

For this tutorial, we will cover four methods of data collection.

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- **Census.** A census is a study that obtains data from every member of a **population**. In most studies, a census is not practical, because of the cost and/or time required.

1

- **Sample survey.** A sample survey is a study that obtains data from a subset of a population, in order to estimate population attributes.

2

- **Experiment.** An experiment is a controlled study in which the researcher attempts to understand cause-and-effect relationships. The study is "controlled" in the sense that the researcher controls (1) how subjects are assigned to groups and (2) which treatments each group receives.

3

- **Observational study.** Like experiments, observational studies attempt to understand cause-and-effect relationships. However, unlike experiments, the researcher is not able to control (1) how subjects are assigned to groups and/or (2) which treatments each group receives.

4

#### Why use simulation?

Some situations do not lend themselves to precise mathematical treatment. Others may be difficult, time-consuming, or expensive to analyze. In these situations, simulation may approximate real-world results; yet, require less time, effort, and/or money than other approaches.

7. Decide which method of data collection you would use to collect data for the study (observational study, experiment, simulation, or survey):

- a) A study of the salaries of college professors in a particular state
- b) A study where a political pollster wishes to determine if his candidate is leading in the polls
- c) A study where you would like to determine the chance getting three girls in a family of three children
- d) A study of the effects of a fertilizer on a soybean crop
- e) A study of the effect of koalas on Florida ecosystem

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- 7. a) survey
- b) observation
- c) simulation
- d) experiment
- e) simulation