

Gale Resources Tip Sheet

Gale In Context Toolbox—How to Read and Interpret Graphs

The *Gale In Context* toolbox tip sheets are designed to help middle school and high school researchers prepare a written report. Graphs can be a great way to show data. This document will explain how to **read and interpret graphs**. You can use the tips provided to create your own report.

Graphs are used in newspapers, magazines, history books, and science texts. While they're an excellent way to show a lot of information, reading and interpreting graphs can be confusing. Answering questions about graphs can also be hard. Generally, when people make mistakes reading and interpreting graphs it's for the following two reasons:

Common Mistake #1

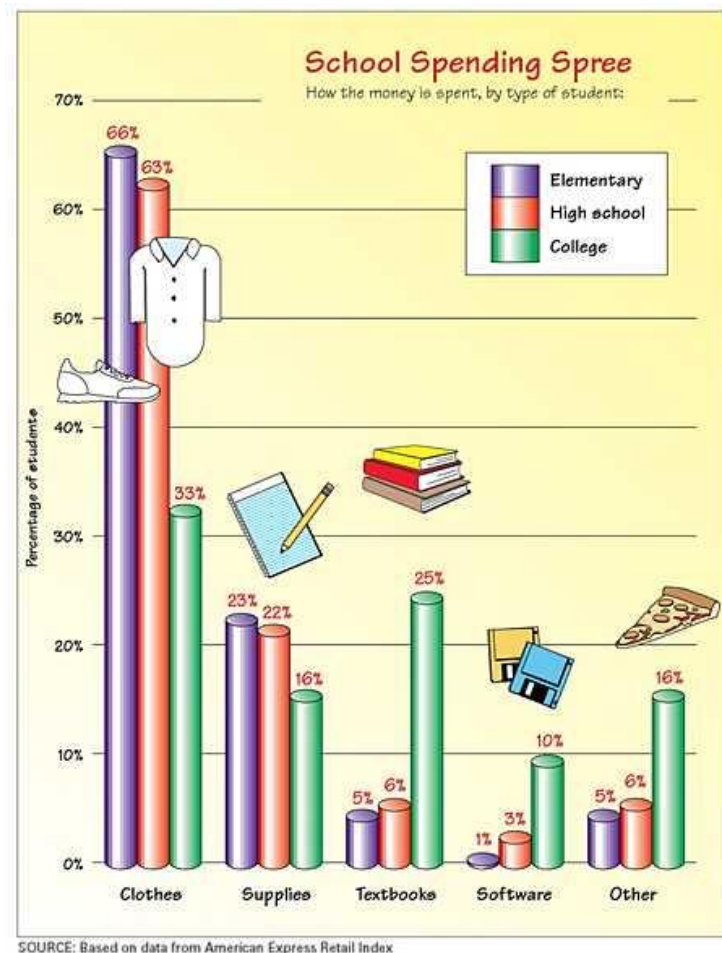
The most common mistake seems to be trying to interpret the graph before understanding it. Graphs can be read just like you read the words in a story. Look at the title, the words describing the X and Y axis (the bottom and side of the graph), and the information presented. As you read the graph, think about whether the information makes sense. If it's a graph about the number of sunny days per month in each state, think about how much sun you usually get in your state each month. Does the information seem to make sense with what you know? If it does, it's likely you're reading the graph correctly. If it doesn't make sense, try to figure out why it isn't making sense before you try to answer the questions.

Common Mistake #2

The second mistake people make when reading and interpreting graphs is not understanding the questions. Break down each question to make sure you understand it. For example, if you're asked to compare the marriage and divorce rate between 1950 and 1998, you know that you'll have to look at the difference between the numbers of marriages and divorces in those two years. If you're asked to describe a trend based on information in a graph, you'll have to notice how the amounts increase or decrease over the time shown. We'll use the bar graph to the right as an example.

