

## Forensic Science Fingerprint Analysis / Case Studies

### Case Study 1: The Stolen Exam Papers

**Scenario:** Exam papers were stolen from a locked drawer in the teacher's office between 4:00-7:00 PM. Three suspects were in the area:

- **Evelyn (Straight-A Student):** Said she left by 4:30 PM after picking up an assignment.
- **Jake (Struggling Student):** Claimed he was waiting for a friend near the office until 6:00 PM.
- **Mr. Klein (Teacher):** Said he worked late nearby but heard nothing unusual.

#### Timeline:

- 4:00 PM: Papers confirmed in the drawer.
- 4:30 PM: Evelyn seen leaving.
- 6:00 PM: Jake said he left the area.
- 7:00 PM: Drawer found open.

#### Fingerprint Evidence:

1. Whorl pattern found on the drawer lock.
2. Loop with bifurcations found on the desk.
3. Smudged arch on the office door handle.
4. Suspect Samples:
  - Evelyn: Whorls.
  - Jake: Loops.
  - Mr. Klein: Arches.

#### Additional Clues:

- Evelyn's whorl matches the drawer lock, but she denies touching it.
- Jake's loop is on the desk, though he claimed not to enter the office.
- Mr. Klein's arch was found smudged, consistent with someone wearing gloves.

**Challenge:** Who is lying, and how do the fingerprints reveal the thief

## Case Study 2: The Trophy Theft

**Scenario:** The championship trophy disappeared during a pep rally between 2:00–3:00 PM. The security cameras were disabled at 2:20 PM. Three suspects:

- **Ben (Ex-Team Member):** Said he left at 2:15 PM for the nurse.
- **Lila (Reporter):** Claimed she was photographing the rally near the trophy case at 2:30 PM.
- **Mark (New Student):** Reported walking past the trophy case but didn't touch anything.

### Timeline:

- 2:00 PM: Rally begins.
- 2:20 PM: Cameras disabled.
- 2:30 PM: Trophy seen missing.

### Fingerprint Evidence:

1. **Partial whorl** on the trophy.
2. **Loop** found on the case handle.
3. **Arch** on the camera wires.
4. **Suspect Samples:**
  - Ben: Loops.
  - Lila: Whorls.
  - Mark: Arches.

### Additional Clues:

- Ben's **loop** matches the case handle.
- Lila's **whorl** is consistent with the trophy but lacks motive.
- Mark's **arch** matches the camera wires.

**Challenge:** Who stole the trophy, and how did they disable the cameras?

## Case Study 3: The Vanishing Science Project

**Scenario:** A renewable energy project disappeared during the science fair setup between 4:00–6:00 PM. Security cameras captured a figure entering the room but not their face. Suspects:

- **Sophie (Struggling Student):** Claimed she left by 5:00 PM.
- **David (Lab Assistant):** Had access to the room and was there until 6:00 PM.
- **Mia (Curious Peer):** Said she returned briefly at 5:15 PM.

**Timeline:**

- 4:00 PM: Setup begins.
- 5:00 PM: Sophie leaves.
- 5:15 PM: Mia enters.
- 6:00 PM: Project missing.

**Fingerprint Evidence:**

1. Whorl on the project stand.
2. Loop on a nearby folder.
3. Arch on the door handle.
4. Suspect Samples:
  - Sophie: Loops.
  - David: Whorls.
  - Mia: Arches.

**Additional Clues:**

- David's whorl is a match for the project stand.
- Sophie's loop was on the folder, contradicting her claim she never touched it.
- Mia's arch matches the door handle, though she denied entering the room.

**Challenge:** Who took the project, and how do the fingerprints and timeline expose the culprit?

## Case Study 4: The Locker Break-In

**Scenario:** A locker was broken into between **12:30–1:15 PM**, and a pair of sneakers were stolen. Suspects:

- **Alex (Friend):** Said they were in the library at 12:45 PM.
- **Jordan (Classmate):** Seen near the lockers at 12:50 PM.
- **Taylor (Rival):** Claimed to leave school early.

**Timeline:**

- **12:30 PM:** Locker last checked.
- **12:45 PM:** Alex in the library.
- **12:50 PM:** Jordan near the lockers.
- **1:15 PM:** Locker found open.

**Fingerprint Evidence:**

1. **Loop** on the locker handle.
2. **Whorl** on a notebook inside.
3. **Arch** on a nearby water bottle.
4. **Suspect Samples:**
  - Alex: Loops.
  - Jordan: Whorls.
  - Taylor: Arches.

**Additional Clues:**

- Alex's **loop** matches the locker handle.
- Jordan's **whorl** on the notebook contradicts their statement of not touching anything.
- Taylor's **arch** was found on the water bottle.

**Challenge:** Who broke into the locker, and how do fingerprints expose inconsistencies?

## Case Study 5: The Library Laptop Theft

**Scenario:**

A laptop was stolen from the library between **3:00-3:45 PM**. Suspects:

- **Emily (Classmate)**: Claimed to use the laptop at 3:00 PM and leave.
- **Chris (Student Assistant)**: Denied touching the laptop but was in the area until 3:30 PM.
- **Ryan (Student)**: Admitted sitting at a nearby table until 3:45 PM.

**Timeline:**

- **3:00 PM**: Laptop last used.
- **3:30 PM**: Chris leaves.
- **3:45 PM**: Laptop missing.

**Fingerprint Evidence:**

1. **Whorl** on the laptop.
2. **Loop** on the table.
3. **Arch** on the chair.
4. **Suspect Samples:**
  - Emily: Loops.
  - Chris: Whorls.
  - Ryan: Arches.

**Additional Clues:**

- Chris's **whorl** matches the laptop but claims he never touched it.
- Emily's **loop** was on the table, inconsistent with her claim of leaving.
- Ryan's **arch** was smudged on the chair.

**Challenge:** Who stole the laptop, and how does evidence contradict the suspects' testimonies?

## Case Study 6: The Art Room Vandalism

**Scenario:** A painting for a competition was vandalized between **4:00-5:30 PM**. Suspects:

- **Jamie (Friend):** Claimed to leave the room at 4:30 PM.
- **Logan (Competitor):** Stayed until 5:00 PM.
- **Casey (Prankster):** Was seen entering the art room at 5:15 PM.

#### Timeline:

- **4:00 PM:** Painting intact.
- **4:30 PM:** Jamie leaves.
- **5:00 PM:** Logan leaves.
- **5:30 PM:** Vandalism discovered.

#### Fingerprint Evidence:

1. Whorl on the paint can.
2. Loop on the canvas.
3. Arch on the light switch.
4. **Suspect Samples:**
  - Jamie: Loops.
  - Logan: Whorls.
  - Casey: Arches.

#### Additional Clues:

- Logan's whorl matches the paint can.
- Jamie's loop matches the canvas.
- Casey's arch is on the light switch, though they denied entering the room.

**Challenge:** Who vandalized the painting, and how do the fingerprints and timeline expose the truth?