In the 1960’s, Richard J. Thompson discovered a remarkable infinite discrete group called $F$, whose elements are certain piecewise-linear homeomorphisms of the unit interval. In this talk, I will show how to represent elements of $F$ using pictures called strand diagrams. A strand diagram is similar to a braid, except that instead of twisting, the strands can split apart and then merge back together differently. Strand diagrams can be used to give a simple geometric solution to the conjugacy problem in $F$, and they are related to a classifying space for $F$ which is a kind of configuration space. (Received September 20, 2007)