

## Class Evidence Probability

Usually, evidence is used to link or associate a suspect to a crime. More often than not, the evidence is class evidence.

1. For example, a blue fiber is found at a crime scene. Look at your classmates; how many could have transferred a blue fiber from the clothes they are wearing? How many suspects, then, are in your class?
2. Suppose the entire student body (650 students) had access to the crime site. How many suspects would there be based on the statistics from your class? (Clearly show all relevant calculations!) Is the blue fiber evidence of value? That is, does it do a good job of reducing the number of suspects down to a small number?
3. Suppose that along with the blue fiber, an orange fiber was also found. Does the combination of a blue fiber and an orange fiber improve the evidentiary value? Explain why. (Clearly show all relevant calculations!)
4. Does the number of characteristics of a material and/or the number of different, relevant objects found at a crime scene improve the probability of matching the evidence to a single suspect? Why or why not?
5. Camden has the following demographics:
  - Female residents 2206
  - Male residents 1787
  - Unmarried residents 1712
  - Asian residents 20
  - American Indian residents 2
  - Caucasian residents 3937
  - a) A suspect is described as a male, Asian resident of Camden. How many people fit that profile? Would that characterization be of value?
  - b) A suspect is described as a female, married, and Caucasian. How many people fit that profile? Would that characterization be of value?
6. The body of a woman was found in the woods. Some hair fibers found on the body were sent to the crime lab for analysis. The ends of the hair attached to the body were gray, but the tips of the hair show it had been dyed. The distance from the root of the hair to the beginning of the dyed area measured 8 mm (.8 cm). Investigators determined that the victim's hair had last been dyed on August 1, 2004. On approximately what day did the woman die? Explain, showing your calculations. (Assume that typical hair grows 1 cm/month)
7. A woman with long hair is a suspect in a burglary case. At the crime scene, several long hairs were found attached to a broken lock of the safe. The police obtain a warrant and request a sample of 25 to 50 hairs

from this woman. They tell the woman it is important that they pull the hairs from her head rather than to merely cut the hairs. The police suspect that the woman was stealing to help support a drug habit.

- Why is it important that the police pull the hairs from her head rather than cut them?
- Why is it necessary to obtain 25 to 50 hairs from this woman?
- The woman denies that she is currently taking illegal drugs and states that she stopped using drugs about a year ago. Explain how police can determine if the woman has been off drugs for a year.
- Is the hair found at the crime direct evidence? Explain why.
- Is the hair found at the crime scene class or individual evidence? Explain why.

- Someone in your class has stuck a wad of bubble gum on the teacher's desk. Embedded in the top of it is a hair. Examination finds that it is brown, 5 cm long from bulb to tip, the medulla is fragmented the shaft is 85  $\mu\text{m}$  in diameter, the tip is cut, and there is no evidence of any treatment. Data was collected and analyzed from a single classroom of 23 students, as shown in the table below. Use the data from table to calculate the number of suspects in the school of 630 students. Show your work!

Characteristic	Number of students in the class having that characteristic
<b>Color</b>	
Brown	13
Black	4
Red	1
Blonde	5
<b>Length</b>	
Under 3 cm	3
3-8 cm	8
8-15 cm	5
15-30 cm	7
Over 30 cm	
<b>Cosmetic Treatment</b>	
Dyed	3
Bleached	1

Characteristic	Number of students in the class having that characteristic
<b>Medulla</b>	
Absent	1
Fragmented	14
Interrupted	6
Continuous	2
<b>Diameter</b>	
under 40 $\mu\text{m}$	8
40 – 60 $\mu\text{m}$	7
60 – 80 $\mu\text{m}$	5
Over 80 $\mu\text{m}$	3
<b>Tip</b>	
Cut	16
Split	6
Frayed	1