

Simple Random Samples

A sample is a simple random sample if

- each member of the population is equally likely to be chosen and
 - the members of the sample are chosen independently of one another.
-
-

1. Determine whether or not the following sampling methods produce a simple random sample from a class of 30 students. Use principles of simple random sampling to justify your answers.
 - a. A teacher wants to select five students from the class. She selects the first five students that enter the room.
 - b. A teacher wants to select ten students from the class. She lists students in alphabetical order, then selects every third student.
 - c. A teacher wants to select six students from the class. She writes each student's name on an index card, places the index cards in a box, mixes the cards, then chooses six cards from the box.
2. Occasionally, random sampling yields a sample that is not *representative* of the population. Suppose there are fifteen boys and fifteen girls in a math class. Each student's name is placed in a hat and the names are thoroughly mixed. Seven names are drawn and all names correspond to the boys in the class.
 - a. Did the sampling method produce a simple random sample? Use principles of simple random sampling to justify your answer.
 - b. Is this a *representative* sample? Use mathematics to justify your answer.

Simple Random Samples

Answer Key

1.
 - a. Not a simple random sample. Students that get to class early may have views that are systematically different from those students who come to class later.
 - b. Not a simple random sample. The members of the sample are not chosen independently of each other. For example, two students whose names appear next to each other alphabetically, will never be in the same sample.
 - c. Simple random sample. Each student and each combination of students is equally likely.

2.
 - a. Yes. Each student is equally likely to be chosen and the students are chosen independently of each other.
 - b. No. It's possible to obtain a sample of all boys, even if the method used produces a simple random sample. One way to avoid non-representative samples is to take a large sample. Unfortunately, it is not always possible to tell if the sample is not representative of a population unless we already know about the population. But if we already knew about the population, we would not need to sample from it. This is a paradox that all statisticians face.