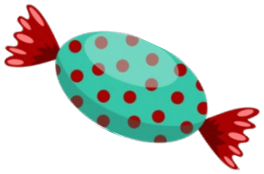
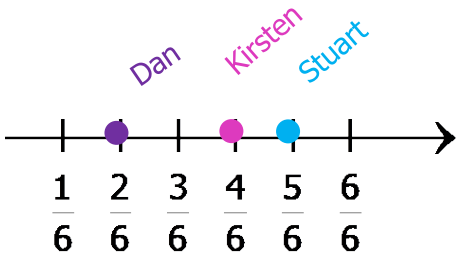
Ordering Fractions

Sometimes we may be in situations where we want to compare more than two fractions. For example, if Dan has eaten $\frac{2}{6}$ of his candy, Stuart has eaten $\frac{5}{6}$ of his candy, and Kirsten has eaten $\frac{4}{6}$ of her candy. Who has eaten the most candy and who has eaten the least?



The easiest way to compare multiple numbers is to place them on a number line. Then we can see all the fractions in comparison to one another:



Now we can see that Stuart has eaten the most candy, then Kirsten, and Dan has eaten the least.

We could also show this using the symbols we use for comparison:

$$\frac{2}{6} < \frac{4}{6} < \frac{5}{6}$$

When we have to compare fractions with different denominators we have to rewrite them with a **COMMON DENOMINATOR** using **EQUIVALENT FRACTIONS**.

Sometimes, to shorten our work at the end when simplifying the final fraction, we can use the **LOWEST COMMON DENOMINATOR** which is the lowest common multiple between the denominators. Sometimes it is simply faster to multiply the denominators together to get a common denominator.

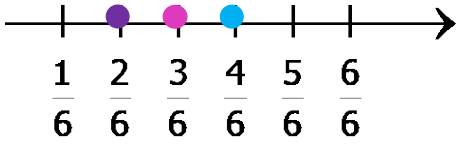
Example 1:

Let's say Dan ate $\frac{2}{6}$ of his candy, Stuart ate $\frac{2}{3}$ of his candy, and Kirsten ate $\frac{1}{2}$ of her candy. Compare the fractions on a number line and order from least to greatest.

Since all our denominators are different we have to make equivalent fractions so all denominators can be the same. All of the fractions are factors of 6, so let's change all our denominators to 6.

$$\frac{1\times3}{2\times3}=\frac{3}{6} \quad \textbf{and} \quad \frac{2\times2}{3\times2}=\frac{4}{6}$$

Now we can place all these numbers on a number line:



Now we can order the original fractions from least to greatest: $\frac{2}{6}, \frac{1}{2}, \frac{2}{3}$

Example 2:

Order the following fractions from least to greatest:

$\frac{4}{8}, \frac{18}{24}, \frac{3}{4}, \frac{3}{12}$

First, we will see if we have a common factor to reduce each fraction. We can reduce each denominator to 4 since each denominator has a factor of 4.

$$\frac{4\div2}{8\div2}=\frac{2}{4} \textbf{ and } \frac{18\div6}{24\div6}=\frac{3}{4} \textbf{ and } \frac{3}{4} \textbf{ and } \frac{3\div3}{12\div3}=\frac{1}{4}$$

Now we can order these fractions from least to greatest:

$\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{3}{4}$

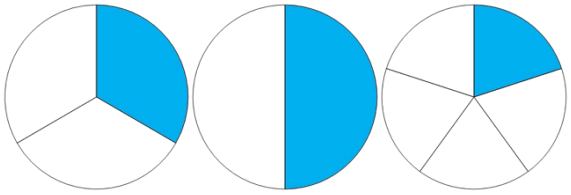
And then we can order the original fractions:

$\frac{3}{12}, \frac{4}{8}, \frac{3}{4}, \frac{18}{24}$

Example 3:

Erin jogged for one third of a km, Bailey jogged for one half of a km, and Katherine jogged for one fifth of a km. Order these distances from least to greatest.

We can simply compare $\frac{1}{3}, \frac{1}{2}, \frac{1}{5}$ because they each have a numerator of 1, the smaller the denominator, the bigger the fraction. This can be demonstrated visually:

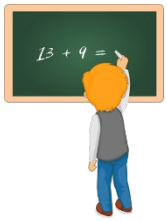


Therefore, we would order the fractions:

$\frac{1}{5}, \frac{1}{3}, \frac{1}{2}$

Example 4:

Ben, Jack, and Will all took different lengths of time to complete their math homework. It took Ben three fifths of an hour to complete his homework, Jack spent five sixths of an hour on homework, and Will took two thirds of an hour to finish his. Order the students time spent on homework from least to greatest.



The lowest common denominator is the LCM of the denominators (so find the lowest common multiple of 3, 5 and 6).

The lowest common denominator for $\frac{3}{5}, \frac{5}{6}, \frac{2}{3}$ is 30.

$$\text{Ben} = \frac{3\times6}{5\times6} = \frac{18}{30} \textbf{ and } \text{Jack} = \frac{5\times5}{6\times5} = \frac{25}{30} \textbf{ and } \text{Will} = \frac{2\times10}{3\times10} = \frac{20}{30}$$

Now we can order the fractions from least to greatest:

Ben $\frac{3}{5}$, Will $\frac{2}{3}$, Jack $\frac{5}{6}$