Discovering Math: Statistics and Data Analysis
Teacher’s Guide

Grade Level: 6–8  Curriculum Focus: Mathematics  Lesson Duration: Three class periods

Program Description

Discovering Math: Statistics and Data Analysis — From central tendencies to frequency and distribution to sample selection methods, introduce students to more advanced concepts of statistics and data analysis.

Lesson Plan

Student Objectives

- Calculate the mean, median, mode, and range.
- Identify outliers in a data set.
- Choose an appropriate chart, table, or graph to display a given set of data.
- Represent data in a way that creates an accurate perception of the data.
- Identify an example of data that is presented in a misleading way and display the data accurately.
- Choose a sample, collect data, display data, calculate central tendencies, and present their findings in an appropriate display.

Materials

- Discovering Math: Statistics and Data Analysis video
- Computer with Internet access
- Data Sets for Central Tendencies Worksheet (see below)
- Example of bar graph, circle graph, line plot, stem-and-leaf plot, box-and-whisker plot, scatter plot, and histogram
- Data Sets for Graphing (see below)
- Newspapers, magazines, or brochures that contain data representations
- Calculator
**Procedures**

1. Display the terms mean, median, mode, and range. Ask students to identify the terms, referring to examples from the video as needed.

   Display the following data set: 69, 44, 87, 75, 32, 85, 65, 75, 72, 68, and 76. Model how to find the mean, median, mode, and range (mean = 68, median = 72, mode = 75, and range = 55).
   - Distribute copies of the Data Sets for Central Tendencies Worksheet. Have students calculate the mean, median, mode, and range of each data set (allow them to use calculators as needed).

2. Review the graphs and tables presented in the video. Display each type of graph and table and discuss their characteristics and uses.
   - bar graph — A type of graph in which the lengths of bars are used to represent and compare data in categories.
   - circle graph — A type of graph that displays data as sections of a circle. The entire circle represents all the data.
   - line plot — A graph that shows one value changing over time in relation to another value.
   - stem-and-leaf plot — A display that shows how data is distributed. Each data value is separated into a leaf (the last digit) and the stem (the remaining digits).
   - box-and-whisker plot — A display that divides a data set into four parts using the lower extreme, lower quartile, median, upper quartile, and upper extreme.
   - scatter plot — An effective way to represent relationships between paired quantities.
   - histogram — A type of graph that displays data from a frequency table. The height of the bars represents the frequency for the interval.

3. Assign each student a partner. Tell students that they will determine the best way to display a set of data. Distribute copies of Data Sets for Graphing to each pair.

   Students must display the data by choosing the most appropriate graph or table. When all graphs and tables are complete ask each pair share their work with the class. They should be able explain why they chose the particular graph or table to display the data.

4. Ask students to identify examples of data misrepresentation from the video. They should share and explain their examples, telling how the data was misrepresented or misleading.
   - Provide newspapers, magazines, or other available resources that contain various data presentations. Ask students to identify data that may be presented in a misleading way.
   - Have students chose a more appropriate way to display the data. They should prepare the new presentation and explain how they developed it to the class.
5. Have students work in small groups to collect and display data.

- Have each group identify a topic they would like to study (e.g., what pets classmates own, favorite school subjects, or a community statistic).

- Have students create a plan for collecting data. They can conduct a poll, create surveys, or gather information from newspaper, magazine, or Internet sources. Allow time for students to collect their data. They should record the data in an organized way.

- Have students identify an appropriate way to display the data so it is not misleading. They must be able to justify their choice of data displays.

- Have students calculate the mean, mode, median, and range of their data set. They should also identify any outliers. If there are outliers, they should discuss and explain how the outliers affected the central tendencies and range.

- Have each group present their data to the class. They should discuss the following:
  - What was the topic?
  - How did they collect the data?
  - How did they represent the data? Why is this the best method of representation?
  - What are the central tendencies? Were there any outliers and what affect did the outliers have on the central tendencies?
  - What conclusions can they make based on the data?

**Assessment**

Use the following three-point rubric to evaluate students’ work during this lesson.

