



Sample 5: Solvent Front: 8.1-8.2 cm  
 Crime Scene Sample: Same as sample 3  
 Implicates Suspect 3

Spots: 1.2 cm, 7.6 cm

R<sub>f</sub> values: .14-.15, .92-.93

Central Pocket Whorl	Radial Loop	Ulnar Loop	Radial Loop	Plain Whorl	Ulnar Loop
Plain Arch	Ulnar Loop	Ulnar Loop	Ulnar Loop	Radial Loop	Ulnar Loop (Look closely, it's not a tent-ed arch)
<b>Suspect 1</b>		<b>Suspect 2</b>		<b>Suspect 3</b>	
Plain Whorl	Ulnar Loop	Plain Whorl	Ulnar Loop	1. Implicates suspects 2, 3, and 4 because only they have fingerprints—at least for the thumb and index fingers—on their dominant hands that are all loops and not an arch or whorl.	
Plain Arch	Radial Loop	Ulnar Loop	Ulnar Loop		
<b>Suspect 4</b>		<b>Suspect 5</b>			

2. Less
3. Mobile phase: water; Stationary phase: paper

**Part F: Fingerprint Analysis (1 pt per ID, 2 pts for implication, 1 pt per answer for 2-7, 32 pts total)**

2. Latent
3. Ninhydrin, Purple
4. Iodine
5. Silver Nitrate, Sunlight/UV light
6. loop, 70, arch, 5

**Part G: DNA (2 pts per question, 12 pts total)**

1. STR or Short Tandem Repeats
2. No because impurities in the DNA will be multiplied. It is okay that the DNA sample is highly degraded—that's one of the reasons why scientists use PCR.
3. Sweat, Blood, Dandruff, Ear Wax
4. Denaturation, Annealing, Primer Extension
5.  $2 \times 2^{12} = 2^{13} = 8192$

6. 3' or 3'-OH, Taq

**Part H: Glass Analysis (4 pts per refraction index, 2 pts for implication, 14 pts total; deduct 1 pt for correct answer but no work)**

1. PMMA: 1.48 (or within reasonable distance if work is shown)  
Diamond: 2.4 (or within reasonable distance if work is shown)  
Amber: 1.55 (or within reasonable distance if work is shown)  
Implicates suspect 2 because he wears a Plexiglass shard as a necklace and Plexiglass is made of PMMA.

**Part I: Entomology (2 pts question, 10 pts total)**

1. Because flesh flies are attracted to the body undergoing microbial fermentation.
2. Order: Calliphoridae; Common name: blowfly
3. Can infer that the corpse has been moved (blowflies wouldn't be found in closet, body was most likely outside where flies would have arrived at the body and then the body was moved indoors.
4. They feed on dead flesh/are carrion eaters.
5. Complete; egg larva, pupa, adult

**Part J: Blood Analysis and Spatters (6 pts for 1a, 1 pt for 1b, 2 pts for parts of 2, 1 pt for each answer for 3-5, 5 pts total for 5 (3 for ID and 2 for implication))**

- 1a. The person is 5'2" or 62" tall.
- 1b. The size of the spatter would be larger.
2. a. Knife stab: smaller stains, linear pattern  
b. Whack from bat or hammer: drops of varying sizes  
c. Gun-shot: mist-like spatters
3. i. Contact and collapse  
ii. Displacement  
iii. Dispersion  
iv. Retraction
4. Void
5. A: spines  
B: satellites
6. Type A, Implicates Suspect 3 who is of blood type A-

**Part K: Bullet Striations (2 pts for questions 1,2,7; 1 pt per answer for 3-5; 5 pts for 6; 16 pts total)**

1. Rifling means that inside of the barrel, there are rotating grooves that impart spin to a bullet when it is fired. It increases the accuracy of the firearm.
2. It can be concluded that the victim was shot at close range (so that the residue from the firearm would be found on his/her body). Accepted that victim shot himself.
3. Bottom/casing/shell

4.



- a. Land
  - b. Groove
- Twist: Right/clockwise  
(for labeled picture, see last page)

5. Caliber of a bullet is its diameter
6. 2.28 inches
7. The pitch is the angle at which rifling is cut into barrel; effects the rate of twist.

**Crime Analysis: (2 pts for each piece of correct evidence, 3 pts for verdict)**

Suspect	Evidence Convicting This Person	Verdict
<b>Suspect 1 (Joe Jackson)</b>	Powder (Samples 2,4), Fiber	Release (Not guilty)
<b>Suspect 2 (Mason Montclair)</b>	Powder (Samples 1, 3, 5), Fiber, Fingerprints, Glass Analysis, Soil, Plastic	Hold for Hearing (Guilty)
<b>Suspect 3 (Liza Lafar)</b>	Powder (Samples 2,6), Fiber, Chromatography, Fingerprints, Blood Spatters, Blood	Hold for Hearing (Guilty)
<b>Suspect 4 (Janice Jahn)</b>	Fiber, Fingerprints	Release (Not guilty)
<b>Suspect 5 (Morgan Mabel)</b>	Fiber, Soil	Release (Not guilty)

