

# PRACTICE

A student council wants to know whether students would like the council to sponsor a mid-winter dance or a mid-winter carnival this year. Classify each sampling method.

1. Survey every tenth student on the school's roster. systematic
2. Survey all freshmen and all juniors. cluster
3. Survey 20 freshmen, 20 sophomores, 20 juniors, and 20 seniors. stratified
4. Survey those who ask the council president for a questionnaire. self-selected
5. Survey those who happen to be in the cafeteria at noon. convenience

Use the following information for Exercises 6–9.

The officers of a neighborhood association want to know whether residents are interested in beautifying the neighborhood and, if so, how much money they are willing to contribute toward the costs involved. The officers are considering the three sampling methods below.

- A. Call and survey every tenth resident on the association's roster.
- B. Randomly select and survey 10 residents from among those who come to the neighborhood block party.
- C. Mail a survey to every resident with instructions to complete and mail the survey back.

6. Identify the population.

residents of the neighborhood

7. Which sampling method is most likely to result in a representative sample of the population? Explain.

calling every 10<sup>th</sup> resident because it includes the entire population with a system for the sample.

8. Describe another sampling method that is likely to result in a representative sample of the population.

Randomly choose who to call using a # generator.

9. Describe the categorical and numerical data that the officers of the neighborhood association want to gather through a survey.

categorical - interest in beautifying  
numerical - \$ willing to contribute

Use the following information for Exercises 10–14.

A community theater association plans to produce three plays for the upcoming season. The association surveys a random sample of the approximately 7000 households in the community to see if an adult member of the household is interested in attending plays and, if so, what type of plays the person prefers (comedy, drama, or musical), how many members of the household (including the person surveyed) might attend plays, and how many of the three plays those household members might attend.

Of the 50 adults surveyed, 12 indicated an interest in attending plays. The table lists the data for those 12 people.

Preferred type of play	Number of people attending	Number of plays attending
Comedy	2	1
Musical	3	2
Musical	1	2
Drama	2	3
Comedy	3	2
Comedy	2	3
Musical	4	1
Drama	2	3
Comedy	2	2
Musical	2	3
Comedy	5	1
Drama	1	2

10. Describe the categorical and numerical data gathered in the survey.

categorical - type of plays  
 numerical - # of people in household interested in plays and the # of plays they would attend.

11. Calculate the proportion of adults who indicated an interest in attending plays. Then calculate the proportion of those interested in attending plays who prefer dramas.

plays:  $\frac{12}{50} = \frac{6}{25} = 24\%$     dramas:  $\frac{3}{12} = \frac{1}{4} = 25\%$

12. Approximately 15,000 adults live in the community. Predict the number of adults who prefer plays that are dramas. Show your calculations.

$\frac{3}{50} = \frac{x}{15000}$     900 adults

13. For an adult with an interest in attending plays, calculate the mean number of household members who might attend plays. Then calculate the mean number of plays that those household members might attend. Round each mean to the nearest tenth.

$\bar{x}_{\text{attending}} = 2.42$      $\bar{x}_{\text{plays}} = 2.08$

14. The theater association plans to sell tickets to the plays for \$40 each. Predict the amount of revenue from ticket sales. Show your calculations and include units.

$24(7000) = 1680$  households  
 $1680(2.42) = 4065.6$  people  
 $4065.6(2.08) = 8456.45$  tickets  
 $8456(\$40) = \$338,240$  ticket revenue