be found at www.tn.gov/education.** **Ok, let's begin!**	Students get materials ready for the lesson.
Intro (5 mins) **Today we are going to think about composing fractions. A fraction is a number that names equal parts of a whole. We will also think about how to model our thinking about fractions by drawing pictures.**	

Let's start with drawing a picture of a whole divided into equal parts. Draw a rectangle on your paper [Pause, then draw a rectangle] 	Student draws rectangle.
Now we are going to show twelfths in our rectangle. What might that look like? [Pause]	
Twelfths mean that I am going to build the whole from 12 equal parts. One way to draw that might look like this: [Draw the image below] 	Student partitions rectangle into 12 equal parts.
Do you see how there are 12 equal size pieces within the rectangle? [Pause]	
Remember that in a fraction, the numerator is the number above the line that tells the number of equal parts. The denominator is the number below the line in a fraction that tells the number of equal parts in a whole. How could we write a fraction to represent one part of the whole that we drew? [Pause]	Students will be reviewing the meaning of a fraction and how to write a fraction to represent an object or drawing.
That's right, the fraction 1/12 represents one part of the whole. This is called a unit fraction because it has a numerator of one.	
Let's try to write an addition equation to show one whole built from twelfths. [Shade your rectangle as you say the following]: **For example, 4/12 + 8/12 = 12/12 or one whole. I know this because I could shade in 4 parts of my rectangle, plus 8 more parts, and the whole rectangle would be shaded.**	This warm-up will support students' facility with composing fractions, foreshadowing the twelfths they will work with to solve the first problem in the Teacher Model section.
Now you try! What is another addition equation to show one whole built from twelfths? [Pause]	
Great job! Here are some other possible options: [Write and say the following possible answers. If short on time, all responses do not need to be listed.] **1/12 + 11/12** **2/12 + 10/12** **3/12 + 9/12** **5/12 + 7/12**	

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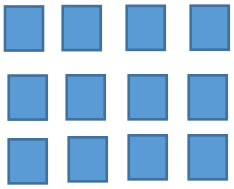
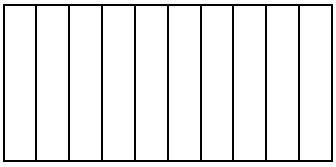
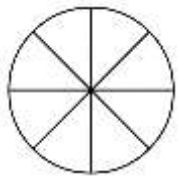
6/12 + 6/12	
<u>Teacher Model (10 mins)</u> Objective 1: Teacher modeling of how a fraction can be built from the sum of other fractions **Let's use what we just discussed to try and solve a problem about some friends sharing a pack of cards.** **Lynn, Paco, and Todd share a pack of 12 cards. Lynn gets 4 cards, Paco gets 3 cards, and Todd gets the rest of the cards. What fraction of the pack does Todd get?** **First, let's think about how many cards are in the pack that the friends are sharing.** [Pause] **Right, 12 cards make one whole pack.** **How many cards does Lynn have?** [Pause] **Good, she has 4 cards. Think about how you can represent the number of cards that Lynn has with a fraction.** [Pause] **There are 12 cards in the pack. The numerator tells the number of cards Lynn has, and the denominator tells the number of cards in the whole pack, so Lynn has 4/12 of the pack. Since each card is 1/12 of the pack, I could also think about this as 1/12 + 1/12 + 1/12 + 1/12 = 4/12.** **How many cards does Paco have?** [Pause] **Good, he has 3 cards. Think about how you can represent the number of cards that Paco has with a fraction. [Pause] That's right, Paco has 3/12 of the pack of cards. Since each card is 1/12 of the pack, I could also think about this as 1/12 + 1/12 + 1/12 = 3/12.** Objective #2: Teaching modeling/guided practice of finding an unknown value using the sum of fractions **Todd gets the rest of the cards. How many cards will Todd get? Hmm, I am going to try a picture of 12 equal sized cards to help me figure this out. Draw along with me.** [Draw an image like the one below.] 	Objective #1: Students will continue to review the meaning of a fraction and how to write a fraction to represent an object or drawing. This will allow students to understand that a fraction can be built from the sum of other fractions. Students will listen to the teacher do a think aloud working a contextual problem modeling the thought process for a problem from the start of the problem through finding the solution. Objective #2: Students will continue to review the meaning of a fraction and how to write a fraction to represent an object or drawing. This will allow students to understand that a fraction can be built from the sum of other fractions and use that understanding to find an unknown value. Students will listen to the teacher do a think aloud working a contextual problem modeling the thought

