significant impairment in the non-verbal cognitive and perceptual motor skills measured by the performance scale of the Wechsler intelligence tests." That statement confirms these results: From analysis of variance we know that at least one mean is different from the others, but such differences are not strong enough so that the Bonferroni test results identify any one particular mean as being significantly different. However, the sample means of 102.7 (low blood lead level), 94.1 (medium blood lead level), and 94.2 (high blood lead level) suggest that medium and high blood lead levels are associated with lower mean performance IQ scores than the low blood level group.

using TECHNOLOGY

STATDISK Enter the data in columns of the Data Window. Select **Analysis** from the main menu bar, then select **One-Way Analysis of Variance,** and select the columns of sample data to be used. Click **Evaluate.**

MINITAB First enter the sample data in columns C1, C2, C3 . . . . Next, select **Stat, ANOVA, ONEWAY (UNSTACKED),** and enter C1 C2 C3 . . . in the box identified as "Responses" (in separate columns).

EXCEL You can use either XLSTAT or Excel's Data Analysis add-in. An advantage of the Data Analysis add-in is that you are not required to stack all of the data in one column with corresponding category names in another column.

XLSTAT First stack all of the sample data in column B with the corresponding variable names listed in column A. Click on **XLSTAT,** then select **Modeling Data,** then select **ANOVA.** In the "Quantitative" box, enter the range of cells containing the sample data, such as B1:B121. In the "Qualitative" box, enter the range of cells containing the variable names, such as A1:A121. Put a check next to the "Variable labels" box only if the first row consists of labels. Click **OK.** In the results, look for the "Analysis of Variance" table that includes the *F* test statistic and the *P*-value.

Data Analysis add-in: Enter the data in columns A, B, C, ... In Excel 2013, 2010, and 2007, click on **Data;** in Excel 2003, click on **Tools.** Now click on **Data Analysis** and select **Anova: Single Factor.** In the dialog box, enter the range containing the sample data. (For example, enter A1:C30 if the first value is in row 1 of column A and the longest column has 30 data values.)

TI-83/84 PLUS First enter the data as lists in L1, L2, L3 . . . then press STAT, select **TESTS,** and choose the option **ANOVA.** Enter the column labels. For example, if the data are in columns L1, L2, and L3, enter those columns to get **ANOVA (L1, L2, L3),** and press ENTER.

STATCRUNCH Click on **Open StatCrunch.** Enter the columns of data or open a data set. Click on **Stat,** then select **ANOVA,** then select **One Way.** Enter the columns to be used, then click on **Calculate.** Results will include the test statistic and *P*-value.

12-2 Basic Skills and Concepts

Statistical Literacy and Critical Thinking

In Exercises 1–4, use the following listed chest deceleration measurements (in g, where g is the force of gravity) from samples of small, midsize, and large cars. (These values are from Data Set 13 in Appendix B.) Also shown (on the next page) are the SPSS results for analysis of variance. Assume that we plan to use a 0.05 significance level to test the claim that the different size categories have the same mean chest deceleration in the standard crash test.

Chest Deceleration Measurements (*g*) from a Standard Crash Test

Small	44	39	37	54	39	44	42
Midsize	36	53	43	42	52	49	41
Large	32	45	41	38	37	38	33