**PBS Lesson Series**

**Math: Grade 4, Lesson 7, Fractions**

**Lesson Focus:** Add Fractions
**Practice Focus:** Students will focus on drawing models in order to add fractions.
**Objective:** Students will use various strategies to add fractions with a focus on drawing pictures and number lines.
**Key Vocabulary:** numerator, denominator, fraction, addend
**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 |
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| Opening: (1 min)<br>**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 seventh in our series.**<br><br>**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!**<br><br>**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.**<br><br>**Today we will be learning about adding fractions in mathematics! Before we get started, to participate fully in our lesson today, you will need:**<br>• **Paper and a pencil, and a surface to write on**<br><br>**Ok, let's begin!** | Students get materials ready for the lesson. |
| Intro (5 mins)<br>**Today we are going to think about adding 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 and number lines.**<br><br>**Let's start by looking at two fraction expressions.**<br>[Write and say] | |

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| **1/5 + 1/5 + 1/5**<br><br>**1/5 + 2/5**<br><br>**How are they the same?**<br>**How are they different?**<br>**Let's draw a picture to help us think about these fractions.**<br>**Draw along with me!** [Draw the image below]<br><br>  <br><br>**I drew a rectangle and split it into 5 equal size pieces. Remember that the denominator, or the number below the line in a fraction, tells the number of equal parts in a whole. The numerator is the number above the line that tells the number of equal parts.**<br><br>**Let's shade the rectangle to represent the first expression.** [Say aloud while shading] **1/5 plus 1/5 plus 1/5.**<br>**How much of the rectangle did we shade?** [Pause]<br>**That's right, we shaded 3/5 of the rectangle!**<br><br>**Now, let's draw and shade another rectangle to represent the second expression.** [Draw another rectangle. Say aloud while shading] **1/5 plus 2/5.**<br>**How much of the rectangle did we shade?** [Pause]<br>**That's right, we shaded 3/5 of the rectangle!**<br><br>**How are they the same?** [Pause]<br>**The expressions have the same value of 3/5. We can see this in the shaded rectangles.**<br>**How are they different?** [Pause]<br>**The expressions have different addends. Addends are numbers that are being added together.** | This warm-up will support students' understanding of adding fractions, foreshadowing the work in in the Teacher Model section by drawing a picture to represent the fractions.<br><br>Students will listen to the teacher think aloud modeling the thought process for a problem from the start of the problem through finding the solution. Students will follow along by drawing and shading on their own paper and responding to teacher questioning. |
| <u>Teacher Model (10 mins)</u><br><br>Objective #1: Teacher will explicitly instruct how to draw a picture in order to add fractions.<br>**Let's use what we just discussed to try and solve a problem about some friends painting a fence.**<br>**Josie and Margo are painting a fence green. Josie starts at one end and paints 3/10 of the fence. Margo starts at the other end and paints 4/10 of it. What fraction of the fence do they paint altogether?** | Objective #1:<br>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.<br><br>Through following along with the think aloud, students solve a |