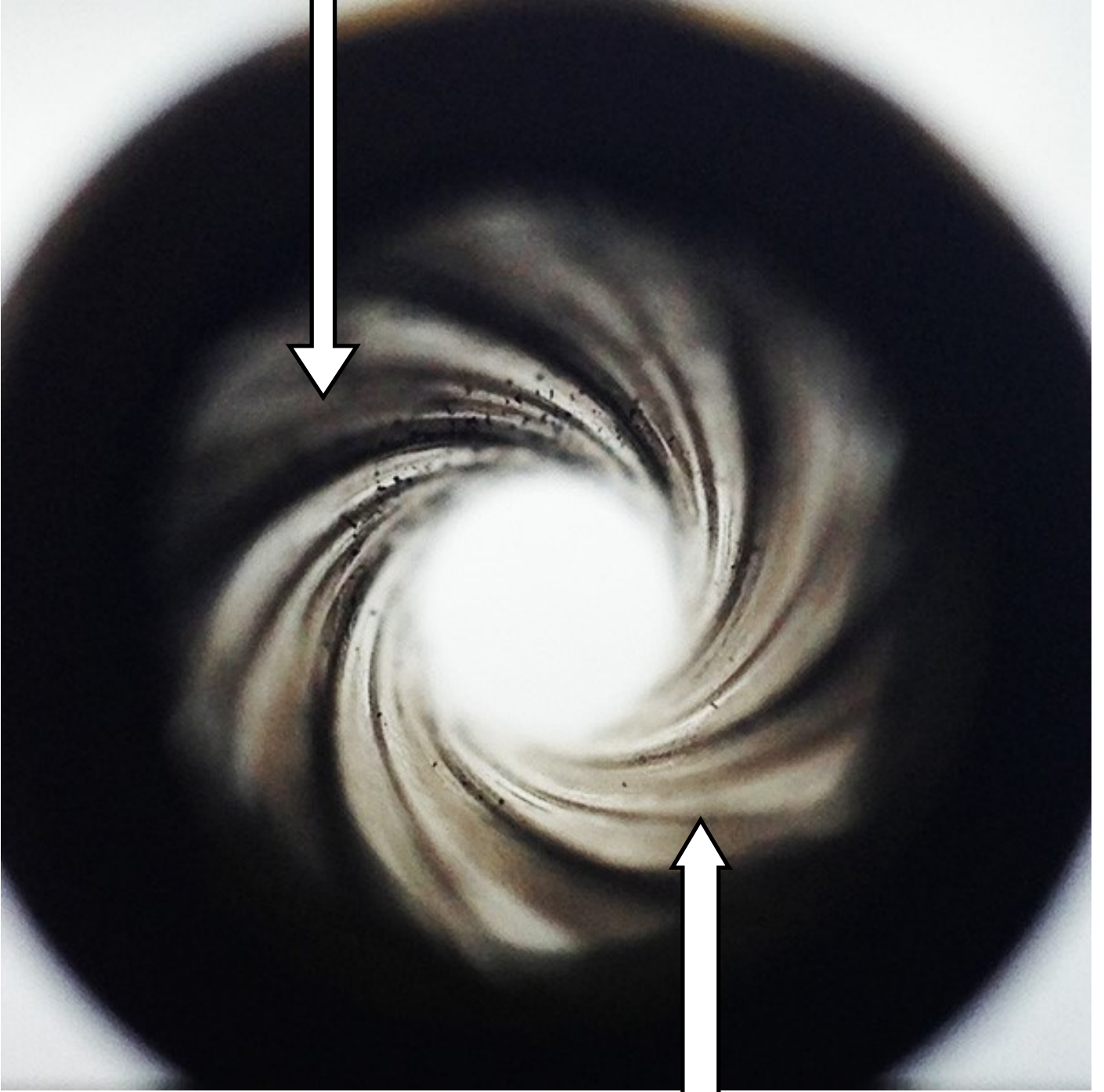
**Analysis (not limited to this answer, 1 pt per correct piece of info mentioned in analysis):**

Mason Montclair and Liza Lafar should be held for hearing because of the following reasons:

Mason’s powder sample (sodium bicarbonate) matched those of the crime scene (1 & 3) and one of the crime scene’s fibers was nylon, which is found on the men’s uniforms. His dominant hand’s fingerprints are all loops and the glass analysis evidence concluding that PMMA was the material found at the scene, matches with that of the Plexiglass (made of PMMA) necklace that he wears. The loamy soil found at the scene would link to him because he also works as the gardener. In addition, the plastic found at the scene—HDPE—has the resin number 2, which matches with his bracelet’s material. Furthermore, his sketchy history and frequent transitions from workplace to workplace makes him a suspicious suspect.

Liza’s powder sample (sucrose) almost matched that of the crime scene (2) and one of the crime scene’s fibers was cotton, which is found on the women’s uniforms. Her dominant hand’s fingerprints are all loops and the chromatography sample from the ink found at the crime scene matches that of her pen. Someone with her height would have caused the paint spatter on the wall and her blood type, A-, matches the blood type of the sample found (A). An anti-superhero activist, Liza also had the incentive to wreck havoc on the Incredibles’ vacation, a sentiment expressed in the wording of the note.

The other three suspects has a couple pieces of evidence pointing to them, but none significant or numerous enough to implicate them or to have them held for further questioning.



B



A