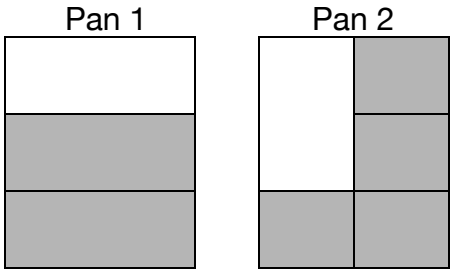
Equivalent Fractions
A Closer Look at the Video

After watching the *Equivalent Fractions* video, make sense of the mathematics by taking a closer look at the problem situations and solutions. Use the comments and questions in bold to help you solve the problems and develop a deeper understanding of equivalent fractions.

Problem 1:
Guy walks into a bakery and wants to buy brownies. There are two pans, each partially full of brownies. The bakery is selling the remaining brownies in each pan for $4.00. Which pan of brownies is the better buy? Explain your reasoning.



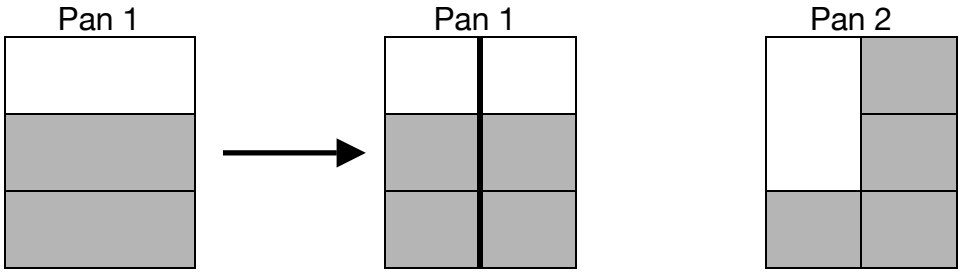
Should he buy the pan with two out of three bigger pieces, or should he buy the pan with four out of six smaller pieces? It looks like two of the smaller pieces in the pan on the right are the same size as one of the larger pieces in the pan on the left, so the pans contain the same amount.

Each pan of brownies is a fraction of a full pan. If the pans contain the same amount, the two fractions must be equivalent.

What fraction describes the amount of brownies in the first pan? $\frac{2}{3}$

What fraction that describes the amount of brownies in the second pan? $\frac{4}{6}$

How can you show that the two fractions are equivalent? If you divide the pan with the larger pieces in half, you get four smaller pieces. Now each pan has four small pieces.

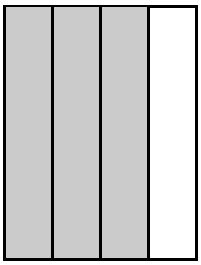


$\frac{2}{3}$ $\frac{\text{shaded parts}}{\text{total parts}}$ $\frac{4}{6}$ $\frac{\text{shaded parts}}{\text{total parts}}$

Consider the first pan of brownies. What happened to the number of shaded parts when you cut the brownies? The number of shaded parts doubled. **What happened to the number of total parts?** The number of total parts doubled. If you start with two thirds and double both the number of shaded parts and the number of total parts, you get four sixths, an equivalent fraction.

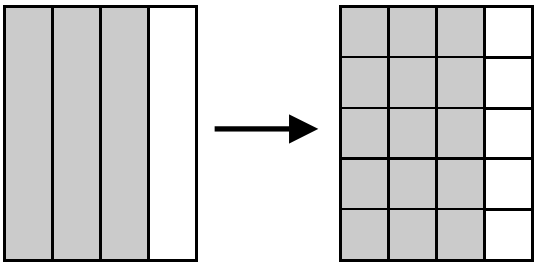
$$\frac{2}{3} \overset{\times 2}{=} \frac{4}{6}$$

Problem 2:
What fraction of the following region is shaded? There are four total parts and three shaded parts, so $\frac{3}{4}$ of the region is shaded.



Divide the region into five equal rows. Now what fraction of the region is shaded?

There are twenty total parts and fifteen shaded parts, so $\frac{15}{20}$ of the region is shaded.



$\frac{3}{4}$ $\frac{\text{shaded parts}}{\text{total parts}}$ $\frac{15}{20}$ $\frac{\text{shaded parts}}{\text{total parts}}$

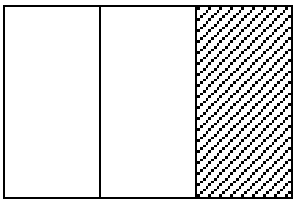
What happened to the number of shaded parts? There are five times as many shaded parts. **What happened to the number of total parts?** There are five times as many total parts. **Are the two fractions are equivalent? Explain your reasoning.** The two fractions

are equivalent because they represent the same amount. If you start with three fourths and multiply both the numerator and denominator by five, you get an equivalent fraction.

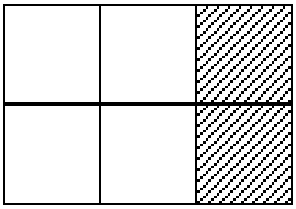
$$\frac{3}{4} \overset{\times 5}{=} \frac{15}{20}$$

You can create equivalent fractions by multiplying the numerator and denominator by the same number.

Problem 3:
Fold a paper into three equal parts and shade one part to represent one third.



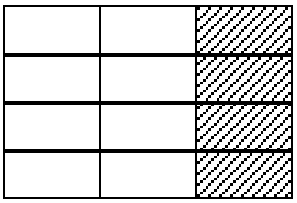
Refold the paper as before. Now fold the paper in half and predict what fraction you will see when you unfold the paper. Finally, unfold the paper. What fraction of the paper is shaded? Two sixths of the paper is shaded.



What happened to the number of shaded parts? There are twice as many shaded parts.
What happened to the number of total parts? There are twice as many total parts. Folding the paper in half had the same effect as multiplying the numerator and denominator by two.

$$\frac{1}{3} \overset{\times 2}{=} \frac{2}{6}$$

Refold the same paper again. Now fold the paper in half again and predict what fraction you will see when you unfold the paper. Finally, unfold the paper. What fraction of the paper is shaded? Four twelfths of the paper is shaded.



What happened to the number of shaded parts? There are twice as many shaded parts. **What happened to the number of total parts?** There are twice as many total parts. Folding the paper in half had the same affect as multiplying the numerator and denominator by two.

$$\frac{2}{6} \overset{\times 2}{=} \frac{4}{12} \quad (\times 2)$$

Equivalent fractions represent the same amount. You can create equivalent fractions by multiplying the numerator and denominator of a fraction by the same number. Models like the pans of brownies or paper folding help show why this procedure works.