Name _____

Teacher Note:

- Refer students to "Proportion" on page 9 in the *Student Reference Guide.*

page 193

Focus on

• Data and Sampling

- A bar graph displays numerical data in shaded bars. A bar graph makes it easy to compare data.

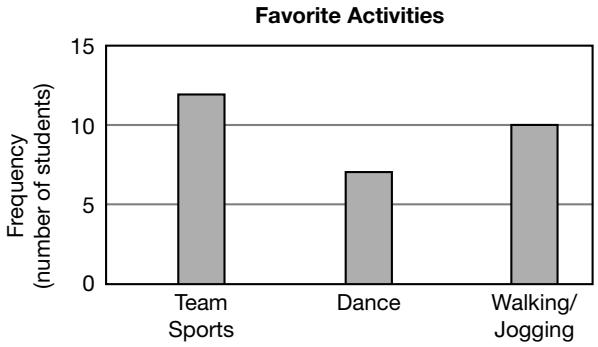
Example

Math Language

Data can be described as quantitative or qualitative. **Quantitative data** are described with numbers. **Qualitative data** are described with categories like a month in which a student was born or a kind of cereal.

Precious gathered data by asking each of her classmates to select his or her favorite activity.

Then she displayed the data with a bar graph.



Which type of exercise is most popular among her classmates?

The tallest bar is for team sports.

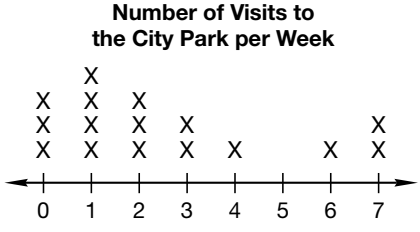
The most popular activity was **team sports.**

- A **line plot** shows single data points. A line plot makes it easy to compare data.

Example

Roger went to every third house on his street and asked, "How many times per week do you visit the city park?"

Roger displayed the data he collected with a line plot.



How many neighbors visited the city park 2 times per week?

There are three X's above the 2.

Three neighbors visited the park 2 times per week.

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- There are two kinds of data.
  1. **Quantitative data** are numbers, such as numbers of visits to a park each week. Roger collected quantitative data when he asked about the **number of visits** to the park.
  2. **Qualitative data** are categories, such as favorite colors or sports. Precious collected qualitative data when she asked about the **favorite activity.**
- Decide whether the data are quantitative or qualitative.

1. Jagdish collects 50 bags of clothing for a clothing drive and counts the **number of items** in each bag.

He is counting, so he records n_____.

The data are _____.

2. For one hour Dayshaun notes the **color** of each car that drives past his house.

There are many kinds of colors, so color is q_____.

The data are _____.

3. Latanya rides a school bus home after school. For two weeks she measures the time **the bus trip takes.**

I measure time using n_____.

The data are _____.

4. Lourdes asks each student in her class, "Which is your **favorite holiday**—New Year's, Thanksgiving, or Independence Day?"

The data are _____.

5. Lorenzo asks each player on his little league team, "Which major league baseball team is your favorite? Which team do you like the **least**?"

The data are _____.

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6. Write a quantitative survey question about television viewing.

How many h _____ per _____ do you watch TV?

Write a qualitative survey question about television viewing.

Which television program is your f _____?

(Collecting and recording the data is optional.)

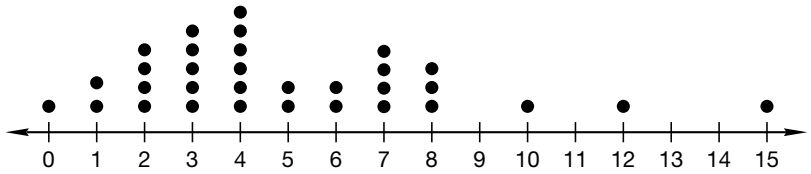
- **A line plot** is a good way to organize *quantitative* data.
- The data shown here are responses to the question, "How many hours a week do you spend watching television?"

0 1 1 2 2 2 2 3 3 3 3 3 4 4 4 4 4 4

5 5 6 6 7 7 7 7 8 8 8 10 12 15

- The data make the line plot below. Each dot is for one of the numbers. The plot shows that the number of hours watching TV ranges from 0 to 15, but most students watch either 2–4 or 7–8 hours of television each week.

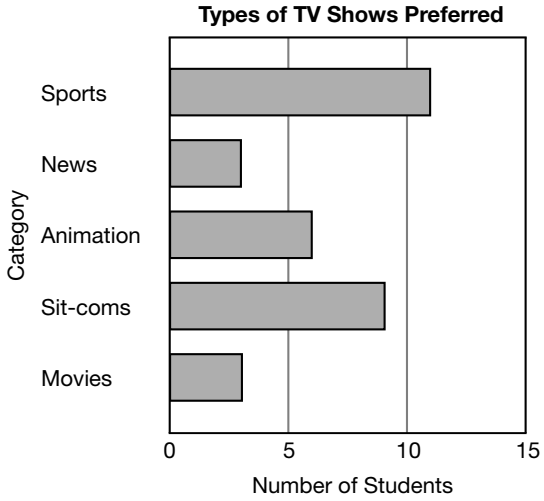
Number of Hours of TV Watched per Week



- **A bar graph** is a good way to organize *qualitative* data.
- To make a bar graph:
  1. First, make a frequency table.
  2. Then draw bars to record the data.
- The frequency table below displays responses to the question, "Which type of television shows do you prefer to watch—sports, news, animation, sit-coms, or movies?"

