PBS Lesson Series

Math: Grade 3, Lesson 6, Explore Equivalent Fraction

Lesson Focus: The student will explore equivalent fractions.
Practice Focus: Students will focus on practicing recognizing and generating equivalent fractions in order to be able to explain why the fractions are equal.
Objective: Students will use fraction models to generate equivalent fractions with a focus on simple equivalents.
Key Vocabulary: • denominator: the number below the line in a fraction that tells the number of equal parts in the whole. • equivalent fractions: two or more different fractions that name the same part of a whole or the same point on a number line. • fraction: a number that names equal parts of a whole. A fraction names a point on the number line. • numerator: the number above the line in a fraction that tells the number of equal parts that are being described.
TN Standards: 3.NF.A.3
Teacher Materials:

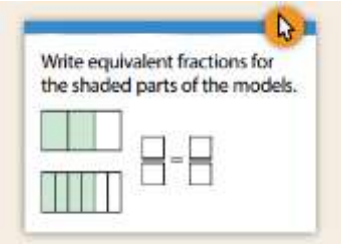
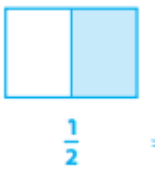
- Paper/pencil or dry erase board/marker

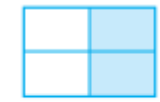
Student Materials:

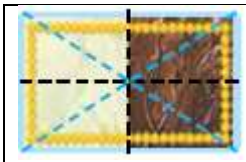
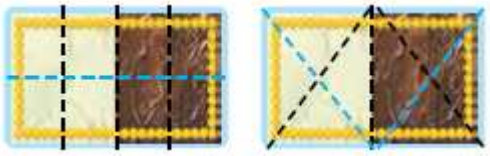
- Paper
- Pencil
- Student packet for Math, Grade 3, Lesson 6
- A surface to write on.

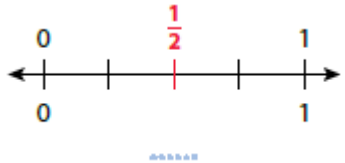
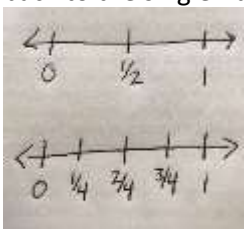
Teacher Do	Student Do
Opening (1 min) **Hello! Welcome to Tennessee's At Home Learning Series for math! Today's lesson is for all our 3rd graders out there, though all children are welcome to tune in. This lesson is the sixth in our series.** **My name is ____ and I'm a ____ grade teacher in Tennessee 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 seen 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 Equivalent Fractions in mathematics! Before we get started, to participate fully in our lesson today, you will need:** • **Paper and pencil** • **A surface to write on and**	Students get materials ready for the lesson.

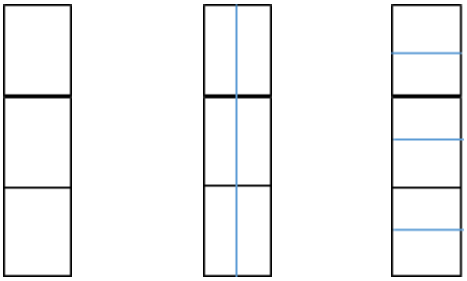
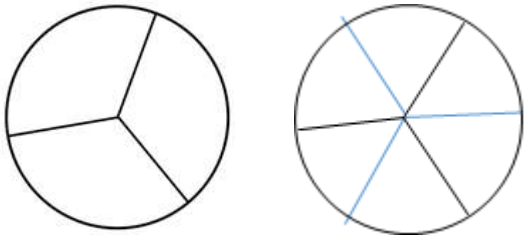
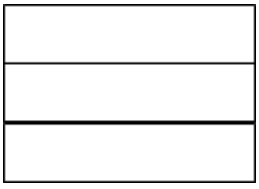
PBS Lesson Series