This is a bar graph with a lot of information. Our first priority is to look at the title and the categories. The title, *School Spending Spree*, tells us that this graph has information about money spent on school. Hopefully this makes you think about the shopping you did before school started. A look at the categories listed in the bottom of the chart (the X axis) will help us to see what kinds of things money was spent on. The categories of clothes, supplies, textbooks, and software sound like typical ways to spend money for school. There's nothing unexpected, like bubble gum or costumes.

Now that we know what the graph will tell us about, we need to look at the key and the writing on the left side of the graph. The left side of the graph is the Y axis. The key shows three colors: purple, red, and green. Purple represents elementary students, red is for high school students, and green stands for college students. The Y axis tells us that the information is being presented in percentages. In other words, if you added up all the purple percentages, it would equal 100%. The same is true for the red and the green.



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Take a minute to think about what you would expect those different types of students to spend. Students who are growing the most would probably spend the most on clothing, while college students would likely spend the most on textbooks and software. A quick glance at the graph confirms these predictions. Before you try to answer any questions about the graph, read it carefully. See if there is any surprising information in it. This will help you to see if the information makes sense.

Answering questions about this graph could be tricky since it shows spending in five categories by three different age groups of students. Make sure as you answer the questions, you think about that.

Let's try some questions about this graph.

1. What do college students typically spend the most on for school?

Look at all the green bars. Which one shows the largest percentage? You'll notice that the clothes category is 33%. That's more than the percentages spent on supplies, textbooks, software, or the other category.

2. What's the difference in spending on clothing between elementary students and high school students?

The key to answering this question is to understand what the question is asking. If it's asking for the difference between two categories, you'll need to subtract. Find the percentage of spending on clothing for elementary students (the purple bar in the clothes category) and for high school (the red bar in the clothes category). From there, it's a simple matter of subtraction.

$$66\% - 63\% = 3\%$$

3. What do elementary students spend the least on for school?

This is one of the easiest questions to answer. Make sure you're looking at the purple bars. Which one is the smallest and shows the smallest percentage? Software, at 1% of the total expenditure, is clearly the least.

4. What's the total expenditure on school supplies for high school and college students?

To answer this question, you must first make sure you understand what you're being asked. The word "total" helps you to know that you're going to be adding some numbers together. The category that you'll look at is school supplies. The next step is to find the colors that correspond to high school and college. Add together the green and red columns.

5. Which category of student is likely to spend the most on miscellaneous expenditures?

You'll notice that there's no category for miscellaneous items. There's only one possible category to which this can refer. The last column in this graph is labeled "Other" and shows a slice of pizza above it. The green bar is clearly the largest, so college students must spend the most on miscellaneous items.

Types of Graphs

There are two types of graphs you'll see most often. Each type is used for different reasons. No matter which type of graph you're reading, it will be important to read and understand the graph before you answer any questions about it.

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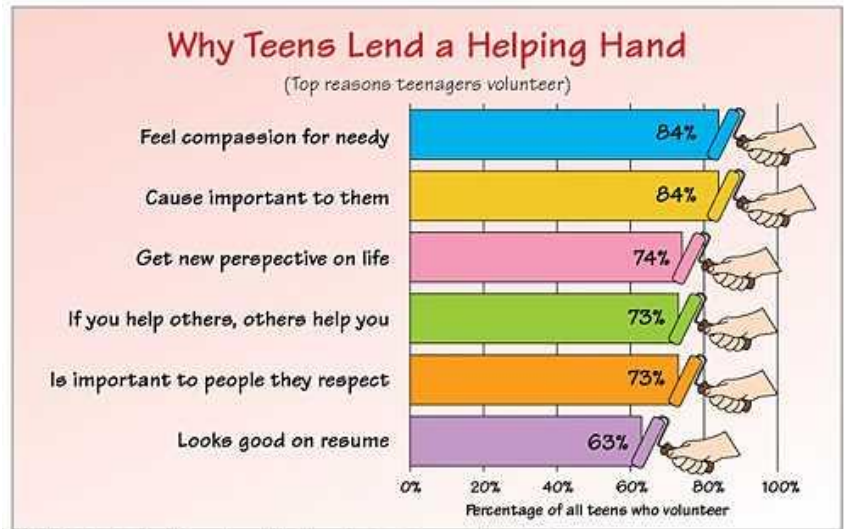
Bar Graph

Bar graphs are used to compare information or look at information over time, such as years. The graph we used earlier is an example of a vertical bar graph. It compares the percentage of money that elementary, high school, and college students spend on school-related items. Bar graphs can also be horizontal.