- **3 points:** Students clearly demonstrated the ability to correctly calculate central tendencies and range of data sets; clearly demonstrated the ability to identify outliers in a data set; clearly demonstrated the ability to represent data in appropriate displays that convey an accurate meaning of the data; identified misleading representations of data and demonstrated the ability to represent the data in a more meaningful way; clearly demonstrated the ability to collect, organize, display, and analyze data.

- **2 points:** Students satisfactorily demonstrated the ability to calculate central tendencies and range of data sets at least 80% of the time; satisfactorily demonstrated the ability to identify outliers in a data set at least 80% of the time; satisfactorily demonstrated the ability to represent data in appropriate displays that convey a somewhat accurate meaning of the data; identified some misleading representations of data and satisfactorily demonstrated the ability to represent the data in a more meaningful way; satisfactorily demonstrated the ability to collect, organize, display, and analyze data although some data was incomplete.

- **1 point:** Students demonstrated the ability to calculate central tendencies and range of data sets less than 80% of the time; demonstrated the ability to identify outliers in a data set less than 80% of the time; did not demonstrate the ability to represent data in appropriate
displays that convey an accurate meaning of the data; were unable to identify misleading representations of data or did not demonstrate the ability to represent the data in a more meaningful way; were unable to collect, display, and analyze data or the data collected was disorganized and inaccurate.

Vocabulary

**bar graph**
*Definition:* A graph in which the lengths of bars are used to represent and compare data in categories  
*Context:* Lara surveyed her classmates on their favorite ice cream flavors and displayed the results in a bar graph.

**box-and-whisker plot**
*Definition:* A display that divides a data set into four parts using the lower extreme, lower quartile, median, upper quartile, and upper extreme  
*Context:* Ethan used a box-and-whisker plot to display his data because he wanted the four quartiles to be easily identified.

**circle graph**
*Definition:* A graph that displays data as sections of a circle, where the entire circle represents all the data  
*Context:* Bryan created a circle graph to show what percentage of the day he spent performing different activities.

**histogram**
*Definition:* A graph that displays data from a frequency table, where the height of the bars represents the frequency for the interval  
*Context:* Paul used a histogram to display data from a frequency chart.

**line plot**
*Definition:* A graph that shows one value changing over time in relation to another value  
*Context:* Tom recorded the temperature each day for one month and displayed the data in a line plot so he could see the change in temperature over time.

**mean**
*Definition:* The sum of the values in a data set divided by the number of values (average)  
*Context:* Chris dove five times in one competition and scored 7.5, 8.0, 8.5, 9.0, and 9.5. His mean score was 8.5.
**median**

*Definition:* The middle value in a set of data when the values are listed numerically

*Context:* The median of the data set 24, 34, 35, 54, 67 is 35.

**mode**

*Definition:* The value in a data set that occurs most often

*Context:* The mode of the data set 54, 34, 67, 34, 35 is 34.

**outlier**

*Definition:* A value beyond the main part of the distribution

*Context:* Rob measured several caterpillars and found that most were 1 to 2 inches long. But one caterpillar was 4 inches long, so Rob identified this value as an outlier.

**range**

*Definition:* The difference of the greatest and least values in a data set

*Context:* The range of the data set 54, 34, 67, 34, 35 is 33.

**scatter plot**

*Definition:* A graph of a set of data pairs, which is a collection of points in a coordinate plane

*Context:* Oliver wanted to see if there was a relationship between the amount of milk he drank and his height so he recorded data over one year and displayed it in a scatter plot.

**stem-and-leaf plot**

*Definition:* A display that shows how data values are distributed, with each data value separated into a leaf (the last digit) and the stem (the remaining digits)

*Context:* The coach used a stem-and-leaf plot to display the runners’ race times so he could easily see the distribution.

**Academic Standards**

**Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K–12 Education addresses 14 content areas. To view the standards and benchmarks, visit [http://www.mcrel.org/compendium/browse.asp](http://www.mcrel.org/compendium/browse.asp).

This lesson plan addresses the following benchmarks:

- Understands basic characteristics of measures of central tendency (i.e., mean, mode, median).
- Understands basic characteristics of frequency and distribution (e.g., range, varying rates of change, gaps, and clusters).
- Understands the basic concepts of center and dispersion of data.
- Reads and interprets data in charts, tables, and plots (e.g., stem-and-leaf, box-and-whiskers, and scatter).
Uses data and statistical measures for a variety of purposes (e.g., formulating hypotheses, making predictions, testing conjectures).

