1014-06-112 **Michael E. Hoffman*** (meh@usna.edu), U. S. Naval Academy, 572C Holloway Road, Annapolis, MD 21402. *Updown categories and algebraic structures.* Preliminary report.

In earlier work we have introduced updown categories, which can be thought of as graded posets with "up" and "down" operators U, D respectively. Updown categories generalize R. Stanley's notion of a differential poset by accomodating multiplicities of covering relations and automorphisms of objects. Now suppose objects of an updown category can be multiplied. We give some algebraic conditions that imply the commutator $[D, U]$ is a multiple of the identity or diagonal, and illustrate with examples including commutative and noncommutative polynomial algebras, partitions, compositions, and rooted trees. We also extend these ideas to cases where $[D, U]$ is not diagonal, including an algebra of necklaces. (Received July 28, 2005)