

Correlation of Lessons to the NCTM *Principles and Standards for School Mathematics*

Digging into Data addresses the Data Analysis, Communication, and Number and Operations standards for grades six through eight. NCTM has identified data analysis as a curriculum focal point for grade eight. *Digging into Data* can also be used to address the data analysis connection to the focal points for grade seven.

Data Analysis Strand: The table below shows how individual lessons address the standards.

Standard: Formulate questions that can be addressed with data, and collect, organize, and display relevant data to answer them.	
Expectation: In grades 6–8, all students should formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population.	Digging into Data: Students formulate questions in Lessons 1.1, 2.1, 2.4, and 4.1. They design studies in Lessons 1.1, 2.1, and 2.4, and collect data in Lessons 2.1 and 3.1.
Standard: Select and use appropriate statistical methods to analyze data.	
Expectation: In grades 6–8, all students should select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatter plots.	Digging into Data: With TinkerPlots, students can create many different kinds of graphs, including histograms, box plots, and scatter plots, and can also invent their own representations. In many lessons, such as Lessons 1.3, 2.4, 3.4, 4.2, and 5.6, students select, create, and compare the different types of displays and decide which are better tailored to the question they’re trying to answer. Students specifically create and use histograms in Lessons 4.5–4.7; box plots in Lessons 2.5–2.7; and scatter plots in Lessons 5.1–5.5.
Expectation: In grades 6–8, all students should find, use, and interpret measures of center and spread, including mean and interquartile range.	Digging into Data: Students find, use, and interpret measures of center and spread in meaningful contexts in many lessons, such as Lessons 1.4, 1.6, 2.5–2.7, and 3.2–3.4. Lessons 4.3 and 4.4 illustrate the value and the limitations of different measures of center and dispel common misconceptions. TinkerPlots makes it easy to change data values in order to ask hypothetical questions about how center and spread are affected, and then switch back to the authentic data with new insight (Lesson 4.3).

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<p>Expectation: In grades 6–8, all students should discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots and scatter plots.</p>	<p>Digging into Data: Every lesson helps students connect a data set to one or more representations of it, and TinkerPlots strengthens this connection. For example, students can select a case on a data card and immediately see how it is represented on a graph or vice versa. They can select multiple cases on a graph and see the corresponding values on a table, or vice versa. Some example lessons are Lessons 1.2, 1.3, 2.2, 4.2, 4.3, and 4.6. Students specifically work with histograms in Lessons 4.5–4.7; box plots in Lessons 2.5–2.7; and scatter plots in Lessons 5.1–5.5. <i>Note:</i> TinkerPlots and <i>Digging into Data</i> do not include stem-and-leaf plots.</p>
<p>Standard: Develop and evaluate inferences and predictions that are based on data.</p>	
<p>Expectation: In grades 6–8, all students should use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken.</p>	<p>Digging into Data: Students make conjectures about how their findings for a sample apply to a larger population in Lesson 4.6. Also, many lessons, such as Lessons 2.3, 2.4, and 5.6, have discussion questions to encourage this thinking informally.</p>
<p>Expectation: In grades 6–8, all students should make conjectures about possible relationships between two characteristics of a sample on the basis of scatter plots of the data and approximate lines of fit.</p>	<p>Digging into Data: Students explore relationships between pairs of attributes using two plots in Lesson 3.4, and using scatter plots and drawing informal lines of fit in Lessons 5.1–5.5. TinkerPlots allows students to easily understand and manipulate scatter plots and lines of fit.</p>
<p>Expectation: In grades 6–8, all students should use conjectures to formulate new questions and plan new studies to answer them.</p>	<p>Digging into Data: Students make conjectures and carry out investigations in many lessons, such as Lessons 1.3, 1.6, 2.3, 3.4, and 5.6. Students use their conjectures to formulate new questions and design studies to answer them in Lessons 2.1, 2.4, 3.5, and 4.1. Additionally, many lessons, such as Lesson 3.3, have discussion questions to encourage this thinking informally.</p>

Source: *Principles and Standards for School Mathematics*, NCTM, Reston, VA, 2000.

Communication Strand: *Digging into Data with TinkerPlots* provides many opportunities to address the NCTM Communication Standard for grades 6–8. Throughout the lessons, students discuss their hypotheses, findings, and strategies and write strong, specific conclusions that use data as evidence. Using a rubric, they examine sample conclusions, identify areas in need of improvement, and make revisions. Particular lessons to note are Lessons 1.7, 3.4, and 4.7. By talking and writing about their findings,

students consolidate and clarify their thinking about specific data sets and about the data-analysis process.

Number and Operations Strand: In *Digging into Data* students apply and deepen their understanding of percentages, ratios, and integers—concepts that are central to the middle-school curriculum. Students use percentages to make comparisons within and across groups in many lessons, such as Lessons 3.3, 4.2, and 4.6. Using formulas, they create new attributes that are ratios of other attributes in Lessons 1.8, 1.9, and 5.5. They apply their knowledge of integers to figure out what positive and negative values mean in the context of specific data sets in Lessons 3.1, 3.2, and 5.6.