

Algebra 2

9-04 Experimental Design

Describing Experiments

Controlled Experiment

- Groups have same _____ except for the _____ of interest
- Treatment group: has the _____
- Control group: _____ (sometimes has _____)

Randomized comparative experiment

- Members are _____ assigned to the groups to try to eliminate _____

Determine whether the study is a randomized comparative experiment. If it is, describe the treatment, the treatment group, and the control group. If it is not, explain why not and discuss whether the conclusions drawn from the study are valid.

At a car dealership, customers were given the choice of whether to have side cameras installed on their new cars for free. Forty car owners who had the cameras installed were monitored for two years, as were forty car owners who did not have side cameras installed. At the end of two years, car owners who had side cameras installed had 22% fewer car accidents than car owners in the other group.

Comparative Studies and Causality

- Experiment
 - Well-designed _____ by eliminating other variables can conclude _____
- Observation
 - Can show _____, but not _____

Determine whether the following research topic is best investigated through an experiment or an observational study. Then describe the design of the experiment or observational study.

A researcher wants to know whether eating carrots daily improves a person's eyesight.

A school wants to test the effectiveness of an online program designed to teach writing skills. Identify a potential problem, if any, with each experimental design. Then describe how you can improve it.

a. Forty students volunteer to use the online program. Forty other students volunteer to refrain from using the online program. After 6 months, each student is evaluated and it is determined that the students who have been using the online program improved their writing skills more than the other group.

b. The school randomly selects 100 students from each grade. Within each grade, the students are randomly assigned to use the online program or to refrain from using the online program. After 6 months, a significantly large number of the students who used the online program show significant gains in their writing skills.

493 #1, 2, 3, 5, 6, 7, 9, 11, 12, 13, 16, 18, 20, 21, 23 = 15