How to Compare Fractions

Introducing:

- common denominator
- least common denominator
- like fractions
- unlike fractions.
The fractions $\frac{3}{4}$ and $\frac{2}{4}$ have the same denominator. Fractions with the same denominators are *like fractions*.
If denominators are the same, the fraction with the larger numerator is larger. So $\frac{3}{4}$ is larger than $\frac{2}{4}$. 

$\frac{3}{4} > \frac{2}{4}$
\( \frac{9}{16} \) and \( \frac{7}{16} \) are like fractions. The numerator 9 in \( \frac{9}{16} \) is larger than the numerator 7 in \( \frac{7}{16} \), so \( \frac{9}{16} \) larger than \( \frac{7}{16} \).
The fractions \( \frac{2}{3} \) and \( \frac{2}{5} \) have the same numerator. The denominator 3 in the fraction \( \frac{2}{3} \) means that the unit has less parts, making the parts larger. Therefore, \( \frac{2}{3} \) is larger than \( \frac{2}{5} \).
The larger the denominator the smaller the fraction.

Compare Fractions 5

2/3 is larger than 2/5

\[
\frac{2}{3} > \frac{2}{5}
\]

The larger the denominator the smaller the fraction.
The fractions $\frac{3}{4}$ and $\frac{5}{8}$ have unlike denominators and unlike numerators. Fractions that have unlike denominators are *unlike fractions*.
To compare $\frac{3}{4}$ and $\frac{5}{8}$, rename one or both fractions so that they will have the same denominators. Since the two fractions are now like fractions, compare the fractions by comparing the numerators. Now that $\frac{3}{4}$ is renamed as $\frac{6}{8}$, we can now compare the numerators of $\frac{6}{8}$ and $\frac{5}{8}$.

\[ \frac{3}{4} > \frac{5}{8} \]

$\frac{3}{4}$ is larger than $\frac{5}{8}$.
To compare fractions with unlike denominators rename the fractions so that they will have with like or common denominators, making them *like fractions*.

To find a common denominator:
Think of the denominators 4 and 8 in $\frac{3}{4}$ and $\frac{5}{8}$. Does the smaller denominator 4 divide evenly into the larger 8? Yes, then the larger denominator 8 is the common denominator.

If the smaller denominator does not divide evenly into the larger, multiply the larger denominator by 2, 3, and then 4, etc. Each time check for division by the smaller denominator.
In the fractions $\frac{3}{4}$ and $\frac{2}{3}$:

1. Multiply the larger denominator 4 by 2 to get 8. Does the denominator 3 divide evenly into 8? No.

2. Multiply the larger denominator 4 by 3 to get 12. Does the denominator 3 divide evenly into 12? Yes. So 12 is a common denominator of the denominators 4 and 3.
Now that we know that 12 is the least common denominator for the fractions \( \frac{3}{4} \) and \( \frac{2}{3} \), we can write each fraction with a denominator of 12 using the procedure in Rename Fractions To Higher Terms.

\[
\frac{3}{4} = \frac{9}{12} \\
\frac{2}{3} = \frac{8}{12}
\]

\( \frac{9}{12} \) and \( \frac{8}{12} \) are like fractions so now all we have to do is compare the numerators. Since 9 is greater than 8 the fraction \( \frac{9}{12} \) is greater than \( \frac{8}{12} \).
Here is the picture of $\frac{3}{4}$ and $\frac{2}{3}$. The picture shows that $\frac{3}{4}$ is larger than $\frac{2}{3}$. Notice that each fraction has been renamed to $\frac{9}{12}$ and $\frac{8}{12}$. 
The common denominator of 5 and 4 is 20 because both 5 and 4 divide evenly into 20.
The numerators are the same in $\frac{3}{5}$ and $\frac{3}{4}$. The smaller denominator will give a larger fraction.
Another method for comparing is to think of the fractions. In this example it is obvious that $\frac{1}{3}$ is smaller than $\frac{7}{8}$. For one thing, $\frac{1}{3}$ is smaller than $\frac{1}{2}$ and $\frac{7}{8}$ is larger than $\frac{1}{2}$. 
Being able to compare fractions by picturing them in your mind will help you arrive at an answer more quickly than with calculation. As mentioned before, as the numerator increases it means that you have selected more parts. As the denominator increases it means that the parts are smaller.

Which is larger, $\frac{5}{8}$ or $\frac{7}{16}$?
\frac{5}{8} is larger. It takes practice, but being able to estimate by visualizing the fraction (number sense) will help you to understand fractions better.