Lesson 9.4  Understanding Random Sampling Methods

State which sampling method or methods are being described for questions 1 to 5.

1. To determine the average number of hours people spend per day watching television, a researcher divided the population into groups according to age. Then he randomly selected 50 people from each age group.
   - Stratified random sampling and simple random sampling

2. To study the migratory behavior of loons, biologists randomly tag 64 loons of the Great Lakes.
   - Simple random sampling
   - Systematic random sampling

3. As melons are unloaded from a truck, Elio picks every 10th melon until he has collected 80 melons to estimate the average mass of the melons.
   - Stratified random sampling and simple random sampling

4. To determine the level of air pollution, air samples were taken from 100 locations across 5 countries.
   - Simple random sampling

5. To survey tourists' impression of a historical town, an interviewer randomly selects 150 tourists in the town.
Refer to the situation below to answer questions 6 to 8.

Mr. Jones plans to open a shop selling organic food in a small town. He would like to survey the town people as to whether they will be interested in organic food. The town has about 6,000 households along 20 streets. Mr. Jones has asked you to help him conduct the survey but he does not want a simple random sampling method.

6. Explain the possible reasons why Mr. Jones does not want a simple random sampling method.

6. The population of 6,000 households is quite large. Households along certain streets might be isolated from the survey. The results obtained may not be representative of the population studied.

7. Describe how you would carry out the survey if you use a systematic random sampling method.

7. Answers vary. Sample: Plan to obtain a N/10 sample. Label all the households in some numeric sequence. Divide the number of households by the sample size: \( \frac{6,000}{100} = 60 \). Pick the first household at random among the first 60 households according to the numeric sequence. Then select every 60th household from there for subsequent members of the sample.

8. Describe how you would carry out the survey if you use a stratified random sampling method.

8. Answers vary. Sample: First divide all the 6,000 households by their streets. Then randomly select a few households from each street. The number of households selected from each street is not necessarily the same.

Solve.

9. Soon after a company introduced their new phone into the market, they conduct a survey to determine if the public likes this new product. The person conducting the survey randomly picks 100 people from the company’s customer list with the first name beginning with the letter A. Is the sample an appropriate sample? Explain.

9. No, the sample is not an appropriate sample, it is a biased sample. The result obtained from 100 people with the first name beginning with the letter A is not representative of the general public.