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| **How many equal parts of the fence are there if Josie paints 3/10 of it?** [Pause]<br>**Right, the fence has a total number of 10 equal parts because the denominator tells the number of equal parts in a whole.**<br>**We can use a picture to help understand the problem.**<br>**Think about what a fence might look like if it has 10 equal size parts.** [Pause]<br>**Draw with me a fence with 10 equal size parts.**<br>  <br><br>[Point to one section of the fence drawing and say]<br>**Each part of the fence is 1/10 of the whole.**<br><br>**Now let's shade our drawing to show the part of the fence that Josie painted. Josie starts at one end and paints 3/10 of the fence. Start at the left and shade 3/10 of your drawing.** [Shade the drawing]<br><br>**Now let's shade our drawing to show the part of the fence that Margo painted. Margo starts at the other end and paints 4/10 of it. Start at the right and shade 4/10 of your drawing. [Shade the drawing]**<br><br>**Where does your drawing show the total number of equal parts in the fence?** [Pause, then point and count 10 sections of the fence drawing]<br><br>**Point to where the drawing shows the part Josie paints.** [Pause and label the fence drawing]<br>**Point to where the drawing shows the part Margo paints.** [Pause and label the fence drawing]<br><br>**Where does the drawing show the total number of tenths the two girls paint?** [Pause. Reference and label drawing to model thinking aloud about the solution.]<br>**Josie painted 3/10 of the fence. Margo painted 4/10 of the fence. Together, the friends painted 7/10 of the fence. Look at your drawing to see that 7 out of 10 equal parts of the fence are shaded.** | problem that requires finding the sum of 3/10 and 4/10. Students will model the fractions in the word problem on paper to represent the sum. The purpose of this problem is to have students develop strategies to add fractions. |
| Objective #2: Teacher will explicitly instruct how to use a number line to add fractions.<br>**Nice job! We can also use a number line to model this problem. Let's try this together. How many parts should we divide the number line into?** [Pause] | Objective #2:<br>Students will listen to the teacher do a think aloud working a contextual problem modeling the thought process for a problem from the start |

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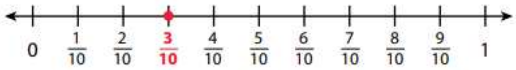
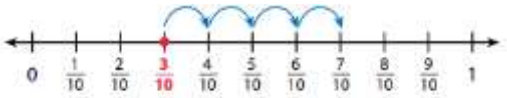
| **Right! 10 parts because the denominator of our fraction is 10, which is the total number of equal parts. Draw a number line with me like this:**<br>  <br>**Now we're going to make a point at 3/10 on the number line to show the part of the fence that Josie painted.**<br>**How much of the fence did Margo paint?** [Pause]<br><br>**That's right, Margo painted 4/10 of the fence. To show this on the number line, we are going to start at 3/10 and count 4 tenths to the right to add 4/10. Count with me!** [Point to the number line, draw jumps, and count aloud] **1 tenth, 2 tenths, 3 tenths, 4 tenths.**<br>  <br>**Where did we land on the number line?** [Pause]<br>**7/10! Just like in our fence drawing, we can see on the number line that the friends painted 7/10 of the fence.**<br><br>**What number tells the number of equal parts in the whole in the fence drawing?** [Pause]<br>**What number tells the number of equal parts in the number line?** [Pause] **Is it the same or different?** [Pause]<br><br>**It is the same! The answer to both questions is 10, becuase10 is the denominator. It tells the total number of equal parts in both the fence drawing and the number line. Both show 10 equal parts because they represent the same whole.**<br><br>Tying the learning together:<br>**Let's review!**<br>**How do you know that each section of fence is 1/10 of the whole fence?** [Pause]<br>**The denominator tells the total number of equal-sized fence sections. There are 10 equal parts in all, so one part equals 1/10.**<br><br>**What do the numerators, 3 and 4, tell you?** [Pause]<br>**3 tells the number of fence sections that Josie paints. 4 tells the number of fence sections that Margo paints.**<br><br>**How many tenths of the fence do Josie and Margo paint altogether?** [Pause] **Right! 7.** | of the problem through finding the solution.<br><br>Through following along with the think aloud, students solve a problem that requires finding the sum of 3/10 and 4/10. Students will model the fractions in the word problem on paper to represent the sum. The purpose of this problem is to have students develop strategies to add fractions.<br><br>Tying the learning together:<br>Students will compare and connect the different representations and identify how they are related.<br><br>Students will respond to questions to display an understanding of how to add any two fractions that have the same denominator. |

