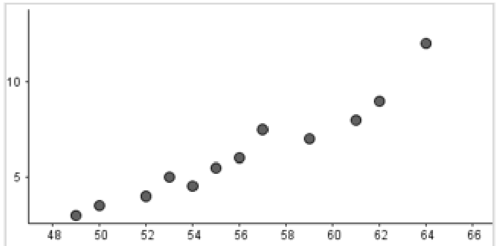
PDF File

DISPLAY DATA



Unit Overview

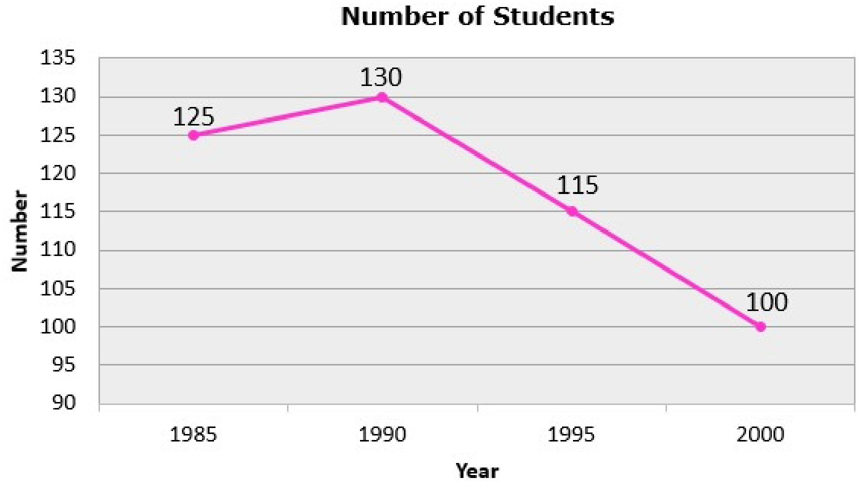
In this unit, you will extend your knowledge of data displayed in graphs. You will examine, analyze, and evaluate double-bar graphs, scatter plots, and misleading graphs.

Displaying Data in Graphs

Let's take a look at some data and the resulting appropriate graphs.

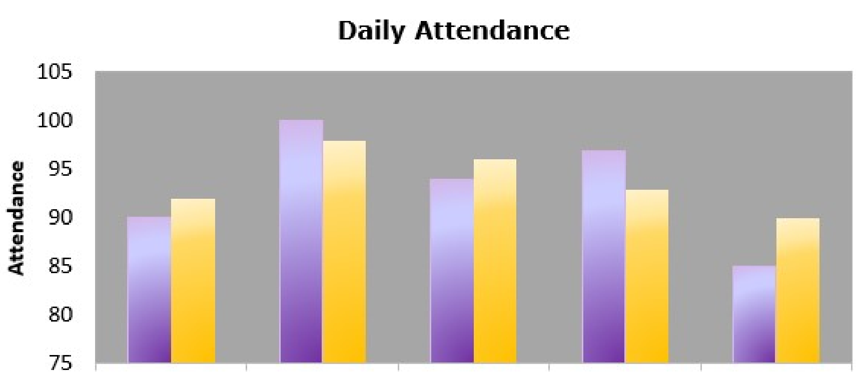
Beth is examining the student enrollment in her school's 6th grade class. She started with the year 1985 and made a line graph to look for a trend for the enrollment at her school. The line graph displayed that there is an overall gradual decline in enrollment.

Number of Students in 6th Grade Class	
Year	**Number**
1985	125
1990	130
1995	115
2000	100



Beth is examining the daily attendance of here 6th grade class. She wanted to see which day of school students attend best. She selected a bar graph to compare the data for two weeks. She found that the daily attendance was best on Tuesday.

Daily Attendance of 6th Grade Class		
	Week One	Week Two
Monday	90	92
Tuesday	100	98
Wednesday	94	96
Thursday	97	93
Friday	85	90



Wednesday Tuesday Wednesday Thursday Friday

Day of Week

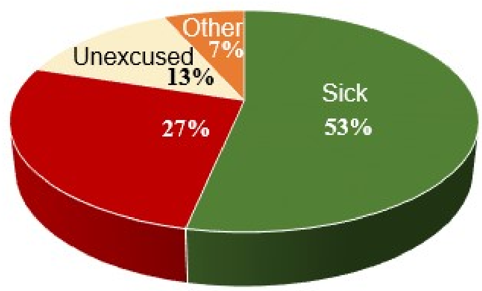
Week One Week Two

Beth is examining the reasons for student absences on Friday. She decided to display the information in a circle graph to show percentages of the whole group.

