PBS Lesson Series

Math: Grade 3, Lesson 7, Finding Equivalent Fractions

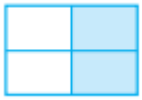
Lesson Focus: Finding Equivalent Fractions
Practice Focus: Students will focus on practicing how to use number lines and area models in order to show two fractions are equivalent and represent the same quantity.
Objective: Students will use area models and number lines to find equivalent fractions with a focus on showing that two fractions are equivalent and represent the same quantity.
Key Vocabulary: denominator, equivalent fractions, fraction, numerator
TN Standards: 3.NF.A.3
Teacher Materials:

- Paper/pencil or dry erase board/marker
- 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 3rd graders out there, though all children are welcome to tune in. This lesson is the seventh 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 how to use number lines and area models in order to show two fractions are equivalent and represent the same quantity in mathematics! Before we get started, to participate fully in our lesson today, you will need:** • **Paper and pencil and** **Ok, let's begin!**	Students get materials ready for the lesson.
Intro (5 min.) **Today we are going to think about equivalent fractions. A fraction is a number that names equal parts of a whole. We**	This warm-up will support students' understanding of equivalent fractions.

will also think about how to model our thinking about fractions by using area models and number lines. **Let's start by looking at these two fractions.** [Write and say] **1/2** **6/8** **How are these fractions the same?** [Pause] **They are both fractions with numerators and denominators.** **How are these fractions different?** [Pause] **They have different numerators and denominators.** **Two different fractions can name the same part of a whole. How can we write two different fractions for a rectangular area model?** [Pause.] **Let's draw a picture to help us think about these fractions. Draw along with me!** [Draw the image below]  **Let's look at this area model. How many parts do we have?** [Pause] **Yes, we have 2 parts. How many are shaded?** [Pause] **Yes, 1 of the 2 parts are shaded. So, this area model would be ½.** **Draw along with me again!** [Draw the image below] **Let's add a horizontal line.**  **Let's look at this area model. How many parts do we have?** [Pause] **Yes, we have 4 parts. How many are shaded?** [Pause] **Yes, 2 of the 4 parts are shaded. So, this area model would be 2/4.** **½ is equal to 2/4. Two fractions are equivalent fractions if they are the same size. ½ and 2/4 are simple equivalent fractions.**	

Let's start by looking at these two fractions. [Write and say] **1/3** **2/6** **How are these fractions the same?** **They are both fractions with numerators and denominators.** **How are these fractions different? They have different numerators and denominators** **Two different fractions can name the same part of a whole. How can we write two different fractions for a rectangular area model?** [Pause.] **Let's draw a picture to help us think about these fractions. Draw along with me!** [Draw the image below]  **Let's look at the area model. How many parts do we have?** [Pause] **Yes, we have 3 parts. How many are shaded?** [Pause] **Yes, 1 of the 3 parts are shaded. So, this area model would be 1/3.** **Draw along with me again!** [Draw the image below] **Let's add a horizontal line.**  **Let's look at this area model. How many parts do we have?** [Pause] **Yes, we have 6 parts. How many are shaded?** [Pause] **Yes, 2 of the 3 parts are shaded. So, this area model would be 2/6.** **1/3 is equal to 2/6. Two fractions are equivalent fractions if they name the same part of a whole. ½ and 2/4 are simple equivalent fractions.**	
<u>Teacher Model (10 min.)</u>	

