

Collecting Data: Sampling Plans and Experiments

Grade 12 – AP Statistics math · Test · Standards: AP Statistics Unit 1 (2026-27)

Name: _____ Date: _____ Class: _____

This 45-minute test has nine AP-style questions worth 20 points. Write in complete sentences, refer to the context, and describe random procedures clearly enough that another person could carry them out.

Standards: AP Statistics Unit 1 (2026-27) · **Level:** Grade 12 AP Statistics

Time: 45 minutes · 9 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Statistical Questions (2 points)

For each question, state whether it is a statistical question and give a reason.

- How much does a bag of oranges cost at stores in this city? (1 point)
- How tall is the Washington Monument? (1 point)

Question 2 Simple Random Sample Selection (3 points)

A school has 600 students labeled 001 to 600. A statistician reads random digits in groups of three, starting at the left: 893 104 167 692 861 834 085 543 637 364 484 380 251 707. (a) Which four students are selected? (b) Explain how the statistician treats labels above 600 and repeated labels. (c) Explain why the result is a simple random sample.

Question 3 Identify the Sampling Method (2 points)

A school has 6 homerooms, shown as columns. The principal randomly selects 2 homerooms and surveys every student in them.

School plan

●	○	○	●	○	○
●	○	○	●	○	○
●	○	○	●	○	○
●	○	○	●	○	○
●	○	○	●	○	○

- a. Name this sampling method. (1 point)
- b. Explain how it differs from a stratified sample. (1 point)

Question 4 Types of Bias (2 points)

Name the type of bias in each situation.

- a. A survey about internet use is conducted only by landline phone calls. (1 point)
- b. A mailed survey is sent to 500 randomly chosen households, but only 60 respond. (1 point)

Question 5 Observation and Confounding (2 points)

A study of 800 adults finds that those who take a daily vitamin report fewer colds. Participants chose for themselves whether to take the vitamin. (a) Is this an experiment? Explain. (b) Describe a confounding variable.

Question 6 Design a Randomized Experiment (3 points)

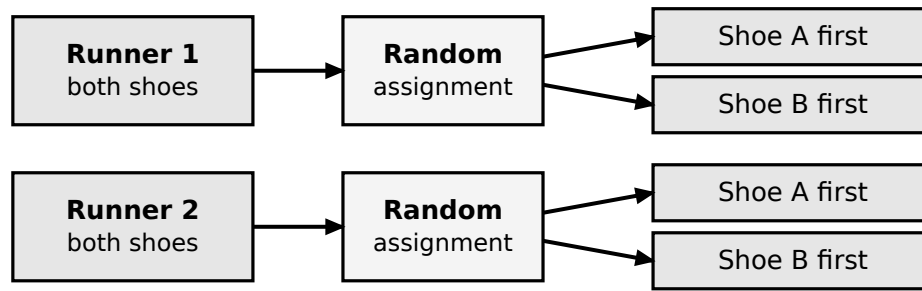
A bakery wants to learn whether a new recipe produces a higher taste rating than the current recipe. Thirty customers agree to taste samples. Describe a completely randomized design that includes random assignment, a way to reduce bias in the ratings, and the comparison to be made.

Question 7 Placebo and Blinding (2 points)

In a trial of an allergy pill, one group takes the pill and another takes a look-alike pill with no medicine. (a) What is the look-alike pill called and why is it used? (b) What does double-blind mean?

Question 8 Matched Pairs (2 points)

The diagram shows a design in which each runner tries two shoe brands.



Each runner is a block of size two.

- Name this design. (1 point)
- Explain why randomizing the order is important. (1 point)

Question 9 Scope of Inference (2 points)

A researcher randomly selects 90 teenagers from a large district and randomly assigns them to two bedtime routines. After a month the sleep durations are compared and one routine shows a much larger average. (a) May the researcher conclude that the routine causes the difference? (b) To which group can the results be generalized?