Forensics Coaches Clinic Workshop

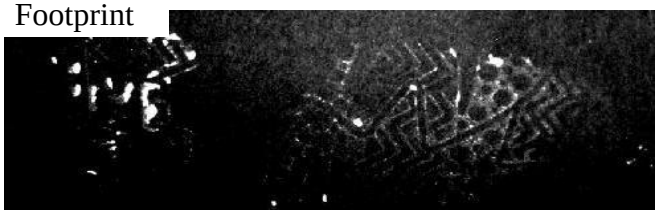
The family was very upset when Fluffy showed up missing. They were even more upset when Fluffy was found dead a week later in the park by Lemon Lake. Fluffy had a note attached that said the perpetrator had told them to quit investigating the lake or else. Since this was the first the family had heard anything it was assumed that this was a case of mistaken identity. Police found blood on Fluffy's teeth. A fingerprint was found on Fluffy's collar, and a footprint and a tire track were found next to Fluffy. They also found fabric, hair, and plastic on Fluffy's teeth. What appeared to be a juice was splattered around & under Fluffy. There was also some powder near Fluffy. Fluffy had a number of bullet wounds and there was evidence that insects had started to invade the wounds. There were some seeds in Fluffy's fur all over the body, as well as some pieces of glass and flakes of paint. There was also some soil embedded in Fluffy's footpads. Due to the nature of the crime, an autopsy was performed on Fluffy. Drugs were found in Fluffy's system. Fluffy also had high amounts of chromium in the blood. The police need to put this crime together. They think that the crime is a case of mistaken identity and the perpetrators were trying to stop a different family from investigating a lake although it is not known if the lake referred to is Lemon Lake or not. There are two suspects. Your task will be to identify the powder, hair, plastic, fabric, determine which suspect's pen wrote the note, whose juice was found at the scene, whose fingerprint it was, if the blood was human, if human what the blood type is and whose blood was on the teeth based on the DNA, and whose footprint and tire tracks were found at the scene and whose gun fired the bullets. In addition, the police need some information on exactly what happened. The police need to know how long Fluffy was dead, the index of refraction of the glass to see where the glass was from, where Fluffy was between the time Fluffy was taken and when Fluffy was found, what the spatter marks say about the crime, what the cracks in the glass can tell them, and what the drug in Fluffy's system was.

The pen and juice were subjected to paper chronographic analysis. The R_f of the only molecule of the pen was .678 with a standard deviation of .018. The R_f of the only molecule in the juice was .38 with a standard deviation of .113. The drug in Fluffy's system was put through a mass spectrograph. The paint was put through TLC with water solvent. The paint had 3 R_f's. They were .92, std. dev. .09: .79 std. dev. .11; & .15, std. dev .01. The last one fluoresced in the short UV light.

Tire Track

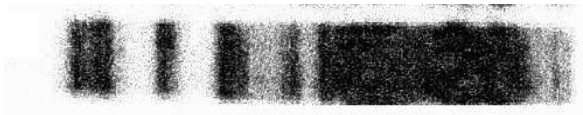
Insects

Footprint



Fingerprint

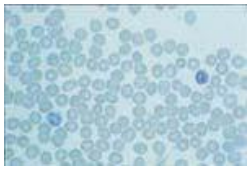
DNA



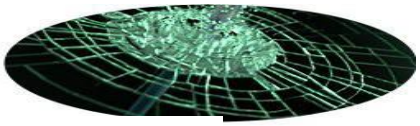
Seedpods

Spattered Juice Pattern

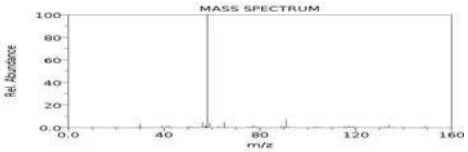
Blood Micrograph



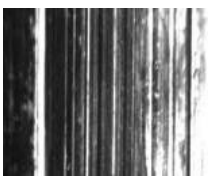
Glass fracture



Mass Spec drugs



Bullet Striations



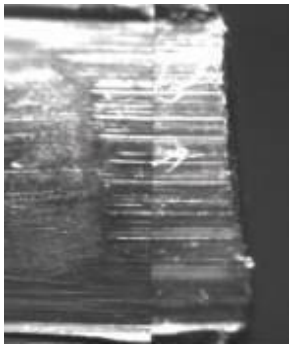
NAME Johnston, Jamie **PET** Cow and Horse **AGE** 25 **HAIR** Sandy Blond
FAVORITE DRINK Tropical Punch **HOBBIES** Working Out **PEN** Vis-A-Vis **Plastic** HDPE

