1137-20-17 **Joel Zablow*** (dquandle@netscape.net), 290 9th Ave. Apt. 19H, New York, NY 10001. *Braid Relations and Deep Braiding.*

We look at braid relations $aba = bab$ in groups, focusing initially on such relations among cycles in symmetric groups S_n. We show k-cycles in S_n, which are braided, label vertices, faces, and edges of graphs and polyhedra, called platihedra. The platihedra exhibit many interactions between braiding and other algebraic properties, particularly conjugation, via their combinatorial structure. Braided n-cycles in S_n yield quandle structures on the graph components/skeletons of the platihedra. We give criteria under which braid relations in S_n can be lifted to "deep braids" (non-obvious braiding among products of generators) in braid groups, B_n, and also give examples of deep braiding in mapping class groups of surfaces, "lifting" braided elements in S_n. Time permitting, we discuss how deep braiding among cycles in S_n suggests deep braiding relations in B_n analogous to the Zamolodchikov tetrahedron equation and suggests existence of other analogous higher morphisms in higher categories. (Received December 29, 2017)