



Biotechnology: Forensics

Grade Level: 6th through 12th grade

Where Taught: Lab or central classroom

Students: Up to 30 students, plus teacher or another adult supervisor

Time needed for presentation: 60-90 minutes, plus 10 minutes between sessions to cleanup and prepare for the next session.

Georgia Performance Standards: 7th grade: S7L2 a, b, c, d, e and S7L3 a, b, c;
9th-12th grades: SB1 a, b, c and SB2 a, b, c, d, e, f

This is a fun module that mixes learning with a little mystery. We hope to leave the students shocked and amazed as they use the evidence to figure out who the real criminal is!

Purpose:

- To introduce students to a wide spectrum of biological subjects, from molecular biology to genetics and anatomy
- To clarify techniques that forensic scientists use today to solve crimes, and to accurately portray for the students a forensic scientist's profession, correcting common misconceptions often seen on television
- To allow students to understand how and why certain molecular and chemical techniques are used today, such as fingerprint super-glue fuming
- To provide students with the ability to perform classical experiments used by forensic scientists today when solving a crime

Students will participate in solving a crime, while learning about:

*Finger printing:

- why and when they form, what makes them unique to each human being
- fingerprints on palm, toes, and soles
- common human fingerprint patterns, different forms of fingerprint indentions
- ways fingerprints are retrieved from a crime scene

*Blood typing:

- the four blood groups, and in-depth explanations of antigen-antibody differences among them
- blood inheritance patterns
- common blood splatter patterns seen at crime scenes, and explanations of distinctive blood marks seen when different objects hit against an artery or vein
- coagulation testing

*DNA analysis (*for classes with 90 minutes*):

- overview of DNA basics, including difference between types of DNA, bases, and bonds
- explanation of the "Central Dogma" and its importance in DNA identification
- isolation of DNA from different substances, specifically saliva
- description of DNA presence on a substance due to trace saliva by amylase testing
- Southern blotting techniques [gel electrophoresis]

Experiments run by students include fingerprinting on model windows, such as in the crime, blood coagulation test to narrow down the suspects, and DNA analysis through gel electrophoresis to ultimately identify the final suspect and *solve the crime!*