String Method Lab -Blood Spatter Analysis

Scenario: This morning the bodies of two deceased victims were discovered in a remote cabin on property owned by Aloha Paint Services near Kahakuloa.   It is accessible only by a gravel road cutting into the forest. Soon after the bodies were discovered, the small cabin was surrounded by police tape and investigators combing the scene in search of evidence. Detective Kealoha, the lead investigator in the case, explained, "A Girl Scout on a hiking trip found the victims about an hour and a half ago. There are two bodies inside, both in advanced stages of decomp; PMI (Post Mortem Interval: the time that has elapsed since a person has died) undetermined. The female victim was identified as Leilani Andersen. The bodies are in bad shape, but hopefully we'll get a positive ID when DNA analysis comes back."

Inside the cabin investigators discovered the bulk of the blood spatter in the corner near the male corpse. Spatter covered the two corner walls and a number of spatter-centers were evident. While processing the crime scene investigators also found a small amount of blood on a piece of firewood found near the female victim, pooled blood around the female victim that appeared consistent with a knife wound around her throat, and low-velocity spatter near her body.

Additionally, a trail of blood droplets was found connecting the male and female victims, and another similar trail was found connecting the female victim's body to a spot near the door, where the trail ended. A trail of what appeared to be bloody footprints also led from the female victim to the door. Each of these bloodstains was documented and photographed by crime scene investigators for further analysis.

Note: There were signs of struggle near the male victim. Two chairs were turned over and some flesh was found on the fireplace near the male victim. The male victim has been rumored to be having an affair with the female victim and Mr. Andersen who owns Aloha Paint Services is the primary suspect. A diorama of the scene and the photograph is available for you in the class if needed.

Procedure:

1. Choose up to 15 large, clear blood spots from blood spatter images A, B, and C. When choosing, choose ones with tails or satelites so direction of spatter can be easily identified. Also do not choose very circular blood spots, the angle will place the string outside of the cabin. Circle these 15 spots using a pencil and number them #1 - #15.

2. Draw the direction of blood on the paper.

3. In data table 1**, write** the length and the width of each drop – only in the gray shaded area. Then calculate the angle of each blood drop.

4. Assemble the cabin model (1/8 scale) of the interior corner of the cabin using blood spatter images A, B, and C. The sheet should be mounted 5 cm from the floor to aid in measuring. Note that the base of the model has the largest area.

5. Use a pushpin to secure an end of string to the center of each selected blood spot.

6. Hold a protractor to the model wall so that it is centered on the end of the string. Using a protractor, pull the string out so that it runs in the direction of travel, and at the appropriate angle from the data table.

7. Attach the free end of the string to the base of the model with a piece of tape – Do not use push pins to attach the string to the base.

8. Repeat steps 5 – 7 for each of the drops circled. If a drop is not able to be measured easily, or if the string is too short to mount to the base, choose a different blood drop.

9. After placing the strings, they should converge in one, two, or three areas. These areas are the location of impact.

10 Measure the center of each of the areas of impact, along the x, y, and z axes (as shown in the figure below). Record the measurement in data table 2.

Data:

Table 1. Angle of Impact

Drop Number	Width (cm)	Length (cm)	W/L	Angle
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Table 2. Area of convergence

Convergence	X (cm)	Y (cm)	Z (cm)	Who does the blood belong to?
Area 1				
Area 2				
Area 3				

From the x, y, z coordinate, knowing the scale of the cabin model to be 1/8. Figure out the "real" height" of each convergence point. (Hint: multiply model height by 8)

Area 1: _____ Area 2: _____ Area 3: _____

Questions:

1. From looking at the spatter patterns and reading the scenario, what kind of weapon could have made the spatter seen at the crime scene?

_____

_____

2. When stringing a crime scene or crime scene model, what does the string's intersection indicate?

_____

_____

3. How many points of convergence did you find? _____

4. What might a low point of convergence suggest that a high point of convergence does not (when both were found for a single victim)?

_____

_____

Recreate the scene

Write down the possible sequence of events.

_____

_____

_____

_____

_____

_____

_____

_____