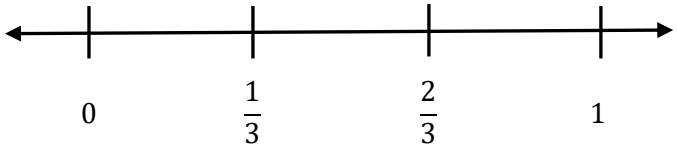
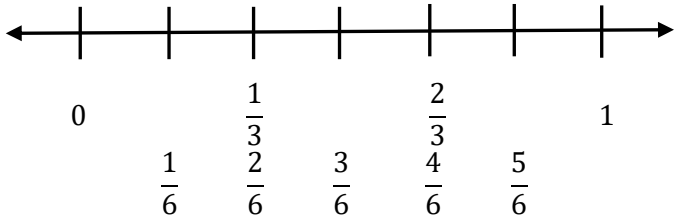
Ok, let's begin!	
Intro (5 min.) [Teacher will need to draw these area models on paper/board before the lesson.] **Students, let's review what you have previously learned about fractions. Let's look at these area models of fractions. What fraction represents the first model?** [Pause] **Correct, two thirds.** [Teacher writes 2/3 in the first fraction boxes.] **The 2 is our numerator and the 3 is our denominator. What fraction represents the second model?** [Pause] **Correct, four sixths.** [Teacher writes 4/6 in the second fraction boxes.] **These fractions are equal which also means equivalent. So, 2/3 and 4/6 are equivalent fractions.**  	This warm-up will support students' understanding of using area models to find equivalent fractions.
Teacher Model (10 min.) Objective 1: Review drawing visual fraction models to generate equivalent fractions. **Students, let's do a problem together.** **Izzy's mom bakes a rectangular cake. She puts chocolate frosting on half of the cake and vanilla frosting on half of the cake. So, I am going to draw a rectangle. Then, cut the rectangle in half and shade one side to represent the chocolate icing.** [Teacher draws rectangle and draws a vertical line to represent cutting the cake in half. Write ½ under picture.]  **Then Izzy's mom cuts the cake into fourths so that each fourth has either all chocolate or all vanilla frosting.**	Objective #1: Students will listen to the teacher do a think aloud working a fraction problem modeling the thought process from the start of the problem through finding the solution.

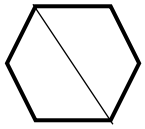
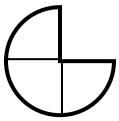
 $= \frac{2}{4}$ [Teacher draws a horizontal line in the rectangle to represent cutting it in fourths. Write 2/4.] **What fraction other than 1/2 names the part of the cake that has chocolate frosting?** [Pause] **2/4 ½ is equivalent to 2/4. So half of our rectangular cake is chocolate, but we could also say that 2/4 of our rectangular cake is chocolate.** Objective #2: Guided Practice: **What fraction other than ½ names the part of the cake that has chocolate frosting?** [Pause] **It's 2/4 because when you divide the cake into four equal parts, two of the four parts have chocolate frosting. The amount of cake with chocolate frosting stays the same whether it is cut into halves or fourths. This means ½ and 2/4 are equivalent fractions.** **You have seen many different types of fraction models, such as area models, number lines, and fractions bars. You can find equivalent fractions by dividing the same model in different ways.** **Look at the three rectangular cakes below. Each cake shows fourths. Notice that there are two pieces of chocolate cake in each of the cakes. It doesn't matter how the cake is cut into fourths. Let's see if we can draw lines on one of the cakes to show eighths.** [Teacher shows the three cake models below.]  **Let's do the first cake together. We need to draw the cake on our paper so that it looks like the first cake model.** [Teacher draws the cake and displays her drawing so students can see it and copy it on their paper.]**We can shade the right half that is the chocolate frosting. Now we need to include the two lines that cut the cake into fourths. We can just draw solid lines instead of the dashed lines. Does your cake look similar to this one?** [Pause] **Now let's draw lines to show eight equal parts. I can make two diagonals across the rectangular cake so that it looks like this.** [Teacher shows the cake model with the diagonal cuts.]	Objective #2: Students will be building off their work on fractions to recognize and generate equivalent fractions. Student watches teacher cut the first cake into eighths.

 **I started with a cake cut into fourths, and after I drew two diagonal lines across the cake, I now have eight parts.** **Now you try showing eight parts on the second cake or the third cake. Let me show you what the cakes look like again so you can draw them on your paper.** [Teacher shows the three cakes.]	Student chooses the second or third cake to cut into eighths. Student checks their cake to see if they have eight equal parts.
 **We just did the first cake together. You choose the second or third cake. I'll give you a minute to draw the cake on your paper. Remember to shade the half that is chocolate frosting, and remember to draw the lines that cut the cake into fourths.** [Pause]	Student signals understanding with a thumbs up. Student holds up four fingers to indicate there are 4 pieces of cake with chocolate frosting. Student records 2/4.
Now you are ready to draw a line or lines to show eight equal parts. [Pause.] **This is one way to show eight parts on the second and third cakes.** [Teacher shows the two cakes below.]  **Do you see how the horizontal line I drew through the middle of cake two has made eight equal parts?** [Pause] **Give me a thumbs up when you see it. Do you see how the two lines I drew on the third cake shows eighths?** [Pause] **Give me a thumbs up when you see it.** **Look at one of the cakes that is cut into eighths. How many pieces of the cake have chocolate frosting now? Show me with your fingers.** [Pause.] **Yes, now there are 4 pieces with chocolate frosting. It doesn't matter how the cake is cut into eighths, there are four pieces. We can write this as a fraction where our numerator is 4 and the denominator is 8.** [Teacher writes 4/8.]	

