

AP Statistics - Experimental Design and Random Assignment - Quiz

Common Core AP STAT 3.4, AP STAT 3.5, AP STAT 3.6, HSS-IC.B.3, HSS-IC.B.5 · maths-pdf.fr/en/

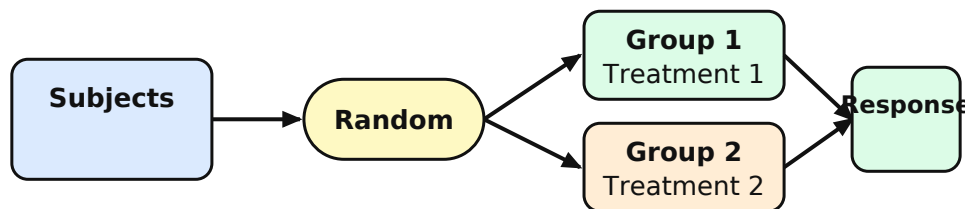
Name: _____ Class: _____ Date: ____/____/____

Ten multiple-choice questions test experimental design vocabulary and conclusions. Read each explanation, since many choices differ by one key word.

AP Statistics · Common Core State Standards: **AP STAT 3.4, AP STAT 3.5, AP STAT 3.6, HSS-IC.B.3, HSS-IC.B.5**

Questions

Question 1



A design diagram.

What design is shown?

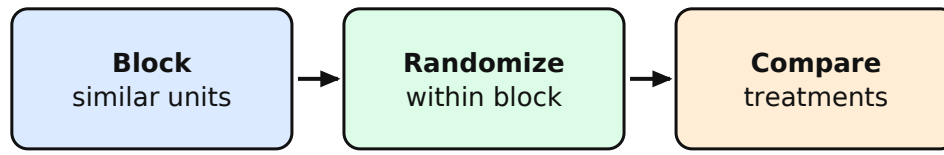
- A. A randomized block design
- B. A matched pairs design
- C. A completely randomized design
- D. An observational study

Question 2

What is the main benefit of random assignment?

- A. It lets us generalize to a population
- B. It makes treatment groups similar on average
- C. It eliminates all variability
- D. It guarantees significance

Question 3



Blocking.

Blocking is used to:

- A. select a random sample
- B. eliminate the placebo effect
- C. replace replication
- D. reduce variability by grouping similar units

Question 4

	Assignment	No assignment
Selection	Generalize and cause	Generalize only
No selection	Cause only	Neither

Scope.

Volunteers are randomly assigned to treatments. Which conclusion is supported?

- A. Generalize to the population
- B. Cause and effect for the volunteers only
- C. Neither generalization nor causation
- D. Both generalization and causation

Question 5

An experiment in which neither subjects nor evaluators know the treatments is:

- A. single-blind
- B. observational
- C. double-blind
- D. randomized block

Question 6

A variable that is associated with both the treatment and the response, making effects hard to separate, is:

- A. a confounding variable
- B. a block
- C. a placebo
- D. the control

Question 7

Replication in an experiment means:

- A. repeating the same unit once
- B. using a placebo
- C. using a random sample
- D. using enough units in each treatment group

Question 8

A study records 300 students' habits without assigning anything. This is:

- A. an observational study
- B. an experiment
- C. a block design
- D. a matched pairs design

Question 9

In a matched pairs design, each subject:

- A. receives only one treatment at random
- B. receives both treatments (in random order) or is paired with a similar subject
- C. is a volunteer
- D. is not randomized

Question 10

A result is statistically significant if:

- A. the difference is unlikely to be due to chance alone
- B. the difference is large in practice
- C. the sample is random
- D. the p-value is large

Answers

1. **C** – Subjects are randomly assigned to treatments with no blocks.
2. **B** – Random assignment balances the groups, so differences in response can be attributed to treatments.
3. **D** – Comparing treatments within blocks removes variation due to the blocking variable.
4. **B** – Random assignment supports causation; volunteering means the sample is not random.
5. **C** – Double-blind means both groups are blinded.
6. **A** – Confounding mixes effects so they cannot be separated.
7. **D** – Many units per treatment reduce the effect of chance variation.
8. **A** – No treatments are imposed.
9. **B** – Pairing controls for differences between subjects.
10. **A** – Significance is about how unlikely the result would be by chance.

Remember

- Experiments impose treatments; observational studies do not and cannot prove causation.
- Confounding occurs when the effects of two variables on the response cannot be separated.
- Good design: comparison, random assignment, control, replication; use blinding and placebos when needed.
- Designs: completely randomized, randomized block, matched pairs.
- Random assignment allows cause-and-effect; random selection allows generalization.