1046-I1-2078   **Jeffrey Stuart*** (`jeffrey.stuart@plu.edu`), Mathematics Department, Pacific Lutheran University, Tacoma, WA 98447. *Teach ill-conditioning to introductory linear algebra students in a single lecture!*

Many students complete their one college course in linear algebra with the mistaken view that all invertible linear systems of equations behave the same way: that there is a unique solution, that Gaussian elimination finds it, and that there is no more to be said. We offer an easy, student-centered classroom activity that demonstrates that the solution behavior of small, invertible linear systems can be complicated, showing high sensitivity to small perturbations. The demonstration consists of four parts: a simple physical demonstration using commonly available items, student-performed computations, computer-based computations, and a final algebraic analysis.

The aim of this lesson is to develop an appreciation for the idea that linear systems can be ill-defined and for the role of geometry in ill-conditioning. Supplemental homework exercises demonstrate that poor scaling can also contribute to ill-conditioning.

In the author's experience, students are consistently surprised in the differences of behavior that can occur even in two by two systems. (Received September 17, 2008)