Organizes and displays data using tables, graphs (e.g., line, circle, and bar), frequency distributions, and plots (e.g., stem-and-leaf, box-and-whiskers, and scatter).

Understands faulty arguments, common errors, and misleading presentations of data.

Understands that the same set of data can be represented using a variety of tables, graphs, and symbols and that different modes of representation often convey different messages (e.g., variation in scale can alter a visual message).

Understands the basic concept of outliers.

Understands basic concepts about how samples are chosen (e.g., random samples, bias in sampling procedures, limited samples, sampling error).

National Council of Teachers of Mathematics (NCTM)
The National Council of Teachers of Mathematics (NCTM) has developed national standards to provide guidelines for teaching mathematics. To view the standards online, go to http://standards.nctm.org. This lesson plan addresses the following standards:

- Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.
- Find, use, and interpret measures of center and spread, including mean and interquartile range.
- Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.
- Make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit.
- Analyze and evaluate the mathematical thinking and strategies of others.
- Create and use representations to organize, record, and communicate mathematical ideas.
- Use representations to model and interpret physical, social, and mathematical phenomena.

Support Materials
Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- http://school.discovery.com/teachingtools/teachingtools.html
### DVD Content

This program is available in an interactive DVD format. The following information and activities are specific to the DVD version.

#### How to Use the DVD

The DVD starting screen has the following options:

- **Play Video**—This plays the video from start to finish. There are no programmed stops, except by using a remote control. With a computer, depending on the particular software player, a pause button is included with the other video controls.

- **Video Index**—Here the video is divided into chapters indicated by title. Each chapter is then divided into four sections indicated by video thumbnail icons; brief descriptions are noted for each section. To play a particular segment, press Enter on the remote for TV playback; on a computer, click once to highlight a thumbnail and read the accompanying text description and click again to start the video.

- **Quiz**—Each chapter has four interactive quiz questions correlated to each of the chapter’s four sections.

- **Standards Link**—Selecting this option displays a single screen that lists the national academic standards the video addresses.

- **Teacher Resources**—This screen gives the technical support number and Web site address.

### Video Index

**I. Center and Spread (9 min.)**

- **Center and Spread: Introduction**
  
  See how data can be analyzed to show patterns and relationships and learn about mean, median, mode, and range.

- **Example 1: Line Plots**
  
  Line plots represent data with an x above the corresponding value on a number line. Use a number line to find the mode and range of a data set.

- **Example 2: Mean**
  
  Learn how to find the mean of a data set.

- **Example 3: Extreme Values**
  
  Investigate the effect of extreme values on the mean and range of a data set.

**II. Frequency and Distribution (7 min.)**

- **Frequency and Distribution: Introduction**
  
  Explore frequency charts and their use in identifying patterns and trends.
Example 1: Frequency Plots
See how frequency plots are used to display and compare data.

Example 2: Clusters and Gaps
Use a frequency chart to identify gaps and clusters in a data set. Learn how narrowing the chart intervals yields a more precise analysis.

Example 3: Dispersions
Use a frequency chart to compare and display the distribution of a data set, identifying gaps, clusters, and central tendencies.

III. Reading and Interpreting Data (10 min)

Reading and Interpreting Data: Introduction
Data displayed in a chart makes it easy to analyze and compare.

Example 1: Stem-and-Leaf Plots
Use a stem-and-leaf plot to display data on dogs’ weights. Learn this effective method to see variation in the data and retain the details.

Example 2: Box-and-Whisker Plots
Box-and-whisker plots are effective in displaying data in quartiles and identifying the range. Use a box-and-whisker plot to compare dog breeds and their sizes.

Example 3: Scatter Plot
Learn to use a scatter plot to represent relationships between paired quantities, such as the weights and heights of dog breeds.

IV. Using Data and Statistics (9 min.)

Using Data and Statistics: Introduction
Explore how observations and data help develop theories, make predictions, and test hypotheses.

Example 1: Exploration and Making Hypotheses
Scientists gather data on Jupiter’s Great Red Spot to study the phenomena and compare it to storms on Earth.

Example 2: Making Predictions
Scientists hypothesized that lightning intensity is directly related to storm size. Learn how data supported this hypothesis and helped predict storm size and intensity.