JOB Steel Plant that uses chromium and Nickel Believed to be part of narcotics drug gang **HEIGHT & WEIGHT** 5'8"126#

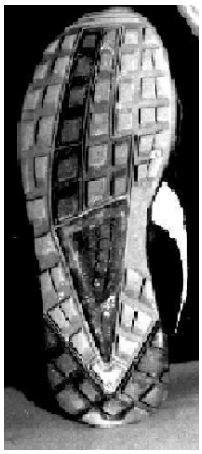
EYES Hazel **Paint** 4 **Blood Type** A **CLOTHING** Cotton Uniform
Chemicals found on sodium acetate, sodium chloride, calcium carbonate , sodium carbonate, lithium chloride, potassium chloride
INTERVIEW STATEMENT Out late the night before. Slept all day on day in question. Alone.

FINGERPRINTS

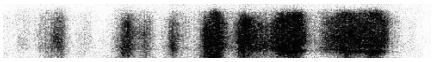
Striations



SHOE BOTTOM



DNA



Tire

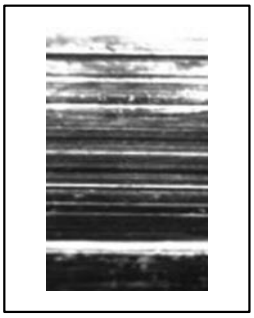
NAME Carlyle, Cary **PET** Squirrel & Bat **AGE** 32 **HAIR** Gray
FAVORITE DRINK Grape Illusion **HOBBIES** Baking & Sewing **PEN** Papermate **Plastic** PVC

JOB Electricity generating plant that uses high sulfur coal & increases TDS. Believed to be part of amphetamine drug gang **HEIGHT & WEIGHT** 5'6",132#

EYES Gray **Paint** 5 **Blood Type** B **CLOTHING** Nylon vest, wool shirt & Blue jeans
Chemicals found on calcium nitrate, calcium sulfate, sodium hydrogen carbonate, cornstarch, glucose, sucrose, magnesium sulfate, boric acid, ammonium chloride
INTERVIEW STATEMENT Out on drive to beach when Fluffy likely dumped in park. Alone.

FINGERPRINTS

Striations

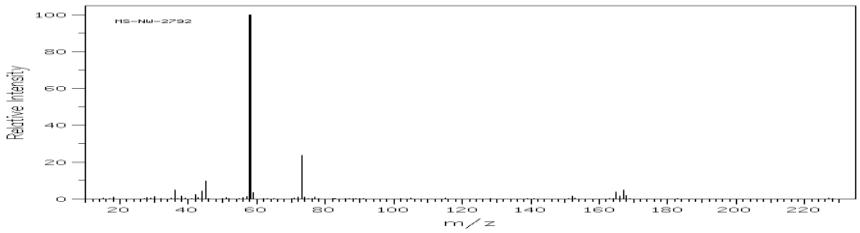
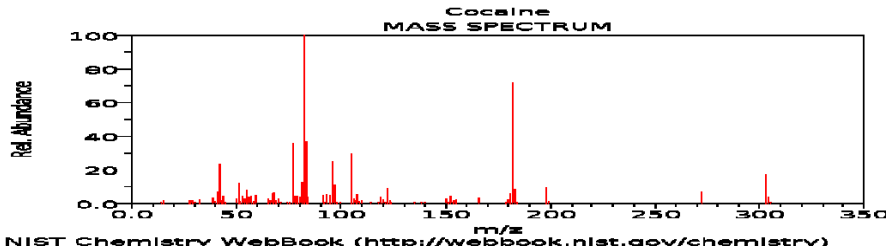
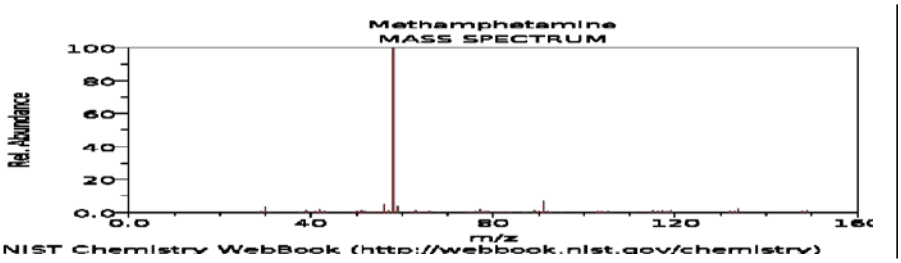
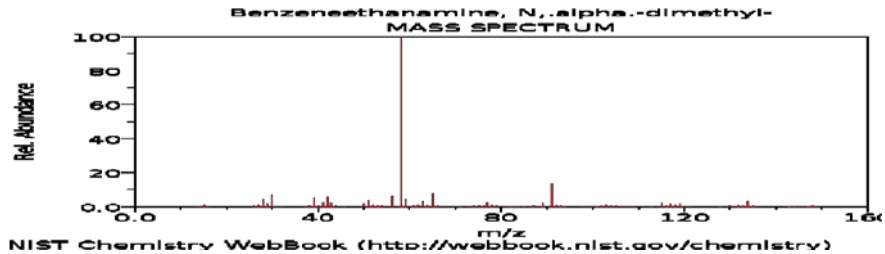


