

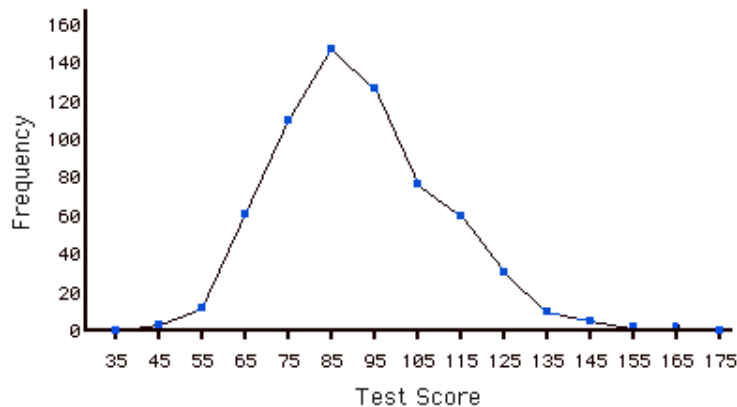
Chapter 2 Exercises

Prerequisites

[All material presented in chapter 2](#)

Selected answers

1. Name some ways to graph quantitative variables and some ways to graph qualitative variables. ([relevant section](#) & [relevant section](#))
2. Based on the frequency polygon displayed below, the most common test grade was around what score? Explain. ([relevant section](#))



3. An experiment compared the ability of three groups of participants to remember briefly-presented chess positions. The data are shown below. The numbers represent the number of pieces correctly remembered from three chess positions. Create side-by-side box plots for these three groups. What can you say about the differences between these groups from the box plots? ([relevant section](#))

Non-players	Beginners	Tournament players
22.1	32.5	40.1
22.3	37.1	45.6
26.2	39.1	51.2
29.6	40.5	56.4
31.7	45.5	58.1
33.5	51.3	71.1
38.9	52.6	74.9
39.7	55.7	75.9
43.2	55.9	80.3
43.2	57.7	85.3

4. You have to decide between displaying your data with a histogram or with a stem and leaf

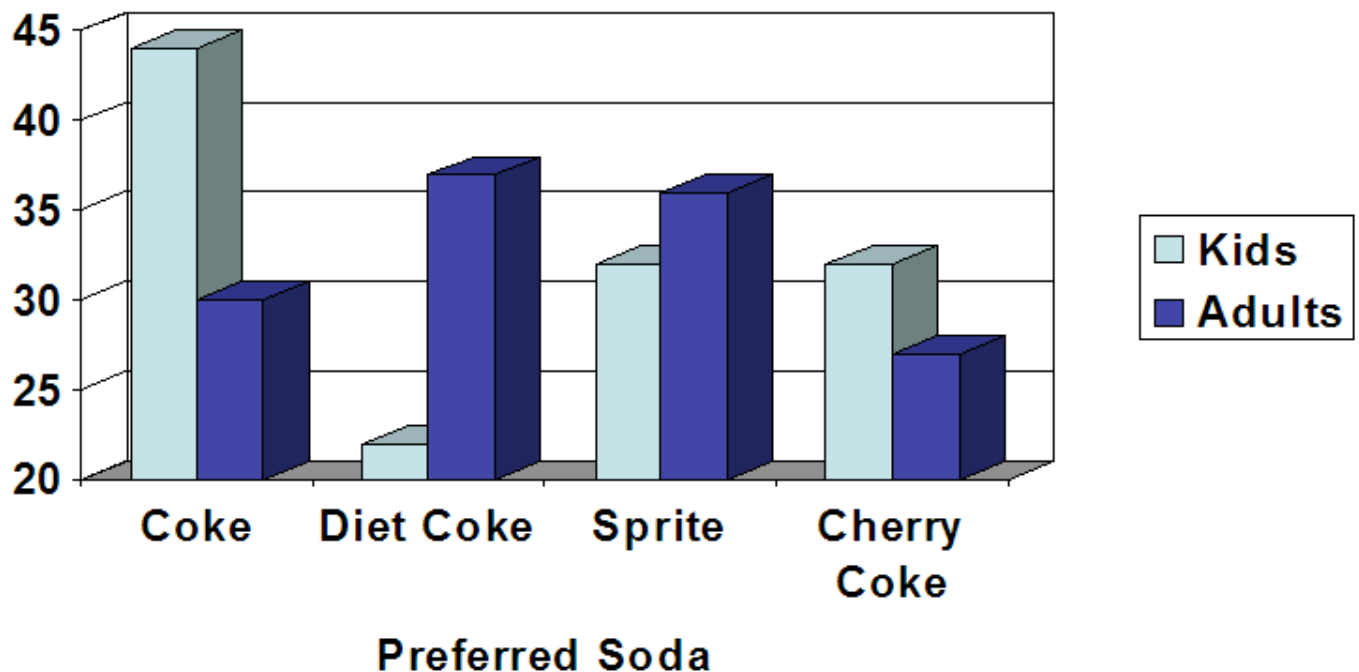
display. What factor(s) would affect your choice? ([relevant section](#) & [relevant section](#))