Example 3: Testing Hypotheses
Scientists use data to create a model of Jupiter’s atmosphere and experimental observation to conclude that giant storms consume energy from smaller ones.

V. Preparing Tables, Graphs, and Plots (8 min.)

Preparing Tables, Graphs, and Plots: Introduction
Understanding data and identifying trends is easier when the data is displayed in graphs and tables.
Example 1: Bar and Circle Graphs
See how a bar graph and circle graph display and compare the average monthly precipitation in Chicago.

Example 2: Frequency Distribution and Line Graphs
Histograms show frequencies in intervals of quantitative data. Line graphs show one value changing over time in relation to another. See average monthly temperatures displayed in a histogram and line graph.

Example 3: Line Graphs and Scatter Plots
Use a line graph to show relationships between two quantitative variables. Discover how a scatter plot organizes data, and investigate the relationship between alligator length and age.

VI. Faulty Arguments, Errors, and Misleading Presentation (10 min.)

Faulty Arguments, Errors, and Misleading Presentation: Introduction
Misleading presentation of data can produce an inaccurate perception. Data on shark attacks can be misrepresented, causing bias.

Example 1: Errors in Data
Investigate the causes of error in data: human error, error in measurement, measurement bias, and incomplete reporting.

Example 2: Misleading Presentations of Data
Global warming data illustrates misleading presentation. Changing the intervals on a line graph can affect changes, and data displays may affect interpretation.

Example 3: Faulty Arguments From Data
Misinterpreting data may lead to inaccurate conclusions. Explore the difference between causation and correlation using air quality data.

VII. Representation of Data (10 min.)

Representation of Data: Introduction
Isolating or emphasizing specific data illustrates how presentation can be misleading and affect interpretation.

Example 1: Tables and Charts
Data about the number of salps captured shows that the way data is displayed or emphasized may influence its interpretation.

Example 2: Symbols
Use a symbol graph to display Earth’s temperature at different depths, and learn why distorted symbols show how data can be misleading.

Example 3: Line Graphs
See how a line graph displaying the Earth’s temperature at different depths can be manipulated to emphasize the importance of visual representation and how it affects interpretation.
VIII. Outliers (10 min.)

Outliers: Introduction
Learn how to identify the outlier, a value beyond the main data distribution.

Example 1: Erroneous Data
Investigate why outliers occur in data: errors in measurement or recording; unusual but accurate values; or inclusion of inaccurate values.

Example 2: Correct but Unusual Data
Outliers may occur when unusual values are included in the data set. Study the heights of soldiers to identify unusual but accurate data.

Example 3: Handling Outliers
Learn how to handle outliers using ozone layer data: Never reject an outlier, and determine whether it’s an error or legitimate data that explains an unusual occurrence.

IX. Choosing Samples (10 min.)

Choosing Samples: Introduction
Random sampling is an effective way to gather data, but accuracy depends on the sample.

Example 1: Random Samples
In a random sample every member of a population has the same chance of being selected. See why larger samples more accurately represent the distribution of a characteristic.

Example 2: Bias in Sampling
Investigate why samples must represent an entire population before a generalization can be made. If the sample is limited, the conclusions must be limited to the specific subgroup.

Example 3: Sampling Error
See how the size of a sample affects the sampling error: As size increases, error decreases.

Quiz

I. Center and Spread

1. What is the median? 81, 30, 68, 75, 72, 72, 69, 80, 74
   A. 30
   B. 69
   C. 72
   D. 81

Answer: C
2. What is the mean? 81, 30, 68, 75, 72, 72, 69, 80, 74
   A. 68
   B. 69
   C. 72
   D. 80
   Answer: B

3. Identify the central tendency measure that is most affected by an extreme value in a data set.
   A. mean
   B. mode
   C. median
   D. maximum
   Answer: A

4. Luke collected data on the ages of students attending summer camp. What is the mode of the data displayed?
   A. 10
   B. 8
   C. 6
   D. 5
   Answer: C

