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# Microscopic Forensics Kit

TEACHER'S MANUAL WITH STUDENT GUIDE



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## Teacher's Manual

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# Investigation Report



**Suspect:** *Kisha Kendall, the pool cleaner and lifeguard*

**Location:** *Interview Room 1*

**Time:** *10:02 a.m.*

### Investigator's Notes:

*Kisha's role during the party was simply to keep an eye out for anything or anyone falling into the pool in the courtyard, and scoop them out. During the party, Kisha was highly visible in her red nylon lifeguard uniform, and she seems to be the only suspect who is not fed up with Mr. Parker's butterflies. During the interview, however, the pool cleaner exhibited signs of resentment toward her employer for other reasons. She was obviously anxious to get out of the interview.*

### Quotes from Kisha Kendall

*"I don't mind them [the butterflies] so much. They fall into the pool and clog the filter now and then, but all the different species are really pretty."*

*"Before the party, I scraped my knuckles on the edge of the pool rescuing a Papilio troilus. But I'll shed a little blood to save a butterfly."*

*"If that stingy Mr. Parker doesn't give me a raise soon... I just don't know what I'm going to do. Beauty products are expensive, you know."*

*"The sun's rays are most intense between ten and two, and this interrogation is wreaking havoc on my tan. Can I go now?"*

# Microscopic Forensics Kit

## Overview

This activity introduces students to the basic concepts of forensic science. First, students observe slides of materials representative of those collected at crime scenes and write detailed descriptions of what they see. Next, they are presented with a murder mystery (the untimely demise of *Vanessa cardui* butterflies), a list of suspects, and several pieces of forensic evidence. Students must effectively focus their observation, documentation, and scientific inquiry skills in order to identify the most likely suspect.

## Content Standards

This kit is designed for middle school and high school students and addresses the following National Science Education Standards:

### Grades 5–8

#### Science as Inquiry

- Abilities necessary to do scientific inquiry

#### Science and Technology

- Understanding about science and technology

#### Science in Personal and Social Perspectives

- Science and technology in society

#### History and Nature of Science

- Science as a human endeavor

### Grades 9–12

#### Science as Inquiry

- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

#### Science and Technology

- Understanding about science and technology

## Materials

*Provided in the kit:*

Known Slide Set:

human blood

frog blood

human cheek cells (stratified squamous epithelium)

human skin section

- human hair
- cat hair
- male chromosome set
- female chromosome set
- 8 multifiber fabric swatches with strands of:
  - acetate
  - cotton
  - nylon 6.6
  - silk
  - viscose
  - wool
- 8 Stained Cotton Fabric Sets:
  - blood-stained cotton
  - grass-stained cotton
  - lipstick-stained cotton
  - oil- and soot-stained cotton
- Evidence Set:
  - 8 “blood evidence” slides (human male blood slides)
  - “unidentified” fibers (grass-stained cotton fibers, oil- and soot-stained cotton fibers)
  - “unidentified” hair (cat hair)
  - glass slides
  - glass coverslips
  - 8 plastic pipets
  - 8 plastic forceps
  - Teacher’s Manual with Known Slide Identification Keys and Student Guide
- Needed, but not supplied:*
  - 8 compound microscopes
  - colored pencils
  - markers or glass marking pencils
  - small containers of water

## Background

Forensic science is the application of scientific processes and methods to situations concerning criminal or civil law. Forensic scientists are individuals who study evidence from a crime scene or elsewhere in order to collect information for application within the legal system. Physical evidence studied by forensic scientists includes fingerprints, blood stains, bruises, cuts, abrasions, textiles, fibers, handwriting, dentition markings, and skeletal and tissue remains. One of the most challenging aspects of a forensic scientist’s job is that physical evidence does not always lead to a single, clear conclusion. Forensic evidence often can be used to link a suspect to a victim or to the scene of a crime, but does not necessarily prove that the individual committed the crime. Many times, forensic evidence simply helps to identify a suspect and



# Investigation Report



**Suspect:** *Myron Ivy, the gardener*

**Location:** *Interview Room 3*

**Time:** *9:42 a.m.*

**Investigator’s Notes:**

*The murder weapon was an insecticide found in Mr. Ivy’s tool shed, making him a prime suspect. He also has a motive. The gardener deals daily with countless hungry larvae feasting on his landscape designs. The animals are clearly an impediment to Mr. Ivy’s efforts to maintain the Parker’s gardens, and they certainly create more work than would otherwise be required. However, Ivy’s alibi places him away from the scene of the crime all evening, as he was assisting Darwin Huckleberry, the cook, by serving the calamari and fries to guests during the party.*

**Quotes from** Myron Ivy

*“I spend every day crawling around in the grass, on my hands and knees, inspecting the plants for caterpillar damage. I have to remove them one at a time... blasted nuisance!”*

*“The bandage? I cut my finger helping Darwin in the kitchen last night. It’s no big deal.”*

*“Sure, I’ve fantasized about ‘accidentally’ spraying the garden with insecticide rather than with the usual fertilizer mixture, but I would never do it. I am so close to retirement, it just wouldn’t be worth it.”*

*“Mrs. Bernice Goose [a wealthy widow who attended the party] will support my alibi. She kept saying how good I looked in my cotton pants. She followed me around all evening.”*

**Suspect:** *Marvin Trotter, the butler*

**Location:** *Interview Room 2*

**Time:** *9:44 a.m.*

**Investigator’s Notes:**

*Marvin Trotter says he was answering the door and running errands during the party. He seems uncomfortable in his wool butler’s uniform. He is irritated about the fact that a large number of butterflies find their way into the house whenever he (or anyone else) opens an exterior door to the home. Mr. Trotter admits having a terrible fear of six-legged creatures, and capturing dozens of butterflies in the house every week has fueled his anxiety and (perhaps) his desire to reach for something more lethal than a butterfly net to solve the problem. Having complained to the Parkers on several occasions, Trotter says he now fears for his job, which he seems to take very seriously.*

**Quotes from** Marvin Trotter

*“It’s called ‘entomophobia’ and it’s a very serious condition. Insects are everywhere, you know. It’s not funny!”*

*“Working inside the house all day turns into little more than a butterfly hunt. But I’ll tell you—on most days, I think those monsters are hunting me!”*

*“I pride myself on my ability to get from one end of the house to the other quickly and quietly, while blending into the background.”*

*“I am a very good butler, you know, but nobody seems to acknowledge me. It’s as if I’m invisible.”*