Hair Unit Final Conclusions

Hair is considered class evidence in forensic science. Depending on the circumstances, its evidentiary value or importance is based on statistics. What are the chances that a hair came from a suspect or a victim? If there are only three possible suspects, a blonde, a brunette, and a redhead, and the circumstantial evidence consists of a red hair, then there is a 100% probability that the redhead committed the crime. However, if all three suspects have red hair, then the probability of choosing the perpetrator is one out of three. Not good enough! In this case, one would hope for more hair characteristics, or other circumstantial evidence. As you learned earlier, as the number of characteristics or objects linking a suspect increases, so does the probability of association or involvement.

1. A class has the following makeup:

Hair Color	Girls	Boys
Blonde	6	4
Brown	4	7
Red	0	1
Black	6	2

a. A red hair is found at a crime scene. Calculate the probability of this characteristic in this class.

b. A black hair?

c. If 75% of students in this class have short hair, what is the probability of finding the student who left a long brown hair?

d. If there are 630 students in the school, statistically how many boys would have black hair?

e. In this class, two blondes have a fragmented medulla and one other blond has hair longer than 50 cm. How many girls in the school would you expect to have blond hair longer than 50 cm with a fragmented medulla?

2. **HINT: *READ* the introductory section in this workbook!!** 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.

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3. 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.
   a. Why is it important that the police pull the hairs from her head rather than cut them?
   b. Why is it necessary to obtain 25 to 50 hairs from this woman?
   c. 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.
   d. Is the hair found at the crime circumstantial or direct evidence? Explain why.
   f. Is the hair found at the crime scene class or individual evidence? Explain why.

4. 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 µm 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
Color	
Brown	13
Black	4
Red	1
Blonde	5
Length	
Under 3 cm	3
3-8 cm	8
8-15 cm	5
15-30 cm	7
Over 30 cm	
Cosmetic Treatment	
Dyed	3
Bleached	1

Characteristic	Number of students in the class having that characteristic
Medulla	
Absent	1
Fragmented	14
Interrupted	6
Continuous	2
Diameter	
under 40 µm	8
40 – 60 µm	7
60 – 80 µm	5
Over 80 µm	3
Tip	
Cut	16
Split	6
Frayed	1