II. Frequency and Distribution

1. The frequency plot displays the number of teams from countries that participated in the Discovery Challenge Games. Which statement is true?
   A. There is a higher frequency of teams from China than France.
   B. There is a lower frequency of teams from France than Canada.
   C. There is a higher frequency of teams from Australia than France.
   D. The United States has the most teams.
   Answer: C
2. Tara created a frequency chart to display marathoners’ finish times. She plotted the data to the nearest minute, but wants to analyze the data more precisely. How can she do this?
   A. Plot the data to the nearest second.
   B. Plot the data to the nearest 30 seconds.
   C. Plot the data to the nearest five minutes.
   D. Plot the data in two groups.
   Answer: A

3. The frequency chart displays the number of hours students spend on homework each week. Calculate the average number of hours spent on homework by fifth through ninth graders.
   A. 7.4 hours
   B. 8 hours
   C. 9.4 hours
   D. 10 hours
   Answer: C

III. Reading and Interpreting Data

1. Which dog breed weighs 62 pounds?
   A. Boxer
   B. Beagle
   C. Poodle
   D. Labrador
   Answer: D

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<td>German shepherd</td>
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</table>
2. Identify the data display that divides values into quartiles and can be used to find the range.
   A. line plot
   B. frequency chart
   C. stem-and-leaf plot
   D. box-and-whisker plot

   Answer: D

3. Jenn collected data on the ages and heights of 20 oak trees and wants to analyze any relationships between the two quantities. What is the best way for Jenn to display the data?
   A. Create a scatter plot.
   B. Create a frequency chart.
   C. Create a stem-and-leaf plot.
   D. Create a box-and-whisker plot.

   Answer: A

IV. Using Data and Statistics

1. What is the relationship between lightning intensity and storm size?
   A. smaller lightning intensity, no storm
   B. greater lightning intensity, larger storm
   C. smaller lightning intensity, larger storm
   D. greater lightning intensity, smaller storm

   Answer: B

2. What is the current theory that explains how the Jupiter’s Great Red Spot has maintained its energy for more than 300 years?
   A. The storm gets its energy from fuel on the planet’s surface.
   B. The storm spins very fast and creates lightning energy to maintain itself.
   C. The storm consumes other small storms to maintain itself.
   D. The storm consumes gases from the atmosphere to maintain itself.

   Answer: C
V. Preparing Tables, Graphs, and Plots

1. Sam collected data on his classmates' favorite types of movies and displayed it in a circle graph. What type of movie did \( \frac{1}{4} \) of his classmates like?
   A. comedy
   B. suspense
   C. adventure
   D. science fiction

   \textit{Answer: C}

2. Jason collected data on the average seasonal temperatures in his hometown and displayed it in a line graph. What is the range of the data displayed?
   A. 20
   B. 30
   C. 40
   D. 60

   \textit{Answer: D}
3. Ron collected data on the height and weight of people ages 3–20 and displayed it in a scatter plot. What relationship can be identified?
   A. As height increases, weight increases.
   B. As height increases, weight decreases.
   C. As weight decreases, height increases.
   D. As height increases, weight stays the same.

   Answer: A

VI. Faulty Arguments, Errors, and Misleading Presentation

1. A scientist hypothesizes that warmer temperatures affect the growth of plants. The scientist records plant growth only on warm days, records the measurements accurately, chooses the appropriate measuring tools, and uses the tools correctly. What error has occurred in this data collection?
   A. human error
   B. measurement bias
   C. incomplete reporting
   D. error in measurement

   Answer: C

2. The line graph shows the daily average of visitors at the library during every season and it appears there is a large difference between visitors in the summer and winter. How could you change the line graph to more clearly present the data?
   A. Change the title of the graph.
   B. Change the labels on the x-axis.
   C. Change the intervals on the y-axis.
   D. Change the positions on the x-axis.

   Answer: C
VII. Representation of Data

1. Hannah recorded the number of pages she read each day during the week. If she showed her teacher only the data from Monday, Tuesday, and Wednesday, what might her teacher think?

A. Hannah didn’t like reading the book.
B. Hannah read very different amounts each night.
C. Hannah stopped reading her book on Tuesday.
D. Hannah read about 25 pages every day of the week.

*Answer: D*

2. Gary collected data on the number of video games his four friends have. His display of the data is misleading and might make someone think there is a wide range in the number of video games the boys have. Why?

A. The names are not displayed correctly.
B. The intervals on the y-axis are too narrow.
C. Gary didn’t collect all the data.
D. The title of the graph is incorrect.

