Applications

For Exercises 1–3, use the line plot below.

Number of Children
in a Household
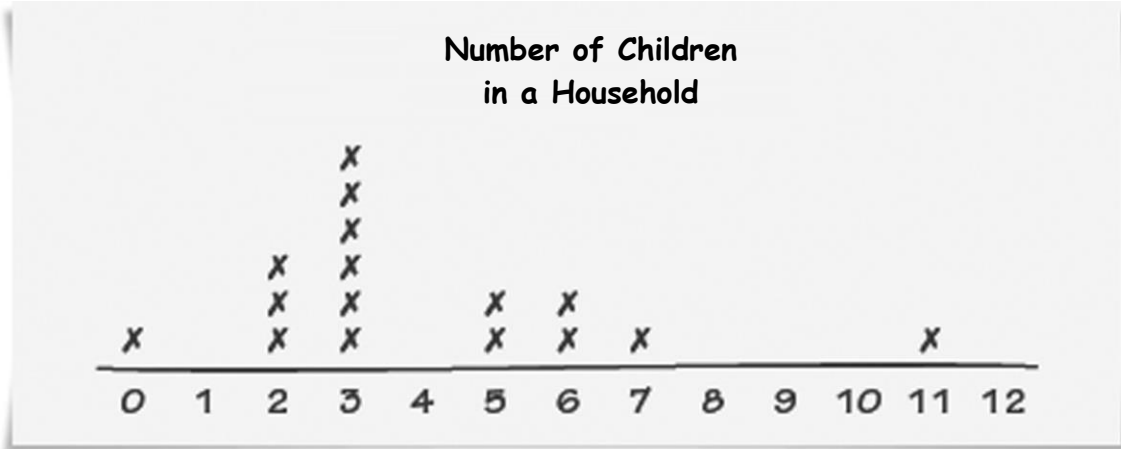
1. **a.** What is the median number of children in the 16 households? Explain how to find the median. What does the median tell you?

   b. Do any of the 16 households have the median number of children? Explain why this is possible.

2. **a.** What is the mean number of children per household for the 16 households? Explain how to find the mean. What does the mean tell you?

   b. Do any of the 16 households have the mean number of children? Explain why this is possible.

3. Use either the mean or the median to answer this question: "What is the typical household size for the data?" Explain your reasoning.

For Exercises 4–7, the mean number of people per household in eight households is six people.

4. **Multiple Choice** What is the total number of people in the eight households?

   A. 16   **B.** 64   **C.** 14   **D.** 48

5. Make a line plot showing one possible arrangement of the numbers of people in the eight households.

6. Make a line plot showing a different possible arrangement of the numbers of people in the eight households.

7. Are the medians the same for the two distributions you made? Is it possible to have two distributions that have the same means, but not the same medians? Explain your reasoning.

8. A set of nine households has a mean of $3\frac{1}{3}$ people per household.

   Make a line plot showing a data set that fits this description.

9. A set of nine households has a mean of five people per household. The largest household in the group has ten people. Make a line plot showing a data set that fits this description.

For Exercises 10–16, tell whether the answers to the question are numerical or categorical data.

10. What is your height in centimeters?

11. What is your favorite musical group?

12. In which month were you born?

13. What would you like to do when you graduate from high school?

14. Use your foot as a unit of measure. How many of your "feet" tall are you?

15. What kind(s) of transportation do you use to get to school?

16. On average, how much time do you spend doing homework each day?

Connections

17. During Mr. Wilson's study hall, students spent the following amounts of time on their homework:

$\frac{3}{4}$ hour $\qquad$ $\frac{1}{2}$ hour $\qquad$ $1\frac{1}{4}$ hours $\qquad$ $\frac{3}{4}$ hour $\qquad$ $\frac{1}{2}$ hour

a. What is the mean time Mr. Wilson's students spent on homework?

b. Multiple Choice What is the median time the students spent on homework?