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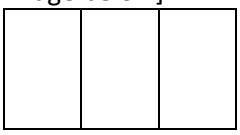
| **Write an equation to show what fraction of the fence Josie and Margo painted altogether.** [Pause]<br>**Here are two different questions you could write.** [Write and say aloud] **3 tenths + 4 tenths = 7 tenths, OR 3/10 + 4/10 = 7/10.**<br><br>**What would be the sum if the fractions were 3/10 and 5/10?** [Pause] **Right! 8/10.**<br><br>**Explain how you add fractions that have the same denominator.** [Pause]<br>**Add the numerators of the addends to get the numerator of the sum to find how many parts you added. The denominators of the sum and the addends are the same because that tells what kind of parts you added.** | |
| <u>Guided Practice (10 mins)</u><br>[I do]<br>**Let's practice three more fraction addition problems today. Use models like a drawing or a number line to help you find a solution.**<br><br>**Here is the first problem: Lita and Otis help their mom clean the house. Lita cleans 1/3 of the house. Otis cleans 1/3 of the house. What fraction of the house do Lita and Otis clean altogether?** [Pause]<br><br>**I am going to draw a picture like this to help me:** [Draw the image below]<br>  <br><br>**Take a moment to find a solution using your drawing.** [Pause]<br><br>**Nice job! Shade 1/3 of the drawing, and then another 1/3 of the drawing. Lita and Otis cleaned 2/3 of the house altogether. You can write the equation 1/3 + 1/3 = 2/3.**<br><br>**Remember, you could also show 1/3 on a number line divided into thirds and count 1 tick mark to the right.**<br><br>[We do] | Students work alongside the teacher as the teacher thinks aloud.<br><br>Students will respond to teacher questions with less scaffolding than the previous example. Students will have more time to think and |

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| **Here is the second problem: Mark and Imani use string for a project. Mark's string is 1/5 of a meter long. Imani's string is 3/5 of a meter long. How long are the two strings combined?**<br><br>**Give this one a try! I would suggest drawing a number line to help you.** [Pause to allow students time to think and work.]<br><br>**For this problem, you might draw a number line divided into fifths.** [Pause and draw this.]<br>**Show 1/5 on a number line divided into fifths and count 3 marks to the right.** [Pause and draw this.]<br>**You could also write the equation 1/5 + 3/5 = 4/5. What does 4/5 mean in this problem?** [Pause]<br>**The two strings combined are 4/5 of a meter long.**<br><br>[You do]<br>**Now you are going to try a problem on your own. Remember to draw a picture or use a number line! Listen as I read aloud: Paola makes a fruit smoothie. She uses 2/8 of a pound of strawberries and 4/8 of a pound of blueberries. How many pounds of fruit does she use?**<br>[Pause to allow students time to think and work.]<br>**Great job, students! Paola used 6/8 pounds of fruit to make her smoothie.**<br><br><u>Additional Problems (if Needed):</u><br>What is 1/6 + 3/6? Draw a model to show your answer.<br>Answer: 4/6<br>  <br><br>In science class, students spend 2/10 of the time reading and 7/10 of the time doing an experiment. How much time did the students spend reading and doing an experiment altogether?<br>Answer: 2//10 + 7/10 = 9/10<br><br>Luke spent 2/6 of an hour practicing violin in the morning. He spent 3/6 of an hour practicing violin in the evening. How much time did Luke spend practicing violin that day?<br>Answer: 2/6 + 3/6 = 5/6. Luke spent 5/6 of an hour practicing.<br><br>Jin cleans 1/10 of the patio before lunch and 9/10 of the patio after lunch. What fraction of the patio does Jin clean altogether? Show your work.<br>Answer: 1/10 + 9/10 = 10/10 (or 1 whole). Jin cleaned the whole patio. | respond on their own prior to the teacher providing solutions.<br><br>Students are working almost exclusively independently with the teacher providing answers at the end. |

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| Independent Practice (1 min)<br>**Great work, everyone! Today, we practiced adding fractions. I hope you're seeing adding fractions as joining together referring to the same whole! You sure did a great job! 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.]<br>**Good luck and do your best!** | |
| Closing (1 min)<br>**I enjoyed learning about adding 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!** | |