A number of authors have considered the weighted sum of various types of curves with a certain genus $g$ over a finite field $k := \mathbb{F}_q$ of a specific characteristic. These include elliptic curves (Howe), hyperelliptic curves (Van der Geer, Van der Vlught), and Artin-Schreier curves (Cardona, Nart, Pujolàs, Sadornil). We denote this weighted sum as $\sum_{[C]} 1/|\text{Aut}_k(C)|$, where the sum is over $k$-isomorphism classes of the curves and $\text{Aut}_k(C)$ is the automorphism group of $C$ over $k$. 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 $\text{PGL}_2(k)$ on the models. In addition, we will discuss the geometric connections to the moduli space of Artin-Schreier covers. (Received September 02, 2014)