



# A CRIME HAS BEEN COMMITTED

## QUICK PEEK

*In this lesson, students will demonstrate all of the techniques they have learned during the lessons Ink Chromatography, What Could It Be? Glass Chip Density, Forensics, Dirt and Fibers and Forensics.*

### SUGGESTED GRADE LEVELS: 8-12

### ILLINOIS STATE LEARNING GOALS

#### SCIENCE

11.A, 13.A

#### MATH

6.A, 7.A, 10.A, 10.B

#### LANGUAGE ARTS

1.C, 3.A, 3.B, 3.C, 4.A

### OBJECTIVES

- ★ Students will demonstrate proper lab techniques to analyze soil and fiber samples, perform chromatography, calculate density of glass samples and analyze unknown powders.
- ★ Students will construct a table and organize data.
- ★ Students will draw conclusions based on data and evidence collected.

### PACE YOURSELF:

250 MINUTES

5-6 CLASS PERIODS

FOR THIS LESSON



### PREPARE YOURSELF

1. Decide in advance of the activity which ink, soil sample, fiber, glass and powder you will use for that found at the crime scene and on the suspects. You may set up the crime to have only one person guilty, 2 guilty or none of the given suspects guilty.
2. *(optional)* Write evidence collected on the board or poster paper.



### MATERIALS

Refer to Glass Chip Density, Ink Chromatography, What Could It Be?, and Forensics and Dirt lessons for complete materials list.



## WHAT YOU NEED TO KNOW...

This lesson is a culmination of the previous five lessons: Glass Chip Density, Fibers and Forensics, Ink Chromatography, What Could It Be?, and Forensics and Dirt. Students must think back to the procedures and techniques that they used in each lab to complete this project. For background information, refer back to the corresponding lesson.



## WARM UP!

*Read students the following:*

### INCIDENT REPORT

Friday night at approximately 2200 hours, police were called to the scene of what they believe to be an attempted murder. The victim had been hit by a car and was laying on the ground unconscious, though had a pulse and was breathing. The victim was rushed to the hospital and has been identified as a 28 year old Caucasian male. A forensic team was called in to investigate.

*The following evidence was collected from the crime scene:*

- Broken glass on the ground near the victim
- Dirt from the ground around the crime scene
- Powder samples from a small resealable bag found in the victim's inside jacket pocket
- Blue material fibers from the victim's hand that did not match anything the victim was wearing
- A note on the ground near the victim

*Interviews with the victim's family and friends revealed the following:*

- The victim did not have a steady girlfriend.
- The victim was interested in a girl that he worked with who has an extremely jealous boyfriend.
- The victim's parents and friends said he did not use drugs
- The victim's best friend said that the victim was excited about meeting someone Friday night but that he wouldn't give any details.

*The Police have six suspects. Searches have been conducted and the following is what was collected:*

#### **Suspect #1: female**

1. ink sample
2. blue jacket

#### **Suspect #2: female**

1. ink sample
2. dirt from her car floor
3. white powder found in a zip-lock bag in her bedroom

Encourage students to investigate the evidence using proper procedures, organize that information and draw a reasonable conclusion that they can support.

This lab requires a lot of organization on the part of the teacher. You may wish to find additional help—perhaps an aid or parent volunteer, to help set up and run the lessons.

**TIP:** Guide students to the appropriate pages and data tables on the previous labs to help organize their procedures and information.

## Suspect #3: female

1. ink sample
2. blue jacket

## Suspect #4: male

1. sample of headlight glass
2. dirt from car floor
3. powder residue on car seat

## Suspect #5: male

1. sample of glass from headlight
2. dirt from bottom of shoes
3. blue shirt

## Suspect #6: male

1. sample of headlight glass
2. dirt from car floor
3. powder found inside pocket of blue jacket
4. blue jacket

**TIP:** Allow the students to assign different tasks to one another so everyone in the group has a job he/she can be successful in completing.



## THE HOW TO:

1. Obtain samples of each piece of evidence found at the crime scene  
Remember to use proper tools so you don't contaminate the evidence.
2. Label each piece of evidence.
3. Obtain samples of all the items found with each suspect.
4. Label.
5. Follow the procedures from Glass Chip Density, Ink Chromatography, What Could It Be?, Fibers and Forensics, and Forensics and Dirt to analyze the evidence.
6. Create a separate data table for each piece of evidence found at the crime scene and how it compares with the evidence from the suspects. (5 separate data tables!!!!) You can find sample data tables in the individual lesson instructions.
7. Create a data table or graphic organizer that supports who you feel committed the crime.
8. Write a story about the events leading up to the crime. Include in your story: motive, all the evidence, how the crime occurred and what the suspect(s) did after the crime. Use correct spelling and grammar.

