

Choosing the Correct Testing Procedure: For each of the following scenarios, identify the inference procedure you would use and state the hypotheses for the appropriate test (define variables when appropriate).

1. A teacher wants to know if the method of instruction affects how well students learn. Using two classes of the same level of statistics, she teaches one class using lecture only and the other class using lecture and group work. She measures the level of learning by giving both classes the same test.
2. A student of political science wished to determine whether there is a relationship between the gender of a student and their political affiliation.
3. A student wishes to test if SUV drivers in his state are more likely to be male than female. He randomly selects 50 students from a list of registered SUV drivers and records their gender.
4. Your friend in Portland claims that many drivers who pass her while she awaits the school bus are talking on a cell phone. You think it's a worse problem in your hometown.
5. In your psychology class, your group (5 students) wants to investigate the relative intelligence of mice. You decide to perform an experiment on mice, using mazes. Each of you has one male and one female mouse at home (for a total of 10 mice), and you each build a different maze. Each of you will allow each mouse one trial and record the time to reach the cheese at the end of the maze.
6. Xylitol is a food sweetener that may also have antibacterial properties. In an experiment conducted in Finland, 1 group of children regularly chewed gum with Xylitol, 1 group regularly took Xylitol lozenges, and a third group regularly chewed gum that did not contain Xylitol. The experiment lasted 3 months and researchers noted whether each child had an ear infection during that period.
7. Is there a relationship between the number of years a teacher has worked and their annual salary?
8. Researchers have noted that sleep deprivation leads to car accidents and other mistakes, often due to inattention or slower reaction time. In order to examine the level of sleep deprivation in high school students, a researcher performs the following study. At 10 a.m. on a particular school day, students in two classes play a computer game that is actually recording the time it takes them to negotiate a mental obstacle course. At 2 p.m. that day, one of the classes is given 30 minutes in a silent, dark room with comfortable furniture, and the students are allowed to sleep. The other class has regular classes. At 3 p.m., both classes play the computer game again. The researcher records the differences in the times it takes each student to complete the game.
9. Suppose that 25% of all Hondas produced last year were white, 25% silver, 20% black, 15% blue, 10% green, and 5% other. To see if they should change the distribution of colors for cars produced next year, Honda takes a random sample of potential car buyers and asks what color they prefer the most.
10. Suppose that the 2000 Census showed that the mean household income in the US was \$51,000. A random sample of Californians was taken to see if Californians make more money than the rest of the country.
11. Which brand of AAA batteries last longer, Duracell or Eveready?
12. According to a recent survey, a typical teenager has 38 contacts stored in his/her cell phone. Is this true at your school?
13. Do the majority of students at your school have a MySpace or Facebook page?
14. Is there a relationship between the age of a car and the number of miles it has been driven?
15. Is there a relationship between the type of music a student prefers and the student's favorite academic subject?
16. Is one gender more likely to own an iPod?
17. Do students spend at least 1 minute brushing their teeth, on average?
18. Are the colors uniformly distributed in Fruit Loops cereal?
19. Which brand of razor gives a closer shave? To answer this question, researchers recruited 25 men to shave one side of their face with Razor A and the other side of their face with Razor B. After 12 hours the length of the men's whiskers was measured.
20. To see what factors influence heart attacks, subjects were recruited for an experiment and randomly assigned to one of three treatment groups: low fat diet, exercise, and both.