An old (still unproved) conjecture of Ore asserts that every element in a finite simple group can be realized as a commutator. In other words, the equation

$$xyx^{-1}y^{-1} = g$$

has at least one solution $\langle x, y \rangle$ for every element $g$. I will talk about various methods, combinatorial and geometric, for proving that group equations have solutions over finite simple groups. This work is joint with Aner Shalev. (Received April 11, 2007)