*Answer: B*
VIII. Outliers

1. Isabelle collected data to determine how many minutes her classmates spend reading each night. Identify the outlier in her data.
   A. 10 minutes
   B. 15 minutes
   C. 35 minutes
   D. 40 minutes
   **Answer: D**

2. Samantha collected data on the weight of students’ backpacks. Most weighed 10–13 pounds, but one weighed 27 pounds. Samantha identified this as the outlier. What should she do with it?
   A. Include the outlier because it may explain an unusual occurrence.
   B. Do not include the outlier because the scale was wrong.
   C. Ignore the outlier because it is so far from the average weight.
   D. Weigh the backpack again and ignore the data.
   **Answer: A**

3. The central value in a data set is 15, and the majority of the other values are within 5 points of the central value. Which of the following would be considered an outlier?
   A. 20
   B. 16
   C. 11
   D. 5
   **Answer: D**
IX. Choosing Samples

1. A scientist is studying a large population of monarch butterflies chooses a sample, but only picks butterflies that live in one small area of a meadow. What problem has she created?
   A. She has chosen a true random sample.
   B. It is impossible to study whole population with a sample.
   C. There is a sampling error because all the butterflies might not be able to fly.
   D. The sample is biased because she only collected butterflies from one small area.
   
   Answer: D

2. Ryan wants to study the colors of beetles in his area. Since he cannot study the whole population, what is the best way to study the beetles?
   A. create a sampling error
   B. choose a biased sample
   C. choose a random sample
   D. choose only two beetles

   Answer: C

3. Which statement is true?
   A. Smaller samples result in a smaller sampling error.
   B. Larger samples result in a smaller sampling error.
   C. Larger samples result in a larger sampling error.
   D. Sample size and sampling error are not related.

   Answer: B
### Data Sets for Central Tendencies Worksheet

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Data Sets for Graphing

Highest Mountains

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<td>Kangchenjunga</td>
<td>Nepal/India</td>
<td>8,586</td>
<td>28,169</td>
<td></td>
</tr>
<tr>
<td>Lhotse</td>
<td>Nepal/Tibet</td>
<td>8,516</td>
<td>27,940</td>
<td></td>
</tr>
<tr>
<td>Makalu</td>
<td>Nepal/Tibet</td>
<td>8,463</td>
<td>27,766</td>
<td></td>
</tr>
<tr>
<td>Cho Oyu</td>
<td>Nepal/Tibet</td>
<td>8,201</td>
<td>26,906</td>
<td></td>
</tr>
<tr>
<td>Dhaulagiri</td>
<td>Nepal</td>
<td>8,167</td>
<td>26,795</td>
<td></td>
</tr>
<tr>
<td>Manaslu</td>
<td>Nepal</td>
<td>8,163</td>
<td>26,781</td>
<td></td>
</tr>
<tr>
<td>Nanga Parbat</td>
<td>Pakistan</td>
<td>8,125</td>
<td>26,660</td>
<td></td>
</tr>
<tr>
<td>Annapurna</td>
<td>Nepal</td>
<td>8,091</td>
<td>26,545</td>
<td></td>
</tr>
<tr>
<td>Gasherbrum</td>
<td>Pakistan/China</td>
<td>8,068</td>
<td>26,470</td>
<td></td>
</tr>
<tr>
<td>Broad Peak</td>
<td>Pakistan/China</td>
<td>8,047</td>
<td>26,400</td>
<td></td>
</tr>
<tr>
<td>Gasherbrum II</td>
<td>Pakistan/China</td>
<td>8,035</td>
<td>26,360</td>
<td></td>
</tr>
<tr>
<td>Shisha Pangma</td>
<td>Tibet</td>
<td>8,013</td>
<td>26,289</td>
<td></td>
</tr>
</tbody>
</table>

