Name _____ Date _____

Take a Bite Out of Crime

A Lab on Dental Forensics

Objective

You will analyze bite marks and use your analyses to solve a mystery.

Background Information

"Dr. Johnson, would you introduce yourself to the jury, please, and explain why you are qualified to testify in this trial?"

"Of course. I am a forensic dentist. That means that I use my knowledge of dentistry to help solve crimes, or help identify unknown persons. I've been involved in dental forensics for the last twenty years, and have testified in many cases."

"Thank you, Dr. Johnson. Let me turn your attention to Exhibit #34—a piece of used chewing gum. Do you recognize this?"

"Yes, I do. This piece of gum was found at the murder scene. When I examined the gum, I found several marks made by teeth. This piece of gum led me to think that we might be able to identify the murderer with these marks. The police were holding two suspects in jail, so I made impressions of their teeth. I also made impressions of the victim's teeth."

"What did you do with those impressions, Doctor?"

"I used those impressions to make test marks in silicone, which has a consistency similar to chewing gum. Then I compared the three sets of silicone test marks to the marks left in the chewing gum."

"Was the gum dropped by the murder victim, Dr. Johnson?"

"No, it was not. The marks in the chewing gum were made by very sharp teeth, one of which was chipped. The victim had rounded, smooth teeth because of his advanced age. You see, young people have sharp teeth. But as a person ages, his or her teeth are continually worn down so that they are no longer sharp."

"Did the chewing gum marks match either of the test marks from the suspects' teeth?"

"Yes, they did. Both of the suspects are young men, and they have relatively sharp teeth. However, that is the only similarity in their teeth. One suspect has an undamaged set of teeth, without any nicks or breaks. However, the other suspect has a broken tooth; his teeth marks perfectly match the marks in the chewing gum. Without a doubt, the used chewing gum at the crime scene belonged to him."

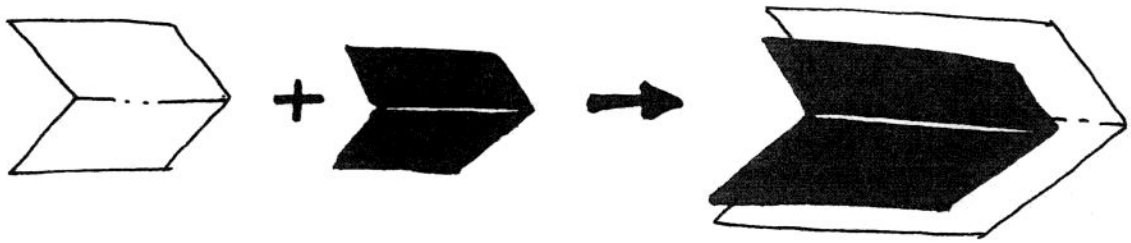
Materials, Day 1

12 pieces of 6 cm × 12 cm white paper

12 pieces of 6 cm × 12 cm carbon paper

Procedure, Day 1

1. Fold twelve pieces of carbon paper in half, carbon side out. Fold twelve pieces of white paper in half. Place the carbon paper inside the white paper. Arrange the other eleven pieces of white and carbon paper the same way.



2. Choose one member of your lab group to bite down on all twelve pieces of folded paper. Throw away the carbon, then spread the white paper to dry.

Materials, Day 4

Bite marks from six suspects, labeled A, B, C, D, E, F
Crime scene bite mark

Procedure, Day 4

1. Analyze each bite mark given to you by your teacher. Record information about each mark on the diagrams. For example, if bite mark A has a broken central incisor, draw a broken central incisor on diagram A. When you finish drawing details on diagram A, it should look very similar to bite mark A.
2. Repeat step 1 with bite marks B, C, D, E, F. Record all information on the appropriate diagrams.
3. Analyze the crime scene bite mark, and record information about it in the appropriate diagram.
4. Analyze all of your diagrams to determine which suspect bite mark matches the bite mark from the crime scene.

Postlab Questions

1. How can bite marks be used to help solve crimes?

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2. Who has sharper teeth, young people or old people? Why?

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3. In the lab today, whose bite mark matched the bite mark from the crime scene?

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4. Name the teeth that left impressions in the crime scene bite mark.

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Diagrams for Recording Information about Bite Marks