5. In a box plot, what percent of the scores are between the lower and upper hinges? ([relevant section](#))
6. A student has decided to display the results of his project on the number of hours people in various countries slept per night. He compared the sleeping patterns of people from the US, Brazil, France, Turkey, China, Egypt, Canada, Norway, and Spain. He was planning on using a line graph to display this data. Is a line graph appropriate? What might be a better choice for a graph? ([relevant section](#) & [relevant section](#))
7. For the data from the 1977 Stat. and Biom. 200 class for eye color, construct: ([relevant section](#))
 - a. pie graph
 - b. horizontal bar graph
 - c. vertical bar graph
 - d. a frequency table with the relative frequency of each eye color

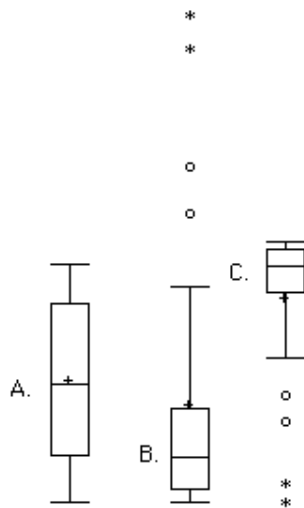
Eye Color	Number of students
Brown	11
Blue	10
Green	4
Gray	1

(Question submitted by J. Warren, UNH)

8. A graph appears below showing the number of adults and children who prefer each type of soda. There were 130 adults and kids surveyed. Discuss some ways in which the graph below could be improved. ([relevant section](#))



9. Which of the box plots on the has a large positive skew? Which has a large negative skew? ([relevant section](#) & [relevant section](#))



Questions from Case Studies:

The following questions are from the [Angry Moods](#) (AM) case study.

10. (AM#6) Is there a difference in how much males and females use aggressive behavior to improve an angry mood? For the "Anger-Out" scores:
 - a. Create parallel box plots. ([relevant section](#))
 - b. Create a back to back stem and leaf displays (You may have trouble finding a computer to do this so you may have to do it by hand.) ([relevant section](#))
11. (AM#9) Create parallel box plots for the Anger-In scores by sports participation. ([relevant section](#))
12. (AM#11) Plot a histogram of the distribution of the Control-Out scores. ([relevant section](#))
13. (AM#14) Create a bar graph comparing the mean Control-In score for the athletes and the non-athletes. What would be a better way to display this data? ([relevant section](#))
14. (AM#18) Plot parallel box plots of the Anger Expression Index by sports participation. Does it look like there are any outliers? Which group reported expressing more anger? ([relevant section](#))

The following questions are from the [Flatulence](#) (F) case study.

15. (F#1) Plot a histogram of the variable "perday." ([relevant section](#))
16. (F#7) Create parallel box plots of "howlong" as a function gender. Why is the 25th percentile not showing? What can you say about the results? ([relevant section](#))
17. (F#9) Create a stem and leaf plot of the variable "howlong." What can you say about the shape of the distribution? ([relevant section.1](#))

The following questions are from the [Physicians' Reactions](#) (PR) case study.

18. (PR#1) Create box plots comparing the time expected to be spent with the average-weight and overweight patients. ([relevant section](#))
19. (PR#4) Plot histograms of the time spent with the average-weight and overweight patients. ([relevant section](#))
20. (PR#5) To which group does the patient with the highest expected time belong?

The following questions are from the [Smiles and Leniency](#) (SL) case study

21. (SL#1) Create parallel boxplots for the four conditions. ([relevant section](#))
22. (SL#3) Create back to back stem and leaf displays for the false smile and neutral conditions. (It may be hard to find a computer program to do this for you, so be prepared to do it by hand). ([relevant section](#))

The following questions are from the [ADHD Treatment](#) (AT) case study.

