

# Science Crime Busters

Div. B

Northridge Invitational 2009

By Katie Mika



A) \_\_\_\_/50

B) \_\_\_\_/10

C) \_\_\_\_/5

D) \_\_\_\_/10

E) \_\_\_\_/25

Total: \_\_\_\_/100

## CRIME

At 12:36pm today, in the coastal town of Granlago, a phone call was placed to the police from a local bakery. The police, not having much to do in this town other than watch the local tourists and eat donuts, responded quickly to a call from their favorite bakery. When they arrived, the baker told them that while he was at lunch someone broke into the bakery and stole all the donuts he had made for the day. Needless to say the police were furious and quickly on the case. While looking around, the police found many pieces of forensic information so they called in their forensic investigators (aka: you). The window on the door was broken through, presumably so the perpetrator could open the door, and there was a white powder there. There was also a shred of fabric on the door jam. The donuts were stored in the back room. Leading up to the door of the back room there was a trail of different powders, as well as a few hairs. The police also found a few powders on the way to the register. Back in the back room it seemed as if there was an explosion of powders and liquids and everything. This wasn't completely unexpected because the baker is known to be a bit of a slob. More hair, and even some fabrics, was found in the chaos. Along the way, the police found a few plastics. They found one in the front room and one in the back room. There was some blood on the on the broken window. The police believe that their perpetrator will have a cut on his hand. Fingerprints were found on the doorknob to the bakery and the doorknob to the back room. Lastly, the police found a scrap of paper with what seemed like a grocery list written on it with a pen.

The police found four suspects: the baker, a local hobo, a visiting surfer, and a frequent customer with a police record. Each has been interviewed and all their information is listed for you below.

Remember to wear your goggles at all times and to clean up when you are done.  
Good Luck!

# UNKNOWNNS

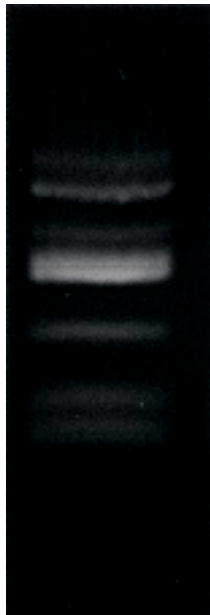
**Found Fingerprint #1 (on entrance):**



**Found Fingerprint #2 (on door to the back room):**



**Unknown DNA from blood on the door's window:**



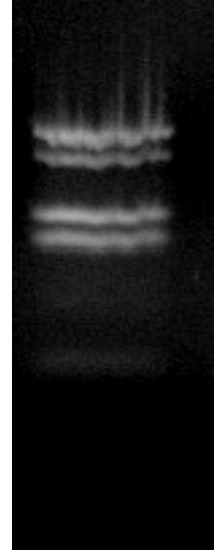
## SUSPECTS

**Bob Thatcher:** The owner of the bakery that was broken into. Police believe that he was getting desperate for attention for his bakery because he was losing business to the new Dunkin Donuts that opened down the street. He doesn't have any pets because he is worried about accidentally getting hairs into something and selling to someone with allergies. It's bad for business. He uses a lot of cling wrap in the bakery.

**Fingerprint:**



**DNA:**



**Joe Smith:** The town's local hobo. He lives right next to the bakery. Joe generally goes into the bakery once a day asking for bread and Bob chases him out. Bob will occasionally throw bread out after him. The police think Joe got desperate and may have broken in to get some food. Joe is often seen in the company of a stray cat, affectionately named Muggles. He keeps all of his belongings in plastic bags he has found around town.

