

Name _____ Date _____

HAIRY CAT CAPERS

A Lab on Hair Identification

Objectives

You will compare different types of hair under the microscope.

You will analyze the medulla, cortex, and cuticle of several hair samples.

Background Information

Janis Menendez owns a cat, Stingray, who has starred in several commercials for Flower Fresh Kitty Litter. Before Stingray was a famous cat, she belonged to Penny Jenkins, a full-time college student. Janis agreed to take the cat from Penny several years ago when Penny was too busy to properly care for her. Since Stingray's recent introduction to the world of television, she has earned her owner about \$750,000.

On April 2, Ms. Menendez calls San Diego 911 to report that Stingray has been stolen. Menendez states that she was in the family room watching the news while Stingray ate her dinner in the kitchen. Menendez heard a door open, and then a loud screech from the cat. By the time she got to the door, Stingray was gone. All Ms. Menendez saw was a medium-sized car speeding away from her home.

Police who investigate the scene of the crime find no evidence of a forced entry at the kitchen door. Therefore, it is concluded that whoever opened the door and stole Stingray had a door key. Police ask Ms. Menendez for a list of people who drive a medium-sized car and have a key to her house. Her list includes:

- a. Joe Menendez, her husband, who loves dogs and is allergic to cats.
- b. Bill Branson, a cosmetic salesman whose products are boycotted by Ms. Menendez because they are tested on animals. Susan Branson, his wife, is one of Janis's best friends and knows where the spare key to her house is hidden.
- c. Jill Rayburn, a neighbor and cat hater who has poisoned several cats in the neighborhood. _____ kitchen window looks into Janis's back yard, Jill may have seen Janis hide her spare key.
- d. Brandy Bledsoe, the maid who often complains that Stingray sheds hair all over the house. Brandy has her own key.
- e. Penny Jenkins, Stingray's previous owner and part-time sitter. Penny keeps a key for those occasions when she cat-sits.

Neither Bill, Jill, Brandy, nor Penny own a cat. By evening, the police comb the interiors of their cars to see if they can find any cat hairs.

- Determine the medullary ratio of each hair by measuring the diameter of the medulla and the diameter of the hair. Express these two numbers as a fraction in the Data Table.
- Note the hair length, tip condition, and shape of root in the Data Table.

DATA TABLE

Measurements and characteristics of hair samples A, B, C, D, E.

	Sample A	Sample B	Sample C	Sample D	Sample E
Diameter of medulla					
Diameter of hair					
Medullary ratio					
Hair Length					
Tip condition: Smooth, split, blunt, crushed, frayed					
Condition of root: Absent, rounded, tapered					

- Repeat steps 1 through 4 for hair samples in envelopes B, C, D, and E.

Postlab Questions

- Based on information in your sketches and in the Data Table, which hair sample(s) belong to Stingray?

- How can you tell human hair from animal hair?

- When examining the hairs under the microscope, were the cuticle scales clearly visible? Describe their appearance.

- How can investigators use hair evidence to help solve a crime?

Materials

Envelopes containing hair samples taken from the suspects' cars:

- A — Joe
- B — Bill
- C — Jill
- D — Brandy
- E — Penny

Compound-light microscope

5 slides

5 cover slips

Small beaker of water

Dropper

Small, transparent ruler

Procedure

1. Prepare a wet-mount slide of a piece of hair from Envelope A by:
 - a. placing a hair on the slide
 - b. adding a drop of water to the hair
 - c. covering the hair and water with a cover slip
2. Examine the hair under low, medium, and high power. Draw what you see on high power in the chart.

Sample A	Sample B	Sample C	Sample D	Sample E