Let $\varphi : D \to D$ be any non-constant linear fractional transformation which maps the unit disk into itself. Let $D$ denote the Dirichlet space of analytic functions. We determine the spectrum of the composition operator $C_\varphi : D \to D$ defined by $C_\varphi(f) = f \circ \varphi$. The full solution requires the use of an interesting variety of techniques.