

Making Inferences Using Probability

Workshop

1. About 10% of people are left-handed. In a group of 400 people, there is 95% chance the number of left-handed people will be between what two numbers?

2. Slate magazine conducted a blind taste test to see if volunteers can tell the difference between lemons and limes. Of the 27 volunteers, 20 correctly identified which was which.
 - (a) What percent could tell the difference?

 - (b) If the volunteers were all just guessing, what is the standard deviation for the number who would guess correctly?

 - (c) According to the normal approximation, there is a 95% percent chance that the number of correct guess out of 27 should be between what two numbers (if the volunteers are just guessing)?

3. **Confidence Intervals** In 2004 the *British Medical Journal* reported on a study showing that dogs can be trained to smell cancer. In one test, six dogs each performed nine trials for a total of 54 trials. On each trial, the dog would sniff seven bowls of urine, one of which was from a bladder-cancer patient. The dogs were trained to sit down by the bowl they thought smelled cancerous. Overall, the dogs were correct on 22 of 54 trials (about 41% of the time).

(a) If the dogs were guessing on each trial, how many guesses would you expect to be correct?

(b) Using the value of p from part (a), find the standard deviation for randomly guessing 54 times.

(c) If we believe that the dogs are just guessing, then there would be a 95% chance that the number of correct guesses would be between what two numbers?

(d) Do you think that the dogs were just guessing? Explain.