1033-55-121    **Jeff Strom\*** (`jeff.strom@wmich.edu`), Department of Mathematics, Western Michigan University, 1902 W. Michigan Ave., Kalamazoo, MI 49008. *Categorical Sequences and the Lusternik-Schnirelmann Category of Spaces with Free Fundamental Groups.*

We will introduce the notion of the categorical sequence $\sigma_X$ of a space $X$. The $k^{\text{th}}$ term of $\sigma_X$ (for $k \geq 2$) is the least integer $n$ for which $\text{cat}(X_n) \geq k$; or $\infty$ if no such $n$ exists. We prove certain key properties of categorical sequences and show how to apply them. In particular, we will show that if $\pi_1(X)$ is free, then $\text{cat}(X) \leq \frac{2}{3}\dim(X) + 1$. (Received September 07, 2007)