A number of authors have considered the weighted sum of various types of curves with a certain genus $g$ over a finite field $k := F_q$ of a specific characteristic. These include elliptic curves (Howe), hyperelliptic curves (Van der Geer, Van der Vlught), and Artin-Schreier curves (Cardona, Nart, Pujolás, Sadornil). We extend the work of these authors by considering a related weighted sum for Artin-Schreier curves with a given genus $g$ over fields of any characteristic $p$. We will discuss our results and methods of counting, which include looking at ramification divisors, finding associated rational models $y^p - y = u(x)$, and examining the actions of $PGL_2(k)$ on the models. In addition, we will discuss the geometric connections to the moduli space of Artin-Schreier curves. (Received January 16, 2017)