The following experiments provide useful introductions to the statistical analysis of data in the analytical chemistry laboratory.

A more comprehensive discussion of the analysis of data, which includes all topics considered in this chapter as well as additional material, are found in many textbook on statistics or data analysis; several such texts are listed here.


The importance of defining statistical terms is covered in the following papers.


The detection of outliers, particularly when working with a small number of samples, is discussed in the following papers.


The following papers provide additional information on error and uncertainty, including the propagation of uncertainty.


Consult the following resources for a further discussion of detection limits.


The following articles provide thoughts on the limitations of statistical analysis based on significance testing.
• Analytical Methods Committee “Significance, importance, and power,” AMCTB 38, 2009.
• Kryzwinski, M. “Significance, P values, and t-tests,” Nat. Methods 2013, 10, 1041–1042.

The following resources provide additional information on using Excel, including reports of errors in its handling of some statistical procedures.

• Morgon, S. L.; Deming, S. N. “Guide to Microsoft Excel for calculations, statistics, and plotting data,”
  (http://www.chem.sc.edu/faculty/morga...ide_Morgan.pdf).

To learn more about using R, consult the following resources.


The following papers provide insight into visualizing data.

• Analytical Methods Committee “Representing data distributions with kernel density estimates,” AMC Technical Brief, March 2006.