We know that Lynn has 4 of the cards. [Circle 4 cards and label with Lynn.] **We also know that Paco has 3 of the cards.** [Circle 3 cards and label with Paco.] **Todd gets the rest of the cards. How many cards are left that we did not circle?** [Pause] **Great! There are 5 cards not circled. That means Todd gets 5 cards. Write that amount as a fraction.** [Pause] Tying the learning together **Todd gets 5 cards. There are 12 cards in the pack. The numerator tells the number of cards Todd gets, and the denominator tells the number of cards in the whole pack, so Todd gets 5/12 of the pack. Since each card is 1/12 of the pack, I could also think about this as 1/12 + 1/12 + 1/12 + 1/12 + 1/12 = 5/12.**	process for a problem from the start of the problem through finding the solution. Tying the learning together: Students will listen to the teacher do a think aloud of the problem solution.
<u>Guided Practice (10 mins)</u> [I do] **In the problem that we just discussed, the whole is the pack of cards. Since there are 12 cards in the pack, each card represents 1/12 of the whole.** **Let's try another example together.** **Draw a fence divided into 10 equal sections.** [Pause, then draw the image below.]  [Point to a section and ask] **How do I know this is 1/10 of the fence?** [Pause] **1 is the numerator. 10 is the denominator. The fraction 1/10 tells this is 1 out of 10 sections.** [Point to and count 3 sections.] **Josie paints 3 sections of the fence. Write 3/10. What does the numerator 3 in this fraction mean?** [Pause] **The numerator 3 tells me that Josie paints 3 sections of the fence.** **How could we use an addition sentence to show how much of the fence Josie painted?** [Pause] **Right! 1/10 + 1/10 + 1/10 = 3/10.**	Students will continue to review the meaning of a fraction and how to write a fraction to represent an object or drawing. This will allow students to understand that a fraction can be built from the sum of other fractions. Students will respond to teacher questions with less scaffolding than the previous example. Students will have more time to think and respond on their own prior to the teacher providing solutions.

[Point to and count 4 sections.] **Margo paints 4 sections of the fence. Write 4/10. What does the numerator 4 in this fraction mean?** [Pause] **The numerator 4 tells me that Margo paints 4 sections of the fence.** **How could we use an addition sentence to show how much of the fence Margo painted?** [Pause] **Right! 1/10 + 1/10 + 1/10 + 1/10 = 4/10.** [We do] **Now let's think about a different problem. Do you like pizza?** [Pause] **What's your favorite kind of pizza?** [Pause] **My favorite is _____ pizza! In our new math problem, the whole is the pizza. A whole pizza is a single object. Our pizza is going to be cut into 8 equal size pieces.** **We can draw a picture of the pizza by drawing circle and cutting it into 8 equal parts.** [Model drawing the image below.]  **What fraction can you use to describe each piece of pizza?** [Pause] **Yes, 1/8** **What fraction can you use to describe the whole?** [Pause] **Good! 8/8** **Write an addition equation to describe the whole pizza.** [Pause] **Nice! A possible equation is 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 = 8/8** **What fraction can you use to describe 3 pieces being taken away?** [Pause] **Great! 3/8** **Write an equation to represent the 3 pieces.** [Pause] **Awesome! A possible equation is 1/8 + 1/8 + 1/8 = 3/8** [You do] **Here is a problem for you to try on your own:** **At a party, you are giving out 8 pieces of cake. People will get different amounts of cake. Tom get 1 piece of cake. Hal will get 1 piece of cake. Mary will get 2 pieces of cake. Nancy will get the remaining pieces of cake. What fraction of the cake will each person eat? Write an equation to match the situation.**	The student should do work during intentional teacher pauses and then receive answers along the way. For this last problem, students are working almost exclusively independently with the teacher providing answers at the end.

[Pause. Allow students time to think and work on their own before providing a solution.] **Let's see how you did! Tom ate 1/8 of the cake. Hal also ate 1/8 of the cake. Mary ate 2/8 of the cake. Nancy ate 4/8 of the cake. A possible equation is 1/8 + 1/8 + 2/8 + 4/8 = 8/8.** **How does knowing about equal parts help you add fractions?** [Pause] **Adding fractions means joining equal parts of the whole.** <u>Additional Problems (if Needed):</u> Write at least four different addition equations to show one whole built from eighths. Possible answers: 3/8 + 5/8 = 8/8 4/8 + 4/8 = 8/8 2/8 + 2/8 + 2/8 + 2/8 = 8/8 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 + 1/8 = 8/8 Write at least four different addition equations to show one whole built from tenths. Possible answers: 6/10 + 4/10 = 10/10 5/10 + 5/10 = 10/10 2/10 + 2/10 + 2/10 + 2/10 + 2/10 = 10/10 1/10 + 1/10 + 1/10 + 1/10 + 1/10 + 1/10 + 1/10 + 1/10 + 1/10 + 1/10 = 10/10 Mary and Lacey decide to share a pizza. The pizza has a total of 6 pieces. Mary ate 3 pieces and Lacey ate 2 pieces of the pizza. What fraction of the pizza did each person eat? Write a fraction addition equation to represent how much of the pizza the girls ate together. Answer: Mary ate 3/6. Lacey ate 2/6. 3/6 + 2/6 = 5/6 Matt is making a bracelet with 8 equal sections. He makes 4 sections of the bracelet on Saturday, and 2 sections of the bracelet on Sunday. What fraction of the bracelet did Matt make on Saturday? What fraction of the bracelet did Matt make on Sunday? Write an addition equation to show what fraction of the bracelet Matt made on both days combined. Answer: Sat. 4/8. Sun. 2/8. 4/8 + 2/8 = 8/8	Student responses will display their understanding of adding fractions as joining together.

Independent Practice (1 min) **Great work, everyone! Today, we practiced composing fractions. I hope you're seeing adding fractions as joining together referring to the same whole! You sure did a great job! After the video, you will have some problems to practice on your own. I will show you the independent practice problems now, or you can find them in the student practice for this lesson posted on our website, www.tn.gov/education.** [Teacher shows student practice page under document camera or camera zooms in on student practice page.] **Good luck and do your best!**	
Closing (1 min) **I enjoyed learning about composing and decomposing fractions with you! Thank you for inviting me into your home. I look forward to seeing you in our next lesson in Tennessee's At Home Learning Series! Bye!**	