Reasons for Absences

Reasons for Absences	
Sick	8
Doctor's Appointment	4
Unexcused	2
Other	1

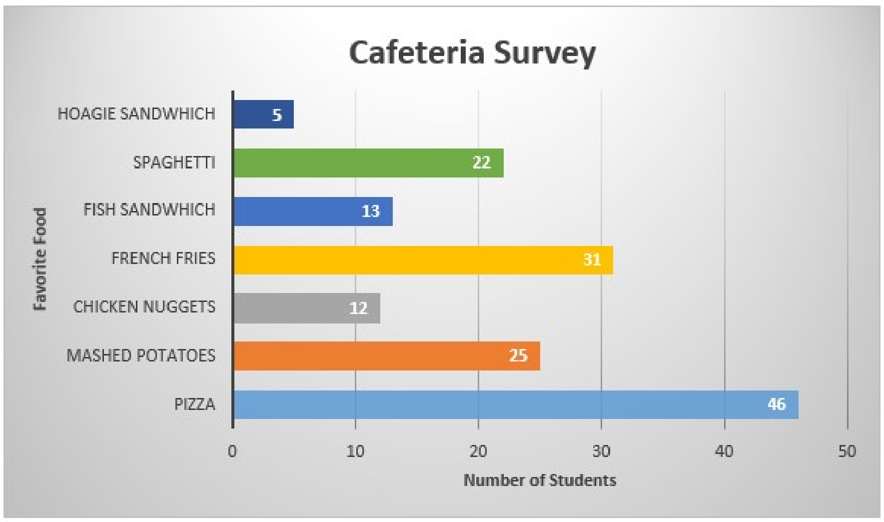
Reasons for Absences

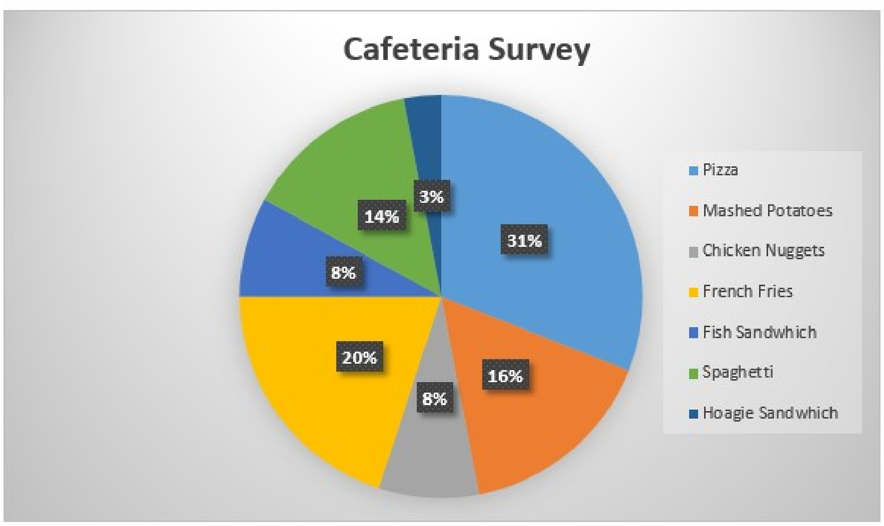


Same Data in Different Graphs

Jennifer surveyed the sixth grade students to determine the favorite food in the school cafeteria with these results: Pizza (46), Mashed Potatoes (25), Chicken Nuggets (12), French Fries (31), Fish Sandwich (13), Spaghetti (22), Hoagie Sandwich (5). She made a table to display her results.

Jennifer then decided to compare her results in two different types of graphs. In the bar graph, the number of students surveyed can be determined. In the circle graph, the percent of students is shown rather than the number. In both graphs, pizza is clearly the favorite choice of the students. *Which graph would you use to display the results to the student body?*

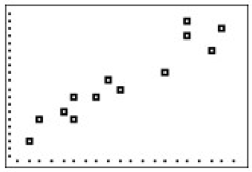
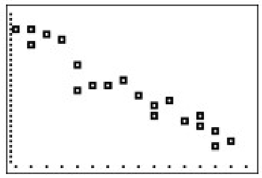
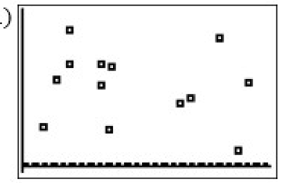




Scatter Plots

Scatter plots are an easy way to determine if there is a relationship between two variables. This relationship is called a **correlation**. A correlation is based on the slope of the line of best fit. (We will discuss how to find the line of best fit later in the unit).