**Fingerprint:**



**DNA:**

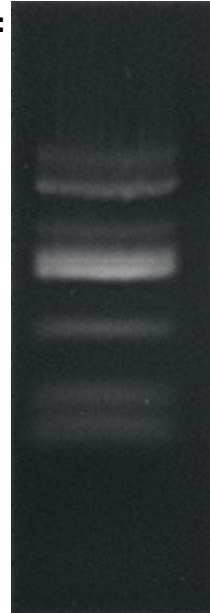


**David Jones:** A tourist who comes into town a few times a year to surf the waves on the local beach. He claims that they have the best waves around. Witnesses saw David and Bob arguing the other day at the beach about the rising prices in the bakery. They also heard David announce that he wouldn't go to the bakery until the prices came down. David says that claims that he broke in are ridiculous because he loves that bakery and has been going there since he was a child, but he did say he would not be going there any time soon. The police believe he may have broken in and stolen the donuts as a stand against the store's rising prices. David has a dog, named Killer, who he brings with him to Granlago every time he comes. He also always has a bottle of lemonade on him; he believes it has properties that help him surf.

**Fingerprint:**



**DNA:**



**Julia Sommers:** A local housekeeper with a record of breaking and entering. Police know that she goes to the bakery to buy bread for the family she works for. With her record, the police have decided to watch her as well. Julia says this is ridiculous. She was just there the day before while doing the family's shopping, why would she need to break in? And why would she steal donuts and not cash? Neither she, nor the family she works with, has any pets. She is allergic to fur. She always carries sandwich bags on her, in case one of the children need it for something, plus they make good temporary storage for small things. She has also been sick lately.

**Fingerprint:**



**DNA:**



# ANSWERS

## A. Qualitative Analysis (1pt. Each)

1	What is the identity of powder #1?	
2	How did you identify it?	
3	Who does this implicate?	
4	What is the identity of powder #2?	
5	How did you identify it?	
6	Who does this implicate?	
7	What is the identity of powder #3?	
8	How did you identify it?	
9	Who does this implicate?	
10	What is the identity of powder #4?	
11	How did you identify it?	
12	Who does this implicate?	

13	What is the identity of powder #5?	
14	How did you identify it?	
15	Who does this implicate?	
16	Name one use for this powder.	
17	What is the identity of metal #6?	
18	How did you identify it?	
19	Who does this implicate?	
20	What is the identity of metal #7?	
21	How did you identify it?	
22	Who does this implicate?	
23	What is the identity of metal #8?	
24	How do you identify it?	
25	Who does this implicate?	
26	What is the identity of liquid#9?	

27	How did you identify it?	
28	Who does this implicate?	
29	What is the identity of liquid #10?	
30	How did you identify it?	
31	Who does this implicate?	
32	What is the identity of liquid #11?	
33	How did you identify it?	
34	Who does this implicate?	
35	What is the identity of powder #12?	
36	How did you identify it?	
37	Who does this implicate	
38	What is the identity of powder #13?	
39	How did you identify it?	
40	Who does this implicate?	



41	What is the identity of one of the powders in mixture #1?	
42	How did you identify it?	
43	What is the identity the other powder in mixture #1?	
44	How did you identify it?	
45	Who does mixture #1 implicate?	
46	What is the identity of one of the powders in mixture #2?	
47	How did you identify it?	
48	What is the identity of the other powder in mixture #2?	
49	How did you identify it?	
50	Who does mixture #2 implicate?	

**B. Polymer Testing/Natural and Man-made Substances (1 pt. Each)**

51	What kind of hair is #1?	
52	What kind of hair is #2?	
53	What kind of hair is #3?	

54	What kind of hair is #4?	
55	Who does this implicate?	
56	What is fiber #1?	
57	What is fiber #2?	
58	What is polymer #1?	
58	What is polymer #2?	
59	Who does this implicate?	

**C. Paper Chromatography (5 pts)**

60-64	Chromatography of suspects' pens versus the unknown. You must share the pens, located in the front.	Paperclip/staple your chromatography to your test. 1pt per pen.
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**D. Crime Scene Physical Evidence (1 pt. Each)**

65	Whose fingerprint is #1?	
66	What type is it?	
67	Whose fingerprint is #2?	
68	What type is it?	



