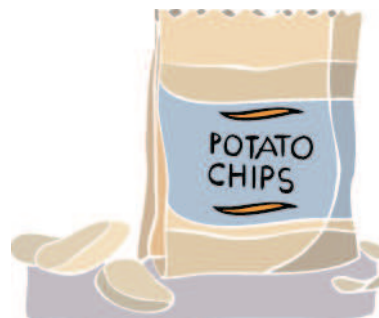


**Statistical Studies: Analyzing Data**III.B Student Activity Sheet 7: Using Technology

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Suppose data were collected on 25 bags of Spud Potato Chips. The weight (to the nearest gram) of the chips in each bag is listed below.

25	28	23	26	23
25	25	24	24	27
23	24	28	27	24
26	24	25	27	26
25	26	24	25	25



1. Create a dotplot of the potato chip data and describe the distribution.
2. Does this distribution appear to support or contradict the manufacturer's claim of an average weight of 28.3 grams of chips per bag? Explain your reasoning.
3. Use your calculator or spreadsheet software to create a more formal display of these data. Make a sketch of the result here and save an electronic copy for your formal report. (If you create a histogram, remember to carefully consider your bin size.)
4. You can also use your calculator or spreadsheet software to create more precise numerical descriptions of the data. This approach is quicker and usually more accurate than computing by hand.

The mean of the data is  $\bar{x} =$

The standard deviation of the data (a measure of "spread-outness") is  $S_x =$

The number of data values is  $n =$

The five-number summary is

The numbers in the five-number summary represent

5. Sometimes it makes sense to analyze the proportion of a population that meets some criterion. This is another method for investigating whether the manufacturer is correct in claiming that the average weight of a bag of Spud's is 28.3 grams. Write a statement or hypotheses involving the proportion of bags of chips that meet a weight criterion.

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6. What proportion of the bags in your sample were 28.3 grams or more? Does the answer change your opinion about Question 2? Why or why not?
7. Suppose instead that the weight of the chips in each Spud's bag is the following:

29	34	22	27	26
25	28	24	26	33
28	29	31	30	27
28	31	28	32	25
31	28	30	29	27

Produce a histogram and recompute the descriptive statistics for this set of data. What do you notice?

The mean of the data is  $\bar{x} =$

The standard deviation of the data is  $S_x =$

The number of data values is  $n =$

The five-number summary is

8. **EXTENSION:** Prepare a professional report for the president of Spud Potato Chips based on one of the data sets.

## Statistical Studies: Analyzing Data

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#### Data Set 1

Go to [www.billboard.com](http://www.billboard.com) and select the Hot 100. This list gives the top 100 songs for the week. You will compute statistics on the number of weeks that a random selection of the songs has been on the charts. (If you wish, choose one of the specialized charts such as R&B/Hip-Hop or Country.)

Use your calculator or a random number table to select 10 of the 100 songs. Write down the name of each song, its rank on the list, and the number of weeks it has been on the chart. For example, if your random number generator gives you 3, write “No. 3, Mary Had a Little Lamb, 14 weeks.”

Calculate the descriptive statistics for the data set and interpret all statistics.

Write a couple of sentences for the school newspaper about your results.

What would a graph tell you about these data?

#### Data Set 2

Go to [www.imdb.com](http://www.imdb.com) and select IMDb Top 250. (To find this link, scroll down and look for User’s Favorites in the sidebar on the left.) This list ranks the top 250 movies as voted by regular users of the Internet Movie Database (IMDb). (**Note:** These are listed by ranking, not by number of voters. The voters did not vote for a favorite movie; rather, they ranked the movies on a scale of 0-10). You will compute statistics on the number of voters who provided input on the movies, without actually using 250 pieces of data in your calculation. (If you wish, choose the IMDb Bottom 100 instead.)

Use your calculator or a random number table to select 10 of the 250 movies. Write down the name of each movie, its rank on the list, and the number of voters who ranked it.

Calculate the descriptive statistics for the data set and interpret all statistics.

Write a couple of sentences for the school newspaper about your results.

What would a graph tell you about these data?

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#### Data Set 3

For information about state sales taxes, go to the Federation of Tax Administrators' website at [www.taxadmin.org/FTA/rate/sales.html](http://www.taxadmin.org/FTA/rate/sales.html). The sales tax for each state and the District of Columbia is listed. You will compute statistics for state sales taxes, without actually using 51 pieces of data in your calculation.

Use your calculator or a random number table to select 10 of the 51 locations. Write down the name of each location and its sales tax.

Calculate the descriptive statistics for the data set and interpret all statistics.

Write a couple of sentences for the school newspaper about your results.

What would a graph tell you about these data?