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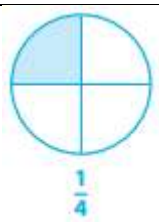
Objective #1: Teacher will explicitly instruct how to use an area model to find equivalent fractions. **Let's use what we just discussed to try and solve a problem about equivalent fractions.** **Listen and follow along as I think and work out this problem. Carl eats 2/8 of an orange. Trey's orange is the same size. He eats 1/4 of it. Show that the two boys eat the same amount of an orange.** **Okay, they both ate the same amount. It is not asking me about how many whole oranges Trey and Carl ate. It says to show that the two boys ate the same amount. The word amount means the quantity of something.** **Let's draw a picture to help us think about these fractions. Carl eats 2/8 of an orange. 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. My denominator is 8. So, I will need 8 pieces. Since he ate 2 out of the 8, I am going to shade 2.** **Since an orange is round, I am going to draw circles. Draw along with me!** [Draw the image below]  $\frac{2}{8}$ **The amount that Trey ate is the same as Carl's, but he eats ¼ of it.** **Why is it important that Trey's orange is the same size as Carl's orange?** [Pause] **Yes, because we need to make sure our models match so we can compare them. The circles should be the same size so that the amount shaded is the same for equivalent fractions.** **I am going to draw another circle. Draw along with me!** [Draw the image below] **Trey's fraction is ¼. We need 4 equal parts in our whole. We need to shade 1 of the equal parts.**	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 responding to teacher questioning. Objective #1: 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.



What fraction of an orange did each boy eat? [Pause] **Yes, Carl ate 2/8 and Trey ate ¼ which are the same amounts. These are called equivalent fractions. They are equal to each other.**

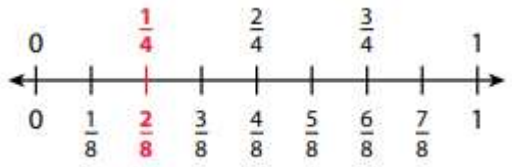
Objective #2: Teacher will explicitly instruct how to use a number line to find equivalent fractions.

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]

Right! 8 parts because the denominator of our fraction is 8, which is the total number of equal parts.

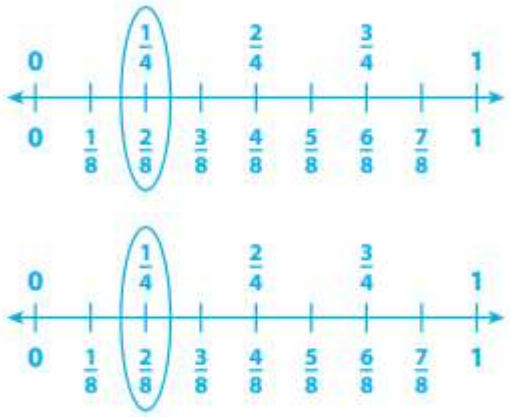
The bottom of our number line will be divided into eights. Then, we will divide the number line into fourths too because the other fraction is ¼. Our denominator is 4.

Draw a number line with me like this: [Draw the image below]



Why is it helpful to use one number line for both fractions instead of two separate number lines? [Pause] **Using one number line ensures that the wholes are the same size, and it is easier to tell whether the fractions represent the same point.**

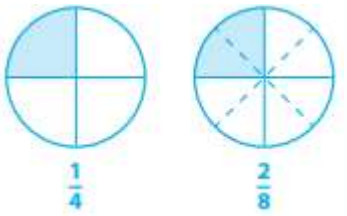
Now we're going to look at 2/8 on the number line to show the part of the orange that Carl ate. Look at ¼ on the number line which is how much Trey ate. ¼ and 2/8 are located at the same point on the number line. Circle those fractions on the number line like mine. [Circle the two fractions.]

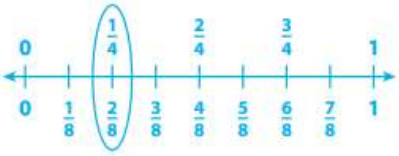


That's right, 2/8 = ¼. So, Carl and Trey ate the same amount of an orange.

Tying the learning together

Let's review!
To show fractions are equivalent, we can show the same amount in equal-sized area models, or we can see if they are at the same point on a number line. [Refer back to your previous area models and number line.] **As we compare and connect these different representations, we can visually identify how they are related.**

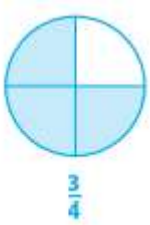


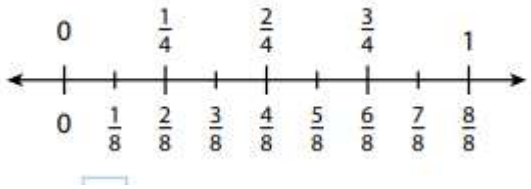


Tying the learning together: Students will compare and connect the different representations and identify how they are related.

