

Fractions: Booklet 4 - Equivalent Fractions

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To all of the mathematicians, from antiquity to the present, who discovered the principles of mathematics goes our heartfelt appreciation for your dedication.

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Relative Sizes: A Cutting Activity

Purpose	The purpose of this lesson is to use paper cutting to demonstrate that larger numbers of smaller pieces cover the same area as a smaller number of larger pieces. It also introduces the physical concept of multiplier in the costume of the scissors. This activity has students cut paper to directly experience the multiplier effect. It also uses measurement of the area covered by each fractional unit to graph the relationship between the size of the denominator and the area covered by that piece. This reveals the inverse nature of fractions.
Prerequisites	Basic concept of a fraction, what the numerator and the denominator are, fraction notation, calculation of the area of a rectangle, and coordinate graphing
Materials	Relative Sizes: A Cutting Activity, Worksheets 1 - 3, pages 4 - 6 Scissors and pencil Several sheets of white, blank paper Inch ruler Graph paper
Preparation	Pre cut several 3 x 8 inch strips of paper. <i>Do not use 8 ½ inch wide strips; cut off the last half inch.</i> We are going to be measuring the area of each fractional unit, so the strips need to be carefully cut. Copy these four sentences onto a piece of paper or an overhead: <ol style="list-style-type: none">1. The <i>more</i> pieces in the whole, the <i>greater</i> the size of each piece.2. The <i>more</i> pieces in the whole, the <i>less</i> the size of each piece.3. The <i>less</i> pieces in the whole, the <i>greater</i> the size of each piece.4. The <i>less</i> pieces in the whole, the <i>less</i> the size of each piece.
Lesson Part 1 Halves of Halves	“Each strip is defined here as the whole, or one. Label one of your strips as the whole. Do not cut this one up.” “Take another strip, fold it in half using a hamburger fold,* and cut it in half.” “Label each piece as one-half, $\frac{1}{2}$.” “Put both of the one-half pieces on top of the whole. What do you notice?” “They match. I still have the same amount.” “Take another strip, use a hamburger fold and cut it in half. Now use a hamburger fold to cut each of your halves in half. How many pieces will you have then?” “Four.” “How should you label these pieces? How do you know?” “I will label each one as $\frac{1}{4}$ because there are four parts in the whole.” “Put all of your $\frac{1}{4}$ pieces on top of your whole. What do you notice?” “They cover the whole thing. I still have the same amount.”

* A hamburger fold is a fold that creates two squarish sections. It is the shortest line fold. A hot dog fold is a long fold that looks like a hot dog bun.