1) A study involves three variables: income level, hours spent watching TV per week, and hours spent at home on the Internet per week. List some ways the variables might be confounded.

2) Consider a completely randomized experiment in which a control group is given a placebo for congestion relief and a treatment group is given a new drug for congestion relief. Describe a double-blind procedure for this experiment and discuss some benefits of such a procedure.

3) Zane is examining two studies involving how different generations classify specified items as either luxuries or necessities. The first study, the Echo generation is defined to be people ages 18-29. The second study, the Echo generation is defined to be people ages 20-31. Zane notices that the first study was conducted in 2006 while the second one was conducted in 2008.

   a) Are the two studies inconsistent in their description of the Echo generation?
   b) What are the birth years of the Echo generation.

4) Suppose you are looking at the 2006 results of how the Echo generation classified specified items as either luxuries or necessities. Do you expect the results to reflect how the Echo generation would classify items in 2016? Explain.

5) Which technique for gathering data (observational study or experiment) do you think was used in the following studies?

   a) The Colorado Division of Wildlife netted an released 774 fish at Quincy Reservoir. There were 219 perch, 315 blue gill, 83 pike, and 157 rainbow trout.

   b) The Colorado Division of Wildlife caught 41 bighorn sheep on Mt. Evans and gave each one an injection to prevent heartworm. A year later, 38 of these sheep did not have heartworm, while the other three did.

   c) The Colorado Division of Wildlife imposed special fishing regulations on the Deckers section of the South Platte River. All trout under 15 inches had to be released. A study of trout before and after the regulation went into effect showed that the average gength of a trout increased by 4.2 inches after the new regulation.

   d) An ecology class used binoculars to watch 23 turtles at Lowell Ponds. It was found that 18 were box turtles and 5 were snapping turtles.
6) Which technique for gathering data (sampling, experiment, simulation, or census) do you think was used in the following studies?

a) An analysis of a sample of 31,000 patients from New York hospitals suggests that the poor and the elderly sue for malpractice at one-fifth the rate of wealthier patients.

b) The effects of wind shear on airplanes during both landing and takeoff were studied by using complex computer programs that mimic actual flight.

c) A study of all league football scores attained through touchdowns and field goals was conducted by the National Football League to determine whether field goals account for more scoring events than touchdowns.

d) An Australian study included 588 men and women who already had some precancerous skin lesions. Half got a skin cream containing a sunscreen with a sun protection factor of 17; half got an inactive cream. After 7 months, those using the sunscreen with the sun protection had fewer new precancerous skin lesions.

7) How would you use a completely randomized experiment in each of the following settings? Is a placebo being used or not? Be specific.

a) A veterinarian wants to test a strain of antibiotic on calves to determine their resistance to common infection. In a pasture are 22 newborn calves. There is enough vaccine for 10 calves. However, blood tests to determine resistance to infection can be done on all calves.

b) The Denver Police Department wants to improve its image with teenagers. A uniformed officer is sent to a school one day a week for 10 weeks. Each day the officer visits with students, eats lunch with students, attends pep rallies, and so on. There are 18 schools, but the police department can visit only half of these schools this semester. A survey regarding how teenagers view police is sent to all 18 schools at the end of the semester.

c) A skin patch contains a new drug to help people quit smoking. A group of 75 cigarette smokers have volunteered as subjects to test the new skin patch. For one month, 40 of the volunteers receive skin patches with the new drug. The other volunteers receive skin patches with no drugs. At the end of two months each subject is surveyed regarding his or her current smoking habits.