Name/Date: Key AP Statistics Unit 3 HW #3.12A

1. **Student Center Survey.** For their class project, a group of Statistics students decide to survey the student body to assess opinions about the proposed new student center. Their sample of 200 contained 50 first-year students, 50 sophomores, 50 juniors, and 50 seniors.

a) Do you think the group was using an SRS? Explain.

NOT SRS. The samples are designed to get 50 students from each grade level.

b) What sampling design do you think they used?

stratified sample, with 4 strata, one for each class year.

2. **Drug tests.** Major League Baseball tests players to see whether they are using performance-enhancing drugs. Officials select a team at random, and a drug-testing crew shows up unannounced to test all 40 players on the team. Each testing day can be considered a study of drug use in Major League Baseball.

a) What kind of sample is this?

This is a cluster sample, with teams being the clusters.

b) Is that choice appropriate?

Cluster sampling is a reasonable solution to the problem of randomly sampling players blc an entire team can be sampled easily.

3. **Parent opinion, part 1.** In a large city school system with 20 elementary schools, the school board is considering the adoption of a new policy that would require elementary students to pass a test in order to be promoted to the next grade. The PTA wants to find out whether parents agree with this plan. Listed below are some of the ideas proposed for gathering data. For each, indicate what kind of sampling strategy is involved and what (if any) biases might result.

a) Put a big ad in the newspaper asking people to log their opinions on the PTA Web site.

voluntary response sample

b) Randomly select one of the elementary schools and contact every parent by phone.

cluster sampling

The opinions of parents in one school may not be typical of the opinions of all parents.

c) Send a survey home with every student, and ask parents to fill it out and return it the next day.

An attempt at a census, and will probably suffer from nonresponse bias.

d) Randomly select 20 parents from each elementary school. Send them a survey, and follow up with a phone call if they do not return the survey within a week.

Stratified sampling

If follow-up is carried out carefully, the sample should be unbiased.

BACK →

4.

We wish to draw a sample of 5 without replacement from a population of 50 households. Suppose the households are numbered 01, 02, . . . , 50, and suppose that the relevant line of the random number table is 11362 35692 96237 90842 46843 62719 64049 17823.
Then the households selected are

(a) households 11 13 36 62 73
(b) households 11 36 23 08 42
(c) households 11 36 23 23 08
(d) households 11 36 23 56 92
(e) households 11 35 96 90 46

ignore

56, 92, 96, and 79 are ignored (unassigned); repeat of 23 is ignored.

5.

A maple sugar manufacturer wants to estimate the average trunk diameter of Sugar Maples trees in a large forest. There are too many trees to list them all and take a SRS, so he divides the forest into several hundred 10 meter by 10 meter plots, selects 25 plots at random, and measures the diameter of every Sugar Maple in each one. This is an example of a

(a) multistage sample.
(b) stratified sample.
(c) simple random sample.
(d) cluster sample.
(e) convenience sample.

The sugar Maples in each plot are a cluster. The manufacturer is assuming that they mirror the characteristics of the entire population of Sugar Maples in the forest.