SHOE BOTTOM

DNA

Tire

1		ID of powder found at scene
2		Write the chemical equation when sodium bicarbonate reacts with HCl
3		What is the pH of sodium bicarbonate in distilled water
4		ID of Plastic found at the scene?
5		Monomer of PVC?
6		Density of PVC?
7		Type of condensation of PVC?
8		What type of hair was found in Fluffy's mouth?
9		What type of cuticle does Bat hair have?
10		What type of fabric was found in Fluffy's mouth?
11		What type of polymer is found in wool?
12		What are the R_f's of all the molecules in the Vis-à-vis pen?
13		What are the R_f's of all the molecules in the Papermate pen?
14		Whose pen most likely wrote the note?
15	_____	What are the R_f's of all the molecules in the Tropical Punch juice?
16	_____	What are the R_f's of all the molecules in the Grape Illusion juice?
17		Whose juice was most likely at the scene?
18	_____	What drug was most likely in Fluffy's system?
19	_____	What is the molecular weight of the most abundant piece?
20		What type of fingerprint was found at the scene?
21		Circle a bifurcation in both the fingerprint at the scene & the matching print
22		What % of people have this type of fingerprint?
23		What type of fingerprinting technique would have been best for lifting the print?
24		What arrangement of the volmer fat forms this type of fingerprint?
25		Whose DNA was found in the blood on Fluffy's teeth?
26		What is the refractive index of the glass?
27		What can we learn from the fracture pattern?
28		What is the stage of the insect in the photo?
29		How long is Fluffy likely to have been dead based on this being the only stage?
30		What was the angle of impact of the spatters?
31		Was the velocity of the impact high, medium, or low?
32		What do the splatters tell us about the crime?
33		Were the seeds put into Fluffy's fur before or after death?
34		Are the seeds useful in identifying where Fluffy was between abduction & death?
35		Whose shoe prints most likely made the tracks?
36		Whose tire threads most likely made the tracks?
37		What type of soil was found in Fluffy's pads?
38		What does this type of soil tell us about where Fluffy was?
39		Are the bullet striations from one of the suspects guns?
40		What category of animal is the blood from? (Human, other mammal, Bird, fish, or reptile)
41		What is the blood type of the blood found at the scene?
42		What are the R_f's of all the molecules in the Paint 4
43		What are the R_f's of all the molecules in the Paint 5
44		Were the fluorescent marks long wave, short wave, both or none for paint 4
45		Were the fluorescent marks long wave, short wave, both or none for paint 5
46		Who most likely put Fluffy in the park?
47	Analyze crime	

Chemical Name	Mass Spectrograph
Benadryl	
Cocaine	
Methamphetamine	
Benzeneethanamine, N,α-dimethyl	

Refractive index	Type of Glass	Refractive index	Type of Glass
1.56	Car Windows	1.40	Storm Doors
1.50	Window Glass	1.45	Drinking Glass

Container #	**Contents**	**Density**	**Index of Refraction**
1	**Corn Oil**	**.917**	**1.56**
2	**46% Isopropyl Alcohol**	**.950**	**1.35**
3	**Distilled Water**	**1**	**1.33**
4	**10% NaCl**	**1.07**	**1.40**
5	**25% NaCl**	**1.19**	**1.45**
6	**Saturated NaCl**	**1.25**	**1.50**

