

# A Crime



at VHS

# Blood Spatter Evidence

Name: \_\_\_\_\_

## CASE HISTORY:

Mr. Baker was in the lab late one night when an accident occurred. While working in the lab, the power suddenly shorted causing the lights to flicker. At this point, the experiment Mr. Baker was working on exploded because he could not see well enough to control the reaction. The beaker shattered in his hand. In a quick reaction Mr. Baker screamed like a girl and yanked his hand away splattering blood on the ceiling, wall and floor.

Meanwhile, Mr. Walther was doing his own thing at his desk in the room next door. Upon hearing the scream he listened and waited to hear if he would hear Mr. Baker say anything else. After a few minutes of eerie silence, Mr. Walther decided to check things out. He stealthily snuck into Mr. Baker's lab to find Mr. Baker unconscious and bleeding on the floor. Mr. Walther, claiming to be a hero, yelled for help and called 911.

After hearing the help call and apparently not hearing the scream Mr. Schneid, Mr. Rupp, and Mrs. Rini all came to help out. They all helped in wrapping Mr. Baker's arm in a tourniquet. When the police and paramedics finally arrived they noticed that everyone's shoes were covered in blood. Suspecting some sort of foul play, the four teachers were ordered to leave their shoes behind for evidence. Once in the hospital, the doctors were able to revive Mr. Baker and take care of all of his injuries. They also talked with the authorities and explained and inexplicable injury on Mr. Baker's upper arm that also required stitches. He had apparently been hit with a foreign object.

It appears as though one of the shoes bore the unmistakable spray of high-velocity impact blood spatter, which is evidence that one or several of them were standing within an arm's length of Mr. Baker when the "accident" occurred. Another blood trail was also left behind as the perpetrator left the scene with the foreign object.

**Materials:** pipette or dropper bottle filled with blood, paper, ruler, protractor

## Procedure: Part 1: High Velocity Blood:

1. The blood likely left Mr. Baker's hand from a height of 50 cm. The stains below were each found on different shoes.

Angle:



Mr. Walther



Mr. Rupp



Mrs. Rini



Mr. Schneid

2. Test the angle at which each of the blood spatters hit each shoe. Label each of the blood stains above with an estimated angle of spatter.

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## Procedure: Part 2: Blood Spatter From a Certain Height:

1. As the perpetrator left the scene they left a trail of blood. The blood appears to have been dripping from the end of a broken meter stick that was used to impact Mr. Baker's upper arm.
2. Based on the heights of the suspects, each would have dripped blood from different heights. Mrs. Rini being the shortest would have dropped blood from a height of 25 cm. Mr. Walther from a 50 cm height, Mr. Schneid from about 75 cm, and Mr. Rupp from a height of 1 meter. Devise a test to compare blood spattering from different heights. Compare your results with those found on the scene. (be aware that the weapon was being slowly swung as the suspect walked)

## Police Report:

1. If an individual had flickered the lights, rather than a power short, the individual would have been standing about 3 meters away from Mr. Baker. The blood would have hit their shoes at about a  $30^\circ$  angle. Which suspect most likely is responsible for flickering the lights?
2. The individual that hit Mr. Baker would have been about 1.5 meters away from Mr. Baker and would have been hit with blood at a  $70^\circ$  angle. Which suspect most likely is responsible for bludgeoning Mr. Baker?
3. The weapon may have been passed off by the bludgeoner. Which suspect most likely left the scene with the weapon?

## Projectile Motion and Gravitational Acceleration

4. Explain how the height from which the blood was dropped affected the speed of the blood as it hit the ground.
  - a. how did the appearance of the blood drop change as it was dropped from a greater height?
5. Why are we able to use the drops at angles to estimate how far away suspects were during the crime?