

Welcome to AP Statistics!

This summer work serves three purposes. First, it introduces you to the type of topics you will encounter this year in AP Statistics. Second, it gives you an idea of the higher expectations that go along with this AP class. Third, it allows us to hit the ground running. We have a lot of material to cover this year!

Please send your answers (typed or neatly written) to nathan.bracy@sau19.org , danny.kalloger@sau19.org or jason.shea@sau19.org by the deadlines listed below. Don't hesitate to contact us before the due dates with any questions, comments, or concerns. This is a graded assignment, and we look forward to everyone starting the class successfully. Please be sure to submit your work (preferably using an attached PDF or Word document) by the posted deadlines.

Directions: Read Sections 4.1, 4.2, and 4.3 in *The Practice of Statistics* and answer the following prompts.

The prompts for Section 4.1 are due no later than Friday, August 23.

The prompts for Section 4.2 and 4.3 are due no later than Friday, August 30.

We will begin the year with a quick assessment on this material.

Section 4.1

1. What is the difference between a population and a sample?
2. What is bias?
3. What is the problem with convenience sampling?
4. What is the problem with voluntary responses?
5. What is a simple random sample (SRS)? What are the steps in constructing an SRS?
6. What is the difference between sampling *with* replacement and sampling *without* replacement? Which method should be used when constructing an SRS?
7. What is a stratified random sample? When is it a preferred method over an SRS?
8. What is a cluster sample? When is it a preferred method over an SRS?
9. What is undercoverage? Why is it a problem?
10. What is nonresponse? How is it different than voluntary response?
11. What are factors that could lead to response bias?

Section 4.2

1. What is the main difference between an observational study and an experiment?
2. What is the difference between an explanatory variable and a response variable?
3. Briefly define the following terms:
 - Treatment
 - Experimental units
 - Subjects
 - Factors
 - Levels
4. How can confounding lead to incorrect conclusions about a response?
5. What is the placebo effect?
6. What is a single-blind experiment?
7. What is a double-blind experiment?
8. What is the purpose of randomizing?
9. How could you randomly choose 3 individuals (without replacement) from a group of 10?
10. Why is it important to control variables in an experiment?
11. What does it mean to use replication in an experiment?
12. What does it mean to block an experiment? What is the purpose of blocking?
13. What is the difference between blocking and stratifying?
14. What are the two types of matched pairs designs?

Section 4.3

1. What is sampling variability? How is it related to sample size?
2. What does it mean if the results of a study or an experiment are statistically significant?
3. What is necessary in order to make an inference about a population from a sample?
4. What is the best strategy for making an inference about cause and effect?
5. If the strategy for the previous question is infeasible or impossible, what are the five criteria for establishing cause and effect from observational studies?