LESSON 7

Comparing Fractions with the Rule of Four

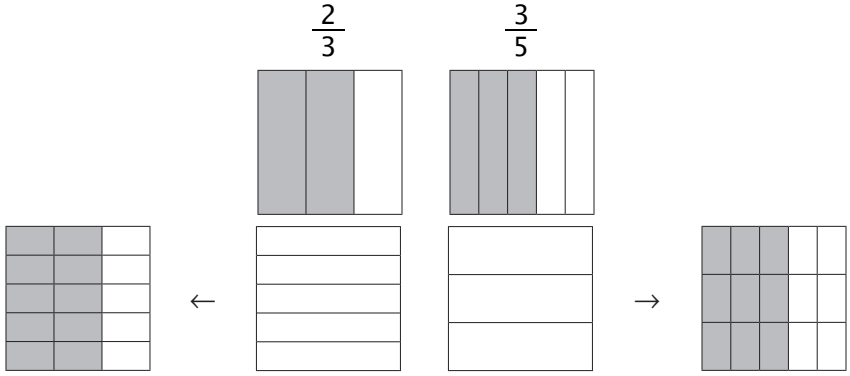
We know that the symbol "=" means "equals" or "is the same as." In *Beta*, we introduced symbols that are used to show that one value is greater than or less than another. As we read an equation from left to right, the symbol ">" means "is greater than," and the symbol "<" means "is less than." These symbols are called ***inequality*** symbols, and they are used in number sentences called ***inequalities***. For example, "nine is greater than three" is written as $9 > 3$. "Three is less than nine" is written as $3 < 9$. Inequality symbols may also be used to compare fractions.

To remember which symbol is which, some say that the open, or large, end of the symbol always points to the greater number and the small end points to the number that is less. Some students think of the symbol as a hungry alligator with his mouth open, always trying to eat the greater number.

Inequalities with fractions fall into one of two categories: both fractions have the same denominator, or each fraction has a different denominator. If the denominators of two fractions are the same, you simply compare the numerators. It is easy to see that three fourths is greater than one fourth ($\frac{3}{4} > \frac{1}{4}$).

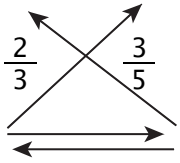
Comparing $\frac{2}{3}$ and $\frac{3}{5}$ is more difficult. Which is greater? When we added two fractions with different denominators, we first found common denominators (same kind) and then combined the numerators. In the same way, it is easier to compare fractions with different denominators when we first rewrite them with a common denominator. Once the fractions have the same denominator, we compare the numerators. Study the examples on the next page.

Example 1



$\frac{10}{15}$ $\frac{10}{15}$ > $\frac{9}{15}$ $\frac{9}{15}$

10 9

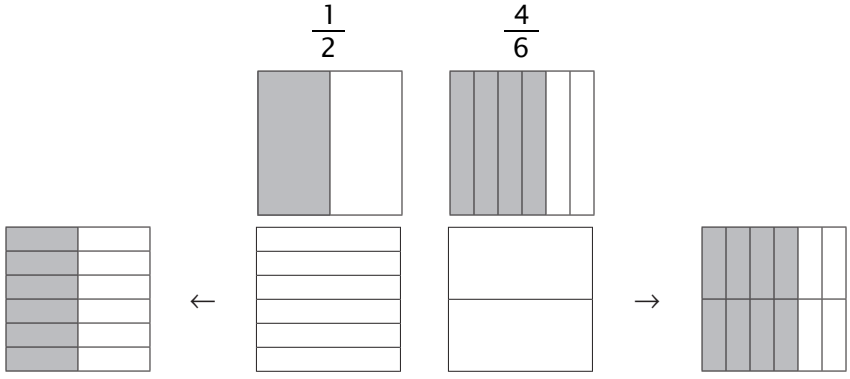


15 15

$\frac{10}{15} > \frac{9}{15} \rightarrow \frac{2}{3} > \frac{3}{5}$

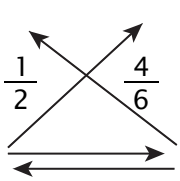
Two thirds is greater than three fifths.

Example 2



$\frac{6}{12}$ $\frac{6}{12}$ < $\frac{8}{12}$ $\frac{8}{12}$

6 8



12 12

$\frac{6}{12} < \frac{8}{12} \rightarrow \frac{1}{2} < \frac{4}{6}$

One half is less than four sixths.