**TIP:** Require only one of each data table per group instead of one per each individual.



## WHAT'S GOING ON HERE?

Forensic scientists must be able to perform two roles in their work: analyzing physical evidence found either on a victim, at the scene of a crime, or both; and providing expert testimony in a court of law. In this lesson, students must be extremely organized and focused as they perform all procedures previously learned to analyze physical evidence. In the “real world,” forensic scientists each have a specialty or area of expertise, (toxicology, trace evidence, etc.) and would not be responsible for performing all of the tests that the students have learned to do.



## ET CETERA

1. To celebrate finishing the unit, have students work in groups to plot their own imaginary “Crime Scenes.” What evidence would they plant at the scene, and how could other groups use that evidence to determine the guilty party? Make sure that they include at least two scientific tests that other groups would use to solve the crime. (Possible ideas: pH test, hair analysis under a microscope, footwear impressions.)
2. Have students that finish early learn more about forensic science and pursuing a career in forensics by reading this article: <http://www.bls.gov/opub/ooq/1999/Fall/art01.pdf>

**TIP:** Give the students the scoring guide before they start the assignment so they can keep track of what is expected of them.

# A CRIME HAS BEEN COMMITTED



## DID THEY GET IT?

### SUGGESTED INDIVIDUAL SCORING GUIDE FOR "A CRIME HAS BEEN COMMITTED"

<b>5 = ALWAYS, 4 = MOST OF THE TIME, 3 = OBSERVED HALF THE TIME, 2 = OBSERVED, BUT NOT OFTEN, 1 = RARELY OBSERVED</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Has read and seems to understand all experimental procedures prior to their beginning.					
Is attentive to the instructor and others working within the laboratory area.					
Has taken all safety precautions and follows safety regulations adequately.					
Observes adequately and records thoroughly what has been observed.					
Labels everything used in the lab.					
Classifies items, thoughts, or observations in an organized and methodical manner.					
Uses self-direction and exhibits common sense in the setting up of experimental apparatus so as to measure correctly.					
Draws insight from questions, past procedures or earlier explanations.					
Predicts proposed results prior to collecting and analyzing the data gathered.					
Carefully and effectively gathers measurements and observations in an adequate quantitative manner.					
Carefully and effectively gathers measurements and observations in an adequately qualitative manner.					
Communicates appropriately with members of their group.					
Organizes collected data in visual patterns for a more definitive illustration and interpretation of it.					
Recognizes incompatibilities in gathered observations or data samples.					
Adequately interprets results from organized data samples and properly notes relationships.					
Hypothesizes as to why a procedure did or did not yield successful results.					
Experiments with equipment and equipment set-ups in order to yield more consistently valid results.					
Experiments safely with procedures and techniques so as to yield more consistently valid results.					
Exhibits proper overall laboratory technique.					
Is able to communicate the results of an experiment effectively to others.					
<b>TOTAL POSSIBLE:</b>	<b>100 POINTS</b>				

# A CRIME HAS BEEN COMMITTED

## SUGGESTED GROUP SCORING GUIDE FOR "A CRIME HAS BEEN COMMITTED"

	<b>10</b>	<b>5</b>	<b>1</b>	<b>Score</b>
<b>Evidence Data Tables (times 5)</b>	All 5 data tables are present. All tables are properly labeled, including a title. All data is properly and clearly entered.	Missing a data table. Tables not clearly labeled or titled. Missing data.	Missing more than one table. Unclear labeling. Missing a lot of data.	
<b>Graphic Organizer (times 3)</b>	Titled. Clearly shows how the evidence leads to the conclusion.	Untitled. Good attempt but not completely clear how evidence leads to conclusion.	Confusing. Cannot figure out how things relate.	
<b>Story (times 3)</b>	Less than 3 spelling and grammar errors. Includes motive, how crime occurred, all of the evidence, what happened after the crime. Creative.	More than 3 but less than 10 spelling and grammar errors. Includes all of the requested components. Lacks creativity.	More than 10 spelling or grammar errors. Missing one or more of the requested components.	
<b>Total Score</b>				