There are three possible types of correlation: a) positive, b) negative, or c) no correlation. The illustrations below show the graph of each correlation.

a.)  b.)  c.) 

In graph "a," notice how the points cluster in a rise to the right. Recall from a previous unit that this suggests a **positive slope**. Graph "b" shows points that cluster in a fall to the right, which suggests a **negative slope,** and graph "c" shows no cluster pattern and suggests that the two variables have **no relationship** to each other.

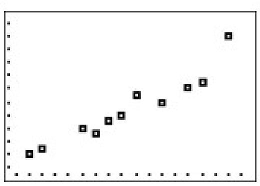
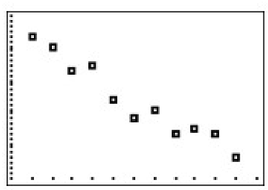
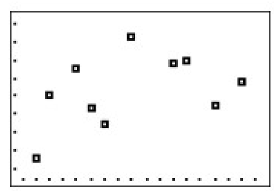
Let's take a look at a few examples and determine if each situation has a positive, negative, or no correlation.

Example: Determine which scatter plot represents each situation.

a.) a person's height and his/her hourly wage

b.) a person's height and his/her shoe size

c.) a person's age and his/her time needed to run 100 yards

1)  2)  3) 

Scatter plot 1 shows a strong positive correlation. A **positive correlation** occurs when **both variables increase**. As you grow taller your shoe size increases; therefore, **plot 1** represents situation **"b."**

Scatter plot 2 shows a strong negative correlation. A **negative correlation** occurs when **one variable increases as the other variable decreases**. In situation **"c"** as your age increases, the time it takes you to run 100 yards decreases.

The third scatter plot shows **no correlation** because the data points are **randomly scattered**. Your height has no relationship with your hourly wage; therefore, this plot represents situation **"a."**

Misleading Statistics

Statistics and graphs are very valuable tools for determining, processing, and evaluating data. However, some persons may misuse statistics purposely to promote an outcome they desire.

Example 1: Timothy purchased five raffle tickets that cost \$1 each, based on the sales promotion that the top prize was \$400 and the average award amount was \$20. What the salesperson failed to mention to Timothy is that the rest of the prize awards were for \$1.

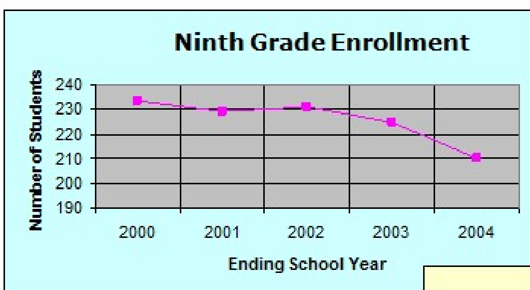
This promotion was mathematically correct, but if Timothy won, most likely his prize would be \$1, not \$400.

The Math:

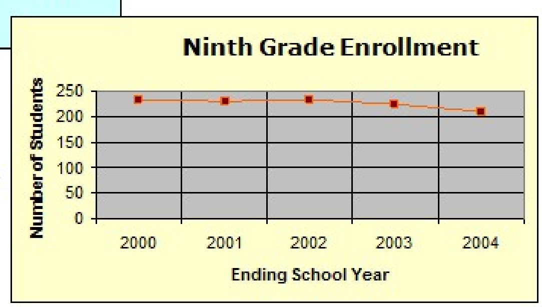
$$\begin{array}{lcr} \text{1 prize of \$400} & = & 400 \\ \text{20 prizes of \$1} & = & 20 \\ \hline \text{21 prizes} & = & 420 \end{array}$$

Average prize amount is $\dfrac{420}{21} = \$20$

Example 2: Graphs may be constructed in a way to emphasize certain data presented. Here are two graphs that show the enrollment of a ninth grade class over the school years 2000 through 2004.



In this graph, an overall decline in enrollment is shown with a sharp decline in the year 2004.



In this graph, the enrollment looks pretty steady with a small decline in the year 2004.

The different appearance of these two graphs was simply achieved by making changes in the beginning and ending values of the vertical axis and also by making changes in the amount of increments in the scale of the vertical axis.