F. $\frac{1}{2}$ hour $\qquad\qquad\qquad\qquad$ **G.** $\frac{3}{4}$ hour

H. 1 hour $\qquad\qquad\qquad\qquad$ **J.** $1\frac{1}{4}$ hours

18. A soccer league wants to find the average amount of water its players drink per game. There are 18 players on a team. During one game, the two teams drank a total of 1,152 ounces of water.

a. How much water did each player drink per game if each player drank the same amount of water?

b. Does this value represent the mean or the median? Explain.

19. Sabrina, Diego, and Marcus entered a Dance-a-thon that ran from 9 A.M. to 7 P.M. The times that each student danced are shown at the right.

a. Write the number of hours each student spent dancing as a mixed number.

b. Look at the data from part (a). Without doing any computations, do you think the mean time spent dancing is the same as, less than, or greater than the median? Explain.

Dance-a-thon SCHEDULE

STUDENT	TIME
Sabrina	9:15 A.M. to 1:00 P.M.
Diego	1:00 P.M. to 4:45 P.M.
Marcus	4:45 P.M. to 7:00 P.M.

20. Jon has a pet rabbit that is 5 years old. He wonders if his rabbit is old compared to other rabbits. At the pet store, he finds out that the mean life span for a rabbit is 7 years.

    a. What does the mean tell Jon about the life span for a rabbit?

    b. What additional information would help Jon to predict the life span of his rabbit?

21. A store carries nine different brands of granola bars. What are possible prices for each of the nine brands of granola bars if the mean price is $1.33? Explain how you determined values for each of the nine brands. You may use pictures to help you.

For Exercises 22–25, a recent survey of 25 students in a middle-school class yielded the data in the table below.

Mean Time Spent on Leisure Activities by Students in One Class

Activity	Time (minutes per day)
Watching videos	39
Listening to music	44
Using the computer	21

22. Did each student watch videos for 39 minutes per day? Explain.

23. Jill decides to round 39 minutes to 40 minutes. Then she estimates that the students spend about $\frac{2}{3}$ of an hour watching videos. What percent of an hour is $\frac{2}{3}$?

24. Estimate what part of an hour the students spend listening to music. Write your answer as a fraction and as a decimal.

25. The students spend about 20 minutes per day using a computer. How many hours do they spend using a computer in 1 week (7 days)? Write your answer as a fraction and as a decimal.

26. Three candidates are running for the mayor of Slugville. Each has determined the typical income of residents of Slugville, and they use that information for campaign sound bites.

Some of the candidates are confused about "average." Slugville has only 16 residents. Their weekly incomes are $0, $0, $0, $0, $0, $0, $0, $0, $200, $200, $200, $200, $200, $200, $200, and $30,600.
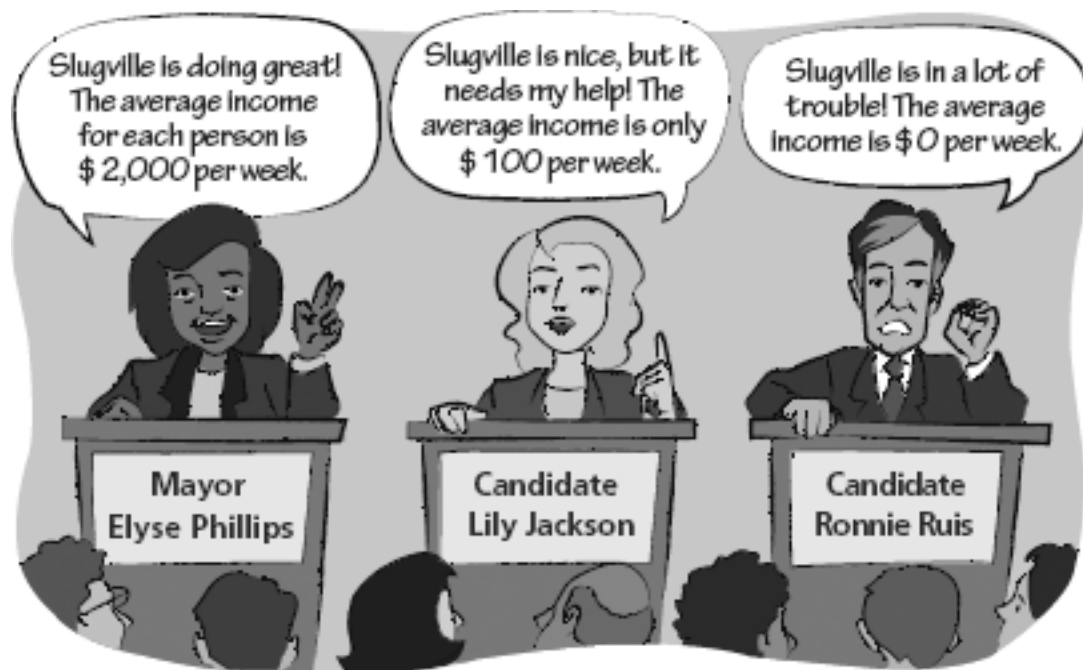
a. Explain what measure of center each of the candidates used as an "average" income for the town. Check their computations.

