1067-03-2275 **Matthew Anthony Jura*** (matthew.jura@manhattan.edu), 3611 Henry Hudson Pkwy, Apt 2B, Bronx, NY 10463. *Comparing the Weak and Strong Omega Coloring Number of Graphs.*

We use the program of reverse mathematics to analyze the proof theoretic strength of a theorem involving the coloring number of graphs. Classically, the coloring number of a countable graph $G$, written $\mathrm{Col}(G)$, is the least $k \leq \omega$ such that there is a well ordering of the vertices of $G$ for which each vertex $v \in G$ has at most $k$ many predecessors connected to $v$ by an edge. In the context of reverse mathematics, we formulate notions of weak and strong $\omega$ coloring number of a graph $G$. The "$\omega$" means that the well ordering witnessing $\mathrm{Col}(G)$ has order type $\omega$. In the strong version, the well ordering must be given explicitly by a bijection from $\mathbb{N}$ to the vertex set of $G$; for the weak version, we only know there is some finite bound on the number of vertices below a given vertex in the ordering. We uncover similarities and differences between these two notions of coloring number. (Received September 22, 2010)