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Let Γ be a finite group and let Δ be a generating set for Γ . A Cayley map associated with Γ and Δ is an oriented 2-cell embedding of the Cayley graph $G_\Delta(\Gamma)$ such that the rotation of the arcs emanating from each vertex is determined by a unique cyclic permutation of generators and their inverses. A formula for the average Cayley genus is known for the dihedral group with generating set consisting of all the reflections. However, the known formula involves sums of certain coefficients of a generating function and its format does not specifically indicate the Cayley genus distribution. We determine a simplified formula for this average Cayley genus as well as provide improved understanding of the Cayley genus distribution. (Received September 28, 2000)