b. Does anyone in Slugville have the mean income? Explain.

c. Does anyone in Slugville have an income that equals the median? Explain.

d. Does anyone in Slugville have an income that equals the mode? Explain.

e. When you decide to use a measure of center—mode, median, or mean—you must choose which measure best helps you tell the story of the data. What do you consider to be the typical income for a resident of Slugville? Explain your choice of measure.

f. Suppose four more people moved to Slugville. Each has a weekly income of $200. How would the mean, median, and mode change?

27. A recent survey asked 25 middle-school students how many movies they see in one month. The table and line plot below show the data.
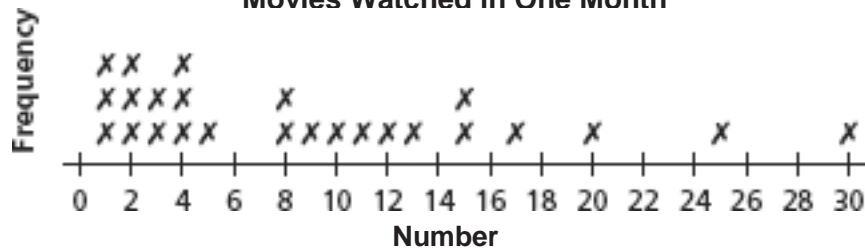
Movies Watched in One Month

Student	Number
Wes	2
Tomi	15
Ling	13
Su Chin	1
Michael	9
Mara	30
Alan	20
Jo	1
Tanisha	25

Student	Number
Susan	4
Gil	3
Enrique	2
Lonnie	3
Ken	10
Kristina	15
Mario	12
Henry	5

Student	Number
Julian	2
Alana	4
Tyrone	1
Rebecca	4
Anton	11
Jun	8
Raymond	8
Anjelica	17

Movies Watched in One Month

a. Identify one section of the line plot where about half the data values are grouped and a different section where about one quarter of the data is grouped.

b. What is the range of the data? Explain how you found it.

c. Find the mean number of movies watched by the students. Explain.

d. What do the range and mean tell you about the typical number of movies watched for this group of students?

e. Find the median number of movies watched. Are the mean and the median the same? Why do you think this is so?
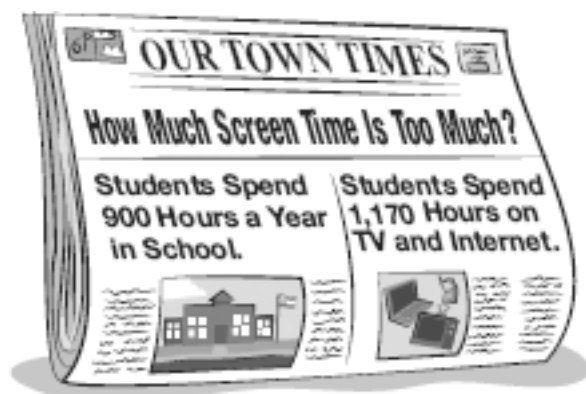
For Exercises 28–32, use the graph below. The graph shows the number of juice drinks 100 middle-school students consumed in one day.