Great job showing equivalent fractions on the area models we used to represent the cakes! Now let's look at different equal-sized parts on a number line to find equivalent fractions. Look at this number line that is partitioned into fourths and that shows the location of ½. [Teacher shows number line below.]  **Fill in the fraction for fourths that is equivalent to ½.** [Pause.] **Did you record 2/4?** [Teacher writes 2/4 in the blank.] [Students may not be familiar with seeing number lines labeled with fractions on both the top and the bottom. Draw two separate number lines like the ones below and connect back to the single number line.]  **You may be used to drawing separate number lines to show your equivalent fractions. You would draw a number line showing ½ and then another number line below it that shows ¼, 2/4, ¾. We can see from the two number lines, that ½ and 2/4 are both in the same location on the number lines and are both the same distance from zero on the number lines. So ½ and 2/4 are equivalent fractions. Having them both on one number line can make it easier to see the equivalent fractions.** [Tying the learning together:] **Take a minute to reflect on the fraction models from today. Why does it make sense that one-half and two-fourths can name the same amount?** [Pause.] **Thinking back to the cake models, one-half of a cake can be divided again to make two fourths, but the amount of cake does not change. So ½ and 2/4 represent the same quantity divided into different numbers of parts.**	Students will respond to questions to display an understanding of how two fractions can have an equivalent fraction. Tying the learning together: Student reflects over today's work and verbalizes why ½ and 2/4 name the same amount.
<u>Guided Practice (10 min.)</u> **So far, we've considered simple equivalent fractions when our wholes have been sectioned into halves, fourths, and**	

eighths. Let's now practice finding equivalent fractions for thirds. The model below shows thirds. I'll draw a line so that the model shows sixths. [Teacher shows the model sectioned into thirds. Teacher draws a vertical line to make sixths and shows the resulting shape. Teacher then shows the second way she can show sixths.]  **Below is another model that shows thirds. Draw the circle on your paper. Draw the lines so that your circle shows thirds. Let's work together to show sixths. I'll give you a minute to get started first.** [Pause and then show the circle with sixths.]  **Give me a thumbs up if you agree that my circle shows sixths.** [Pause] **Now it's your turn to try showing sixths!** [Teacher shows the model below.] **Draw this rectangular model on your paper and be sure to draw the lines that cut the rectangle into thirds.** [Pause] **Now talk out loud while you draw your line to describe how you are making sixths.** [Pause.]  **If you said you drew a vertical line down the middle of the rectangle, then you made six equal parts, or sixths.** [Teacher draws a vertical line down the middle of the model to show sixths.]	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.

How can we show sixths on a number line? Here is a number line that shows thirds. [Show the number line.] **Draw this number line on your paper.** [Pause]  **Let's work together to show sixths on the same number line. Where should we draw our lines? I'll give you a minute to draw them first.** [Pause and then show the number line with sixths.]  **Does that make sense to you? We only had to draw three lines to make sixths because 2/6 is at the same point as 1/3, 4/6 is at the same point as 2/3, and 6/6 is at the same point as 3/3 or 1.** **You try to write an equivalent fraction for 1/3 using the number line or your area model above.** [Pause to allow students to write an equivalency statement.] **What equivalent fraction did you write? Read it out loud.** [Pause.] **Great! Did you write 2/6? I can see on our number line model that 2/6 is equivalent to 1/3.** [Teacher points to 1/3 and 2/6 on the number line.] **I can also see on the area models that 1/3 = 2/6.** **Whenever we need to find or generate an equivalent fraction, we can draw a fraction model or number line to help us!** [Additional problems if needed]	Students are working almost exclusively independently with the teacher providing answers at the end.

The hexagon is cut into two equal parts, or two halves. Draw a line to show fourths. Draw a line to show eighths. Use your models to write the equivalent fractions for ½.  **The pie model is cut into thirds. Draw a line to show sixths. Use your model to write the equivalent fraction for 1/3.** 	
Independent Practice (10 min.) **Great work, students! Today, we reviewed recognizing simple equivalent fractions. I hope you're seeing some connections to fractions and equivalent fractions! 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) **Students, 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!**	