The goal of this thesis is to obtain a weighted first moment of the error term of the approximation of the counting function of prime geodesics on the Picard variety $\mathrm{SL}(2,[i])\backslash H^3$. The group $\mathrm{SL}(2,)$ acts on the 3-dimensional hyperbolic space H^3. We choose a discrete subgroup $\mathrm{SL}(2,[i])$ called the Picard group and study its action on the hyperbolic space. A matrix that fixes two points on the boundary of H^3 is called hyperbolic or loxodromic. These matrices have a similar asymptotic behaviour as primes in number theory. The counting function $\psi_g(X)$ counts the number of conjugacy classes of these matrices with norm less than X. This function asymptotically grows as X and the error term is the difference $\psi_g(X) - X$. The error can be explicitly written using the Selberg trace formula which relates geometrical information with the spectrum of the Laplace operator on the Picard manifold. This is used to calculate the weighted first moment of the error explicitly.