#### Data Set 4

To view gasoline sales taxes by state, go to the American Petroleum Institute website at [www.api.org/statistics/fueltaxes](http://www.api.org/statistics/fueltaxes). You will compute statistics for gasoline sales taxes by state, without actually using 51 pieces of data in your calculation.

Use your calculator or a random number table to select 10 of the 51 amounts. Write down the name of each state and its sales tax on a gallon of gas.

Calculate the descriptive statistics for the data set and interpret all statistics.

Write a couple of sentences for the school newspaper about your results.

What would a graph tell you about these data?

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#### Data Set 5

To view diesel sales taxes by state, go to the American Petroleum Institute website at [www.api.org/statistics/fueltaxes](http://www.api.org/statistics/fueltaxes). (Scroll down to find the diesel data, which appear after the gasoline data). You will compute statistics for diesel sales taxes by state without, actually using 51 pieces of data in your calculation.

Use your calculator or a random number table to select 10 of the 51 amounts. Write down the name of each state and its sales tax on a gallon of diesel fuel.

Calculate the descriptive statistics for the data set and interpret all statistics.

Write a couple of sentences for the school newspaper about your results.

What would a graph tell you about these data?

#### Data Set 6

To view the tournament records for men's college basketball teams, go to [webpages.charter.net/dbwoerner/coaches/schl109.htm](http://webpages.charter.net/dbwoerner/coaches/schl109.htm). Because there are hundreds of schools listed, you will take a sample to compute the average winning percentage.

Use your calculator or a random number table to select 25 teams. Write down the name of each school and compute the winning percentage  $\left( \frac{\text{wins}}{\text{total games played}} \right)$ .

Calculate the descriptive statistics for the data set and interpret all statistics.

Write a couple of sentences for the school newspaper about your results.

What would a graph tell you about these data?

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#### Data Set 7

Visit the website for the National Assessment of Educational Progress (NAEP) at [nces.ed.gov/NATIONSREPORTCARD/states](http://nces.ed.gov/NATIONSREPORTCARD/states). Click on State Comparisons. Circle the subject that your teacher assigns to you:

Mathematics

Reading

Science

Writing

Choose Grade 8, your assigned subject, Gender, and the most recent testing year. Then click on the Next Steps button; this generates a data table from the 50 states, the District of Columbia, and Department of Defense schools. Circle the data display that your teacher assigns to you:

Histogram

Boxplot

Compute the appropriate statistics for each gender's data set.

Create a comparative graphical display.

Write a technical report comparing and contrasting the data that might be submitted to the NAEP website for publication.

Prepare a nontechnical version of your report to be presented to students and parents.

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#### Data Set 8

Visit the website for the U.S. Census Bureau at [www.census.gov](http://www.census.gov). In the People & Households category, click Estimates, then Estimates Data, and then Totals. Under Vintage 2009, click Annual Population Estimates. You can view the Excel document with population estimates for each state. Make a list of the 10 least populous states and a list of the 10 most populous states.

Next, circle the website that your teacher assigns to you:

the American Petroleum Institute at [www.api.org/statistics/fueltaxes](http://www.api.org/statistics/fueltaxes) to view gasoline sales taxes by state

the Census Bureau at [www.census.gov](http://www.census.gov) to view household incomes; in the People & Households category, choose State Median Income

Swivel at [www.swivel.com/data\\_sets/spreadsheet/1006019](http://www.swivel.com/data_sets/spreadsheet/1006019) to view the number of cars per state

Swivel at [www.swivel.com/data\\_sets/spreadsheet/1000483](http://www.swivel.com/data_sets/spreadsheet/1000483) to view the crime rate per state

Go to your assigned website and collect data for the 20 states on your list. You will display these data in one of two ways. Circle the data display that your teacher assigns to you:

Histogram

Boxplot

Compute the appropriate statistics for your assigned data set.

Create a comparative graphical display.

Write a technical report comparing and contrasting the data that might be submitted to the Census Bureau for publication.

Prepare a nontechnical version of your report to be presented to the local media.

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#### Data Set 9

Visit the website for the National Collegiate Athletic Association (NCAA) at [www.ncaa.org/wps/portal](http://www.ncaa.org/wps/portal). Go to Statistics & Records and choose a sport. Which sport did you choose?

Click on Archived Team-by-Team Final Statistics. (**Note:** This may be worded slightly differently, depending on the sport you choose.)

Choose two different schools. (**Note:** Remember that schools do not play every sport, so if you do not get results, pick another school). Which two schools did you choose?

Choose a category such as Points Per Game or Assists and record the data for the players at each school.

Circle the data display that your teacher assigns to you:

Histogram

Boxplot

Compute the appropriate statistics for each data set.

Create a comparative graphical display.

Write a technical report comparing and contrasting the data that might be submitted to the NCAA for publication.

Prepare a nontechnical version of your report to be presented to local sportswriters.