On the next exam, I will ask you to describe a few of the following terms, or identify them from a verbal situation. (see back for a couple of examples.)

Chapter 8:

Population
Sample
Statistic
Parameter
Bias
Sampling variability
Census
Sampling design
Simple random sampling
Stratified random sample
Systematic sampling
Multistage sampling
Voluntary response sampling
Convenience sampling
Response bias
Non-response bias
Undercoverage

Chapter 9:

Factors
Levels
Subjects
Random Assignment

The four principles of experimental design (Yes, I know that the book lists three…)

Single blind
Double blind
Matched pairs
Placebo
Placebo effect
Confounding

Sample questions:

1. A 1993 survey conducted by the local paper in Columbus, Ohio one week before Election Day asked voters whom they would vote for City Attorney. 37% said they would for the Democratic candidate. On Election Day, 41% actually voted for the Democratic candidate. Identify the population, sample, parameter and statistic in this situation.
2. A sportswriter is curious about the level of support among residents of Columbus, Ohio for the local minor league baseball team, the Columbus Clippers. To find out, he stands at one of the entrances to the stadium on a randomly selected day during which the team is playing, and interviews the first 20 people entering the stadium that are willing to give their opinion about the team. What do you think about the method of sampling in the above problem? What method are they using? Are there any biases that may be present?

3. Can aspirin prevent heart attacks? The physician's Health Study, a large medical experiment involving 22,000 male physicians, attempted to answer this question. One group of 11,000 physicians took an aspirin every second day, while the rest took a placebo. After several years the study found that subjects in the aspirin group had significantly fewer heart attacks than subjects in the placebo group. Use a **DIAGRAM** to outline a completely randomized design for the Physician's Health Study.

4. An experiment is to be done on the ability of a new type of paint to completely cover the old paint on a deck in two coats. There are to be two explanatory variables, the temperature and the time between the first and second coat. The temperatures to be used are to be 50 degrees F and 70 degrees F, and the times between coats are to 30 minutes, 60 minutes, and 90 minutes.
   a) How many factors are there? _________
   b) Give each factor, and give how many levels each has.
   c) How many total treatments are there? ____________

Can pleasant aromas help a student learn better? Two researchers believed that the presence of a floral scent could improve a person’s learning ability in certain situations. They had twenty-two people work through a pencil and paper maze six times, three times while wearing a floral-scented mask and three times wearing an unscented mask. The three trials for each mask closely followed one another. Testers measured the length of time it took subjects to complete each of the six trials. They reported that, on average, subjects wearing the floral-scented mask completed the maze more quickly than those wearing the unscented mask did, although the difference was not statistically significant.

5. What is the above study?
   a. a convenience sample.
   b. an observational study, not an experiment.
   c. an experiment, but not a double blind experiment.
   d. a double blind experiment

6. In the above study, what is the factor (explanatory variable)?
   a. the maze.
   b. the presence or absence of the floral scent.
   c. wearing a mask.
   d. the length of time to complete the maze