

Chapter 2: Collecting Data

Section 2.3-2.4

Name _____

1. We have distinguished two types of studies: observational and experimental. Briefly explain the difference between these two types of study. You may use an example to support but not substitute for an explanation.
2. Explain how would one determine if a variable is an explanatory variable or an extraneous variable? Again, you may use an example to support but not substitute for an explanation.

3. River City is seeking to compare the effects of two mosquito sprays, A and B, to be used in the insect control plan for their park system. Consider the following two options for an experiment:
- In Experiment #1, a simple random sample of plots of park land would be taken from the population of River City parks. Treatments would be randomly assigned to the plots.
 - In Experiment #2, a simple random sample of plots of park land would be taken from the population of River City parks, but the plots would be selected in areas of the park that are rarely visited. Treatments would be randomly assigned to the plots.
- a) For each experiment, #1 and #2, discuss in a few sentences whether or not one could legitimately infer a cause-and-effect relation between the choice of repellent and fewer mosquitos.
- b) For each experiment, #1 and #2, discuss in a few sentences whether or not one could legitimately generalize the results to the population of plots of park land in River City.

4. There are six species of wood-pecking birds known to damage homes. Woodpeckers are protected by the Federal Migratory Bird Treaty Act, and homeowners must attempt to control them by nonlethal methods. In a recent study in Tennessee, researchers evaluated the use of mirrors, artificial snakes, and artificial owls. These methods do not require the homeowner to be present, as do such methods as spraying water, throwing baseballs, and shouting “Hey, cut that out!” The deterrents were evaluated over a 3-month period coinciding with maximum woodpecker activity. Yard types under study were classified into 4 categories: (1) no trees; (2) lightly wooded yards; (3) wooded yards; and (4) heavily wooded yards. The homes were visited at least 4 times to establish damage rates (number of new holes per day) before using any deterrent. After establishing a base damage rate for each home, a deterrent was randomly selected for the home and changes in the damage rate were recorded at the end of the experimental time period. The design used was a randomized block design.

(a) What is the explanatory variable (factor) for this experiment?

(b) What is the response variable for this experiment?

(c) After completing the study, someone expressed the opinion that amount of rainfall might affect woodpecker activity and that homes in areas that receive more rainfall might show greater damage. Is this something that the investigator should be worried about? If yes, explain why; if no, explain what aspect of the design of the experiment eliminates this worry.