23. (AT#3) Create a line graph of the data. Do certain dosages appear to be more effective than others? ([relevant section](#))
24. (AT#5) Create a stem and leaf plot of the number of correct responses of the participants after taking the placebo (d0 variable). What can you say about the shape of the distribution? ([relevant section](#))
25. Create box plots for the four conditions. You may have to rearrange the data to get a computer program to create the box plots.

The following question is from the [SAT and College GPA](#) case study.

26. Create histograms and stem and leaf displays of both high-school grade point average and university grade point average. In what way(s) do the distributions differ?
27. The April 10th issue of the Journal of the American Medical Association reports a study on the effects of anti-depressants. The study involved 340 subjects who were being treated for major depression. The subjects were randomly assigned to receive one of three treatments: St. John's wort (an herb), Zoloft (Pfizer's cousin of Lilly's Prozac) or placebo for an 8-week period. The following are the mean scores (approximately) for the three groups of subjects over the eight-week experiment. The first column is the baseline. Lower scores mean less depression. Create a graph to display these means.

Placebo	22.5	19.1	17.9	17.1	16.2	15.1	12.1	12.3
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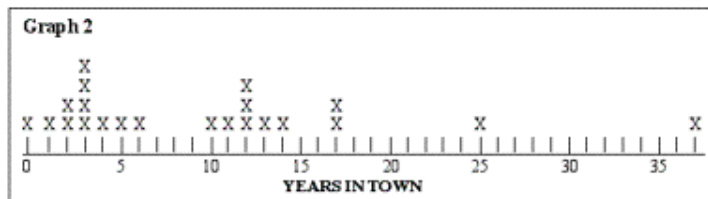
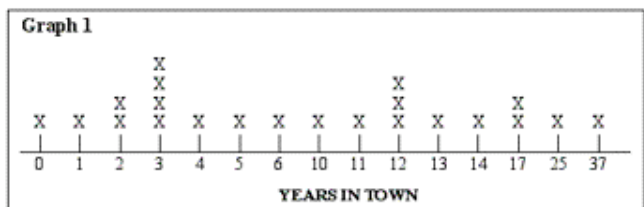
Wort	23.0	20.2	18.2	18.0	16.5	16.1	14.2	13.0
Zoloft	22.4	19.2	16.6	15.5	14.2	13.1	11.8	10.5

The following questions are from



[Visit the site](#)

28. A class of students recorded the number of years their families had lived in their town. Here are two graphs that students drew to summarize the data. Which graph gives a more accurate representation of the data? Why?

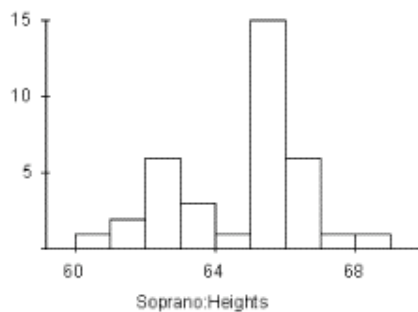


29. The IQ (intelligence) scores of thirty-three students from the same third grade classroom are presented. One set is for boys and the other set is for girls. Summary statistics (mean, standard deviation, median, and quartiles) are provided for each set of children. Use the stems below to create a back-to-back stem-and-leaf plot so that you can visually compare the IQ scores of the boys with the IQ scores of the girls. Write a comparison of the distribution of IQ scores for the boys and girls that includes comparisons of shape, center, and variability.

BOYS					GIRLS				
113	113	122	116	122	115	102	119	114	108
	134					111			
134	105	122	126	129	122	113	125	118	96
	133					112			
122	133	108	120	144	124	122	115		
	104								
$\bar{x} = 122.2$					$\bar{x} = 114.4$				
sd = 11.09					sd = 8.05				
$Q_1 = 113$					$Q_1 = 111.5$				
Median = 122					Median = 115				
$Q_3 = 133$					$Q_3 = 120.5$				

BOYS		GIRLS
	9	
	9	
	10	
	10	
	11	
	11	
	12	
	12	
	13	
	13	
	14	
	14	

30. Do the bar widths used in making a histogram have an effect on the shape of the constructed histogram? Explain your answer and give an example to justify your answer.
31. For the graph below, of heights of singers in a large chorus, please write a complete description of the histogram. Be sure to comment on all the important features.



32. Pretend you are constructing a histogram for describing the distribution of salaries for individuals who are 40 years or older, but are not yet retired. (a) What is on the Y-axis? Explain. (b) What is on the X-axis? Explain. (c) What would be the probable shape of the salary distribution? Explain why.
33. This graph came from the USA Today Snapshots: Commuting Time. List at least two things wrong with this graph.



Answers:

2) 85

