Abstract: Joint project with William Jaco. Following the steps for the prime decomposition of 3-manifolds laid out in the Jaco & Rubenstein paper “0- Efficient Triangulations of 3-Manifolds” we construct the analogous (and well known) result for surfaces. That being the torus and real projective plane are the prime surfaces with respect to the connect sum operation on surfaces. Further the decomposition of surfaces into prime elements can be written uniquely up to homeomorphism.