

Study Guide and Intervention

6MR2.3, 6SDAP2.5

Using Graphs to Predict

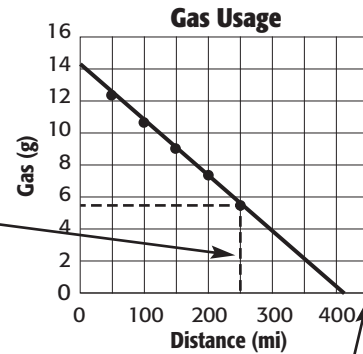
A **line graph** shows trends over time and can be useful for predicting future events. A **scatter plot** displays two sets of data on a graph and can be useful for predictions by showing trends in the data.

Example Use the line graph of the Moralez family car trip shown below to answer the following questions.

- After 250 miles, how much gas did the Moralez family have left?

Draw a dotted line up from 250 m until it reaches the graph and then find the corresponding gas measure.

They will have about 5.5 g left.



- How far can the Moralez family travel before they run out of gas?

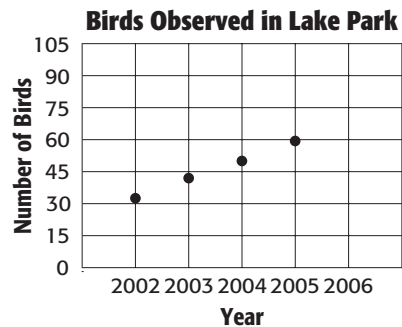
When they run out of gas, the tank will be at 0 so find where the line reaches 0.

They can travel about 430 miles.

Exercises

Use the scatter plot to answer the questions.

- How many birds were there in 2004?
- What relationship do you see between the number of birds and year?
- Predict the number of birds there were in the year 2001?
- Predict the number of birds there will be in the year 2006?
- In what year do you think the bird population will reach 100?



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6SDAP2.2, 6SDAP2.5

Using Data to Predict

Data gathered by surveying a random sample of the population may be used to make predictions about the entire population.

Example 1 In a survey, 200 people from a town were asked if they thought the town needed more bicycle paths. The results are shown in the table. Predict how many of the 28,000 people in the town think more bicycle paths are needed.

More Bicycle Paths Needed?	
Response	Percent
yes	39%
no	42%
undecided	19%

Use the percent proportion.

$$\frac{\text{part}}{\text{whole}} = \frac{\text{percent}}{100} \quad \text{Percent proportion}$$

$$\begin{array}{l} \text{part of the population} \quad \longrightarrow \\ \longrightarrow \end{array} \frac{n}{28,000} = \frac{39}{100} \quad \begin{array}{l} \text{Let } n \text{ represent the number.} \\ \text{Survey results: } 39\% = \frac{39}{100} \end{array}$$

$$\text{Whole population} \quad 100n = 38,000(39) \quad \text{Cross products}$$

$$n = 10,920 \quad \text{Simplify.}$$

So, about 10,920 people in the town think more bicycle paths are needed.

Exercises

- VOTES** In a survey of voters in Binghamton, 55% of those surveyed said they would vote for Armas for city council. If 24,000 people vote in the election, about how many will vote for Armas?
- LUNCH** A survey shows that 43% of high school and middle school students buy school lunches. If a school district has 2,900 high school and middle school students, about how many buy school lunches?
- CLASS TRIP** Students of a seventh grade class were surveyed to find out how much they would be willing to pay to go on a class trip. 24% of the students surveyed said they would pay \$21 to \$30. If there are 360 students in the seventh grade class, about how many would be willing to pay for a trip that cost \$21 to \$30?

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6SDAP2.1, 6SDAP2.2,
6SDAP2.5

Using Sampling to Predict

In an **unbiased sample** the whole population is represented. In a **biased sample** one or more parts of the population are favored over the others.

Example 1

Look at the following table to determine the favorite sport of middle school students.

Favorite Sports of Middle School Students			
Basketball	Baseball	Football	Soccer
10	5	17	52

Based on the table, it would appear that soccer is the favorite sport of middle school students. However, suppose the data collected for this survey was taken at a World Cup soccer match. It can then be concluded that our sample is **biased** because students who are at a soccer match may be more likely to choose soccer as their favorite sport.

To receive an **unbiased** sample of middle school students, the sports survey could be completed at randomly selected middle schools throughout the country.

Exercises

Determine whether the given situations represent a *biased* or *unbiased* sample. Then tell the type of sample.

1. Writers of a popular teen magazine want to write a story about which movies their readers like. The writers decide to interview the first 50 people that walk out of a movie theater.
2. The student council wanted to raise money for their school by selling homemade cookies during lunch time. To find out the favorite kind of cookie for the majority of their school, they conducted a survey. They gave the survey to 20 randomly selected students from each grade level.
3. To determine the most frequently used gas station, a researcher randomly selected every 10th person from a drive-through fast food restaurant and asked them where they last filled up with gas.