1	Ammonium Chloride	ID of powder found at scene
2	$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$	Write the chemical equation when sodium bicarbonate reacts with HCl
3	~8	What is the pH of sodium bicarbonate in distilled water
4	PVC	ID of Plastic found at the scene?
5	$[-CH_2CClH_2-]_N$	Monomer of PVC?
6	1.38	Density of PVC?
7	Addition	Type of condensation of PVC?
8	Bat	What type of hair was found in Fluffy's mouth?
9		What type of cuticle does Bat hair have?
10	Wool	What type of fabric was found in Fluffy's mouth?
11	Keratin	What type of polymer is found in wool?
12	.95, .79, .54, & .19	What are the R_f's of all the molecules in the Vis-à-vis pen?
13	.93, .84, .64, .34	What are the R_f's of all the molecules in the Papermate pen?
14	Neither	Whose pen most likely wrote the note?
15	.9, .42	What are the R_f's of all the molecules in the Tropical Punch juice?
16	.9, .66, .37	What are the R_f's of all the molecules in the Grape Illusion juice?
17	Neither	Whose juice was most likely at the scene?
18	Methamphetamine	What drug was most likely in Fluffy's system?
19	59 g/z	What is the molecular weight of the most abundant piece?
20	Whorl	What type of fingerprint was found at the scene?
21		Circle a bifurcation in both the fingerprint at the scene & the matching print
22	65%	What % of people have this type of fingerprint?
23	Super-gluing	What type of fingerprinting technique would have been best for lifting the print?
24	High fat in center	What arrangement of the volmer fat forms this type of fingerprint?
25	Cary Carlyle	Whose DNA was found in the blood on Fluffy's teeth?
26	1.56	What is the refractive index of the glass?
27	Impact.	What can we learn from the fracture pattern?
28	maggots	What is the stage of the insect in the photo?
29	< day	How long is Fluffy likely to have been dead based on this being the only stage?
30	Drop down 90°	What was the angle of impact of the spatters?
31	low	Was the velocity of the impact high, medium, or low?
32	There before Fluffy	What do the splatters tell us about the crime?
33	Before	Were the seeds put into Fluffy's fur before or after death?
34	No-Wind spread	Are the seeds useful in identifying where Fluffy was between abduction & death?
35	Cary Carlyle	Whose shoe prints most likely made the tracks?
36	Cary Carlyle	Whose tire threads most likely made the tracks?
37	Sand	What type of soil was found in Fluffy's pads?
38	Beach	What does this type of soil tell us about where Fluffy was?
39	Cary Carlyle	Are the bullet striations from one of the suspects guns?
40	Human	What category of animal is the blood from? (Human, other mammal, Bird, fish, or reptile)
41	B	What is the blood type of the blood found at the scene?
42	0.91, 0.53, 0.01	What are the R_f's of all the molecules in the Paint 4
43	0.92, 0.79, 0..15	What are the R_f's of all the molecules in the Paint 5
44	Both	Were the fluorescent marks long wave, short wave, both or none for paint 4
45	none	Were the fluorescent marks long wave, short wave, both or none for paint 5
46	Cary Carlyle	Who most likely put Fluffy in the park?
47	Analyze crime The powder implicates Cary as being at the scene, since it was found on Cary also, but it is a common powder. The plastic, hair, and fiber all implicate Cary. Further analysis will be needed to see if it was Cary's cat's hair and if the fiber was from Cary's clothes. Since a juice was under Fluffy, the juice was spilled by dropping straight down before Fluffy was put there. It did not match either suspect. Fluffy had methamphetamine in the system & Cary was an amphetamine gang member. The pen used to write the note was not found on either suspect, but pens are easily changed. Cary even admitted being at the Beach and Fluffy had been to the beach too. The fingerprint is a pointing piece of evidence pointing to Cary. Cary at least was in contact with Fluffy and at least knows what happened and who did it. The tire tracks add to the evidence although lots of people have the same tires and shoes. Since only maggots, not pupae or adult flies were present, Fluffy had been dead less than a day. Since the seeds were all over Fluffy and they are windblown, they are not helpful in solving the crime. The glass has a refractive index similar to auto glass, the shards show evidence of impact shattering. It is likely Fluffy tried to escape from a window that was shattered with a bullet or other impact. The paint in Fluffy's fur has the same fluorescent Rf as the paint from Cary's car, but lots of people most likely have the same paint. The blood has the same blood type as Cary & it was Cary's DNA. A lot of the evidence is circumstantial, but Cary needs more questioning at least.	