Students will respond to questions to display an understanding of how to identify simple equivalent fractions.

<u>Guided Practice (10 min.)</u>

[I do] **Listen and follow along as I think and work out this problem. Lina and Adam each order a small pizza. They eat the same amount. Lina eats 3/4 of her pizza. Adam's pizza is divided into 8 slices. How many slices of pizza did Adam eat?** **Okay, we know that we have two pizzas because they each ordered a small pizza. We know they ate the same amount, but not the same number of slices. Lina ate ¾ . The denominator is 4. So, I will need 4 pieces. Since he ate 3 out of the 8-4, I am going to shade 3.** **Let's draw a picture to help us think about these fractions. Since a pizza is round, I am going to draw circles. Draw along with me!** [Draw the image below] **Draw a circle cut into 4 slices (parts of our whole) and shade in three of them.** [Pause]  **Let's draw another picture to represent Adam's pizza. We know that Adam's pizza is divided into 8 slices. Draw along with me!** [Draw the image below] **Draw a circle cut into 8 slices (parts of our whole). Now shade the same amount of the circle to match Lina's above. Let's compare the two pizzas.** [Pause.]  **How many slices of pizza did Adam eat?** [Pause] **Yes, Adam ate 6 slices of pizza. So, Lina ate ¾ and Adam ate 6/8. ¾ and 6/8 are equivalent fractions. They are equal amounts.**	[I do] Students work alongside the teacher as the teacher thinks aloud. Through following along with the think aloud, students solve a problem that requires finding the equivalent fraction of …… The purpose of this problem is to have students develop strategies to find equivalent fractions.

[We do] **We can also use a number line to model this problem. Let's try this together.** **Lina and Adam each order a small pizza. They eat the same amount. Lina eats 3/4 of her pizza. Adam's pizza is divided into 8 slices. How many slices of pizza did Adam eat?** **We know that Lina eats 3/4 of her pizza. How many parts should we divide the number line into?** [Pause] **Right! 4 parts because the denominator of our fraction is 4, which is the total number of equal parts.** **Adam's pizza is divided into 8 slices.** **How many parts should we divide the number line into?** [Pause] **Right! 8 parts because the denominator of our fraction will be 8, which is the total number of equal parts.** **The bottom of our number line will be divided into eights.** **Draw a number line with me like this:** [Draw the image below]  **Now, circle ¾ on the number line. What fraction is under ¾ or matches up at the same point as ¾?** [Pause.] **Yes, 6/8! So Adam ate 6 slices.** [You do] **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:** **Alex eats 1/2 of a candy bar. Evan's candy bar is the same size. He eats 4/8 of it. Show that the two boys eat the same amount of a candy bar.** [Pause to allow students time to think and work.] [Draw these area models to show students.]	[We do] 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. [You do] Students are working almost exclusively independently with the teacher providing answers at the end.

 $\frac{1}{2}$ = $\frac{4}{8}$ **Great job, students! Let's look at your work. Here is a possible solution.** Additional Problems (if Needed): 1. **Sharon and Drew each order a small pizza. They eat the same amount. Sharon eats 1/2 of her pizza. Drew's pizza is divided into 10 slices. How many slices of pizza did Drew eat? Draw a model to show your work.** 2. **S and Drew each order a small pizza. They eat the same amount. Sharon eats 1/2 of her pizza. Drew's pizza is divided into 10 slices. How many slices of pizza did Drew eat? Draw a number line to show your work.**	Tying the learning together: Students will compare and connect the different representations and identify how they are related.
Independent Practice (1 min.) **Great work, students! Today, we reviewed the meaning of equivalent fractions. I hope you're seeing some connections to equivalent fractions and number lines! 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.] **Good luck and do your best!**	
Closing (1 min) **I enjoyed reviewing equivalent 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!**	