

# Biotechnology Lesson 3: Using PCR as a Crime Scene Tool CSI at Brighton High

Subject Area	Biology/Biotechnology
Age or Grade	Juniors/Seniors AP Biology
Estimated Length	4 85 minute class periods
Prerequisite knowledge/skills	DNA structure and function.
Description of New Content	DNA profiling determines the exact genotype of a DNA sample, and distinguishes one human being from another by identifying unique differences in their DNA. This powerful tool can be used in crime scene investigations, missing persons, mass disasters, and paternity testing. One way this can be done is by using the technique polymerase chain reaction (PCR) and gel electrophoresis. In this particular lab students will amplify repetitive sequences in DNA samples known as short tandem repeats (STR's), an example of a variable number tandem repeat.
Goals	To learn how DNA profiling and how it is used to differentiate individuals at a crime scene. As well as to learn about the technique polymerase chain reaction (PCR) and gel electrophoresis.
Materials Needed	<a href="#">Crime Scene Investigator PCR Basics Kit</a> PCR Thermocycler. Gel box, and power source. Micro-pipetmem, and pipette tips.
Procedure	Day 1 Introduction: Students will receive a refresher on DNA structure and replication, followed by a brief discussion on crime scene forensics. The students will then receive information about a crime scene that will correspond to the

	<p>samples and crime scene evidence.</p> <p>Day 2 Lab Activity Part 1: Students will participate in a lab activity using PCR to amplify short tandem repeats from samples taken from the crime scene and suspects.</p> <p>Day 3 Lab Activity Part 2: Students will load their PCR samples onto an agarose gel, run the gel, and stain the gel overnight.</p> <p>Day 4 Lab Activity Part 3: Students will analyze their gels, and determine which sample matches the crime scene sample.</p>
References	Bio-rad: <a href="#">Crime Scene Investigator PCR Basics Kit</a>