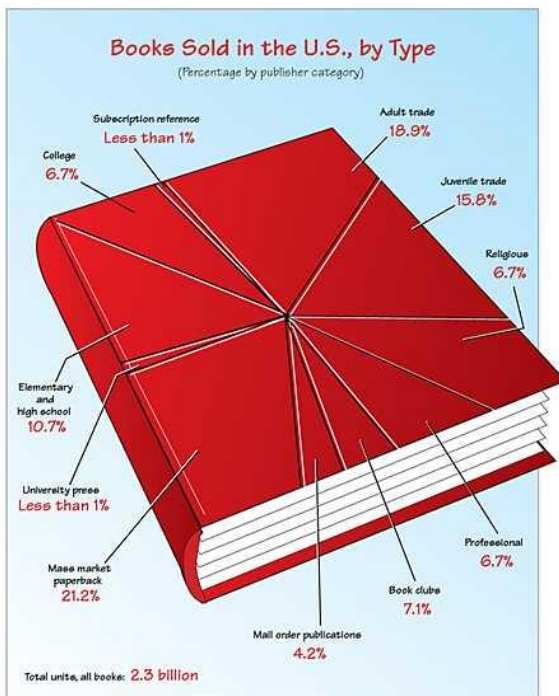
Pie Chart

Pie charts show percentages. If you add up all the percentages in a pie chart, the total is 100%. These charts are good for looking at the parts of a whole. Pie charts are often in the shape of a circle, but they don't have to be. Below is an example of two pie charts. One is a circle and one isn't.

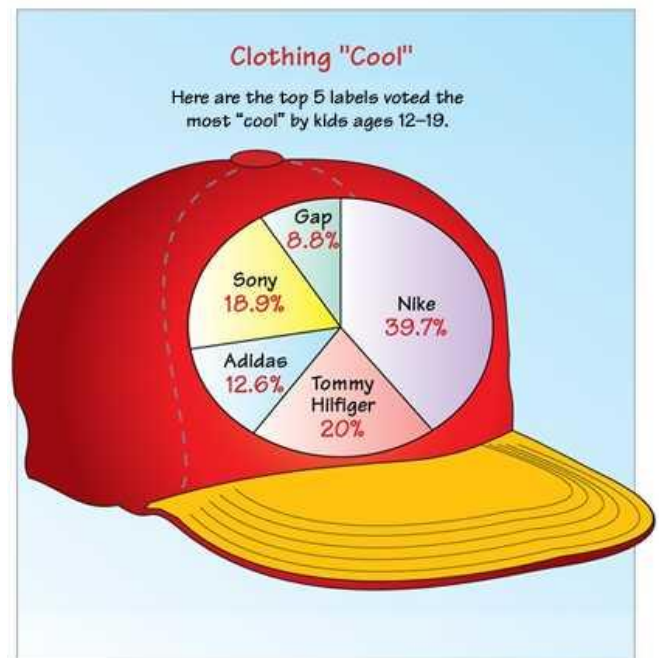
The pie chart on the left shows the types of books sold in the United States. If you add up all the types of books, the total is 100%. The same is true for the Clothing "Cool" pie chart on the right. When added together, the top five labels are equal to 100%. It makes sense to use a pie chart to show this information. It wouldn't be as easy to see the whole picture with a bar graph.



SOURCE: Based on data from Volunteering and Giving Among American Teenagers by Independent Sector



SOURCE: Based on data from Book Industry Study Group, Inc.



SOURCE: Based on data from Teenage Research Unlimited, Inc.

You can download a worksheet to help read and interpret graphs here:

https://support.gale.com/doc/readinggraphs_ws

Need more help? Ask your librarian!

Gale, here for **everyone.**