**Ch. 2 Activity: Probability and Class Evidence**

When considering class evidence, probative value increases when statistical analysis is applied. By determining the probability of certain characters existing in a given population, class evidence can be useful in eliminating or exonerating certain suspects.

(# individuals with characteristic)

(total # individuals) = % individuals with characteristic

(% individuals with (# individuals in expected # individuals in entire

characteristic) x entire population) = population with characteristic

For example:

In a class of 33 students (your representative subset of the greater population), 7 students are wearing a white shirt. Based on this, what percentage of the entire student body (1600 students) would you expect to be wearing a white shirt?

(7)/(33) = 0.21 = 21% (0.21) x (1600) = 340 students

This information becomes much more useful if multiple characteristics are compounded:

(% individ. (% individ. (% individ. (# individ. In # expected individuals

char. #1) x char. #2) x char. #3) x entire pop.) = with all 3 characteristics

For example:

A young person was seen leaving a high school parking lot after having been near a car with a broken window; the car’s stereo is missing. The suspect was identified as having light brown hair and wearing a white shirt, blue jeans, and dark-colored athletic shoes. Recall that you are using a representative subset of 33 students in one class (entire student body of 1600 students).

5 students have light brown hair 7 students are wearing a white shirt

(5)/(33) = 0.15 = 15% (7)/(33) = 0.21 = 21%

12 students are wearing blue jeans 4 students are wearing dark-colored

(12)/(33) = 0.36 = 36% athletic shoes

(4)/(33) = 0.12 = 12%

(0.15) x (0.21) x (0.36) x (0.12) x (1600) = 2 students

You can see how compounding class evidence can narrow down the probability of any one individual in a population having all the described characteristics.

***Example Problems***

Westford Academy has approximately 1600 students. A representative sample of 25 students was examined in the library. Use the numbers below to answer the problems.

**SHOW YOUR WORK IN THE SPACE PROVIDED, AND CIRCLE YOUR FINAL ANSWER!**

Shirt color:

Red shirt = 3 students, green shirt = 5 students, white shirt = 8 students

Shorts:

Jean shorts = 11 students, athletic shorts = 6 students, skirts = 4 students

Shoe type:

Flip-flops = 7 students, sneakers = 10 students, boots = 2 students

Hair color:

Brown = 13 students, blonde = 9 students, red = 1 student

1. How many students in school would be likely to have blonde hair and be wearing a green shirt, jean shorts, and boots?
2. How many students in school would be likely to have red hair and be wearing a white shirt, athletic shorts, and sneakers?
3. How many students in school would be likely to have brown hair and be wearing a red shirt, skirt, and flip-flops?