

10.4 Practice B

In Exercises 1 and 2, determine whether the study is a randomized comparative experiment. If it is, describe the treatment, the treatment group, and the control group. If it is not, explain why not and discuss whether the conclusions drawn from the study are valid.

1. A pool cleaning service is offering a new chlorine solution to its customers. Of 90 customers, the 45 customers who chose to switch to the new chlorine solution were monitored for a year, as were the 45 customers who did not switch. At the end of the year, the customers who switched to the new chlorine solution were 30% more satisfied with the condition of their pools while those who did not switch experienced no significant change.
2. A recycling company is testing the use of recyclables containers rather than recyclables bins, in the hopes of increasing the amount of recycling. It randomly divided 150 customers into two groups. One group received the new recyclables containers, and the other group continued using their recyclables bins. After 6 months, the customers with the new recyclables containers recycled 25% more pounds of recyclables than customers with the recyclables bins.

In Exercises 3 and 4, explain whether the research topic is best investigated through an experiment or an observational study. Then describe the design of the experiment or observational study.

3. An organization wants to know whether donating 20% of one's income to charities affects one's satisfaction with his or her job.
4. A rancher wants to know whether a new feed affects the quality of the milk produced by cows.
5. A researcher wants to test whether drinking diet soda increases sugar cravings. Identify a potential problem, if any, with each experimental design. Then describe how you can improve it.
 - a. The researcher randomly selects 200 people. Half of the people drink diet soda, and the occurrence of sugar cravings is monitored. The other half of the people do not drink diet soda, and their occurrence of sugar cravings is monitored. The occurrence of sugar cravings for the people who drink diet soda is significantly higher than the occurrence of cravings for those who do not.
 - b. The researcher selects 300 people. The people are divided into two groups based on exercise habits. Within each group, the people are randomly assigned to drink diet soda or to not drink diet soda. The people's sugar cravings are monitored. There is no significant difference in the occurrence of sugar cravings between the two groups.