Here is an idea for an inquiry lab that occurred to me while perusing the catalogue from American Science & Surplus. They have a couple of items containing large numbers of springs. One has ~100 springs and the other has ~200. Both cost <$10. In addition, this lab will require Hooke’s Law apparatus (or rulers, ring stands, and suitable clamps to hold the springs), and masses. I don’t know what the range would be needed for the masses; I have not actually ordered a set of springs. Assuming a lab already has masses, ring stands, and clamps, this should be a very inexpensive lab to do.

This lab is more about data than about Hooke’s Law. I would introduce it early in a physics course.

Part 1: Have students pick out 3-6 springs. For each spring, measure the length it stretches the spring with several (at least 4; more would be better) masses, being careful not to exceed the spring’s elastic limit. Start small and increase the mass in sensible increments. For each spring, plot mass vs. stretch length on a graph. (Use of a computer program such as Excel could enhance the lab here.) The slope of the line should be the spring constant divided by the acceleration of gravity. (You decide whether to explain what it represents.)

Part 2: Use the data from part 1 to make histograms of the slope (k/g) values. Students should pick out some bin values to make the histograms, then change the bin values to make new histograms. Option for part 2: Collect all student data from part 1 and distribute it to all groups or students. After they have each made a histogram have them explain how they made their choice for bin ranges.

Another option would be to use the link to histograms on the e-lab. (If I remember correctly it was a page at SHODOR.)