

DNA ACTIVITIES: INSTRUCTIONS

In these activities you will learn the procedure for extracting and analyzing DNA. Once you have mastered this procedure, you will learn how some of these lab techniques are used to identify suspects.

We are currently processing the DNA from the blood found at the crime scene, when you have shown that you can extract and analyze DNA you will be given the DNA report for comparison.

Complete the following DNA activities in this order:

1. Go to "Nova Online"

<http://www.pbs.org/wgbh/nova/sheppard/lab01.html>

***You need the DNA FingerPrinting "Virtual Lab" Sheet to fill out.**

DO:

- "It Takes a Lickin"
- "DNA Fingerprinting at the NOVA Lab"
- Evaluate



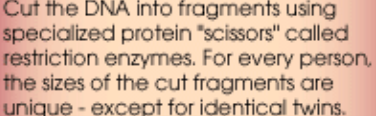
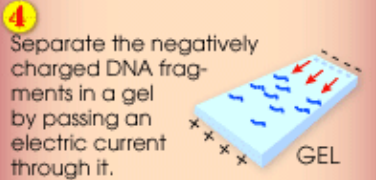
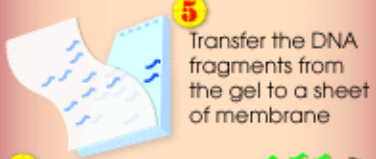

2. Go to "Learn Genetics" at the Univ. of Utah

<http://learn.genetics.utah.edu/>

- Do the VIRTUAL LAB....."DNA Extraction"
- Do the VIRTUAL LAB....."PCR"
- Do the VIRTUAL LAB....."Gel Electrophoresis"
- Do the VIRTUAL LAB....."DNA Microarray"

3. Put together 6 hard pieces of EVIDENCE to obtain a warrant for your suspect. This DNA evidence can be compared to the DNA in the blood stain found at the crime scene. A slam dunk or is it?

FORENSIC DNA ANALYSIS

- 1** Collect evidence from the crime scene

- 2** Isolate DNA from an evidence sample

- 3** Cut the DNA into fragments using specialized protein "scissors" called restriction enzymes. For every person, the sizes of the cut fragments are unique - except for identical twins.

- 4** Separate the negatively charged DNA fragments in a gel by passing an electric current through it.

- 5** Transfer the DNA fragments from the gel to a sheet of membrane

- 6** Probe the membrane with DNA fragments that complement the DNA sequence of the fragments of interest.

- 7** Compare the fragment profile of the evidence DNA with those of the suspects, detective and victim to see if they match.

Evidence DNA	Suspect #1	Suspect #2	Victim	Officer
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
- 8** Re-probe the membrane up to 10 more times to identify different fragments.

If the profiles from the evidence DNA and a suspect match multiple times, then it is very likely that the evidence DNA came from the suspect.