Juice Drinks Consumed by Students in One Day
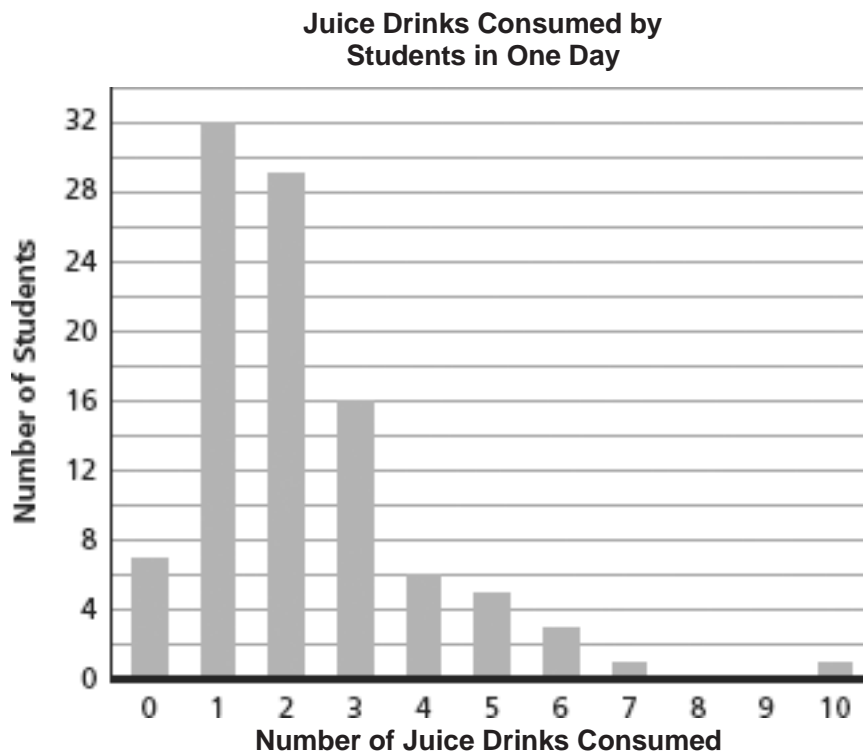
28. Are the data numerical or categorical? Explain.

29. A student used the graph to estimate that the median number of juice drinks students consume in a day is 5. Is this estimate correct? Explain your answer.

30. Another student estimates that the median number of juice drinks is 1. Is this estimate correct? Explain your answer.

31. What is the total number of juice drinks these 100 students consume in one day? How did you determine your answer?

32. Suppose the survey had asked, "What juice drinks do you like?"

    a. List three possible responses.

    b. Are the data numerical or categorical? Explain.

    c. Describe how to make a bar graph showing the distribution of the data collected in answer to this question. How would you label the horizontal axis? The vertical axis? How would you title the graph? What would each bar on the graph show?

Extensions

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For Exercises 33 and 34, use the newspaper headlines.

OUR TOWN TIMES

How Much Screen Time Is Too Much?

Students Spend 900 Hours a Year in School.

Students Spend 1,170 Hours on TV and Internet.

33. Do you think that each headline refers to a mean, a median, or something else? Explain.

34. About how many hours per day does the average sixth grader spend watching television or using the Internet if he or she spends 1,170 hours of screen time in a year?

For Exercises 35–37, use the table at the right.

35. Make a bar graph to display the data. Think about how you will set up and label the horizontal and vertical axes with the correct scales.

36. Use the information in your graph to write a paragraph about the pets these students own. How do these results compare to the results from the class data used in Problem 2.4?

37. Estimate how many students were surveyed. Explain your reasoning.

Types of Pets Students Own

Pet	Frequency
bird	61
cat	184
dog	180
fish	303
gerbil	17
guinea pig	12
hamster	32
horse	28
rabbit	2
snake	9
turtle	13
Total	**841**