Random sample :

- a subset or portion of a population or set that has been selected without
- each member of the population has an of selection
- Though not population member can be chosen, it is still possible, in some cases, for population member to have an (or nearly) chance of

Sampling bias

- errors in estimation caused by a , -representative sample

Sampling error

- a showing how precisely a sample the population, with sampling errors resulting from samples and/or when the data clusters closely around the mean; also called

Reliability

- the to which a study or experiment performed many times would have results

Guided Practice

Example 1

Mr. DiCenso wants to establish baseline measures for the 21 students in his psychology class on a memory test, but he doesn't have time to test all students. How could Mr. DiCenso use a standard deck of 52 cards to select a simple random sample of 10 students? The students in Mr. DiCenso's class are listed as follows.

Tim	Brion	Victoria	Nick	Quinn	Gigi	Jose
Alex	Andy	Michael	Stella	Claire	Lara	Noemi
Eliza	Morgan	Ian	Dominic	DeSean	Rafiq	Gillian

- **Assign a to each student.**
  Assign a card (for example,) to each student, as shown in the following table.

Student	Card	Student	Card	Student	Card
Tim	Ace of spades	Michael	7 of spades	DeSean	King of hearts
Alex	King of spades	Ian	6 of spades	Gigi	Queen of hearts
Eliza	Queen of spades	Nick	5 of spades	Lara	Jack of hearts
Brion	Jack of spades	Stella	4 of spades	Rafiq	10 of hearts
Andy	10 of spades	Dominic	3 of spades	Jose	9 of hearts
Morgan	9 of spades	Quinn	2 of spades	Noemi	8 of hearts
Victoria	8 of spades	Claire	Ace of hearts	Gillian	7 of hearts

- **select cards.**
  the 21 cards thoroughly, then select the cards.
  Identify the students whose names were assigned to the chosen cards.
  Samples may vary;

  6 of spades: Ian
  9 of spades: Morgan
  10 of spades: Andy
  Ace of hearts: Claire
  2 of spades: Quinn
  King of hearts: DeSean
  Jack of hearts: Lara
  4 of spades: Stella
  Queen of hearts: Gigi
  7 of spades: Michael

  The selected cards indicate which students will be a part of the

Well shuffled deck means that the cards are randomized

Example 2

The Bennett family believes that they have a special genetic makeup because there are 5 children in the family and all of them are girls. Perform a simulation of 100 families with 5 children. Assume the probability that an individual child is a girl is 50%. Determine the percent of families in which all 5 children are girls. Decide whether having 5 girls in a family of 5 children is probable, somewhat unusual, or highly improbable.

Create a simulation using

1. Let represent each of the 5 children. Put all into your hands and them vigorously.
2. the coins into the and let them land. Each coin toss represents family. Let a coin that turns up represent a girl and a coin that turns up represent a boy.
3. In a table, record the number of for each coin toss. Repeat for a total of 100 coin tosses. The table below is the results of 100 coin tosses. Each number indicates the of girls in that family. This sample is only possible sample; other will be different.

3	2	2	1	2	2	2	2	1	3
2	1	2	1	2	5	3	2	2	3
3	0	1	4	3	4	2	4	2	3
3	3	0	1	2	2	2	2	3	2
4	4	3	4	2	4	1	1	4	3
1	2	1	4	2	2	3	1	3	5
3	4	3	4	1	2	2	3	2	4
5	3	2	2	4	1	1	3	4	2
2	2	1	2	3	3	2	4	3	1
3	3	2	3	3	2	3	3	2	4

- **Determine the of families with all 5 children of the same gender.**
  Since the table only records the number of girls, a in the table represents all boys and a represents all girls. In the given sample, there are families with all boys and families with all girls; therefore, there are families with all 5 children of the same gender.

  To find the percent, divide the number of families with all 5 children of the same gender by , the

- **Determine the percent of families with girls.**
  Among the 100 families in the given sample, have all girls. To find the percent, divide the number of families with 5 girls by , the .

- **your results.**
  It is important to note that there is no way to with certainty whether the belief that the Bennetts have a special genetic makeup is correct. on this sample, we can only that in families who have 5 children, there is a chance that all 5 children would be the same gender, and that there is a chance that families with 5 children would have 5 girls.

Sampling methods that are not , sampling:

- sampling
- sampling
- sampling

All involv n assignment

e meet the criteria of simple random sampling.

sample:

- occurring groups of population members are chosen for the sample.
- This method involves dividing the population into groups by or other criteria.
- of the groups are selected, while others are .
- This method allows each member of the population to have a chance of selection.
- sampling is usually chosen to excessive travel or the disruption that a study may cause.

sample:

- a sample drawn by selecting people or objects from a list, chart, or grouping at a interval.
- This method involves using a natural of population members, such as by arrival time, location, or placement on a list.
- Once the is established, every member (e.g., every fifth member) is chosen.
- If the starting number is selected, then each member of the population has a nearly chance of selection.
- sampling is usually chosen when relative in a list may be related to key variables in a study, or when it is useful to a researcher to data gathering.

sample:

- the population is into so that the people or objects within the subgroup share relevant characteristics.
- This method involves members of the population by that may be related to of interest.
- Once the groups are formed, members of each group are selected so that the number of members in the sample with given characteristics is to the number of members in the population with the characteristics.
- sampling has been used for many years to predict the results of state and national .

sample:

- a sample for which members are in to minimize time, effort, or expense.
- sampling involves gathering data and .
- The of sampling is that, in some cases, preliminary estimates of population parameters can be obtained .
- The main of convenience sampling is that the samples are prone to . As a result, the estimates obtained are accurate and the statistics are difficult to .

- It is unwise to use a sampling method simply it is the most . Unless the sample is of the population of interest, the statistics that are produced may be
- A sample is always a better sample. There is less variability in measures taken from a large sample, but if the large sample is , the researcher will likely obtain estimates that are .