



Comparing and Ordering Fractions

Comparing and ordering fractions is way to examine fractions that contain different-sized sets. In order to compare these fractions, you must find a common denominator and make equivalent fractions.

Comparing and Ordering Fractions

When **comparing and ordering fractions**, you must have a common denominator. After you find a common denominator, you can simply compare the numerators of the fractions. If the fraction also includes a whole number, you would compare the whole number before finding the common denominator. For example, $6\frac{3}{4}$ would be greater than $5\frac{1}{2}$. We can see that because the whole number is larger in $6\frac{3}{4}$ than it would be in $5\frac{1}{2}$.

Finding the Common Denominator

There are several ways to find a common denominator when getting ready to compare fractions. The easiest method to find a common denominator is to multiply your denominators together. After you have multiplied the denominators together, the product will become your new denominator. For example, when comparing $\frac{7}{8}$ and $\frac{5}{6}$, the two denominators are 8 and 6. To find a common denominator, I would multiply the 8 and 6 together, which equals 48. The common denominator of this problem would be 48.

Now that we know our common denominator is 48, we must get equivalent fractions. Looking at the fraction $\frac{7}{8}$, 8 times 6 is 48, so we must also multiply the numerator times 6. 7 times 6 equals 42. The fraction $\frac{7}{8}$ is equivalent to $\frac{42}{48}$.

Now we must find the equivalent to $\frac{5}{6}$. Since we multiplied the denominator 6 times 8, we must also multiply the numerator 5 times 8, which equals 40. The fraction $\frac{5}{6}$ is equivalent to $\frac{40}{48}$.

Comparing Fractions

In the previous example, we were comparing $\frac{7}{8}$ to $\frac{5}{6}$. The first step was to find a common denominator, which we found as 48. The next step was to find equivalent fractions for each of the fractions. Now we are comparing $\frac{42}{48}$ to $\frac{40}{48}$. Since we know that 42 is larger than 40, we can see that $\frac{42}{48}$ would be greater than $\frac{40}{48}$. The equivalent fraction for $\frac{42}{48}$ was $\frac{7}{8}$, which would be larger than $\frac{5}{6}$.

Comparing Fractions: Example

Comparing fractions can help us compare several items that may not all be the same size. By finding a common denominator, we change our fractions so that the items will be much easier to compare.

Jimmy and Dan both had pizza for supper last night. Jimmy's family ordered pizza from Pizza Palace. Pizza Palace slices their pizzas into sixteen slices. Jimmy's family ate $\frac{10}{16}$ of the pizza for supper last night.

Dan's family ordered pizza from Magic Pizza, which slices their pizza into 8 slices. Dan's family ate $\frac{7}{8}$ of their pizza for supper.

Jimmy and Dan are both curious which one of their families ate more pizza for supper last night. To begin comparing the fractions of pizzas that their families ate, they must first find the common denominator. Since the denominators are 16 and 8, the easiest way to find the common denominator is to multiply the denominators together. 16 times 8 equals 128. So the common denominator for both of these fractions will be 128.

Next, they must make equivalent fractions. Jimmy's family ate $\frac{10}{16}$ of their pizza. To find the common denominator, Jimmy had to multiply his denominator by 8, which equaled 128. He must also multiply the numerator 10 times 8, which would equal 80. So Jimmy's family ate an equivalent of $\frac{80}{128}$ slices of pizza for supper last night.

Dan must now find the equivalent fraction for the amount of pizza his family has eaten. To find the common denominator, Dan multiplied his denominator 8 by 16, which equaled 128. He must now multiply the numerator 7 times 16, which is 112. Dan now knows that his family ate an equivalent of $\frac{112}{128}$ slices of pizza.

So Jimmy's family ate $\frac{80}{128}$ of their box of pizza and Dan's family ate $\frac{112}{128}$ of their box of pizza. Jimmy and Dan now know that Dan's family ate more pizza than Jimmy's family last night, because the numerator 112 is larger than 80.

Ordering Fractions: Example

Later that day at recess, Jimmy and Dan met up with their friends Sal and Rex. They decided to run laps around the track at their school. All four of them take off and run as fast as they can. Dan makes it only $\frac{1}{2}$ of the track before he must stop. Sal makes it $\frac{3}{4}$ of the track before he must stop. Jimmy makes it $\frac{4}{6}$ of the track before he must stop. Rex makes it $\frac{8}{10}$ of the track. All four of them are exhausted as they slowly walk toward the finish line. The four of them want to know in what order from greatest to least they were able to run without stopping.

The boys know that their distances were $\frac{1}{2}$, $\frac{3}{4}$, $\frac{4}{6}$, and $\frac{8}{10}$ of the track. In order to compare these four distances, the boys know that they will need a common denominator. The easiest way to get a common denominator is to multiply the denominators together. However, in this example, it will cause our denominator to be a much larger number that may be impractical to work with. Another way to get a common denominator is to think about what number all four of these denominators will divide into evenly. Since our denominators are 2, 4, 6, and 10, the lowest number that all four of these numbers will divide into is 60, so the boys decided to use 60 as their common denominator. Dan knows that he ran $\frac{1}{2}$ of the track. In order to get the common denominator of 60, Dan must multiply the numerator and denominator by 30. This would mean that Dan's equivalent fraction would be $\frac{30}{60}$.

Next, Sal knows that he ran $\frac{3}{4}$ of the track without stopping. In order for him to compare his fraction, he must use the denominator of 60. Sal will need to multiply both the numerator and denominator by 15 in order to make an equivalent fraction. Sal determines that he ran $\frac{45}{60}$ of the track.

Jimmy also ran hard and ran $\frac{4}{6}$ of the track without stopping. Jimmy uses the common denominator of 60 by multiplying his numerator and denominator by 10. This makes Jimmy's equivalent fraction as $\frac{40}{60}$.

Rex was able to run $\frac{8}{10}$ of the track without stopping. For Rex to compare his fraction to his friends, he must also use the common denominator of 60. In order to do so, Rex must multiply his numerator and denominator by 6, which would make his equivalent fraction as $\frac{48}{60}$.

All of the boys now know their equivalent fractions in order to compare their distances. Dan ran $\frac{30}{60}$ of the track, Sal ran $\frac{45}{60}$ of the track, Jimmy ran $\frac{40}{60}$ of the track and Rex ran $\frac{48}{60}$ of the track.

The boys can now compare their numerators to see in what order they ran the furthest to the least. By comparing their numerators, we can see that Rex ran the furthest, Sal ran the second furthest, Jimmy ran the third furthest, and Dan ran the least far.

Lesson Summary

So, in review, when **comparing and ordering fractions**, you must have a common denominator. After you find a common denominator, you can simply compare the numerators of the fractions. The easiest method to find a common denominator is to multiply your denominators together. Once you have made equivalent fractions using your common denominator, you can just compare the numerators of your new equivalent fractions. Another way to find a common denominator is to look for a number that all of your denominators will divide into evenly.

Learning Outcome

After watching this lesson, you should be able to compare and order fractions by finding a common denominator and creating equivalent fractions.