1056-G1-2000 **Peg Howland*** (peg.howland@usu.edu), Department of Mathematics & Statistics, 3900 Old Main Hill, Logan, UT 84322-3900, and **Brynja R. Kohler** (brynja.kohler@usu.edu), Department of Mathematics & Statistics, 3900 Old Main Hill, Logan, UT 84322-3900. *Three tested ways to empower students to engage in linear algebra.*

"This is nothing like calculus." How do we turn that first-week refrain into abstract mathematical thinking by the end of a semester? Our response involves three class-tested pedagogical tools for motivating students to open their minds to linear algebra. The goal of the first was to avoid presenting a laundry list of dry rules for matrix algebra. Instead, we broke the class into collaborative groups to work on proofs. By throwing the commutative rule for matrix multiplication into the mix, we generated critical thinking that merged all groups into one by the end of class. A difficult exam precipitated the second tool: a linear algebra stimulus package. This took the form of a MATLAB exercise exploring the rank of matrix outer products, a topic usually reserved for higher level courses. As we moved into the final third of the course, we encouraged students to buy into the increasingly abstract material by helping to shape the final exam. To cap the course, they were prompted to write the ultimate questions of orthogonality, eigenvalues, and everything. We will share the descriptions and results of these experiments in our report. (Received September 22, 2009)