Category	Tally	Frequency
Sports	𝍸 𝍸 |	11
News	|||	3
Animation	𝍸 |	6
Sit-coms	𝍸 ||||	9
Movies	|||	3

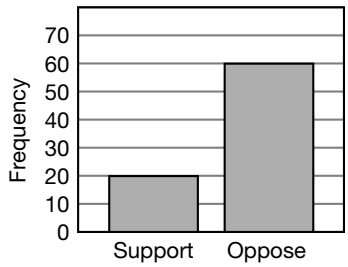
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- A survey asks questions to find out certain things about a group of individuals such as teenagers or senior citizens. This group is called the **population**.
- The population of a survey is often very large, so the survey goes to a small part of a population, called a **sample**. Different samples may give different results.
- If a sample is too small or includes people not in the target population, it will give results that do not match the opinions of the target population. It will be a **biased** sample.
- A sample that is very much like the population is called a **representative** sample. Such a sample will be the most useful to those conducting the survey.

  Explain why each sample is not representative. How would you expect the sample's responses to *differ* from those of the general population?

7. To determine public opinion in the city of Miami about a proposed leash law for dogs, Sally interviews shoppers in *several Miami pet stores.*



Pet store shoppers are more likely to own p_____ than people from the general p_____. Support for a leash law might be _____ among those surveyed than among the general population.

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8. Tamika wants to know the movie preferences of students in her middle school. Since she is in the school orchestra, she chooses to survey *orchestra members.*

O_____ members are _____ likely

to have an interest in music than other s_____.

So movies preferred by orchestra members might

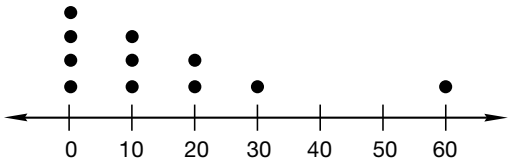
be _____ musically oriented than movies preferred

by other s_____.

- The results of a survey can depend on how questions are worded or who asks them.
- These factors can introduce **bias** into a survey. This means that people are encouraged to give certain answers and not others.

For problems **9** and **10**, expains why the way in which the question was asked may have affected the results.

9. The researcher asked the group of adults, "If you were lost in an unfamiliar town, how much time would you waste before simply stopping to ask for directions?



People generally do not like to w_____ time. They may have

been more likely to report a s_____ amount of time before

asking for directions.

10. Mrs. Wong baked oatmeal bars for her daughter's fundraising sale. She asked the students who attended the sale, "Would you have preferred fruit salad to my oatmeal bars?

Out of politeness, students might be _____ likely to

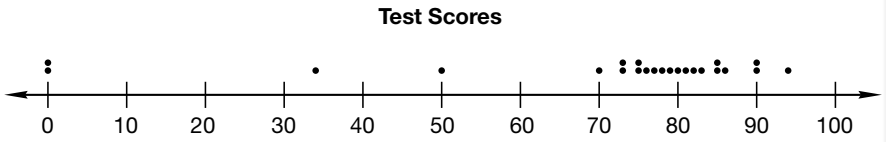
answer "yes" because Mrs. Wong baked the o_____

for the sale.

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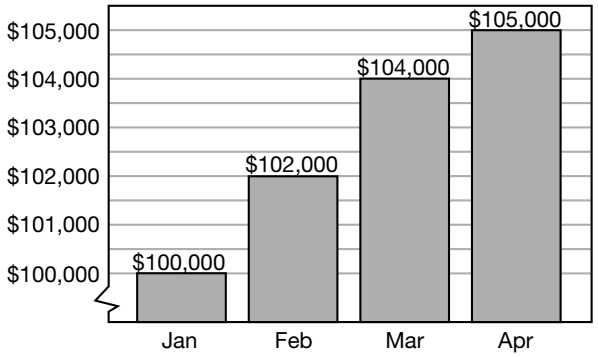
- Sometimes the way data are displayed does not support a statement about it.

11. The teacher told the class that they would all have to retake the test since the mean test score was 68%. Why might the teacher's claim not be valid?



A few very low scores would l_____ the mean test score.

12. The board members cheered when they saw the sales data displayed in a bar graph.



The Chief Financial Officer pointed out that the growth was not as dramatic as it may appear on the graph. Why might this be so?

If the bar graph does not show the full h_____ of the bars, then the difference in heights of the bars will appear g_____ than it really is.

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