Major U.S. Rivers

<table>
<thead>
<tr>
<th>River</th>
<th>Length (in miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri</td>
<td>2,540</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2,340</td>
</tr>
<tr>
<td>Yukon</td>
<td>1,980</td>
</tr>
<tr>
<td>Rio Grande</td>
<td>1,900</td>
</tr>
<tr>
<td>St. Lawrence</td>
<td>1,900</td>
</tr>
<tr>
<td>Arkansas</td>
<td>1,460</td>
</tr>
<tr>
<td>Colorado</td>
<td>1,450</td>
</tr>
<tr>
<td>Red</td>
<td>1,290</td>
</tr>
<tr>
<td>Brazos</td>
<td>1,280</td>
</tr>
<tr>
<td>Columbia</td>
<td>1,240</td>
</tr>
<tr>
<td>Snake</td>
<td>1,040</td>
</tr>
<tr>
<td>Platte</td>
<td>990</td>
</tr>
<tr>
<td>Ohio</td>
<td>981</td>
</tr>
<tr>
<td>Pecos</td>
<td>926</td>
</tr>
<tr>
<td>Canadian</td>
<td>906</td>
</tr>
</tbody>
</table>

Average Monthly High and Low Temperatures
Annapolis, Maryland

<table>
<thead>
<tr>
<th>Month</th>
<th>Average High (Fahrenheit)</th>
<th>Average Low (Fahrenheit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>42</td>
<td>24</td>
</tr>
<tr>
<td>February</td>
<td>45</td>
<td>25</td>
</tr>
<tr>
<td>March</td>
<td>54</td>
<td>33</td>
</tr>
<tr>
<td>April</td>
<td>65</td>
<td>42</td>
</tr>
<tr>
<td>May</td>
<td>75</td>
<td>52</td>
</tr>
<tr>
<td>June</td>
<td>83</td>
<td>62</td>
</tr>
<tr>
<td>July</td>
<td>88</td>
<td>67</td>
</tr>
<tr>
<td>August</td>
<td>85</td>
<td>66</td>
</tr>
<tr>
<td>September</td>
<td>78</td>
<td>59</td>
</tr>
<tr>
<td>October</td>
<td>67</td>
<td>46</td>
</tr>
<tr>
<td>November</td>
<td>56</td>
<td>36</td>
</tr>
<tr>
<td>December</td>
<td>47</td>
<td>29</td>
</tr>
</tbody>
</table>

Average Monthly Precipitation
Annapolis, Maryland

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Precipitation (in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>3.49</td>
</tr>
<tr>
<td>February</td>
<td>2.95</td>
</tr>
<tr>
<td>March</td>
<td>4.17</td>
</tr>
<tr>
<td>April</td>
<td>3.34</td>
</tr>
<tr>
<td>May</td>
<td>4.42</td>
</tr>
<tr>
<td>June</td>
<td>3.56</td>
</tr>
<tr>
<td>July</td>
<td>3.98</td>
</tr>
<tr>
<td>August</td>
<td>4.04</td>
</tr>
<tr>
<td>September</td>
<td>4.25</td>
</tr>
<tr>
<td>October</td>
<td>3.56</td>
</tr>
<tr>
<td>November</td>
<td>3.33</td>
</tr>
<tr>
<td>December</td>
<td>3.69</td>
</tr>
</tbody>
</table>
**Data Sets for Graphing**

You surveyed 20 people and asked them how many pets they have. The responses were:
6, 2, 3, 1, 5, 0, 2, 4, 1, 1, 6, 2, 0, 3, 1, 4, 3, 2, 1, 1

In a survey, 18 people were asked how many TVs they own. The responses were:
2, 4, 1, 3, 5, 6, 3, 7, 2, 1, 4, 8, 5, 4, 3, 4, 1, 2

**Favorite School Subjects**
This table shows the favorite subjects of all 6th grade students in a school.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>23</td>
</tr>
<tr>
<td>English</td>
<td>45</td>
</tr>
<tr>
<td>History</td>
<td>18</td>
</tr>
<tr>
<td>Science</td>
<td>32</td>
</tr>
</tbody>
</table>

**Plant Growth**
This table shows the recorded growth of a plant over a seven-day period.

<table>
<thead>
<tr>
<th>Day</th>
<th>Height (in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Fuel Use**
This table shows the amount of fuel used by NASA’s Crawler Transporter, which moves the space shuttle around the launch pad.

<table>
<thead>
<tr>
<th>Distance (miles)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of Fuel (gallons)</td>
<td>126</td>
<td>252</td>
<td>378</td>
<td>504</td>
<td>630</td>
<td>756</td>
</tr>
</tbody>
</table>