

Unit Twelve

Title DNA Fingerprinting and Forensic Analysis

Big Idea:

DNA from individuals can be cut and made visible for use as a forensic tool.

Essential Questions:

How much of our DNA is similar to each other and other organisms?

How do restriction enzymes locate cut sites?

What increases the likelihood that matching samples of DNA belong to the same individual?

What environmental factors influence the productivity of enzymes?

How is DNA made visible?

How does electrophoresis move DNA?

How is DNA fingerprinting and profiling used today?

Vocabulary Restriction site EcoRI HindIII cell membrane polar negative positive buffer temperature pH salinity DNA fingerprint agarose gel electrophoresis loading dye RFLP

NGSS Priority Standards

HS-LS3-1

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS-LS3-2

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

HS-ETS1-3

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

Common Core Math and LA Common Core State Standards Connections:

ELA/Literacy -

RST.11-12.7

Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

RST.11-12.8

Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

RST.11-12.9

Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Mathematics -

MP.2

Reason abstractly and quantitatively.

MP.4

Model with mathematics.

