

**CHAPTER**  
**10****Project**  
***You're the Designer!*****Activity 1: Design a Research Study** *Use with Lesson 10-4*

Many types of questions can be investigated through research studies. In this activity, you will choose a question and answer it by collecting and analyzing data. Examples of types of questions to investigate include the following:

- Is a person's running speed related to his or her leg length?
- Is there a correlation between time of day and how many teenagers are talking on the phone?

**1. Choose a topic.** Decide on a topic that you would like to research. State the question that your study will be designed to answer.

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**2. Make a hypothesis.** Write a statement to describe the answer you think you will find in your research. Explain why you think this will be the outcome.

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**3. Design the study.** Write the questions that you will use in your study or describe the data that you will collect, and explain why each question or observation is necessary. Read through your study, and write a justification of why you think it is a reasonable method for answering your question.

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**4. Conduct the study.** Collect as large a sample for your study as you can manage. Be sure that you collect enough data (at least 10 values) to be able to test your hypothesis accurately.

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**5. Display the data.** Summarize the results of your study in a table. Then use one of the methods you studied in this chapter to display your data.

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**6. Analyze the results.** Explain how the data you gathered supports or contradicts the hypothesis you made in Step 2.

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**CHAPTER** **Project**

**10** *You're the Designer!* continued

**Activity 2: Design an Experiment** *Use with Lesson 10-7*

You can estimate the probability of an event by performing an experiment. If the experiment is difficult to perform, you can use a simulation to model it. Identify a question to answer. Consider the following examples:

- How likely is it for a certain basketball player to make 3 free throws in a row? to miss 3 free throws in a row?
- What is the probability of 2 people having the same birthday in a group of 35 people?
- What is the probability that a family with 3 children has 3 boys (assuming that the probabilities of a boy and girl are equally likely)?
- What is the probability that a student correctly guesses all 10 true-false questions on a quiz?

**1. Work with a partner.** Identify the question that your simulation is designed to answer.

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**2. Design the simulation.** First choose a way to generate random numbers. Then decide how to simulate one trial of the experiment.

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**3. Conduct the simulation.** Conduct a large number of trials and record the results.

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**4. Interpret your results.** List the experimental probability of each outcome.

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**5. Find the theoretical probability.** Compare it with your results.

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**6. Communicate the results.** Communicate what you learned. Talk about the results with your partner.

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**7. Analyze the simulation.** Justify your process and your results. Are there ways you could improve the simulation?

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