1. A factory manager wants to know how many of the 20,000 LED light bulbs made each day are defective. His employees suggest three possible ways for taking a sample of 200 bulbs.
   1. Method 1: Test the first 200 bulbs made each day.
   2. Method 2: Test every one-hundredth bulb made each day.
   3. Method 3: Assign the numbers 1 to 20,000 to the bulbs. Randomly select 200 numbers between 1 and 20,000 and test the bulbs with those numbers.
2. Reggie wants to find out the favorite websites of 700 students in grades 7 through 9. His plan for taking a sample is to ask the first 20 male 8th graders on his school bus to name their favorite websites.
   1. Describe a better sampling method that Reggie can use.
   2. Do you think that if he takes two random samples of the same size, he will get the same results?
3. At Jada’s middle school, 8th grade students can choose to take a foreign language class, either Spanish or French, after school. Jada wants to know if 8th graders who take a foreign language after school also plan to take a foreign language class in high school. She considers three methods for taking a sample.
   1. Method 1: Ask every 20th student who walks into school in the morning
   2. Method 2: Ask every 8th grade student who leaves Spanish class
   3. Method 3: Ask every tenth 8th grade student who enters Spanish and French classes.
      1. Which, if any, of these methods is likely to produce a random sample?
         1. Define the sample in each method
         2. Is each sample likely to be representative of the population? Explain.
4. An airline wants to know whether its customers are satisfied with their flights. Describe a sampling method they could use to determine this.
5. The owner of a department store wants to know how many visitors to her store actually make purchases. She considers 3 different methods for taking a sample.
   1. Method 1: Ask the first hundred visitors to the store if they plan on making purchases.
   2. Method 2: Ask every 100th person who leaves the store if they made a purchase.
   3. Method 3: Call every 1000th person an alphabetical list of residents and ask if they usually make purchase when visiting department stores.
      1. What method is likely to produce a random sample?
      2. Define each proposed sample
      3. Is each sample likely to be representative of the population? Explain.
6. Dennis wants to know the approximate number of books that each middle school student in his state reads every summer. Why would taking a random sample of middle school students in the state be the most practical way for him to find an answer?
7. A scientist studies the heights of redwood trees in California. She proposes entering in the location of all redwood forests in the state into a computer program and having the computer randomly select 200 small plots in these forests to measure redwood tree heights. Explain why her method is likely to produce a representative sample of the heights of all redwood trees in California.
8. Carl wants to know if the students in his school are planning a visit to a new mall that will be opening in a few weeks. To get a sample of the students in his school, he places flyers around the school that say “Are you planning to visit the new mall? Let me know!” and includes his email address. Will his sample be random? Will it be representative?