

*Pre-Lab, Skills, and Standards Alignments*

**DNA FINGERPRINT**

In this lab, DNA from “evidence” and “suspects” are compared using restriction enzyme digest and agarose gel electrophoresis. DNA analysis is combined with crime scene data to draw conclusions about each suspect.

**Lab Length:** 1 hour or 2 hours

**Suggested Pre-Lab Teaching**

- DNA structure and function, heredity

**Lab Skills**

- Prepare an agarose gel.
- Use micropipettes to measure small volumes of liquid and load DNA into agarose gels.
- Perform agarose gel electrophoresis to visualize DNA.
- Analyze and interpret DNA fingerprints from “evidence” and “suspects.”

**Conceptual Knowledge/Skills**

- Use agarose gel electrophoresis results to determine whose DNA was at the “crime scene.”
- Explain how the agarose gel electrophoresis results support a conclusion.
- Describe how restriction enzymes cut DNA, and how they can be used to differentiate DNA sequences.

**New York State Science Learning Standards/NGSS**

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Engaging in Argument from Evidence</u> Use an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or model for a phenomenon or a solution to a problem.</p>	<p><u>LS3.A: Inheritance of Traits</u> Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. (MS-LS3-1)  Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (MS-LS3-2)</p>	<p><u>Cause and Effect</u> Cause and effect relationships may be used to predict phenomena in natural systems.  <u>Interdependence of Science, Engineering, and Technology</u> Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.</p>